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Regulation of Drones

Australia • Canada • China • France • Germany • Israel
Japan • New Zealand • Poland • South Africa
Sweden • Ukraine • United Kingdom
European Union

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Contents

Comparative Summary 1

Australia 13

Canada 24

China 36

France 42

Germany 52

Israel 60

Japan 68

New Zealand 71

Poland 83

South Africa 86

Sweden 98

Ukraine 108

United Kingdom 113

European Union 122

Selected Bibliography 133

Comparative Summary

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I. Introduction

The increased use of drones for civilian applications has presented many countries with regulatory challenges. Such challenges include the need to ensure that drones are operated safely, without harming public and national security, and in a way that would protect areas of national, historical, or natural importance. A variety of the countries surveyed in this report have also made efforts to address concerns regarding the property and privacy rights of landowners or other persons impacted by the operation of drones.

International standards to regulate certain aspects of drone operations are currently being considered by the International Civil Aviation Organization (ICAO). In 2011 the ICAO issued a circular titled Unmanned Aircraft Systems (UAS) (CIR328). Serving as a first look at the subject, the circular calls on states to provide comments, "particularly with respect to its application and usefulness," in an effort to proceed with the development of "the fundamental international regulatory framework through Standards and Recommended Practices (SARPs), with supporting Procedures for Air Navigation Services (PANS) and guidance material, to underpin routine operation of UAS throughout the world in a safe, harmonized and seamless manner comparable to that of manned operations."[1]

Efforts to harmonize rules of drone operations are currently being undertaken by the European Commission, which has introduced a proposal to integrate all drones, regardless of their size, into the EU aviation safety framework.

While some individual countries have adopted legislation or implemented temporary provisions on the operation of drones, various regulatory and legislative proposals are currently being considered.

This report surveys the regulation of drone operations under the laws of twelve countries as well as the European Union. Countries surveyed use different terminology in regulating drones. Such terms include "unmanned aircraft systems" (UAS); "unmanned aerial [or air] vehicles" (UAVs), and "remotely piloted aircraft" (RPA). For the purpose of uniformity and to reflect the terminology used by the ICAO, this summary refers to drones as UAS, to include all types of unmanned systems, vehicles, and aircraft, excluding model aircraft used for hobby or recreational purposes.

Similarly, in conformity with universal, commonly used measurements, references to weight and distance in this summary are to kilograms (kg), meters, and kilometers.

[1] ICAO, Unmanned Aircraft Systems (UAS), Circular 328 AN/190 (2011), https://www.trafikstyrelsen.dk/~/media/Dokumenter/05%20Luftfart/Forum/UAS%20-%20droner/ICAO%20Circular%20328%20Unmanned%20Aircraft%20Systems%20UAS.ashx, *archived at* https://perma.cc/J5EM-TSAY.

II. Scope of Regulations

Several countries surveyed regulate UAS operations according to their weight and/or type of use.

A. European Union Member States

The operation of large civilian drones exceeding 150 kg in European Union (EU) Member States is regulated by EU Law and monitored by the European Aviation Service Agency. Smaller drones are largely unregulated at the EU level at this time and are thus regulated by the individual EU Member States.

In France the operation of UAS that weigh no more than 25 kg for experimental or testing purposes does not generally require a special permit as long as the operation complies with certain flight requirements. The operation of UAS that have a mass of less than 150 kg for other "particular activities," primarily for commercial use, is subject to rules. For UAS of 150 kg or more, which are subject to EU-level regulation, the flight and use conditions are authorized on a case-by-case basis.

Under German law, the operation of a UAS that weighs more than 25 kg will not be authorized. In order to operate a UAS that weighs more than 5 kg the owner must obtain specific flight authorization from the aviation authority of the German state in question. For UAS that do not weigh more than 5 kg and do not have a combustion engine, a general authorization to fly may be granted for a period of two years. A general authorization is only issued for a specific state, but may be recognized by other states.

Poland currently excludes UAS weighing less than 25 kg from registration requirements. If the weight exceeds 25 kg a permit to fly is required and operational restrictions may be applicable.

Swedish regulations establish several categories based on UAS weight and usage. UAS used for commercial and research purposes, and those flown outside the sight of the operator, generally require licenses from the Swedish Transport Agency.

While generally exempting the operation of UAS weighing 20 kg or less from airworthiness and flight-crew licensing requirements, the United Kingdom subjects UAS that weigh between 20–150 kg to all articles of its Air Navigation Order. Operators of these aircraft are therefore required, among other things, to obtain a certificate of airworthiness, have a permit to fly, and have a licensed flight crew.

B. Australia

Newly adopted rules in Australia, when they come into force, will generally exempt commercial flights of UAS weighing less than 2 kg from the need for a remote pilot's license or operator's certificate. Operating UAS weighing 2–25 kg will similarly be exempt if flown over a person's own land for certain purposes and in compliance with standard operating conditions. Operating UAS weighing between 25 and 150 kg under similar conditions will require a remote pilot's license. Operators of large UAS, as well as smaller UAS for other nonrecreational purposes, will

still be required to obtain a remote pilot license and operator's certificate. Large UAS must also obtain airworthiness certifications.

C. Canada

In Canada, the need for a UAS operator to have a special flight operations certificate depends upon whether the UAS is used for recreational or nonrecreational purposes, its weight, and whether particular exemptions apply. UAS that weigh 35 kg or less and are used for recreational purposes do not require such a certificate. The operation of UAS for nonrecreational purposes or of UAS that weigh more than 35 kg (irrespective of the purpose) require a certificate. UAS that weigh less than 2 kg or between 2 kg and 25 kg are subject to exemptions if the operator is able to follow strict safety conditions.

New regulations for UAS that weigh 25 kg or less are being developed. These regulations will eliminate the current distinction between recreational and nonrecreational uses. The proposed changes provide a classification system based on the risks involved in the use of UAVs, with the operation of UAS weighing 25 kg or more continuing to be subject to the licensing requirement.

D. China

Interim provisions regulating UAS have recently been issued by China's civil flight regulatory body. While generally exempting UAS weighing 1.5 kg or less from their application, the interim provisions apply to UAS with a maximum empty weight of 116 kg or less, or a maximum take-off gross weight of 150 kg or less, and a calibrated air speed of no greater than 100 kilometers per hour. The provisions are also applicable to "plant protection UAS" used for agricultural, landscaping, or forest protection purposes with a maximum take-off gross weight of 5,700 kg or less and flying no higher than 15 meters above the surface, and to unmanned airships with an inflatable volume of 4,600 cubic meters or less.

E. Israel

Under Israeli law, the operation of all UAS is generally subject to extensive regulation regardless of their weight or type of use under special rules applicable to UAS and general rules that apply to all aircraft.

F. Japan

Japanese law exempts UAS that weigh 200 grams (7 ounces) or less from the licensing and conditions enumerated in the country's Aviation Act.

G. New Zealand

New Zealand differentiates among unmanned aircraft based on their weight. UAS weighing between 15 and 25 kg may not be operated unless constructed under the authority of, or inspected and approved by, an approved person or organization. Such UAS must be operated in compliance with a list of operating limits enumerated by law. The operation of UAS that weigh

more than 25 kg, and the operation of any size UAS outside of the operating limits, requires an unmanned aircraft operator certificate from the Civil Aviation Authority.

H. South Africa

South Africa permits the use of what are known as Class-1 and Class-2 UAS, which are further divided into subclasses, for private, commercial, corporate and nonprofit operations. The level of both technical and operational requirements that apply to UAS in South Africa differs based on the type of operation. For instance, a private operation may only be conducted using a Class-1A UAS (less than 1.5 kg in weight) or Class-1B UAS (less than 7 kg in weight). Private operations are exempt from various requirements applicable to other operations, including the need to obtain a letter of approval, certification of registration, and UAS operator certificate. The level of restrictions applicable to a UAS operation is also related to the complexity of the operation in question. Additional restrictions apply to operations in a controlled airspace and beyond visual line of sight (VLOS).

I. Ukraine

In Ukraine all aircraft, including UAS, that are owned by a legal entity incorporated in Ukraine or by a natural person resident in Ukraine, or rented or leased by a Ukrainian operator from the nonresident owner, must be registered, with the exception of those having a maximum take-off weight not exceeding 20 kg that are used for entertainment and sports activities.

III. Jurisdiction

The countries surveyed usually implement aviation regulations through their national civil aviation authorities. While in most countries the regulation of UAS falls under the jurisdiction of the national government, local authorities in various countries may also have a role in approving UAS operations within their jurisdiction.

In New Zealand, for example, local authorities and the Department of Conservation may decide whether consent to operate unmanned aircraft in public areas within their jurisdiction is required. Similarly in South Africa every operation that needs the Civil Aviation Authority Director's approval may require the approval of local authorities. This applies, for example, to the use of a public road as a takeoff or landing ground. All local laws that relate to various aspects of UAS operation are also applicable.

Local authorities in the United Kingdom have differed with regard to their level of involvement. Some local authorities appear not to have published any guidance on the use of drones in their localities. Other local authorities specifically require UAS owners to comply with the Air Navigation Order and the Civil Aviation Authority requirements for licenses for commercial flights. Local authorities also have the ability to introduce policies to regulate the use of UAS on any land owned by the authority. Refusal to comply with local authorities in the city of Leicester, for example, will result in the removal of the person from the relevant property in accordance with the city's by-laws.

IV. UAS Registration and Labeling

Several countries surveyed have or are in the process of requiring the registration and labeling of certain UAS. In Sweden all UAS must be marked either with the name and telephone number of the operator as well as the certification number (where applicable), or with the registration number in the case of unmanned aircraft certified for use outside the view of the operator.

A proposal by the Israeli Civil Aviation calls for the establishment of a register that would include all UAS owned by Israeli citizens or by Israeli corporations that have received authorization to deal with UAS in Israel. The proposal also calls for labeling UAS with information confirming their Israeli registration, the name of the manufacturer, and the registration number. In addition, the proposal would require fire-resistant license plates in all UAS. The plates would contain specific identifying information including aircraft type, model, and serial number, as well as UAS authorization status.

A UAS registered in South Africa is considered to have South African nationality and it must be engraved with an identification plate including its nationality and registration marks. The South Africa Civil Aviation Technical Standards include additional particulars on the required identification plates and display of marks, including the appropriate colors and fonts, location, allocation, and specification of marks.

The German Ministry of Transportation and Digital Infrastructure is currently working on legislation that would require all UAS weighing more than 0.5 kg to be registered in order to be able to hold the operator/owner accountable if the UAS is used in an unsafe manner or for illegal purposes.

V. Flight Authorization Information

The level of information and documentation required under the laws of the countries surveyed varies. For example, in Canada a request for operating a UAS generally requires identification of the person designated by the applicant to have operational control over the operation. Other required information includes the method by which the operation manager may be contacted directly during operation, the type and purpose of the operation, the altitudes and routes to be used on the approach and departure to and from the area where the operation will be carried out, and other necessary identifying details regarding the planned operation.

In France an application for a permit to fly UAS for experimental and testing purposes must include a description of the proposed conditions of the experimental flights, and of the measures taken to ensure the safety of third parties both on the ground and in the air. Authorization for UAS operation for commercial uses requires certification of the design indicating that adequate analysis and tests have been conducted to ensure safe use of the UAS. The operation of UAS also requires a declaration by the operator describing the activity for which the UAS is being used.

In Germany, an application for either general or specific authorization must identify, in the case of an individual's applicant, his/her name, address and date and place of birth. For a business,

the application must include the name of the company, as well as the name, address, and date and place of birth of the registered agent and of all employees who will operate the UAS. The application must also include the reason for the operation of the UAS and provide proof of sufficient insurance for personal and property damage as required by law.

In addition to the information required for a general authorization, an applicant for a specific flight authorization in Germany must provide specific geographical and technical data on the UAS's planned operation and the operator's skills; a data privacy statement; and authorizations from the relevant competent regulatory or police agency or the competent nature conservation authority, if applicable.

While operators of small unmanned aircraft are generally not required to seek prior approval in New Zealand, certain requirements apply for UAS weighing between 15 and 25 kg. Operators of UAS weighing over 25 kg in that country are subject to more extensive requirements. Issuance of an operating certificate for these types of UAS requires identification of the person with primary responsibility for the operation; details of the physical locations to be used in the operation; information on known and likely hazards to people, property, and other aircraft; an assessment of risks associated with those hazards; and a description of the measures that can be implemented to mitigate or manage the risks. Proof of the knowledge, competence, and fitness of the personnel involved is also required. Details of the aircraft type, identification and control system to be used, and operational procedures and airworthiness assessments are also required.

The operation of a UAS for nonprivate purposes in South Africa requires a letter of approval (RLA) and a certificate of registration. An RLA requires that the applicant submit documentation regarding the UAS's design and safety-related standards.

VI. UAS Operator Qualifications

Several of the countries surveyed impose specific requirements regarding UAS operators' qualifications.

To be eligible for operating a UAS in Australia, operators must obtain certain qualifications, complete certain training, and have a minimum number of hours of experience flying UAS. Entities wishing to obtain an operator's certificate to operate large UAS or smaller (nonexcluded) UAS for nonrecreational purposes must have the facilities, procedures, and personnel needed to operate the UAS safely.

In France UAS operators for "particular [commercial] activities" are generally required to have a certificate of theoretical competence for flying a manned aircraft. They are similarly required to have passed a practical training course. Pilots of UAS flown within a horizontal distance of no more than 1 kilometer from the pilot are subject to additional requirements, which include having a manned aircraft pilot's license, and a specified term of practical piloting experience. The pilots of drones other than tethered aerostats weighing more than 25 kg must perform a demonstration flight before an agent of the ministry in charge of civil aviation before they are authorized to perform the flight.

In Germany the issue of a specific authorization for the operation of a UAS that weigh between 5 and 25 kilograms requires the applicant to provide information on the operator's knowledge and experience, or proof of training.

All aircraft operators, including UAS operators, in Israel must meet certain conditions concerning residence and citizenship, place of incorporation, and location of primary business, as relevant. Additional requirements for licensing of commercial operations include possession of the aircraft and necessary equipment for its operation, and authorization for flying and landing in designated areas in Israel. In addition, a concept paper published by the Israeli Civil Aviation Agency called for incorporating the requirements provided by Circular 328 AN/190 of the International Civil Aviation Organization into regulations that would require a UAS operator to acquire a license containing a specified authorization for the type of activity and equipment involved. Conditions for the issuance of flight licenses would accordingly include a minimum number of prior takeoffs and landings, depending on the type of flight, in the ninety days preceding the flight. Furthermore, the type of licenses issued would be based on the characteristics of the operator—for example, trainee, flyer of a UA subject to VLOS, UAS flyer, and UAS instructor; on the type of flight (domestic, external, experimental); and on the UAS type, category, and class.

According to a New Zealand Advisory Circular, the knowledge and skills needed for the operation of UAS that weigh more than 25 kg or that operate outside of general operating limits may be demonstrated by different qualifications or licenses and/or by the completion of certain training, as well as evidence of relevant experience.

Operators of commercial UAS flights in Poland must have a certificate of competency from the Polish Civil Aviation Authority. The certificate will be issued to individuals who have passed a medical check-up, taken theoretical and practical tests, and have insurance. The certificate of competency can be limited to certain weight ranges (from less than 2 kg to less than 150 kg) and classes of UAS (airplane, helicopter, airship, or multirotor). Obtaining a VLOS operation certificate requires the applicant to sign a declaration of knowledge of relevant regulations and basic theory (airspace, emergencies, flight rules, etc.), and pass theoretical and practical tests conducted by a CAA examiner. A certificate of competency for BVLOS operation allows a pilot to fly beyond VLOS and requires the applicant to take training courses in addition to successfully passing theoretical and practical tests.

In Sweden operating a UAS weighing more than 7 kg within VLOS requires that the operator be eighteen years old. Operating a certified UAS outside of VLOS requires the operator to be at least twenty-one years old and no more than sixty-seven years old, and to hold a certain level of medical certificate attesting to his/her health. In addition to age and health requirements, where applicable, operators must be certified by the Swedish Transport Agency as having completed an unmanned aerial system educational program. General guidelines also require that the pilot have knowledge of the flight safety standards laid down by the Executive Director of the European Aviation Safety Agency.

A valid UAS license is required for commercial, corporate, and nonprofit operations of UAS in South Africa. To obtain a UAS pilot's license applicants must be eighteen years of age or older.

They similarly must hold current medical assessments and present evidence of having successfully completed necessary training. Applicants must also pass the UAS practical assessment and radiotelephony examination, as well as an English language proficiency test. Other professionals operating UAS are subject, among other requirements, to various security reviews, including background checks and periodic criminal record checks.

VII. Operational Requirements

A review of the individual country surveys indicates a variety of operational requirements. The following are some examples.

A. Spatial Restrictions

UAS may generally not be flown above people and public gatherings in several of the countries surveyed, including in France, Germany, Japan, Poland, and the United Kingdom. Restrictions on flights over sensitive locations such as military installations, airfield traffic zones, prisons, and nuclear power plants were identified in many of the countries, including in France, Israel, Germany, Japan, New Zealand, Poland, Sweden, South Africa, Ukraine, and the United Kingdom. Absent prior authorization, flights are also prohibited over specified historical monuments and/or national parks or natural reserves in France, Israel, and Sweden.

Regulation of UAS operations in airport-controlled zones are found in a variety of countries including China, Germany, Israel, Japan, Poland, and Sweden.

A detailed list of specified areas designated as prohibited, restricted, and dangerous for flying is available in Israel. The list provides relevant geographical coordinates, as well as minimum and maximum flight altitudes over designated areas. Similar designations of areas that are prohibited, restricted, and dangerous are indicated under Chinese laws and regulations. A detailed map illustrating where the flying of UAS is restricted in Sweden is maintained by the Air Navigation Services of Sweden.

B. Radio Communication

Several countries surveyed regulate radio frequencies that can be used by UAS. For example, China is identified as a country that allocates specific radio frequency spectrum to UAS flights. Similarly, according to New Zealand's radio spectrum management agency, UAS must use certain radio frequencies to avoid harmful interference with vital radio systems such as those used by air traffic control, cellular phones, or emergency services.

In Sweden all frequencies used by UAS must be preapproved by the Swedish Post and Telecom Authority. Polish telecommunications law requires a license if the UAS uses certain frequencies for communication, although most UAS use frequencies that do not require a license.

South Africa requires all UAS operations to be conducted within a radio line of sight. Additionally, the air-band radio must have the required output and be configured in such a way that the range, strength of transmission, and quality of communication extends beyond the

furthest likely position of the UAS from the pilot. Additional requirements may apply depending on the specific operation in question.

The United Kingdom considers UAS as model control equipment subject to the use of frequencies of the 35 MHz band, which is solely dedicated to aeronautic modeling. Regulations require that model control equipment must not cause undue interference with other wireless telegraphy equipment. The use of these specific frequencies for model control in the United Kingdom is exempt from the requirement to hold a license under its Wireless Telegraphy Act 2006 as long as the model meets certain conditions, such as operating within the designated frequencies, and the equipment must be marked lawfully in accordance with the CE marking and comply with all relevant EU directives.

C. Visual Line of Sight

The country surveys reflect different approaches to maintaining VLOS between the UAS and its operator.

The operation of any type of UAS in Australia usually requires that the operator maintain a VLOS unless prior approval is granted.

In China UAS flying within VLOS must be operated in the daytime. Such a requirement does not apply to UAS flying beyond visual line of sight (BVLOS), but a certain regulatory framework for addressing emergencies applies to BVLOS flights. Both UAS flying within VLOS and BVLOS must give way to manned aircraft.

The maintenance of VLOS between the operator and the UAS is generally required in Germany, where UAS cannot weigh more than 25 kilograms and must be kept within VLOS at all times.

Japan requires operators of all UAS that weigh over 200 grams to monitor the UAS and its surroundings with their own eyes at all times.

In New Zealand, UAS may be flown without the need for an operating certificate if they weigh less than 25 kg and do not exceed certain operating limits. The operating limits include a requirement for the operator to maintain unaided VLOS with the aircraft. Flying any aircraft BVLOS requires an operating certificate.

In Poland a certificate of competency for UAS flight operators can allow for operation in VLOS or BVLOS conditions. If the weight exceeds 25 kg a permit to fly is required and operational restrictions may be applicable (e.g., VLOS only and/or minimum distance from populated areas, people, and property).

Swedish rules generally require UAS lighter than 7 kg that do not create more than a specified level of kinetic energy to be flown within visual sight of the operator.

In South Africa a BVLOS operation is permitted only by special approval based on certain requirements, which vary depending on whether the operation is in or outside of a controlled airspace.

In the United Kingdom UAS weighing less than 20 kg are required to maintain a direct, unaided, visual contact that is sufficient to monitor the flight path of a small unmanned aircraft in relation to other aircraft, persons, vehicles, vessels, and structures in order to avoid collisions.

D. Safety Features

Safety devices are required to be installed in UAS in several countries.

For example, France requires a certification of design as a precondition for the operation of UAS. France also imposes a number of safety requirements that apply specifically to certain types of UAS use. Among the requirements for the issuance of a certificate of design outside a populated area, where no third party is within the area of operation, and within a horizontal distance of no more than 1 kilometer from the pilot, is that the UAS would have an automatic system to prevent it from going beyond the horizontal distance limits of the flight, or would have an alarm system to warn the pilot when it goes beyond those limits.

The use of UAS of 2 kg or more in a populated area in France, but without flying over any third party, staying within the pilot's line of sight, and within a horizontal distance of no more than 100 meters from the pilot, requires the UAS to be equipped with a system to protect third parties. This system is supposed to automatically activate if the UAS lands by itself following a loss of contact with the pilot. UAS of a weight of 4 kg or more would additionally have to have equipment to ensure that the pilot can know the aircraft's speed. This equipment must be independent from the UAS main control link, and there must be an audible alarm to warn of the UAS's fall.

In Sweden all uses of UAS require that they be equipped with an emergency device, enabling shutdown of the UAS if needed. An override system must also be available for UAS with an automated flight system. Additional safety devices including protection against misleading signals either from an outside source or from weather phenomena, availability of transponders, and a compatible anticollision systems, among other things, are required for certain types of UAS in Sweden.

E. Insurance

Several countries require UAS operators to acquire insurance covering liability for third parties on the ground. Such countries include China, Germany, Poland, Sweden, South Africa, and the United Kingdom (for UAS of more than 20 kg).

VIII. Real-Time Supervision System: The Electric Fence and UAS Cloud

Among the countries surveyed China was the only country identified as requiring the installation of an "electric fence" that stops certain UAS from entering specific prohibited areas. China also requires such UAS to be connected to a "UAS Cloud," which has an alarm function that is activated when flights cross the electric fence. The frequency of reporting by operators depends on their weight and ability to operate within a designated area beyond VLOS.

IX. Privacy

Privacy concerns regarding UAS operations have been raised by the European Parliament and other EU bodies, informed by EU and Member State legislation on personal data protection and privacy which impose strict standards on the processing of personal data.

Such concerns are also reflected in the laws of some of the surveyed countries. German air traffic regulation and common principles put particular emphasis on the observance of data privacy and data protection rules. UAS operations that violate these rules will not be authorized. Similarly, principles contained in the New Zealand Privacy Act can apply where an operation involves filming or recording of people.

As in Germany and New Zealand, the operation of UAS in Sweden for recording purposes may be restricted because of privacy rights considerations. The Swedish Administrative Supreme Court is set to decide whether the use of cameras on UAS constitutes "camera surveillance" as defined in Swedish law. The Swedish Parliament is also in an initial phase of considering amendments to legislation regarding privacy in connection with camera surveillance, with the Justice Department having published a Committee Directive in 2015.

The privacy rules with regard to the use of UAS technology by individuals for collecting or recording information in Australia seem to be currently uncertain. In 2014, a parliamentary committee recommended a review of the relevant legislation, but no changes have been proposed to date. A survey of the relevant law in France, Israel, or Japan similarly does not indicate any special regulation on this topic.

Although Polish regulations do not address the issue of personal data protection and privacy concerning the use of UAS, flights above another person's property may constitute an infringement of personal rights.

In the United Kingdom the recording of images obtained via UAS could potentially breach the obligations contained in the Data Protection Act and the CCTV Code of Practice, which address certain aspects of the use of drones that collect information about individuals. Businesses that use UAS that process personal information are required by the Data Protection Act to be listed on the Data Protection Public Register. Furthermore, flying of UAS registered outside of the United Kingdom over the UK for the purposes of aerial photography or aerial surveys is prohibited in the absence of a special authorization.

The specific rules on handling of UAS are outlined in the attached surveys of legislation in individual countries and under EU law.

Australia

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SUMMARY Australia has regulated unmanned aircraft since 2002. The relevant regulations are being substantially revised in 2016, including new rules related to using remotely piloted aircraft (RPA) for nonrecreational purposes that come into force in September 2016. The new rules provide for commercial operations of very small RPA (weighing less than 2 kilograms/4.4 pounds) to be conducted without the need for a remote pilot license or operator's certificate, provided that these are operated under the standard conditions established in the new regulations. Small RPA (2–25 kilograms/4.4–55 pounds) will also be able to operate over a person's own land for certain purposes and under the standard conditions without the need for certification and a license, while the use of medium RPA (25–150 kilograms/55–330.7 pounds) for the same purposes and under the standard conditions will only require a remote pilot's license. Operators of large RPA, as well as smaller RPA for other nonrecreational purposes, will still be required to obtain a remote pilot license and operator's certificate. Large RPA must also have airworthiness certification.

To be eligible for a remote pilot license, operators must obtain certain qualifications, complete certain training, and have a minimum number of hours of experience flying RPA. Entities wishing to obtain an operator's certificate to operate large RPA or smaller (nonexcluded) RPA for nonrecreational purposes must have the facilities, procedures, and personnel needed to operate the RPA safely.

There is currently some uncertainty with respect to the privacy rules applicable to the use of drone technology for collecting or recording information. In 2014, a parliamentary committee recommended a review of the relevant legislation, but no changes have been proposed to date.

I. Introduction

The Australian Civil Aviation Safety Authority (CASA) states that "Australia was the first country in the world to regulate remotely piloted aircraft, with the first operational regulation for unmanned aircraft in 2002."[1] The current rules related to remotely piloted aircraft (RPA) and model aircraft are contained in Part 101 of the Civil Aviation Safety Regulations 1998 (Cth) (CASR).[2]

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[1] *CASA and Remotely Piloted Aircraft*, CASA, https://www.casa.gov.au/aircraft/standard-page/casa-and-remotely-piloted-aircraft (last visited Apr. 4, 2016), *archived at* https://perma.cc/6NUC-HKK7.

[2] Civil Aviation Safety Regulations 1998 (Cth) (CASR), pt 101, https://www.legislation.gov.au/Details/F2016C00234, *archived at* https://perma.cc/3K2L-24HP. The CASR are made under the Civil Aviation Act 1988 (Cth), https://www.legislation.gov.au/Details/C2016C00190, *archived at* https://perma.cc/6WTA-EADA.

CASA is currently working to modernize the regulations and expects to complete a full rewrite by the end of 2016.[3] To achieve this, two "post-implementation review" projects have been initiated with respect to Part 101.[4]

A. US 14/18 – Review of Certain Aspects of Part 101

The objectives of this project include to review the provisions in the regulations related to model aircraft in terms of their "effectiveness in managing emerging risks associated with use of unmanned aircraft which fall outside the scope" of the provisions on large and commercially-used RPA, and to generally review all of Part 101 other than the large and commercially-used RPA provisions.[5]

B. OS 11/20 – Review of Regulations and Guidance Material Related to Unmanned Aircraft Systems (UAS)

The objective of this project is to "provide an up to date regulation and more comprehensive guidance to industry on the regulatory requirements and approval processes for the commercial operation of RPAS [remotely piloted aircraft systems] in Australia."[6] It is being conducted in two phases. Phase 1 involves amendments to Part 101 of the CASR and the publication of a suite of advisory circulars to provide guidance to industry. The process included the development of a notice of proposed rulemaking (NPRM), which was released in 2014, with people able to submit comments on the proposed changes to Part 101.[7]

On March 24, 2016, an amending regulation, the Civil Aviation Legislation Amendment (Part 101) Regulation 2016 (Cth) (2016 Regulation), was promulgated.[8] The amendments will come into force on September 29, 2016.[9] CASA states that the amendments "reduce the cost and legal requirements for lower-risk remotely piloted aircraft (RPA) operations. More complex

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[3] *CASA and Remotely Piloted Aircraft*, *supra* note 1.

[4] *CASR Part 101 – Unmanned Aircraft and Rocket Operations*, CASA, https://www.casa.gov.au/standard-page/casr-part-101-unmanned-aircraft-and-rocket-operations (last visited Apr. 4, 2016), *archived at* https://perma.cc/D59Z-949V.

[5] *Project US 14/18 – Post-Implementation Review – Certain Aspects of Part 101 of CASR*, CASA, https://www.casa.gov.au/standard-page/project-us-1418-post-implementation-review-certain-aspects-part-101-casr (last visited Apr. 4, 2016), *archived at* https://perma.cc/8HF6-TAMH.

[6] *Project OS 11/20 – Review of Regulations and Guidance Material Related to Unmanned Aircraft Systems*, CASA, https://www.casa.gov.au/standard-page/project-os-1120-review-regulations-and-guidance-material-relating-unmanned-aircraft (last visited Apr. 4, 2016), *archived at* https://perma.cc/PS6T-99ZY.

[7] *NPRM 1309OS – Remotely Piloted Aircraft Systems*, CASA, https://www.casa.gov.au/standard-page/nprm-1309os-remotely-piloted-aircraft-systems (last visited Apr. 4, 2016), *archived at* https://perma.cc/JP32-NWPG.

[8] Civil Aviation Legislation Amendment (Part 101) Regulation 2016 (Cth) (2016 Regulation), https://www.legislation.gov.au/Details/F2016L00400, *archived at* https://perma.cc/8YD4-LP3G.

[9] *CASR Part 101 – Unmanned Aircraft and Rocket Operations*, CASA, https://www.casa.gov.au/standard-page/casr-part-101-unmanned-aircraft-and-rocket-operations (last visited Apr. 4, 2016), *archived at* https://perma.cc/S26R-PG3A.

operational matters will be dealt with in a new manual of standards to be developed with industry, providing greater flexibility and responsiveness in this rapidly evolving area."[10]

This report outlines the rules contained in Part 101, as amended by the 2016 Regulation.

Phase 2 of the project "will consist of a complete re-write of the regulation resulting in a new CASR Part 102 for RPAS."[11]

II. CASR Part 101

There are currently three subparts in Part 101 of the CASR that specifically regulate different sizes and uses of RPA and model aircraft: Subpart 101.C contains provisions that are applicable to unmanned aircraft generally; Subpart 101.F, as amended by the 2016 Regulation, applies to the operation of "large" RPA and of "very small," "small," and "medium" RPA for purposes other than sport or recreation; and Subpart 101.G relates to model aircraft, which are only used for recreational purposes. Subpart 101.A also contains some preliminary provisions relevant to operating RPA, and Subpart 101.B includes a general prohibition on the unsafe operation of unmanned aircraft.

The 2016 Regulation will insert a new Subpart 101.AB that provides for the general authorization for people supporting the operation of model aircraft and RPA.[12] As noted above, 2016 Regulation also provides for CASA to issue a "Manual of Standards" prescribing matters required or permitted by the regulations, or that are otherwise "necessary or convenient" to be prescribed in terms of giving effect to Part 101.[13] Other changes include the following:[14]

- Changing the terminology relating to unmanned aircraft from "UAV" (unmanned aerial vehicle) to RPA, to align with that used by the International Civil Aviation Organization.
- Creating new weight classifications for RPA, being "very small" (less than 2 kilograms/4.4 pounds), "small" (2–25 kilograms/4.4–55 pounds), "medium" (25–150 kilograms/55–330.7 pounds), and "large" (more than 150 kilograms/330.7 pounds).[15]
- Introducing the concept of "excluded RPA," which relates to RPA operations considered to be of lower risk, as determined by RPA category and operational use, and that will consequently have reduced regulatory requirements.

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[10] *Part 101 Amendments – Cutting Red Tape for Remotely Piloted Aircraft*, CASA, https://www.casa.gov.au/aircraft/standard-page/part-101-amendments-cutting-red-tape-remotely-piloted-aircraft (last visited Apr. 4, 2016), *archived at* https://perma.cc/49XE-275R.

[11] *CASA and Remotely Piloted Aircraft*, *supra* note 1.

[12] 2016 Regulation, sch 1, item 7.

[13] *Id.* sch 1, item 6 (inserting new r 101.028).

[14] *See id.*; Civil Aviation Legislation Amendment (Part 101) Regulation 2016 – Explanatory Statement, https://www.legislation.gov.au/Details/F2016L00400/Explanatory%20Statement/Text, *archived at* https://perma.cc/GXC5-372F.

[15] 2016 Regulation, sch 1, items 91 (inserting new definition of "large RPA"), 93 (inserting new definition of "medium RPA"), 97 (inserting new definition of "small RPA") & 101 (inserting new definition of "very small RPA").

- Establishing a set of standard RPA operating conditions, which must be complied with in order for certain operations to be considered excluded RPA operations.
- Establishing a new system that allows very small RPA to be operated for commercial purposes without the need for prior certification or licensing, provided certain conditions are met.

The amendments prohibit autonomous flights "until such time as suitable regulations can be developed by CASA." However, the explanatory statement accompanying the 2016 Regulation states that "there is scope for autonomous flight to be approved by CASA on a case-by-case basis in the meantime."[16]

A. General Operating Rules: Subpart 101.C

Subpart 101.C applies to unmanned aircraft of all kinds, except control-line model aircraft and model aircraft flown indoors.[17] It provides that, in order to legally operate any unmanned aircraft, the following requirements must be met:

- The aircraft may not be operated in or over a prohibited or restricted area, unless permission is obtained from the relevant authority controlling the area.[18]
- The aircraft may be operated at an altitude greater than 400 feet above ground level only in designated areas of controlled airspace and in accordance with air traffic control clearance.[19] Under the 2016 Regulation, the Manual of Standards "may prescribe requirements relating to the operation of unmanned aircraft in controlled airspace."[20]
- The aircraft must be operated within the operator's visual line of site, unless approval is granted by the CASA.[21]
- The aircraft may only be operated at an altitude above 400 feet within three nautical miles of an airfield if permitted by the regulations or is otherwise granted by the relevant air traffic control service or by the CASA.[22]
- The aircraft may also be operated above 400 feet in approved areas.[23]
- A person must not cause any item to be dropped or discharged from the aircraft in a way that creates a hazard to another aircraft, person, or property.[24]

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[16] Civil Aviation Legislation Amendment (Part 101) Regulation 2016 – Explanatory Statement, *supra* note 14.

[17] CASR Part 101, rr 101.005 & 101.060.

[18] *Id.* r 101.065.

[19] *Id.* r 101.070.

[20] 2016 Regulation, sch 1, item 11 (inserting new r 101.072).

[21] *Id.* sch 1, item 11 (inserting new r 101.073). "Visual line of site" means that the operator "can continually see, orient and navigate the aircraft 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." *Id.*

[22] CASR Part 101, rr 101.075 & 101.080.

[23] *Id.* r 101.085.

- The aircraft must be operated in visual meteorological conditions, or in instrument meteorological conditions with appropriate approvals.[25]

B. Operating Large RPA and Operating Other RPA for Nonrecreational Purposes: Subpart 101.F

As noted above, Subpart 101.F (as amended) applies to the operation of very small, small, and medium RPA "other than for the purpose of sport or recreation," and to the operation of any large RPA.[26] In many circumstances, the person actually operating such RPA must hold a "remote pilot license"[27] and the relevant entity must hold a certificate authorizing the operation (currently referred to as a UAV operator's certificate or UOC).[28] Under the 2016 Regulation, these requirements will not apply if the operation involves an "excluded RPA."

All operators of RPA covered by Subpart 101.F, other than those operating very small RPA, must also hold a "relevant qualification" related to the use of aeronautical radio, and must maintain a "listening watch" on a specified frequency or frequencies, as well as making required broadcasts at specified intervals.[29]

In general, RPA must not be operated within 30 meters of a person "not directly associated with the operation" of the RPA.[30] The 2016 Regulation creates new exceptions to this rule, stating that it does not apply if the person is standing behind the RPA while it is taking off, or to very small, small, and medium RPA where the person has consented and the RPA is operated no closer than 15 meters to him or her.[31]

The amendments also provide for the Manual of Standards to prescribe requirements relating to the operation of RPA in certain areas.[32]

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[24] *Id.* r 101.090.

[25] *Id.* r 101.095; *Model Aircraft and RPA*, CASA, https://www.casa.gov.au/operations/standard-page/model-aircraft-and-rpa (last visited Apr. 11, 2016), *archived at* https://perma.cc/DB7W-ZATV.

[26] 2016 Regulation, sch 1, item 21 (inserting new r 101.235).

[27] 2016 Regulation, sch 1, item 30 (inserting new r 101.252). Under the current (unamended) CASR provisions, the requirement is for a person to obtain "certification as a UAV controller." Detailed provisions are contained in CASR Part 101, div 101.F.3, with the rules to be amended and substituted by 2016 Regulation, sch 1, items 49–64.

[28] 2016 Regulation, sch 1, item 37 (inserting new r 101.270). Detailed provisions related to the "certification of UAV operators" are currently contained in CASR Part 101, div 101.F.4, with rules to be amended and substituted by 2016 Regulation, sch 1, items 64–82. *See also Operating an Unmanned Aircraft Safely*, CASA, https://www.casa.gov.au/aircraft/standard-page/operating-unmanned-aircraft-safely (last visited Apr. 6, 2016), *archived at* https://perma.cc/CLF2-CPM9.

[29] CASR Part 101, r 101.285, as amended by 2016 Regulation, sch 1, items 44–48.

[30] *Id.* Part 101, r 101.245(1).

[31] 2016 Regulation, sch 1, items 24 (inserting new r 101.245(2) & (3)).

[32] *Id.* sch 1, item 25 (inserting new r 101.247).

1. Excluded RPA

For the purposes of Subpart 101.F, the 2016 Regulation provides that "excluded RPA," for which operators are not required to obtain the license and certification referred to above, include the following:[33]

- A micro RPA, being an RPA with a gross weight of 100 grams or less.[34]
- A very small RPA if it is being operated for the purpose of sport or recreation or in standard RPA operating conditions.
- A small RPA if it is being operated by or on behalf of the owner of the RPA, over land that is owned or occupied by the owner of the RPA, in standard RPA operating conditions, and for certain listed purposes (such as aerial spotting or photography, agricultural operations, communications retransmission, carriage of cargo) for which no remuneration is received by anyone involved in the operation.
- A medium RPA in accordance with the same terms as for a small RPA, above, except that the person operating the RPA must also have a remote pilot license.
- A small or medium RPA being operated for the purpose of sport or recreation, or if it is being operated in standard RPA operating conditions by a person for the purpose of meeting the experience requirement for the grant of a remote pilot license, or by the holder of such a license for the purpose of getting practical experience and gaining competency in the operation of an RPA.
- An RPA being operated for the purpose of receiving training from an RPA operator who holds an operator's certificate.

2. Standard RPA Operating Conditions

The 2016 Regulations sets out the following as being the standard RPA operating conditions:[35]

- The RPA is operated within the visual line of site of the operator.
- The RPA is operated at or below 400 feet above ground level during the day.
- The RPA is not operated within 30 meters of a person not associated with the operation of the RPA.
- The RPA is not operated in a prohibited area, certain restricted areas, over a populous area, or within three nautical miles of the movement area of a controlled airfield.

[33] *Id.* sch 1, item 21 (inserting new r 101.237).

[34] CASR Part 101, r 101.240.

[35] 2016 Regulation, sch 1, item 21 (inserting new r 101.238).

- The RPA is not operated over an area where a public safety or emergency operation is being conducted, unless approval is granted by the person in charge of the operation.
- The person operating the RPA operates only that RPA.

3. Operating Large RPA

In addition to the requirements for a remote pilot's license and operator's certificate, large RPA may only be operated if the operator has been issued a special certificate of airworthiness or an experimental certificate.[36] Furthermore, large RPA can only be operated with the specific approval of CASA, which may impose certain conditions, such as requiring that the RPA stay within a specified area or prohibiting its operation at night.[37]

RPA for which a certificate of airworthiness has been issued must not be operated in 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," unless granted approval from CASA.[38] Before granting such approval, CASA must be satisfied that the operator of the RPA "will take proper precautions to prevent the proposed flight being dangerous to people and property."[39]

The regulations also require that maintenance be carried out on large RPA in compliance with provisions in the Civil Aviation Rules 1988 (Cth) applicable to Class B aircraft.[40]

4. Operating Other RPA for Nonrecreational Purposes

The regulations state that a very small, small, or medium RPA used for a nonrecreational purpose may be operated outside of an approved area if it stays clear of populous areas and, if it is to be operated above a height of 400 feet, the operator has obtained CASA's approval to do so.[41] Approval cannot be granted to operate such 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."[42]

As indicated above, unless it is an excluded RPA, persons operating an RPA for nonrecreational purposes must first obtain a remote pilot license and the relevant business must have an operator's certificate. Excluded RPA include very small RPA operated in standard operating conditions.

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[36] CASR Part 101, r 101.255.

[37] *Id*. r 101.275.

[38] *Id*. r 101.280(3).

[39] *Id*. r 101.280(5).

[40] *Id*. r 101.260.

[41] *Id*. r 101.250, as amended by 2016 Regulation, sch 1, items 27–29.

[42] *Id*. r 101.280(2).

The 2016 Regulation also inserts new provisions regarding the operation of very small RPA (i.e., weighing less than 2 kilograms/4.4 pounds) for "hire or reward,"[43] which require an operator to notify CASA at least five business days before first conducting the operation.[44] Such operations, in order to avoid certification and licensing requirements, must still be conducted under the standard RPA operating conditions, including with respect to height, distance from people, and distance from controlled airfields.[45]

5. Remote Pilot Licenses

The regulations set out what must be included in an application for a remote pilot license and the eligibility criteria for granting a license. The eligibility criteria, as amended by the 2016 Regulation, require a person to have passed one of certain types of examinations or components of training courses related to aviation theory or aeronautical knowledge, to have completed one of certain types of training courses related to the operation of the RPA that he or she proposes to operate, and to have at least five hours experience in operating an RPA under standard RPA operating conditions.[46]

Remote pilot licenses may be subject to conditions related to the type of RPA that a license holder may operate and the areas where he or she may operate RPA, or requiring that he or she only operate RPA in visual meteorological conditions.[47] The 2016 Regulation sets out particular conditions that must apply to the licenses, which relate to additional requirements for certain qualifications in order for the license holder to operate RPA in particular ways, such as above 400 feet in controlled airspace or outside of his or her visual line of sight.[48]

6. RPA Operator's Certificate

The regulations also set out the requirements for applications for certification as an RPA operator and the eligibility criteria for granting certification. The eligibility criteria require the operator to show that the company or other legal entity has

- "an organisation and structure that is appropriate for safe operation of RPA";
- "enough qualified and experienced personnel to undertake the proposed operations safely";
- "facilities and equipment appropriate to carry out the proposed operations using [RPA] of the type to be used";

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[43] 2016 Regulation, sch 1, item 82 (inserting new div 101.F.5).

[44] *Id*. (inserting new r 101.372).

[45] *See* Reece Clothier & Jonathan Roberts, *New Relaxed Drone Regulations Will Help the Industry Take Off*, THE CONVERSATION (Apr. 7, 2016), https://theconversation.com/new-relaxed-drone-regulations-will-help-the-industry-take-off-57201, *archived at* https://perma.cc/2NBF-YFPV.

[46] CASR Part 101, r 101.295, as amended by 2016 Regulation, sch 1, items 54–58.

[47] *Id*. r 101.300.

[48] 2016 Regulation, sch 1, item 60.

- "suitable documented practices and procedures to do so, including practices and procedures for the maintenance of the operator's RPASs"; and
- "nominated suitable persons to be its chief [RPA] controller and maintenance controller."[49]

Various conditions are imposed on an operator's certificate, including that the person "maintains within its organisation a position of chief remote pilot" with certain minimum functions and duties.[50] These functions, which are inserted by the 2016 Regulation, include "ensuring the operator's RPA functions are conducted in accordance with the civil aviation legislation," maintaining a record of the qualifications of each person operating RPA and monitoring their operational standards and efficiency, and maintaining a library of operational documents required by CASA.[51]

In the past ten years, the number of certified drone operators has grown from about twenty-five to 500 (as of March 31, 2016).[52]

C. Operating Model Aircraft: Subpart 101.G

A "model aircraft" is defined as "an aircraft that is used for sport or recreation, and cannot carry a person."[53] Subpart 101.G applies to the operation of such aircraft weighing 100 grams or more, except control-line model aircraft and model aircraft flown indoors.[54]

A person can operate a model aircraft only in good visibility, or at night in accordance with the written procedures of an approved organization. He or she must ensure that the aircraft remains at least 30 meters away from other people. Outside of approved areas, a model aircraft can be flown above a height of 400 feet if the operator keeps it in sight and keeps it clear of populous areas.[55] "Giant model aircraft," being model aircraft weighing between 25 and 150 kilograms, may only be operated in accordance with the rules and procedures of an approved organization or an approval given by CASA.[56]

III. Enforcement and Penalties

CASA is responsible for enforcing the provisions in the Civil Aviation Act 1988 (Cth) and the CASR.[57] Various criminal offense provisions that may be relevant to the operation of unmanned

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[49] CASR Part 101, r 101.335, as amended by 2016 Regulation, sch 1, item 68.

[50] *Id*. r 101.340, as amended by 2016 Regulation, sch 1, item 69.

[51] 2016 Regulation, sch 1, item 74 (inserting new r 101.342).

[52] *CASA Issues 500th UAV Operator Certificate*, AVIATION BUSINESS (Mar. 31, 2016), http://www.aviationbusiness.com.au/news/casa-issues-500th-uav-operator-certificate, *archived at* https://perma.cc/PSF7-94FS.

[53] CASR, Dictionary, Part 1.

[54] CASR Part 101, r 101.375.

[55] *Id*. rr 101.385–101.400.

[56] *Id*. r 101.405.

[57] Civil Aviation Act 1988 (Cth), s 9.

aircraft are contained in the Act. For example, a person who operates an aircraft without a certificate of airworthiness, where such a certificate is required by the regulations, may be subject to a penalty of imprisonment for two years.[58] The same penalty can be applied to flying an aircraft without a required license or other authorization.[59]

In terms of regulatory offenses, as noted above, Subpart 101.B sets out a general prohibition on the operation of any unmanned aircraft "in a way that creates a hazard to another aircraft, another person, or property."[60] Breaching this prohibition is a strict liability offense that is subject to a penalty of 50 penalty units. Under Australian federal law a penalty unit is currently AU$180,[61] making the fine for this offense AU$9,000 (about US$6,815).

Other offenses accompany many of the provisions referred to in this report. For example, a fine of 50 penalty units may be imposed for not complying with a requirement related to the operation of an unmanned aircraft in controlled airspace or prescribed areas; operating an unmanned aircraft outside of the operator's visual line of site, without a remote pilot license, or without an RPA operator's certificate; breaching a condition of a license or certificate; or operating a very small RPA for hire or reward without notifying CASA.[62]

Offenses in the regulations that are subject to a fine of 25 penalty units (AU$4,500, about US$3,408) include operating an unmanned aircraft above a height of 400 feet within three nautical miles of an airfield, dropping or discharging things in a way that creates a hazard to another aircraft or to a person or property, operating in prohibited visual conditions, and operating an RPA in controlled airspace without holding an aeronautical radio operator certificate.[63]

IV. Application of the Privacy Act 1988 (Cth)

The CASR do not specifically address the use of camera, audio recording, or other surveillance equipment on unmanned aircraft. The Privacy Act 1988 (Cth)[64] is a federal law that "regulates the handling of personal information about individuals."[65] It contains thirteen Australian Privacy Principles setting out "standards, rights and obligations for the handling, holding, use, accessing and correction of personal information (including sensitive information)."[66]

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[58] *Id.* s 20AA(3).

[59] *Id.* s 20AB.

[60] CASR Part 101, r 101.055(1).

[61] Crimes Act 1914 (Cth), s 4AA(1), https://www.legislation.gov.au/Details/C2016C00121, *archived at* https://perma.cc/J8QL-HAFY. The dollar amount of a penalty unit is indexed every three years based on inflation.

[62] 2016 Regulation, sch 1, items 11, 25, 30, 37, 60 & 82.

[63] CASR Part 101, rr 101.075, 101.090, 101.095 & 101.285.

[64] Privacy Act 1988 (Cth).

[65] *Privacy Law*, OFFICE OF THE AUSTRALIAN INFORMATION COMMISSIONER (OAIC), https://www.oaic.gov.au/privacy-law (last visited Apr. 7, 2016), *archived at* https://perma.cc/92LB-2QH3.

[66] *Id.*

The Office of the Australian Information Commissioner has published correspondence with the Attorney-General from 2012 and 2013 relating to the current privacy laws and their application to surveillance or recording of information using drones. The correspondence notes that the obligations in the Privacy Act 1988 (Cth) only apply to federal government agencies and certain private sector organizations; they does not apply to persons acting in an individual capacity.[67] However, in addition to the CASR, other federal and state laws could potentially apply to the use of drones by individuals to photograph or record personal information.[68] The Attorney-General stated that she would contact state and territory governments to seek their views regarding the adequacy of current legislation in regulating the use of surveillance drones.[69]

In 2014, a parliamentary committee conducted a series of roundtable discussions and hearings regarding drones and privacy.[70] The committee's report recommended that CASA and the Australian Privacy Commissioner review the adequacy of the privacy and air safety regimes in relation to RPA.[71] To date, no changes to the relevant laws have been announced.[72]

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[67] *Regulation of Drone Technology*, OAIC, https://www.oaic.gov.au/media-and-speeches/statements/regulation-of-drone-technology (last visited Apr. 8, 2016), *archived at* https://perma.cc/ST9S-7EZL.

[68] For example, the Queensland Office of the Information Commissioner has published guidance regarding the different laws applicable to the collection of information using drone technology, although this is primarily targeted at government agencies. *Privacy and Drone Technology*, OFFICE OF THE INFORMATION COMMISSIONER, QUEENSLAND, https://www.oic.qld.gov.au/guidelines/for-government/guidelines-privacy-principles/applying-the-privacy-principles/privacy-and-drone-technology (last visited Apr. 8, 2016), *archived at* https://perma.cc/4VG6-7NA3; *Drones – Collection, Storage and Security of Personal Information*, OFFICE OF THE INFORMATION COMMISSIONER, QUEENSLAND, https://www.oic.qld.gov.au/guidelines/for-government/guidelines-privacy-principles/applying-the-privacy-principles/drones-collection,-storage-and-security-of-personal-information (last visited Apr. 8, 2016), *archived at* https://perma.cc/EM2N-5C48; *Drones – Outsourcing, Use and Disclosure of Personal Information*, OFFICE OF THE INFORMATION COMMISSIONER, QUEENSLAND, https://www.oic.qld.gov.au/guidelines/for-government/guidelines-privacy-principles/applying-the-privacy-principles/drones-outsourcing,-use-and-disclosure-of-personal-information, *archived at* https://perma.cc/8SPW-ZXQT.

[69] *Regulation of Drone Technology*, *supra* note 67.

[70] *Roundtable on Drones and Privacy*, PARLIAMENT OF AUSTRALIA, HOUSE STANDING COMMITTEE ON SOCIAL POLICY AND LEGAL AFFAIRS, http://www.aph.gov.au/Parliamentary_Business/Committees/House/Social_Policy_and_Legal_Affairs/Drones (last visited Apr. 7, 2016), *archived at* https://perma.cc/4E95-F2XH.

[71] HOUSE OF REPRESENTATIVES STANDING COMMITTEE ON SOCIAL POLICY AND LEGAL AFFAIRS, EYES IN THE SKY: INQUIRY INTO DRONES AND THE REGULATION OF AIR SAFETY AND PRIVACY (July 2014), http://www.aph.gov.au/~/media/02%20Parliamentary%20Business/24%20Committees/243%20Reps%20Committees/SPLA/Drones/fullreport.pdf, *archived at* https://perma.cc/7RHU-Y7HF.

[72] *See, e.g.*, *Are Australia's Privacy Laws Ready for Drones?*, HHG LEGAL GROUP (Nov. 17, 2015), http://www.hhg.com.au/blog/are-australia-s-privacy-laws-ready-for-drones-1, *archived at* https://perma.cc/K7RM-AZ76; Matthew Craven & Claire Harris, *Regulation of Drones in Australia – A Balancing Act*, CORRS CHAMBERS WESTGARTH (July 31, 2016), http://www.corrs.com.au/publications/corrs-in-brief/regulation-of-drones-in-australia-a-balancing-act, *archived at* https://perma.cc/6QUZ-V7A3; Kieran Gair, *Privacy Concerns Mount as Drones Take to the Skies*, THE SYDNEY MORNING HERALD (Dec. 12, 2015), http://www.smh.com.au/digital-life/consumer-security/privacy-concerns-mount-as-drones-take-to-the-skies-20151208-glijvk.html, *archived at* https://perma.cc/RTM5-74K7; Omar Mubin, *Police Drones: Can We Trust the Eyes in the Skies?*, THE CONVERSATION (Feb. 29, 2016), https://theconversation.com/police-drones-can-we-trust-the-eyes-in-the-skies-53981, *archived at* https://perma.cc/FY57-W2VU.

Canada

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SUMMARY In Canada, the regulation of unmanned air vehicles (UAVs) falls under the jurisdiction of the federal government. UAVs are mainly regulated by the Canadian Aviation Regulations (CARs) and standards, guidelines, and circulars issued by Transport Canada. The applicable rules and the necessity for a UAV operator to have a special flight operations certificate (SFOC) depend upon the use of the UAV (recreational vs. nonrecreational), its weight, and whether particular exemptions apply. Drones or model aircraft that weigh 35 kilograms or less and are used for recreational purposes do not require a government-issued SFOC but are subject to safety guidelines. Drones that are used for nonrecreational purposes, or that weigh more than 35 kilograms (irrespective of their purpose), require an SFOC to be flown. Specific directions for operating UAVs are set forth in a General Safety Practices circular issued by Transport Canada and in the SFOC. UAVs that weigh less than 2 kilograms or between 2 kilograms and 25 kilograms are subject to exemptions if the operator is able to follow the strict safety conditions outlined in the two exemptions.

Transport Canada is in the process of issuing new regulations for UAVs that weigh 25 kilograms or less that will eliminate the current distinction between recreational and nonrecreational use. The proposed changes provide a classification system based on the risks involved in the use of UAVS. UAVs weighing 25 kilograms or more will continue to be regulated by the SFOC requirements.

I. Introduction

A. Constitutional Jurisdiction

Canada's federal government has primary jurisdiction over matters related to aviation and aeronautics. Section 91 of the Constitution Act, 1867, gives the federal government the general power to make "Laws for the Peace, Order, and good Government of Canada."[1] In 2010, the Supreme Court of Canada held that aeronautics was in the exclusive jurisdiction of the federal government and "falls within a residuum of national importance, which brings it under Parliament's power to legislate for the peace, order and good government of Canada."[2]

[1] Constitution Act, 1867, 30 & 31 Victoria c. 3, § 91 (U.K.), http://laws-lois.justice.gc.ca/eng/Const/FullText.html, *archived at* https://perma.cc/4ZV3-NY69.

[2] Quebec (Attorney General) v. Lacombe, 2010 S.C.C. 38, ¶ 26, http://scc-csc.lexum.com/scc-csc/scc-csc/en/item/7880/index.do, *archived at* https://perma.cc/5G34-MPZA.

Therefore, through the federal government's primary jurisdiction over aviation and aeronautics, the regulation of unmanned air vehicles (UAVs) also falls within the scope of the federal government's constitutional power.[3]

The main legislation that regulates aviation is the Aeronautics Act[4] and its subordinate regulations, the Canadian Aviation Regulations (CARs).[5] In addition, UAV operators must "follow the rules in all acts and regulations—including the *Criminal Code*, as well as all municipal, provincial, and territorial laws regarding trespassing and privacy."[6] Transport Canada, the government department that regulates the use of UAVs,[7] is "responsible for the issuance of transportation (including aviation) operating permits and certifications and for transportation safety oversight."[8]

The Canadian Aviation Regulation Advisory Council (CARAC) "is a joint undertaking of government and the aviation community" whose main objective is to "to assess and recommend potential regulatory changes through cooperative rulemaking activities."[9] In 2010 CARAC established the "Unmanned Aircraft System Program Design Working Group to develop new regulations to increase the safety, scope and regulatory efficiency of commercial UAV applications in Canada."[10]

Regarding the role of municipalities to regulate drones, municipal lawyer Carrie Moffat states that,

> [w]hile Transport Canada generally regulates flying machines in air however they are defined, this does not preclude municipalities from regulating things and activities that are in, on or near public places or other matters liable to disturb the public. But as the

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[3] Martin F. Sheehan & Michael Parrish, *Regulation of Unmanned Aerial Vehicles ("Drones") in Canada*, FASKEN MARTINEAU, http://www.fasken.com/drones-canada/#_ftn2 (last visited Apr. 7, 2016), *archived at* https://perma.cc/QQ95-5WNT.

[4] Aeronautics Act, R.S.C.1985, c. A-2, http://laws-lois.justice.gc.ca/eng/acts/A-2/FullText.html, *archived at* https://perma.cc/L72B-XD2B.

[5] Canadian Aviation Regulations (SOR/96-433), *as amended through* Aug. 31, 2015, http://laws-lois.justice.gc.ca/eng/regulations/SOR-96-433/FullText.html, *archived at* https://perma.cc/CPD3-LA26.

[6] *Flying a Drone Recreationally*, TRANSPORT CANADA, http://www.tc.gc.ca/eng/civilaviation/standards/standards-4179.html (last updated Feb. 9, 2016), *archived at* https://perma.cc/PG92-CSXT. The laws that may apply include, but are not limited to, the Charter of Rights and Freedoms, Criminal Code of Canada, Privacy Act, Personal Information Protection and Electronic Documents Act, Customs Act, Trespass Act, Radiocommunication Act, National Parks Aircraft Access Regulations, Environmental Protection Act, Transportation of Dangerous Goods Act, and Canadian Transportation Accident Investigation and Safety Board Act.

[7] *Id*.

[8] Laura Safran & Prasad Taksal, *Canada: The Aviation Law Review – Canada Chapter*, MONDAQ (Sept. 18, 2014), http://www.mondaq.com/canada/x/341018/Aviation/The+Aviation+Law+Review+Canada+Chapter, *archived at* https://perma.cc/EEE3-JQ7Y.

[9] *Canadian Aviation Regulation Advisory Council (CARAC)*, TRANSPORT CANADA, https://www.tc.gc.ca/eng/civilaviation/regserv/affairs-carac-menu-755.htm (last updated Aug. 14, 2014), *archived at* https://perma.cc/565G-VZTW.

[10] Sheehan & Parrish, *supra* note 3.

> case law illustrates, a bylaw that seeks to regulate whether, where and how drones can be operated in and near public space would likely be found valid under its public place powers in the Community Charter provided that is does not substantially interfere or conflict with federal authority or laws. The case law also indicates that a municipal bylaw that regulates activities such as the use of drones near airports would not fly.[11]

B. Drone Industry in Canada

Reflecting the "exponential growth" of the unmanned aircraft industry over the past few years,[12] the 345 special flight operation certificates (SFOCs) for UAVs that Transport Canada issued in 2012 had grown to 1,672 by 2014.[13] According to lawyers Sheehan and Parrish,

> [t]he expansion of commercial UAV use in Canada in the last 10 years has been dramatic. Due to Canada's large geography, small population and resource focused economy, there are many potential applications for UAVs for Canadian businesses. . . . The number of UAV operations conducted in 2014 under the SFOC exemptions is not known but can be estimated to be in the thousands. This growth is expected to continue as UAV technology continues to develop.[14]

II. Regulation Based on Size and Use

Whether a UAV requires an SFOC depends on its use, its weight, and whether particular exemptions apply.[15]

A. Recreational Use

The Canadian Aviation Regulations defines a "model aircraft" as "an aircraft, the total weight of which does not exceed 35 kg (77.2 pounds), that is mechanically driven or launched into flight for recreational purposes and that is not designed to carry persons or other living creatures."[16] Model aircraft are usually described as devices that are used by hobbyists for recreational purposes. Therefore, if an aircraft weighs 35 kilograms or less and is used for "fun of flying

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[11] Carrie Moffat, *Game of Drones*, LAW LETTER (Lidstone & Company, Vancouver, B.C.), Fall 2015, at 13, http://lidstone.info/wp-content/uploads/2015/10/FALL-2015-Newsletter-00337772xBCD32.pdf, *archived at* https://perma.cc/7B86-J9K4.

[12] *Transport Canada to Introduce New Drone Regulations*, CTV NEWS (Jan. 11, 2016), http://www.ctvnews.ca/canada/transport-canada-to-introduce-new-drone-regulations-1.2732227, *archived at* https://perma.cc/ZT6E-AS3Z.

[13] Press Release, Government of Canada, Transport Canada Encourages New Drone Users to Learn Rules Before Flying (Dec. 11, 2015), http://news.gc.ca/web/article-en.do?nid=1024519, *archived at* https://perma.cc/6UN4-W6UF.

[14] Sheehan & Parrish, *supra* note 3.

[15] TRANSPORT CANADA, FLYING AN UNMANNED AIRCRAFT? FIND OUT IF YOU NEED PERMISSION FROM TRANSPORT CANADA, http://www.tc.gc.ca/media/documents/ca-standards/Info_graphic_-_Flying_an_umanned_aircraft_-_Find_out_if_you_need_permission_from_TC.pdf (last visited Apr. 7, 2016), *archived at* https://perma.cc/6K7N-X6UF.

[16] Canadian Aviation Regulations § 101.01(1).

only," a person does not need permission from Transport Canada for its use.[17] All that is required is to follow the law and fly safely according to safety guidelines.[18]

If an aircraft weighs more than 35 kilograms (irrespective of its use, whether recreational or otherwise) it is legally considered a UAV,[19] and owners must apply for an SFOC.[20]

B. Nonrecreational Use

Canadian Aviation Regulations define an "unmanned air vehicle" as "a power-driven aircraft, other than a model aircraft, that is designed to fly without a human operator on board."[21] According to section 602.41 of the Regulations, "[n]o person shall operate an unmanned air vehicle in flight except in accordance with a special flight operations certificate or an air operator certificate."[22]

Therefore, operators of UAVs used for nonrecreational purposes—namely, work or research—are legally required to apply for an SFOC.[23] According to Transport Canada, "[t]his applies to all UAVs used for anything but the fun of flying and regardless of how much they weigh. Transport Canada inspectors will review your SFOC application and determine what safety conditions are needed to reduce the risks."[24]

However, under what Transport Canada describes as "very specific, lower-risk circumstances," a person may qualify for exemptions. It is for this reason that Canada is considered to have a permissive regulatory approach to the commercial use of drones.[25]

Persons who wish to fly drones that weigh between 2.1 kilograms and 25 kilograms can do so without permission, as long as they meet certain exemption requirements. This exemption "relieves persons conducting non-recreational UAV system operations utilizing a UAV with a

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[17] *Flying a Drone Recreationally*, *supra* note 6.

[18] TRANSPORT CANADA, DO'S AND DON'TS FOR FLYING YOUR DRONE SAFELY AND LEGALLY, http://www.tc.gc.ca/media/documents/ca-standards/Info_graphic_-_Dos_and_Donts_for_flying_your_drone_safely_and_legally.pdf (last visited Apr. 7, 2016), *archived at* https://perma.cc/Z7ZM-GB3N.

[19] Transport Canada, Staff Instruction (SI) No. 623-001, Review and Processing of an Application for a Special Flight Operations Certificate for the Operation of an Unmanned Air Vehicle (UAV) System ¶ 12.1, Nov. 19, 2014, http://www.tc.gc.ca/eng/civilaviation/standards/general-recavi-uav-4161.html#toc3_7, *archived at* https://perma.cc/C7G7-ESLK.

[20] *Flying a Drone Recreationally*, *supra* note 6.

[21] Canadian Aviation Regulations §101.01(1).

[22] *Id*. § 602.41.

[23] *Flying a Drone or an Unmanned Air Vehicle (UAV) for Work or Research*, TRANSPORT CANADA, http://www.tc.gc.ca/eng/civilaviation/standards/general-recavi-uav-2265.htm?campaign=2014-uav-socialmedia-facebook&WT.mc_id=hruzf#safety (last updated Dec. 23, 2015), *archived at* https://perma.cc/57MT-NGAM.

[24] *Id*.

[25] *Are Canada's Drone Regulations Too Permissive?*, CTV NEWS (Aug. 16, 2015), http://www.ctvnews.ca/canada/are-canada-s-drone-regulations-too-permissive-1.2519071, *archived at* https://perma.cc/SVU9-BAV9.

maximum take-off weight not exceeding 2 kilograms, operated within visual line-of-sight [VLOS][,] from the requirement to obtain a Special Flight Operations Certificate (SFOC)."[26] Another exemption relieves persons "conducting non-recreational UAV system operations utilizing a UAV with a maximum take-off weight exceeding 2 kgs but not exceeding 25 kgs, operated within visual line-of-sight[,] from the requirement to obtain a Special Flight Operations Certificate (SFOC)."[27] Even though permission is not needed for drones weighing between 2.1 kilograms and 25 kilograms, a notification to Transport Canada that includes a description of the operation and geographical boundaries of the operation via a submission form is required.[28]

C. SFOC Certificate

According to Transport Canada, the SFOC "contains conditions specific to the proposed use, such as maximum altitudes, minimum distances from people and property, operating areas, and coordination requirements with air traffic services."[29] There are a "number of SFOC application processes depending on the nature and use of the UAV," and "the more complex and risky the proposed operation, the more thorough and onerous the application process."[30] Essentially the most important aspect of the SFOC application is the operator's proof to Transport Canada that he/she will be operating the drone safely and not disrupting air traffic.

The application for an SFOC for the purpose of operating a UAV requires the following information:

> *(a)* the name, address, and where applicable, the telephone number and facsimile number of the applicant;
>
> *(b)* the name, address, and where applicable the telephone number and facsimile number of the person designated by the applicant to have operational control over the operation (Operation Manager);
>
> *(c)* method by which the Operation Manager may be contacted directly during operation;

[26] Transport Canada, Exemption from Sections 602.41 and 603.66 of the Canadian Aviation Regulation, "Purpose," http://www.tc.gc.ca/civilaviation/regserv/affairs/exemptions/docs/en/2880.htm (last updated Nov. 27, 2014), (providing an exemption for a UAV with a maximum take-off weight not exceeding 2 kg), *archived at* https://perma.cc/4J2Y-NHHD. In both exemptions "visual line of sight" (VLOS) is defined as "unaided (corrective lenses and/or sunglasses exempted) visual contact with the UAV sufficient to be able to maintain operational control of the aircraft, know its location, and be able to scan the airspace in which it is operating to decisively see and avoid other air traffic or objects." Transport Canada, *id.*, "Interpretation."

[27] Transport Canada, Exemption from Sections 602.41 and 603.66 of the Canadian Aviation Regulation, http://www.tc.gc.ca/civilaviation/regserv/affairs/exemptions/docs/en/2879.htm (last updated Nov. 27, 2014), (providing an exemption for a UAV with a maximum take-off weight exceeding 2 kgs but not exceeding 25 kgs), *archived at* https://perma.cc/4SD4-ZHA6.

[28] *Flying a Drone or an Unmanned Air Vehicle (UAV) for Work or Research*, *supra* note 23.

[29] *Id.*, "Frequently Asked Questions: What is the Purpose of a Special Flight Operations Certificate?"

[30] Sheehan & Parrish, *supra* note 3.

> *(d)* the type and purpose of the operation;
>
> *(e)* the dates, alternate dates and times of the proposed operation;
>
> *(f)* a complete description, including all pertinent flight data on the aircraft to be flown;
>
> *(g)* the security plan for the area(s) of operation and security plan for the area(s) to be overflown to ensure no hazard is created to persons or property on the surface;
>
> *(h)* the emergency contingency plan to deal with any disaster resulting from the operation;
>
> *(i)* the name, address, telephone and facsimile numbers of the person designated to be responsible for supervision of the operation area (Ground Supervisor), if different from the Operation Manager during the operation;
>
> *(j)* a detailed plan describing how the operation shall be carried out. The plan shall include a clear, legible presentation of the area to be used during the operation. The presentation may be in the form of a scale diagram, aerial photograph or large scale topographical chart and must include at least the following information:
>
> > (i) the altitudes and routes to be used on the approach and departure to and from the area where the operation will be carried out;
> >
> > (ii) the location and height above ground of all obstacles in the approach and departure path to the areas where the operation will be carried out;
> >
> > (iii) the exact boundaries of the area where the actual operation will be carried out;
> >
> > (iv) the altitudes and routes to be used while carrying out the operation;
>
> *(k)* any other information pertinent to the safe conduct of the operation requested by the Minister.[31]

An application for an SFOC for the purpose of flying a UAV has to be "received by the appropriate Regional Transport Canada General Aviation Office, at least 20 working days prior to the date of the proposed operation or by a date mutually agreed upon between the applicant and Transport Canada."[32]

III. Restrictions on Drone Use

A. Restrictions on Recreational Use

Recreational drone operators must follow Transport Canada's safety guidelines[33] and the rules found in the advisory circular on General Safety Practices – Model Aircraft and Unmanned Air Vehicle Systems.[34]

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[31] Canadian Aviation Regulations (CARs) 2015-2, Part VI – General Operating and Flight Rules, Standard 623 – Special Flight Operations Standards § 623.65(d), https://www.tc.gc.ca/eng/civilaviation/regserv/cars/part6-standards-623d2-2450.htm, *archived at* https://perma.cc/89TL-X2LP.

[32] *Id*.

[33] TRANSPORT CANADA, *supra* note 18.

The safety guidelines advise that the following rules be kept in mind before a flight:

a. Inspect that your model aircraft is ready for flight.
    i. This means that the aircraft, control station components (hardware, software and firmware) and control links are in a fit for flight condition.
b. Seek permission from the property owner on which you intend to operate your model aircraft.
c. Know the classification of the airspace you want to fly in. It would be inappropriate and unsafe for you to operate in airspace with heavy aircraft traffic, such as around airports.
d. Confirm that there is no radio frequency interference (from a nearby radar site for example) that will interfere with the control of your aircraft.
e. Have an emergency plan just in case.
    i. This means know the people and equipment available that could help you respond to an incident, accident, medical emergency, you have a fly-away or if your model aircraft becomes uncontrollable.[35]

These rules also recommend that operators fly their drones during daylight hours and in good weather.[36] During a flight drones should be kept in sight, "where you can see it with your own eyes—not only through an on-board camera, monitor or smartphone."[37] Drone operators should respect the privacy of others and should not operate the drone "with any dangerous goods or lasers on the aircraft."[38]

The guidelines also state that drones should be flown at least 9 kilometers away from airports, heliports, or airfields. They should be no higher than 90 meters above the ground and at least 150 meters away from people, animals, buildings, structures, or vehicles.[39] They should not be flown near moving vehicles, highways, bridges, busy streets, or anywhere they could endanger or distract drivers. They should also not be flown "within restricted and controlled airspace, including near or over military bases, prisons, and forest fires."[40] Drones should not be flown anywhere where they may interfere with first responders. Recreational drones are also prohibited from use in national parks.

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[34] Transport Canada, Advisory Circular (AC) No. 600-002, General Safety Practices – Model Aircraft and Unmanned Air Vehicle Systems, Nov. 27, 2014, http://www.tc.gc.ca/eng/civilaviation/opssvs/managementservices-referencecentre-acs-600-2135.html, *archived at* https://perma.cc/PS5N-D2P6.

[35] *Id*. ¶ 4.2 "Before Your Flight."

[36] *Id*. ¶ 4.2 "During Your Flight" (d).

[37] *Flying a Drone Recreationally*, *supra* note 6.

[38] Advisory Circular (AC) No. 600-002, § 4.2, "During Your Flight" (k).

[39] *Flying a Drone Recreationally*, *supra* note 6.

[40] *Id*.

B. UAV Operators Who Have Been Issued an SFOC

Where a drone is operated under an SFOC, "in addition to any specific directions respecting operations set out in the SFOC and the underlying application," the advisory circular on General Safety Practices—Model Aircraft and Unmanned Air Vehicle Systems apply.[41]

C. UAV Operators Under an SFOC Exemption

If the UAV is operated under an SFOC exemption, the governing guidelines are set out in the Guidance Material for Operating Unmanned Air Vehicle Systems Under an Exemption.[42] This advisory circular sets out all the conditions that must be complied with "in order to use the exemption as your authority to operate a UAV." The circular contains detailed general conditions, flight conditions, and pilot training conditions.

UAV operating guidelines set out in the advisory circular include some of the following rules:

a) A human operator is required at all times;

b) Operators must be at least 18 years of age;

c) Operators cannot be impaired by drugs or alcohol;

d) Autonomous (i.e., computer or GPS controlled or guided) operation is not permitted. UAVs must be directly controlled by a human operator at all times;

e) Beyond-line-of-sight operation is not permitted. Live and direct sight of the UAV by the operator is required at all times;

f) Operation and control of UAVs through on-board camera, monitor or smartphone is not permitted;

g) UAVs may only be flown during daylight and in good weather (not in clouds or fog);

h) UAVs must be in safe and working condition before operating. However, the CARs relating to aircraft certification and airworthiness do not apply to UAVs;

i) UAVs cannot be used to transport dangerous goods.[43]

A pilot can operate a UAV only at or below 300 feet above ground level (AGL). Moreover, a pilot operating under this exemption must not operate a UAV over a forest fire area, or over any area that is located within 5 nautical miles (nm) of a forest fire area. According to the circular, a UAV is prohibited in airspace that has been restricted by the Minister or the Aeronautics Act. A UAV must be flown at least 5 nm away from a built-up area or from the center of any airfield. A drone can be flown only at a lateral distance of at least 500 feet from the general public, buildings, structures, vehicles, vessels, animals, or persons unless certain exceptions apply. (For

[41] Advisory Circular (AC) No. 600-002.

[42] Transport Canada, Advisory Circular (AC) No. 600-004, Civil Aviation Resources, Guidance Material for Operating Unmanned Air Vehicle Systems Under an Exemption, Nov. 27, 2014, http://www.tc.gc.ca/eng/civilaviation/opssvs/ac-600-004-2136.html, *archived at* https://perma.cc/U33W-2KZZ.

[43] Sheehan & Parrish, *supra* note 3.

a UAV not exceeding 2 kilograms, the lateral distance for UAVs is reduced to 100 feet.)[44] A person cannot operate a UAV over an open-air assembly of persons.

Each exemption also contains specific training requirements.[45] For example, according to Transport Canada,

> to fly a UAV that weighs between 2 kg and 25 kg without permission, the UAV pilot must be trained to understand:
>
> - airspace classification and structure
> - weather and notice to airmen (NOTAM) reporting services
> - aeronautical charts and the Canada Flight Supplement
> - relevant sections of the Canadian Aviation Regulations.[46]

As stated in Part II(B), above, drones that weigh between 2 kilograms and 25 kilograms used for nonrecreational purposes are also subject to reporting requirements, including notifying the Minister of the type of work being conducted and specific incidents of injury to any person requiring medical attention or other collisions.

D. Other Applicable Laws

The Criminal Code of Canada contains several offenses "involving the dangerous operation of aircraft and endangering the safety of other aircraft." Punishments for these offenses consist of "monetary penalties and/or jail time including imprisonment for life."[47] According to Transport Canada, "[v]iolations of the model aircraft regulation are handled by the courts or judicial action. Endangering the safety of aircraft is a serious offence under the Aeronautics Act and is punishable by a fine."[48]

The private use of jamming equipment to disrupt drones also appears to be illegal in Canada.[49]

Transport Canada has stated that it is working with the Office of the Privacy Commissioner to ensure that drone operators respect Canada's privacy laws. Privacy concerns have been raised

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[44] Advisory Circular (AC) No. 600-004, ¶ 4.2(27), "Note."

[45] *Id*.

[46] *Flying a Drone or an Unmanned Air Vehicle (UAV) for Work or Research*, *supra* note 23, "Frequently Asked Questions: What Training Is Required to Fly a UAV Under the Exemptions?"

[47] Transport Canada, Staff Instruction (SI) No. 623-001, ¶ 3.8.

[48] Transport Canada, Advisory Circular (AC) No. 600-002, § 4.3(1).

[49] Pierre Chauvin, *Can We Stop the Drones Invading Our Public and Private Spaces?*, THE GLOBE & MAIL (Sept. 18, 2014), http://www.theglobeandmail.com/technology/tech-news/can-we-stop-the-drones-invading-our-public-and-private-spaces/article20643509, *archived at* https://perma.cc/CND5-7ZK2. See also *Jamming Devices Are Prohibited in Canada: That's the Law*, INNOVATION, SCIENCE AND ECONOMIC DEVELOPMENT CANADA (July 2011), http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10048.html, *archived at* https://perma.cc/M5AR-9MJX.

by provincial-level privacy commissioners.[50] A 2013 report from the Privacy Commissioner of Canada stated that the current regulations did little to address privacy concerns and that,

> [a]s drones are acquired and put to use in Canada's public and private sectors, it will be important to circumscribe their use within an accountability structure that ensures they are justified, necessary and proportional, and that the necessary checks and balances fundamental to a democratic society are in place to stave off proliferation of uses, abuses, and function creep. Canada's privacy laws will, and do apply to UAVs deployed by public or private sector organizations to collect and/or use personal information about citizens.[51]

IV. Enforcement and Noncompliance

According to Transport Canada, if an incident is reported to the police department, an inspector

> will verify that the operator followed the rules and used the drone safely. Local police may also verify if other laws were broken, including the *Criminal Code* and privacy laws. If you fly a drone for recreational purposes (for the fun of flying), it's illegal to do anything that puts aviation safety at risk.[52]

News reports indicate that enforcement of some of these laws may be lacking.[53]

The use of a UAV without an SFOC may result in a fine of Can$5,000 (approximately US$3,850) for individuals and $25,000 (approximately US$19,240) for corporations.[54] Transport Canada requires SFOCs so that it can verify operators can use their UAV reliably and safely. If an operator does not follow the requirements and conditions of the SFOC, Transport Canada can issue fines of up to Can$3,000 (approximately US$2,310) for an individual and Can$15,000 (approximately US$11,545) for a company.[55] A person who is under an exemption yet operates a UAV in a reckless or negligent manner (e.g., not complying with the conditions in the exemptions) can be subject to a fine of Can$5,000 for individuals or Can$25,000 for corporations.

Since 2010, Transport Canada says it has investigated some fifty incidents involving unmanned aircraft across the country.[56]

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[50] Sheehan & Parrish, *supra* note 3.

[51] RESEARCH GROUP OF THE OFFICE OF THE PRIVACY COMMISSION OF CANADA, DRONES IN CANADA: WILL THE PROLIFERATION OF DOMESTIC DRONE USE IN CANADA RAISE NEW CONCERNS FOR PRIVACY? 14–15 (Mar. 2013), https://www.priv.gc.ca/information/research-recherche/2013/drones_201303_e.pdf, *archived at* https://perma.cc/BE8N-TRAM.

[52] *Flying a Drone Recreationally*, *supra* note 6, "Frequently Asked Questions: How Does Transport Canada Enforce the Regulations?"

[53] CTV NEWS, *supra* note 25.

[54] Canadian Aviation Regulations app. A, sched. II, subpt. 2 – Operating and Flight Rules.

[55] Transport Canada, Advisory Circular (AC) No. 600-002.

[56] CTV NEWS, *supra* note 12.

V. Proposed Changes

As noted in Part I(A), above, in 2010, Transport Canada established a joint industry and federal government working group to develop recommendations for regulatory changes.[57] This led to proposed changes, which were made public on May 2015 in the Notice of Proposed Amendment on Unmanned Air Vehicles[58] and on which Transport Canada invited comments from aviation stakeholders across Canada.[59]

According to lawyer Kathryn McGoldrick, the proposed changes would "replace the current 'exemption' scheme, which was intended to be a temporary solution while Transport Canada introduced more rigorous safety requirements and created greater awareness of UAV operators' legal obligations."[60] The changes would apply to any UAV with a total weight at takeoff of 25 kilograms or less and which is operated in VLOS. They would also eliminate the current distinction between recreational and nonrecreational use.[61] UAVs weighing 25 kilograms or more would continue to be regulated by the SFOC requirements.[62]

The proposed changes provide a new classification system based on the risks involved in the use of UAVs. There are two categories for UAVs weighing 25 kilograms or less, which are described as (a) "Small UAVs used in complex operations," and (b) "Small UAVs used in limited operations." UAVs in the first category would be used in and around urban or built-up areas and would allow operations near to airfields and would have "the most comprehensive set of regulatory requirements which, in turn, would provide for the greatest level of safety and operational flexibility.[63] The second category would apply to UAV use limited to remote areas and would have fewer regulatory requirements.[64]

A third category is being considered for very small UAVs, which could be based "on weight or [on] . . . an alternative approach, such as kinetic energy."[65] Other considerations in the proposed regulations include the following:

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[57] Transport Canada, CARAC, CARAC Activity Reporting Notice # 2015-012, Notice Of Proposed Amendment (NPA): Unmanned Air Vehicles, May 28, 2015, at 1, http://wwwapps.tc.gc.ca/Saf-Sec-Sur/2/NPA-APM/doc.aspx?id=10294, *archived at* https://perma.cc/CRB3-QNTF.

[58] *Id*.

[59] Kathryn McGoldrick, *New Drone Regulations Expected from Transport Canada in 2016*, ALEXANDER HOLBURN BEAUDIN + LANG LLP: AVIATION LAW BLOG (Jan. 6, 2016), http://aviationlawblog.ahbl.ca/2016/01/06/new-drone-regulations-expected-from-transport-canada-in-2016/?utm_source=Mondaq&utm_medium=syndication&utm_campaign=View-Original, *archived at* https://perma.cc/6UWP-E6N4.

[60] *Id*.

[61] Martin F. Sheehan, Michael Parrish & Peter J. Pliszka, *Transport Canada Promises New Drone Regulations*, LEXOLOGY (Jan. 20, 2016), http://www.lexology.com/library/detail.aspx?g=fe100b25-1c2e-40e3-be03-60770057d624, *archived at* https://perma.cc/UAG2-7XC3.

[62] *Id*.

[63] Transport Canada, CARAC, CARAC Activity Reporting Notice # 2015-012, Notice of Proposed Amendment (NPA): Unmanned Air Vehicles, at 13.

[64] *Id*.

[65] *Id*.

Other than the ability of UAVs in the "complex operations" category to operate in closer proximity to built-up areas and aerodromes [airfields], a primary difference between the requirements for the "complex operations" and "limited operations" categories is pilot training. For all operations, Transport Canada has proposed that UAV pilots be considered a "pilot" as defined by the *Aeronautics Act* and the CARs. However, operators in "complex operations" would be required to obtain a "pilot permit." Suggested requirements for a pilot permit include a minimum age of 14 (with adult supervision) or 16 (without adult supervision), a category 4 medical certificate, successful completion of a course of instruction in specific aviation knowledge areas and a written examination, practical training on the specific category of UAV, and demonstrated competency in the performance of normal and emergency procedures.

In contrast, a pilot operating a UAV in either the "limited operations" or "very small UAVs" category would not be required to obtain a pilot permit or medical certificate, and there would be no minimum age requirement provided there is adult supervision. However, the operator would be required to demonstrate aeronautical knowledge in specific subject areas, such as airspace classification and structure.

The other principal difference between the three proposed categories is with respect to marking, registration, and identification. Transport Canada has proposed that UAVs in both the "limited" and "complex" operations categories be required to be marked and registered. They would be required to have a unique series of four-letter registration marks, and to be registered in accordance with the requirements for aircraft registration in the CARs. These include that the registrant be at least 16 years of age and a Canadian citizen or permanent resident, and, if the operator is a corporation, it must meet certain requirements of Canadian ownership and/or incorporation.

Operators of very small UAVs would not be required to register their aircraft, but would be required to have a permanent marking for identification, including the name of the pilot and his or her contact information, on the UAV.[66]

[66] McGoldrick, *supra* note 59.

People's Republic of China

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SUMMARY The December 2015 Interim Provisions on Light and Small Unmanned Aircraft Operations (UAS Operation Provisions) issued by China's civil flight regulatory agency, the Civil Aviation Administration of China, regulate the operation of unmanned aircraft systems (UAS) with a maximum empty weight of 116 kilograms or less, or a maximum take-off gross weight of 150 kilograms or less, and a calibrated air speed of no greater than 100 kilometers per hour. UAS weighing 1.5 kilograms or less are generally not required to follow the Provisions.

The UAS Operation Provisions set forth an online, real-time supervision system comprising the "electric fence," a system consisting of hardware and software that stops aircraft from entering certain areas, and the "UAS Cloud," a dynamic database management system that monitors flight data, which has an alarm function for UAS connected to it that is activated when these UAS fly into the electric fence.

Airport obstacle control surfaces, as well "prohibited areas, restricted areas, and danger zones" provided by other laws and regulations, are restricted areas prescribed by the UAS Operation Provisions. UAS connected to the UAS Cloud must follow the restrictions shown in the system, while those not connected to the UAS Cloud must consult with relevant authorities about the restricted areas.

UAS flying within visual line of sight (VLOS) must be operated in the daytime. Such a requirement does not apply to UAS flying beyond visual line of sight (BVLOS), but a certain regulatory framework for addressing emergencies applies to BVLOS flights. Both UAS flying within VLOS and BVLOS must give way to manned aircraft.

I. Introduction

The People's Republic of China (PRC or China) has not passed any legislation specifically regulating drones or unmanned aircraft systems (UAS). Civil aviation and flight activities are primarily regulated by the PRC Civil Aviation Law, the PRC General Flight Rules, and the Regulations on General Aviation Flight Control. They have not, however, expressly extended their application to the flight of UAS.

China's civil flight regulatory agency, the Civil Aviation Administration of China (CAAC), has issued advisory circulars setting up guidelines for the flight of UAS. These interim measures are expected to be updated as the UAS industry and regulatory framework develop.[1]

[1] 轻小无人机运行规定(试行) [Interim Provisions on the Operation of Light and Small Unmanned Aircraft] (UAS Operation Provisions) (CAAC, Dec. 29, 2015), http://www.caac.gov.cn/XXGK/XXGK/GFXWJ/201601/P020160126526845399237.pdf, *archived at* https://perma.cc/KJW9-9TQ4; 民用无人驾驶航空器系统驾驶员管理暂行规定 [Interim Provisions on the Administration of Unmanned Civil Aircraft System Pilots] (CAAC, Nov. 18, 2013),

The CAAC is considering new rules on commercial operations of UAS and issued a draft of the rules to solicit public opinion in December 2015, but a final version of the rules has not yet been adopted.[2] In addition, the Ministry of Industry and Information Technology (MIIT) is reportedly planning new UAS regulations.[3]

II. Legislation on Civil Aviation and Flight Activities

A. PRC Civil Aviation Law

The PRC Civil Aviation Law regulates civil aviation throughout the country.[4] The Law authorizes the CAAC to formulate regulations concerning civil aviation.[5] The term "civil aircraft" under this Law refers to any aircraft other than those used for military, customs, and police purposes.[6]

B. PRC Basic Rules of Flight

According to the PRC Basic Rules of Flight that were originally promulgated in 2000 and last amended in 2007, all flight activities in China are under unified state control, which is delegated to the State Council and the Central Military Commission (CMC).[7] According to the Rules, all individuals and organizations in China owning aircraft and their flight activities are subject to the Rules.[8]

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http://govinfo.caac.gov.cn/000014170/201312/P020131206515715975483.pdf, *archived at* https://perma.cc/V4PT-9ER6.

[2] Jun Wei et al., *China Launches First Operational Rules for Civil Unmanned Aircraft*, GLOBAL MEDIA AND COMMUNICATIONS WATCH (Jan. 21, 2016), http://www.hlmediacomms.com/2016/01/21/china-launches-first-operational-rules-for-civil-unmanned-aircraft, *archived at* https://perma.cc/E9DT-Y3Z7.

[3] *工信部调研深圳无人机企业，监管法案或年内出台* [*Ministry of Industry and Information Technology (MIIT) Conducting Research on Unmanned Aircraft Enterprises in Shenzhen, Administrative Regulations May Come Out This Year*], SINA (Feb. 29, 2016), http://tech.sina.com.cn/it/2016-02-26/doc-ifxpvysx1694773.shtml, *archived at* https://perma.cc/5PK6-TRUH.

[4] 中华人民共和国民用航空法 [PRC Civil Aviation Law] (adopted by the Standing Committee of the National People's Congress (NPC), Oct. 30, 1995, amended Aug. 27, 2009, and Apr. 24, 2015), art. 3, ZHONGHUA RENMIN GONGHEGUO FALÜ FAGUI HUIBIAN: JINGJI FA JUAN I [LAWS AND REGULATIONS OF THE PEOPLE'S REPUBLIC OF CHINA: ECONOMIC LAW I] (PRC LAWS AND REGULATIONS) 1141–87; Quanguo Renmin Daibiao Dahui Guanyu Xiugai Zhonghua Renmin Gongheguo Jiliang Fa deng Wubu Falü de Jueding [Decision of the NPC Standing Committee on Revising Five Laws Including the PRC Metrology Law] (Apr. 24, 2015), available on the NPC website, *at* http://www.npc.gov.cn/npc/cwhhy/12jcwh/2015-04/25/content_1934602.htm, *archived at* https://perma.cc/P3LW-S24M.

[5] *Id.*

[6] *Id.* art. 5.

[7] 中华人民共和国飞行基本规则 [PRC Basic Rules of Flight] (promulgated by the State Council and CMC, July 24, 2000, amended July 27, 2001, and Oct. 18, 2007), arts. 3 & 4, PRC LAWS AND REGULATIONS 1234–63.

[8] *Id.* art. 2.

C. Regulation on Flight Control of General Aviation

The Regulation on Flight Control of General Aviation is an administrative regulation that applies to all commercial and recreational operations of aircraft except those involved in public air transportation. "General aviation" under Chinese law refers to

> aviation operations other than military flights, police aerial actions, customs anticontraband flights, and public air transportation flights. It includes flight operations in the fields of industry, agriculture, forestry, fishery, mining, and construction, and flight operations in the fields of medical and health work, emergency rescue and disaster relief, meteorological observation, ocean monitoring, scientific experiments, remote sensing and mapping, education and training, culture and sports, and tourism and sightseeing, etc.[9]

III. UAS Operation Provisions

On December 29, 2015, the CAAC issued the Interim Provisions on Light and Small Unmanned Aircraft Operations (UAS Operation Provisions). The Provisions regulate UAS with a maximum empty weight of 116 kilograms or less, or a maximum take-off gross weight of 150 kilograms or less, and a calibrated air speed of no greater than 100 kilometers per hour. The Provisions are also applicable to "plant protection UAS" used for agricultural, landscaping, or forest protection purposes with a maximum take-off gross weight of 5,700 kilograms or less and flying no higher than 15 meters above the surface, and unmanned airships with an inflatable volume of 4,600 cubic meters or less.[10]

A. UAS Categories

The UAS Operation Provisions divide UAS and unmanned airships subject to its regulation into seven categories, mainly based on weight and use, as follows:

- Category I: UAS weighing 1.5 kilograms or less.
- Category II: UAS with an empty weight between 1.5 kilograms and 4 kilograms or with a take-off gross weight between 1.5 kilograms and 7 kilograms.
- Category III: UAS with an empty weight between 4 kilograms and 15 kilograms or with a take-off gross weight between 7 kilograms and 25 kilograms.
- Category IV: UAS with an empty weight between 15 kilograms and 116 kilograms or with a takeoff gross weight between 25 kilograms and 150 kilograms.
- Category V: Plant protection UAS.

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[9] 通用航空飞行管制条例 [Regulation on Flight Control of General Aviation] (promulgated by the State Council and CMC, Jan. 10, 2003, effective May 1, 2003), art. 3, PRC LAWS AND REGULATIONS 1208–17.

[10] UAS Operation Provisions §§ 2.1–2.3; Jun Wei et al., *supra* note 2.

- Category VI: Unmanned airships.
- Category VII: Category I and II UAS that can operate 100 meters beyond visual line of sight.[11]

Category I UAS are required to be operated safely and to avoid causing injury to others, but are not otherwise subject to the UAS Operation Provisions.[12] Nor do the Provisions apply to model aircraft and indoor flights, except under certain conditions specified by the Provisions.[13]

B. Electric Fence and UAS Cloud

The UAS Operation Provisions set forth an online, real-time supervision system that has two components: the "electric fence" and the "UAS Cloud." The "electric fence" is a system consisting of hardware and software that stops aircraft from entering certain areas. The UAS Cloud is a dynamic database management system that monitors flight data, including operation information, location, altitude, and speed, in real time. The UAS Cloud has an alarm function for UAS connected to it that is activated when these UAS fly into the electronic fence.[14]

UAS under categories III, IV, VI, and VII must install and use the electric fence and connect to the UAS Cloud. Operators must report at least every second when in densely populated areas and at least every thirty seconds when in non-densely populated areas.[15]

UAS under categories II and V are required to install and use the electric fence, connect to the UAS Cloud, and report at least every second if they are operated above the airspace of key areas and in airport clear zones.[16] "Key areas" is defined by the Provisions to include military sites, nuclear plants, administrative centers and their neighboring areas, and areas temporarily designated as key areas by local governments.[17]

A qualified UAS Cloud provider must be approved by the CAAC for a trial operation, among other requirements specified by the UAS Operation Provisions.[18] A UAS Cloud system developed by the Aircraft Owners and Pilots Association of China, "U-Cloud," has been approved for operation during a two-year period from March 4, 2016, to March 3, 2018.[19]

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[11] UAS Operation Provisions § 2.4.

[12] *Id.* § 2.5.

[13] *Id.* §§ 2.6 & 2.7.

[14] *Id.* §§ 3.17 & 3.18; Jun Wei et al., *supra* note 2.

[15] UAS Operation Provisions § 14.1; Jun Wei et al., *supra* note 2.

[16] UAS Operation Provisions § 14.1; Jun Wei et al., *supra* note 2.

[17] UAS Operation Provisions § 3.14.

[18] *Id.* § 15.

[19] *无人机监管系统"优云(U-Cloud)"正式获批* [*UAS Supervisory System U-Cloud Officially Approved*], XINHUANET (Mar. 7, 2016), http://news.xinhuanet.com/science/2016-03/07/c_135163844.htm, *archived at* https://perma.cc/REV5-MGJM.

C. Restricted Areas

Airport obstacle control surfaces are restricted areas prescribed by the UAS Operation Provisions. "Prohibited areas, restricted areas, and danger zones" provided by other laws and regulations are also restricted areas under the Provisions.[20] UAS connected to the UAS Cloud must follow the restrictions shown in the system, while those not connected to the UAS Cloud must consult with relevant authorities about the restricted areas.[21]

In 2009, the CAAC issued rules on air traffic control for civil UAS, which subject civil UAS to the relevant provisions of the Civil Aviation Law, the Basic Rules of Flight, the Regulation on Flight Control of General Aviation, and other rules concerning air traffic control issued by the CAAC.[22]

D. Flight Specifications

According to the UAS Operation Provisions, UAS flying within visual line of sight (VLOS) must be operated in the daytime. Such a requirement does not apply to UAS flying beyond visual line of sight (BVLOS), but a certain regulatory framework for addressing emergencies applies to BVLOS flights. Both UAS flying within VLOS and BVLOS must give way to manned aircraft.[23]

E. Insurance

In compliance with the PRC Civil Aviation Law, the UAS Operation Provisions require UAS operators to buy insurance for UAS covering liability for third parties on the ground, a requirement deemed to be "consistent with best practices."[24]

F. Pilots

The UAS Operation Provisions require a pilot-in-command to be appointed who is directly in charge of the operation of the UAS and has the right to make final decisions.[25] Qualification requirements for UAS pilots are prescribed by another CAAC advisory circular issued in 2013, the Interim Provisions on the Administration of Civil Unmanned Aircraft System Pilots.[26]

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[20] UAS Operation Provisions § 10.

[21] *Id.*

[22] 民用无人机空中交通管理办法 [Provisions on Managing Air Traffic of Unmanned Civil Aircraft] (June 26, 2009), http://www.caac.gov.cn/XXGK/XXGK/GFXWJ/201511/t20151102_7975.html, *archived at* https://perma.cc/UJ4F-N4L7.

[23] UAS Operation Provisions §§ 11 & 12; Jun Wei et al., *supra* note 2.

[24] UAS Operation Provisions § 14.2; Jun Wei et al., *supra* note 2.

[25] UAS Operation Provisions § 4; Jun Wei et al., *supra* note 2.

[26] 民用无人驾驶航空器系统驾驶员管理暂行规定 [Interim Provisions on the Administration of Unmanned Civil Aircraft System Pilots] (CAAC, Nov. 18, 2013), http://govinfo.caac.gov.cn/000014170/201312/P020131206515715975483.pdf, *archived at* https://perma.cc/V4PT-9ER6.

IV. Manufacturing and Sale

A. Allocation of Frequencies

On March 10, 2015, the MIIT issued a notification setting forth the radio frequency spectrum allocation for UAS. According to the notification, 840.5–845MHz, 1430–1444MHz, and 2408–2440MHz are dedicated to UAS.[27]

B. Export Ban

In mid-2015, a temporary export ban on certain dual-use UAS was announced by the State Administration of Science, Technology and Industry for National Defense (SASTIND) under the MIIT, joined by the Ministry of Commerce (MOFCOM), General Administration of Customs (Customs), and the army.[28] As of the date of this report, the temporary export ban does not appear to have been lifted.

[27] 工业和信息化部关于无人驾驶航空器系统频率使用事宜的通知 [Ministry of Industry and Information Technology (MIIT) Notification on Matters Regarding Usage of Frequencies by Unmanned Aircraft Systems] (Mar. 10, 2015), http://wgj.miit.gov.cn/n11293472/n11295310/n11297382/n14171129/16541659.html, *archived at* https://perma.cc/P2QE-K2ZD.

[28] 商务部、海关总署、国家国防科技工业局、中国人民解放军总装备部联合公告 2015 年第 20 号 (关于对军民两用无人驾驶航空飞行器实施临时出口管制的公告) [Joint Announcement [2015] No. 20 of the MOFCOM, Customs, SASTIND, and General Armament Department of the People's Liberation Army of China on Implementing Export Control over Dual-Use Unmanned Aircraft] (June 25, 2015, effective July 1, 2015), http://www.customs.gov.cn/publish/portal0/tab515/info761305.htm, *archived at* https://perma.cc/3TPS-T486.

France

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SUMMARY The use of civilian drones in France is governed by two recent regulations that came into force on January 1, 2016. These regulations separate civilian drone use into three categories: hobby and competition flying, flying for experimental and testing purposes, and "particular activities," which essentially means everything else, including commercial use of drones. Drones of all categories are subject to strict geographic restrictions, the main purpose of which is to protect people, property, and other aircraft. Drones may not be flown over public areas of urban zones without governmental approval, and may be flown over private property only with the owner's authorization. Drones are required to fly under certain altitudes, and these altitude limits are substantially lower in the vicinity of airfields. Absent special authorization, drones are entirely forbidden in certain zones, such as military installations and other sensitive sites, but also historical monuments and certain national parks and natural reserves. Violation of prohibited airspace is punishable by jail time and heavy fines.

Drones flown for hobby and competition purposes are subject to certain weight and performance limits. Lighter and less powerful hobby drones may be flown by anyone, but heavier and/or more powerful ones may be flown only under authorization of the ministry in charge of civil aviation. Drones flown for experimental or testing purposes also require government authorization if they weigh more than 25 kilograms.

Drones flown for "particular activities," which include commercial purposes, are regulated on the basis of four different types of scenarios. Different rules apply depending on which type of scenario the drone is to be used for, though many rules apply to all four scenarios. Many drones used for "particular activities" require a certification of design in order to receive authorization to fly, and all must comply with defined safety requirements. Furthermore, the operation of a drone for "particular activities" requires that the operator declare these activities to the government authorities, and certain activities require express approval. Pilots of drones for "particular activities" must have a level of knowledge and training that depends on the type of scenario for which the drone is to be used, with some situations requiring a full pilot's license.

I. Introduction

The use of civilian drones in France is principally governed by two recent regulations: the Arrêté du 17 décembre 2015 relatif à l'utilisation de l'espace aérien par les aéronefs qui circulent sans personne à bord (Order of December 17, 2015, Regarding the Use of Airspace by Unmanned Aircraft) (Airspace Order),[1] and the Arrêté du 17 décembre 2015 relatif à la conception des

[1] Arrêté du 17 décembre 2015 relatif à l'utilisation de l'espace aérien par les aéronefs qui circulent sans personne à bord [Order of December 17, 2015, Regarding the Use of Airspace by Unmanned Aircraft] (Airspace Order), https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000031679868&dateTexte=20160330, *archived at* https://perma.cc/ZFA4-5L63.

aéronefs civils qui circulent sans personne à bord, aux conditions de leur emploi et aux capacités requises des personnes qui les utilisent (Order of December 17, 2015, Regarding the Creation of Unmanned Civil Aircraft, the Conditions of Their Use, and the Required Aptitudes of the Persons That Use Them) (Creation and Use Order).[2] These two orders replace regulations from 2012 that were considered obsolete and inadequate.[3] Both of these orders came into force on January 1, 2016.[4]

The current regulations apply to "aircraft that move without any person on board."[5] The order regarding the use of airspace does not apply to tethered balloons, kites, or military drones.[6] The other order, which aims to regulate the creation of drones, their conditions of use, and the requirements for operators to receive authorization to fly them, does not apply to free-flying balloons, tethered balloons that stay below an altitude of 50 meters and have a payload of no more than 1 kilogram, rockets, kites, and aircraft used in enclosed and covered spaces.[7]

The Creation and Use Order provides for three categories of drone use: (1) hobby and competition flying, (2) flying for experimental and testing purposes, and (3) "particular activities" (*activités particulières*), which are defined as any use that does not fall into categories (1) or (2).[8] The Order specifies that the meaning of "particular activities" is not limited to drone use within the context of a commercial transaction.[9] It would appear that in practice, however, this category would primarily encompass commercial use. Each of these categories is governed by a different set of rules.

II. Airspace Limitations

Drones are subject to strict geographic restrictions, the purpose of which is to protect people and property, as well as other aircraft.[10] They may not be flown over public areas of urban zones,

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[2] Arrêté du 17 décembre 2015 relatif à la conception des aéronefs civils qui circulent sans personne à bord, aux conditions de leur emploi et aux capacités requises des personnes qui les utilisent [Order of December 17, 2015, Regarding the Creation of Unmanned Civil Aircraft, the Conditions of Their Use, and the Required Aptitudes of the Persons That Use Them] (Creation and Use Order), https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000031679906&dateTexte=20160330, *archived at* https://perma.cc/38PR-Y2DJ.

[3] Thierry Vallat, *«Faux-bourdons» mais vraie règlementation: vers l'élaboration d'un véritable droit des drones* [*"Drones" and True Regulations: Toward the Elaboration of a Real Law of Drones*], REVUE: LA LETTRE JURIDIQUE [JOURNAL: LEGAL WEEKLY] No. 608, at 15 (Apr. 9, 2015), available on the Lexbase database, *at* http://www.presentation.lexbase.fr/sites/default/files/actualites/fichiers/24072961.pdf (by subscription), *archived at* https://perma.cc/3338-ZDQ3.

[4] Airspace Order art. 13; Creation and Use Order art. 12.

[5] Airspace Order art. 1; Creation and Use Order art. 1 (all translations by author).

[6] Airspace Order art. 1.

[7] Creation and Use Order art. 1.

[8] *Id.* art. 3.

[9] *Id.*

[10] DIRECTION DE LA SÉCURITÉ DE L'AVIATION CIVILE [DIRECTORATE FOR CIVIL AVIATION SECURITY], AÉROMODÉLISME: MODÈLES RÉDUITS ET DRONES DE LOISIR: GUIDE [MODEL AIRCRAFT FLYING: SMALL-SCALE

except by authorization of the local prefect.[11] They may, however, be flown over private areas with the permission of the property owner, so long as certain speed and altitude limits are respected.[12]

The drone must fly at a speed suitable for limiting the risks to others if there is a loss of control.[13] Within authorized areas, drones must not fly higher than 150 meters above the ground, or higher than 50 meters above any artificial obstacle more than 100 meters in height.[14] Within certain zones where military training exercises may occur, and during the times when those zones are active, drones are limited to an altitude of 50 meters.[15] Drones are entirely forbidden from certain zones, such as military installations, nuclear power plants, historical monuments, hospitals, prisons, and certain national parks or natural reserves, absent prior authorization.[16]

Drones are not allowed to fly in the immediate vicinity of an airfield, and must adhere to strict altitude limits in the surrounding zone, absent authorization from the airfield's operator.[17] For the purposes of these regulatory provisions, the area surrounding an airfield is divided into three zones, the dimensions of which depend on the type of airfield at the center.[18] For example, if a runway is less than 1,200 meters long and is not equipped for instrument approach procedures, the zone where drone flying is entirely prohibited (except with the airfield operator's permission) extends 5 kilometers from either end of the runway, and 0.5 kilometers from either edge of the runway. In the zone that extends from 0.5 to 3.5 kilometers from each edge of the runway, drones may not fly at an altitude of more than 50 meters without the airfield operator's permission. Finally, in the zone that extends from 3.5 to 5 kilometers from each edge of the runway, drones may not fly at an altitude of more than 100 meters without authorization.[19] Airfields that have longer runways, are equipped for instrument approach procedures, or are used for ultralight aviation, and heliports have similar restrictions but with differences in distances and altitude limits.[20]

Drones may not be flown at night,[21] unless the pilot or operator obtains special authorization from the local prefect.[22] Drones flown for hobby and competition purposes may fly at night within specific preauthorized areas.[23] Furthermore, drones must not fly in clouds.[24]

MODELS AND HOBBY DRONES: GUIDE] 8 (Dec. 22, 2015), *available at* http://www.developpement-durable.gouv.fr/IMG/pdf/Guide_Aeromodlisme_v1-0.pdf, *archived at* https://perma.cc/C2T6-BQ5D.

[11] Airspace Order art. 5.

[12] DIRECTION DE LA SECURITE DE L'AVIATION CIVILE, *supra* note 10, at 8.

[13] *Id.*

[14] Airspace Order art. 5.

[15] *Id.*

[16] *Id.* art. 4; DIRECTION DE LA SECURITE DE L'AVIATION CIVILE, *supra* note 10, at 8–9.

[17] Airspace Order art. 4.

[18] *Id.*; DIRECTION DE LA SÉCURITÉ DE L'AVIATION CIVILE, *supra* note 10, at 16–18.

[19] Airspace Order art. 4; DIRECTION DE LA SECURITE DE L'AVIATION CIVILE, *supra* note 10, at 16–18.

[20] *Id.*

[21] Airspace Order art. 3.

Manned aircraft always have the right-of-way over drones.[25] Additionally, drones are not allowed to fly in the vicinity of fires or accident zones, so as to avoid hampering emergency and rescue services.[26]

Flying a drone over a prohibited area, by mistake or by negligence, is punishable by up to six months in jail and a fine of €15,000 (approximately US$17,070).[27] Intentionally flying over a prohibited area is punishable by up to one year in jail and a fine of €45,000 (approximately US$51,200).[28] Furthermore, unauthorized use of photographic equipment over a prohibited zone is punishable by up to one year in jail and a fine of €75,000 (approximately US$85,350).[29]

III. Hobby and Competition Drone Flying

A. Subcategories and Authorization to Operate

Hobby and competition drones are divided into two categories.[30] Category A drones weigh no more than 25 kilograms, and either have no engine or are powered by an engine that is under specific power thresholds (for example, a combustion engine of no more than 250 cm^3, or an electric engine of no more than 15 kW).[31] In an exception to these limitations, tethered drones fall into category A regardless of any propulsion they may have, so long as they weigh no more than 150 kilograms.[32] Any drone that does not fall into category A is considered to be a category B drone.

Category A drones may be flown by anyone, and do not require any authorization documents as long as the regulatory parameters are respected (flying only in permissible areas, no flying by night, etc.).[33] Category B drones, however, cannot be flown without authorization from the ministry in charge of civil aviation, and only the individuals who are specifically listed on the authorization document may fly the drone.[34] Before granting authorization, the ministry is to

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[22] DIRECTION DE LA SÉCURITÉ DE L'AVIATION CIVILE, *supra* note 10, at 9–10.

[23] Airspace Order art. 3.

[24] *Id.*

[25] *Id.*

[26] DIRECTION DE LA SÉCURITÉ DE L'AVIATION CIVILE, *supra* note 10, at 9.

[27] CODE DES TRANSPORTS [TRANSPORTATION CODE] art. L6232-2, https://www.legifrance.gouv.fr/affichCode.do?idSectionTA=LEGISCTA000023078242&cidTexte=LEGITEXT000023086525&dateTexte=20160406, *archived at* https://perma.cc/KR5Y-3HHZ.

[28] *Id.*

[29] *Id.* art. L6232-8, https://www.legifrance.gouv.fr/affichCode.do?idSectionTA=LEGISCTA000023078226&cidTexte=LEGITEXT000023086525&dateTexte=20160406, *archived at* https://perma.cc/274W-MH5A.

[30] Creation and Use Order Annex I.

[31] *Id.*

[32] *Id.*

[33] *Id.*

[34] *Id.*

verify the drone's airworthiness as well as the pilot's aptitude to fly it.[35] The authorization is valid indefinitely, so long as the conditions under which it was given are still true.[36] Authorized pilots must annually send a statement confirming that the drone is still in compliance with the conditions under which the authorization was granted.[37]

B. Flying Conditions

The general rule is that drones should stay within their pilot's line of sight.[38] However, a drone may be flown outside of the pilot's line of sight if a second person keeps it in view while it is outside of the pilot's view.[39] The pilot, or other persons watching the drone while it is out of the pilot's view, must always be able to ensure that the drone is flying in safe conditions and be able to take control of the drone if need be.[40] If the drone weighs no more than 2 kilograms, travels no more than 200 meters from its pilot, and flies no higher than 50 meters, it is possible to fly outside of the pilot's line of sight as long as another person keeps it in view and is able to inform the pilot of dangers in real time.[41] Finally, French regulations allow the flight of drones that are able to fly autonomously by following atmospheric movements, as long as they weigh less than 1 kilogram and fly for less than eight minutes.[42]

IV. Flying Drones for Experimental and Testing Purposes

Annex II of the Creation and Use Order applies specifically to drones that are flown for experimental or testing purposes—that is to say, prototypes—or drones flown in order to develop a new technology or modified to go beyond the parameters they were initially designed for.[43] Flying such drones requires a special permit, to be provided by the ministry in charge of civil aviation.[44] The application for this permit must include a description of the proposed conditions of the experimental flights, and of the measures taken to ensure the safety of third parties both on the ground and in the air.[45] Drones that weigh no more than 25 kilograms do not require a special permit as long as they fly during daytime, within the pilot's line of sight, no farther than 200 meters from the pilot, outside of any populated area, and at least 50 meters away from any person who is not involved in the drone's operation.[46] The other restrictions on flight described in Part II above also apply to experimental drones.

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[35] *Id.*

[36] *Id.*

[37] *Id.*

[38] Creation and Use Order art. 3; DIRECTION DE LA SÉCURITÉ DE L'AVIATION CIVILE, *supra* note 10, at 10.

[39] DIRECTION DE LA SÉCURITÉ DE L'AVIATION CIVILE, *supra* note 10, at 10.

[40] *Id.*

[41] *Id.*; Creation and Use Order art. 3.

[42] Creation and Use Order art. 3.

[43] *Id.* Annex II, ¶ 1.

[44] *Id.* ¶¶ 2–3.

[45] *Id.* ¶ 3.

[46] *Id.* ¶ 2.

V. Other Drone Activities ("Particular Activities")

Annex III of the Creation and Use Order applies to drones that are flown neither for leisure and competition, nor for experimentation and testing purposes.[47] French regulators essentially made "particular activities" a sort of catchall category by not explicitly defining such activities. It appears, however, that this category primarily aims to apply to the commercial use of drones.

The following rules apply to drones that have a mass of less than 150 kilograms. For drones of 150 kilograms or more, the ministry in charge of civil aviation is to define the authorized flight and use conditions on a case-by-case basis; such drones are subject to regulation at the European Union level.[48]

A. Four Basic Scenarios

The regulations laid out in Annex III of the Creation and Use Order are based, to a great extent, on four categories of situations (referred to as "scenarios" in the regulation), designated as S-1, S-2, S-3, and S-4.[49] These categories are defined as follows:

- S-1: Using a drone outside a populated area, without flying over any third party, staying within the pilot's line of sight, and within a horizontal distance of no more than 200 meters from the pilot.
- S-2: Using a drone outside a populated area, where no third party is within the area of operation, within a horizontal distance of no more than 1 kilometer from the pilot, and not falling within the definition of S-1.
- S-3: Using a drone in a populated area, but without flying over any third party, staying within the pilot's line of sight, and within a horizontal distance of no more than 100 meters from the pilot;
- S-4: Using a drone outside a populated area, but not in a manner falling within the definitions of S-1 or S-2.[50]

Some of these scenarios place restrictions on the type of drone that can be used in them. In an S-2 scenario, only drones weighing 2 kilograms or less may be flown at an altitude of more than 50 meters.[51] Only tethered drones or untethered drones weighing no more than 8 kilograms may be used in an S-3 scenario.[52] Furthermore, only drones weighing 2 kilograms or less may be used for an S-4 scenario, and this use must be limited to measurement taking, aerial photography,

[47] *Id.* Annex III.

[48] *Id.* art. 3.¶ 1.2.

[49] *Id.* ¶ 1.3.

[50] *Id.*

[51] *Id.* ¶ 1.4.1.

[52] *Id.* ¶ 1.4.2

observation, or surveillance.[53] Finally, tethered aerostats that fly autonomously must abide by the same rules as nonautonomous tethered aerostats in scenarios S-1 or S-3.[54] With the exception of tethered aerostats, drones that fly autonomously may not be used for "particular activities."[55]

B. Certification of Design and Required Safety Features

The following drones require a certification of design (*attestation de conception*) in order to be flown: drones of more than 25 kilograms, drones used in an S-2 scenario, drones of more than 2 kilograms used in an S-3 scenario (except for tethered aerostats), and drones used for an S-4 scenario.[56] A certification of design is granted by the ministry in charge of civil aviation on the basis of an application that shows that adequate analysis and tests have been conducted to ensure that the drone is safe to use as proposed.[57] Drones that do not require a certification of design must nonetheless comply with the same safety requirements, and their operators must be able to demonstrate compliance if so asked by the government authorities in charge of civil aviation.[58]

The application for a certification of design must include a checklist of safety checks to be done before each flight, the drone's weight limitations, restrictions with regard to weather conditions, programmed safety mechanisms, and emergency procedures.[59] The application must also include a maintenance manual, the radio frequencies used by the drone, and descriptions of the measures available to protect third parties.[60] The measures to protect third parties must be able to limit the impact energy to 69 joules if the drone drops from its maximum operational altitude, and the pilot must be able to trigger them even if the automated systems on board the drone malfunction.[61]

There are also a number of safety requirements that apply specifically to certain types of drones. For example, aerostats may use only inert gases,[62] and the tethers of tethered drones must comply with defined resistance requirements.[63] For all untethered drones, the pilot must be informed of the aircraft's altitude on the basis of a barometric instrument, and there must be a programmable system to automatically prevent the drone from going beyond a maximum altitude even if the pilot instructs it to do so.[64] The pilot of an untethered drone must also be able to

[53] *Id.* ¶ 1.4.3.

[54] *Id.* ¶ 1.5.2.

[55] *Id.* ¶ 1.5.1.

[56] *Id.* ¶ 2.1.1.

[57] *Id.* ¶ 2.1.3.

[58] *Id.* ¶ 2.1.2.

[59] *Id.* ¶ 2.2.3.

[60] *Id.* ¶¶ 2.2.3–2.2.5.

[61] *Id.* ¶ 2.2.5.

[62] *Id.* ¶ 2.3.

[63] *Id.* ¶ 2.4.

[64] *Id.* ¶ 2.5.1.

make it land at any moment by cutting its propulsion, and there must be a system for the drone to automatically initiate a landing procedure if it loses contact with the remote control.[65] The initiation of such an automatic landing may be preceded by a wait procedure to give the pilot an opportunity to reestablish contact, but this wait time must be short enough to minimize the chances that another malfunction could occur.[66]

Furthermore, there are a number of safety requirements that apply specifically to certain types of drone uses. For example, a drone to be used in an S-2 scenario must comply with the following requirements in order to obtain a certification of design:

- The pilot must have access to information on the position and movement of the aircraft in real time, so as to ensure that it does not go beyond the intended limits of its flight.
- The drone must have an automatic system to prevent it from going beyond the horizontal distance limits of the flight, or must have an alarm system to warn the pilot when it goes beyond those limits.
- The function to stop propulsion in flight, as required of all drones used for "particular activities," must be independent from the on-board automatic mechanisms that control the aircraft's flight path.
- There must be an on-board system to record the essential parameters of the flight, such as location, altitude, and quality of the control signal, in order to allow an analysis of the last twenty minutes of flight.[67]

Similarly, heavier-than-air drones of more than 2 kilograms that are to be used in an S-3 scenario must be equipped with a system to protect third parties, which is supposed to automatically activate if the drone lands by itself following a loss of contact with the pilot.[68] Heavier-than-air drones of more than 4 kilograms must, in addition, have equipment to ensure that the pilot can know the aircraft's speed.[69] The system to protect third parties from the fall of heavier-than-air drones of more than 4 kilograms must also automatically stop the propulsion system, the control link for that emergency system must be independent from the drone's main control link, and there must be an audible alarm to warn of the drone's fall.[70]

Failure to comply with these requirements is punishable by up to one year in jail and a fine of €75,000.[71]

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[65] *Id.*

[66] *Id.*

[67] *Id.* ¶ 2.6.

[68] *Id.* ¶ 2.7.

[69] *Id.* ¶ 2.7.3.

[70] *Id.*

[71] CODE DES TRANSPORTS art. L6232-4, https://www.legifrance.gouv.fr/affichCodeArticle.do?idArticle=LEGIARTI000023078234&cidTexte=LEGITEXT000023086525, *archived at* https://perma.cc/6TQH-9EDC.

C. Conditions of Operation

Operation of a drone for "particular activities" requires that the operator make a declaration to the authorities in charge of civil aviation describing the activity for which he/she is using the drone.[72] This declaration must be renewed every two years if the activity stays the same, but any changes must be declared immediately.[73] Additionally, operations falling within an S-4 scenario require the government's approval.[74]

In January of each year, every drone operator who falls within the "particular activities" regulations must send a report to the ministry in charge of civil aviation.[75] This report provides the number of hours of flight flown during the previous year, gives a summary of any problems encountered, and states the airworthiness of any drone weighing more than 25 kilograms.[76]

Any drone used for "particular activities" must have an identification plate affixed to it, showing the operator's name and contact information.[77] Presumably, this is to ensure that the operator could be easily identified for purposes of establishing liability in case of an accident.

A drone's operator is responsible for knowing, and for periodically evaluating, the level of competence of the pilots who fly it.[78]

D. Qualifications Requirements for Professional Drone Pilots

Pilots of drones for "particular activities" must have, or have had, a certificate of theoretical competence for flying a manned aircraft.[79] An exception is made for pilots of tethered aerostats, who are required only to be able to read aeronautical information.[80] Beyond this theoretical competence, drone pilots must take a practical training course determined by the drone operator as necessary to perform the flights required by the "particular activity" in question.[81]

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[72] Creation and Use Order Annex III, ¶ 3.3.1. As used in these regulations, the term "operator" appears to refer to the person or company in charge of the drone's operation. The operator, in this context, is not necessarily the same person as the pilot. Rather, the term refers to the company that owns the drone and employs the pilot. It is possible (and probably not uncommon) for the operator and the pilot to be the same person if he/she is self-employed, but the concepts as used in these regulations are distinct.

[73] *Id.* ¶ 3.3.1–3.3.2.

[74] *Id.* ¶ 3.3.4.

[75] *Id.* ¶ 3.5.4.

[76] *Id.*

[77] *Id.* ¶ 1.7.

[78] *Id.* ¶ 3.5.2.

[79] *Id.* ¶ 4.1.1; DIRECTION DE LA SECURITE DE L'AVIATION CIVILE, AERONEFS CIRCULANT SANS PERSONNE A BORD: ACTIVITES PARTICULIERES : GUIDE [UNMANNED AIRCRAFT: PARTICULAR ACTIVITIES : GUIDE] 17 (Dec. 22, 2015), http://www.developpement-durable.gouv.fr/IMG/pdf/Guide_Activites_particulieres_v1-0.pdf, *archived at* https://perma.cc/V8CH-LHEL.

[80] *Id.* ¶ 4.1.1.

[81] *Id.* ¶ 4.2.1.

Pilots of drones in S-4 scenarios are subject to additional requirements, which include having a manned aircraft pilot's license (for either an airplane, a helicopter, or a glider) and at least one hundred hours of flight operating this aircraft as a pilot.[82] Furthermore, the pilot must have had at least twenty hours of practical experience flying the drone in the six months prior to the S-4 flight.[83]

The pilots of drones other than tethered aerostats weighing more than 25 kilograms must perform a demonstration flight before an agent of the ministry in charge of civil aviation before they are authorized to perform a "particular activity."[84]

[82] *Id.* ¶ 4.2.2.

[83] *Id.* ¶ 4.2.3.

[84] *Id.* ¶ 4.3.

Germany

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SUMMARY The German Air Traffic Act defines unmanned aerial systems (UAS) as unmanned aerial vehicles that are not used for hobby or recreational purposes. The operation of a UAS that weighs more than 5 kilograms requires authorization from the aviation authority of the German state in question. Authorization to fly will be granted if operation of the UAS does not present a risk to air safety or public safety or order, and if rules on data protection and privacy are not violated. Operating a UAS that weighs more than 25 kilograms or operating it outside of the visual line of sight of the operator is generally prohibited. The German Ministry of Transportation and Digital Infrastructure is currently working on changes to the existing drone regulation regime.

I. Definition of Unmanned Aerial Systems

The Air Traffic Act defines unmanned aerial systems (UAS), commonly called "drones," as "unmanned aerial vehicles (UAV), including their control stations, which are not used for hobby or recreational purposes."[1] If these conditions are fulfilled, the UAS are qualified as aerial systems and the requirements of the Air Traffic Act and the Air Traffic Regulation[2] apply to their operation.

If on the other hand the UAVs are merely used for hobby or recreational purposes, they are qualified as "model aircraft."[3] In general, the operation of model aircraft of up to 5 kilograms (approximately 11 pounds) of weight does not require authorization from the aviation authority.[4] UAVs used for hobby or recreational purposes above that weight must adhere to the specific requirements for model aircraft codified in section 20 of the Air Traffic Regulation, as explained below.

The distinction between UAS and model aircraft only depends on the purpose for which the UAV is used. Recreational purposes indicate a model aircraft, whereas other, in particular commercial, purposes indicate a UAS.

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[1] Luftverkehrsgesetz [LuftVG] [Air Traffic Act], May 10, 2007, BUNDESGESETZBLATT [BGBL.] [FEDERAL LAW GAZETTE] I at 698, § 1, para. 1, sentence 3, as amended, http://www.gesetze-im-internet.de/bundesrecht/luftvg/gesamt.pdf, *archived at* http://perma.cc/DN5N-ZKWT.

[2] Luftverkehrs-Ordnung [LuftVO] [Air Traffic Regulation], Oct. 29, 2015, BGBL. I at 1894, http://www.gesetze-im-internet.de/bundesrecht/luftvo_2015/gesamt.pdf, *archived at* http://perma.cc/X72J-S5Z6.

[3] Air Traffic Act § 1, para. 2, sentence 1, no. 7.

[4] Air Traffic Regulation § 20, para. 1, no. 1a.

II. Requirements for the Operation of UAS

A. General Requirements

In order to operate a UAS that weighs more than 5 kilograms, the owner must obtain authorization[5] from the aviation authority of the German state in question.[6] If the aviation authority concludes that the operation of the UAS does not present a risk to air safety or public safety or order, and if rules on data protection are not violated, authorization to fly (*Aufstiegserlaubnis*) will be granted.[7] In order to achieve a harmonized system for the authorization of UAS, the Federation and the German states have agreed on a common set of rules, the Common Principles of the Federation and the States for Granting a Permission to Fly for Unmanned Aerial Systems According to Section 16, para. 1, no. 7 of the Air Traffic Regulation (Common Principles).[8] The Common Principles are not legally binding, but are supposed to provide practical guidance to aviation authorities.[9]

B. Different Types of Authorizations

There are two different types of authorizations for the operation of UAS: a general authorization and a specific, case-by-case authorization.[10] The aviation authority in question has discretion to decide which type of authorization to grant and what documents need to be submitted with an application.[11] Authorizations are generally issued with conditions and limitations that the operator is responsible for complying with.[12] An application for either type of authorization will be denied if the intended operation violates data protection and privacy laws.[13]

1. General Authorization

For UAS that do not weigh more than 5 kilograms and do not have a combustion engine, a general authorization to fly may be granted for a period of two years.[14] A general authorization is only issued for a specific state, but may be recognized by other states.[15]

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[5] *Id*. § 20, para. 1, no. 7.

[6] Air Traffic Act § 31, para. 2, no. 16, in conjunction with Air Traffic Regulation § 20.

[7] Air Traffic Regulation § 20, para. 4.

[8] Gemeinsame Grundsätze des Bundes und der Länder für die Erteilung der Erlaubnis zum Aufstieg von unbemannten Luftfahrtsystemen gemäß § 16 Absatz 1 Nummer 7 Luftverkehrs-Ordnung (LuftVO) [Common Principles of the Federation and the States for Granting Unmanned Aerial Systems Permission to Fly According to Section 16, Paragraph 1, Number 7 of the Air Traffic Regulation], *published in* 61 NACHRICHTEN FÜR LUFTFAHRER [NfL] [NEWS FOR AERONAUTS] I 281/13 (Dec. 26, 2013), https://www.uavdach.org/aktuell/NFL-1-281-13.pdf, *archived at* http://perma.cc/SK5X-FY5G.

[9] *Id*. at 1, no. 1.

[10] Air Traffic Regulation § 20, para. 4, sentence 3.

[11] *Id*. sentence 4.

[12] *Id*. sentence 2.

[13] *Id*. sentence 1; Common Principles, *supra* note 8, at 6, para. 2.3.

[14] Common Principles, *supra* note 8, at 1, paras. 2.1.1. & 2.1.4.

A general authorization may not be issued if the UAS will be operated

- above people and public gatherings;
- above the scene of an accident, disaster zones, and other operation sites of police or other organizations with security-related duties;
- above correctional facilities, military complexes, industrial complexes, power plants, and power generating and distributing facilities, unless the operation has been explicitly permitted by these places; or
- in prohibited areas and in flight-restricted areas.[16]

The application for a general authorization must contain

- the name, date and place of birth, and address of the applicant;
- for a business, the name of the company, as well as the name, address, date and place of birth of the registered agent and of all employees who will operate the UAS;
- the reason for the operation of the UAS; and
- proof of sufficient insurance for personal and property damage according to section 37, para. 1a and section 43 of the Air Traffic Act.[17]

2. Specific Case-by-Case Authorization

For UAS that weigh between 5 and 25 kilograms (approximately 55 pounds), a specific authorization may be obtained from the aviation authority. The same operation prohibitions listed above for UAS subject to general authorization also apply to these UAS.[18] In addition to the information that must be provided in the application for a general authorization, the applicant for a specific authorization must submit

- a map that indicates the launch area and operating space, and clearly marks the launch site (district, lot or city, street, and street number);
- a declaration of consent from the property owner or other beneficiaries of the launch site;[19]
- definite statements about time frame (date and time) and in some cases number and duration of launches;
- technical details of the UAS;

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[15] With the exception of the states of Baden-Württemberg, Berlin, Bremen, Hamburg, and Rhineland-Palatinate. *See* Common Principles, *supra* note 8, at 3, para. 2.1.5.

[16] *Id.* at 1, para. 2.1.1.

[17] *Id.* at 2, para. 2.1.2.

[18] *Id.* at 4, para. 2.2.1.

[19] Air Traffic Act § 25; Air Traffic Regulation § 20, para. 5.

- information on the knowledge and experience, or proof of training, of the operator;
- a data privacy statement;
- a letter of no objection from the competent regulatory or police agency; and
- for flights in nature conservation areas, an authorization or letter of no objection from the competent nature conservation authority.[20]

The aviation authority issues a specific authorization only for the limited time and place specified in the authorization.[21]

C. Prohibitions and Restrictions

There are several general restrictions that must be observed while operating a UAS. The UAS cannot weigh more than 25 kilograms and must be kept within the operator's visual line of sight at all times.[22] A UAS is not within visual line of sight if the operator cannot see the aircraft without vision-enhancing devices or if he/she is not able to have an unobstructed view of the aircraft.[23]

An exception from the general prohibition may be granted by the aviation authority, if the intended use of the air space does not pose a danger to public safety and order and if the UAS will be operated in a restricted-flight area according to section 17 of the Air Traffic Regulation, or if the operation will be outside of the airfield traffic of a landing site. No restricted-flight area needs to be established if the UAS will be operated within the visual line of sight of the operator, for agricultural or forestry purposes, up to 50 meters above ground and water, and outside of the controlled airspace.

Additionally, the UAS must be flown below 100 meters above ground[24] and it cannot be flown within 1.5 kilometers of an airport, unless a special permit is granted.[25] Furthermore, a UAS may not fly over people or public gatherings.[26]

III. Flight in Controlled Airspace

The certification of UAVs and model aircraft for flight in the controlled airspace of international and regional airports and military airfields requires clearance from the German Aviation Control

[20] Common Principles, *supra* note 8, at 4, para. 2.2.2.

[21] *Id*. at 5, para. 2.2.3.

[22] Air Traffic Regulation § 19, para. 3.

[23] *Id.* § 19, para. 3, sentence 2.

[24] Common Principles, *supra* note 8, at 1, para. 1.

[25] Air Traffic Regulation § 20, para. 1., no. 1d.

[26] Common Principles, *supra* note 8, at 1, para. 2.1.1.; *id*. at 4, para. 2.2.1.

(Deutsche Flugsicherung, DFS).[27] The DFS has issued a general clearance for the sixteen international airports[28] that it controls, if the following conditions are met:

- The distance from the airport boundary is 1.5 km or more.
- The flight is conducted within the operator's direct visual line of sight.
- At all times during the flight, the operator or a second person who is in contact with the operator is able to observe the airspace, especially in regard to other traffic.
- Manned aircraft operations are granted the right-of-way at all times.
- Model aircraft and/or unmanned aircraft systems that have gone out of control must be immediately reported to the competent air traffic control unit.
- Maximum weight of model aircraft: 5 kg
- Maximum weight of UAS: 25 kg
- Maximum height for model aircraft: 30 m
- Maximum height for UAS: 50 m[29]

IV. Data Protection and Privacy Rights

The private and commercial operation of UAS might implicate data protection and privacy laws. The Air Traffic Regulation as well as the Common Principles put particular emphasis on the observance of data privacy and data protection rules and do not permit authorization if the intended operation would violate those rules.

A. Federal Data Protection Act

If a UAS is used to process personal data, the requirements of the Federal Data Protection Act must be taken into account.[30] "Personal data" is defined as "any information concerning the personal or material circumstances of an identified or identifiable individual."[31] The Federal

[27] *Id.* § 21, para. 1.

[28] Berlin Schönefeld, Berlin Tegel, Bremen, Düsseldorf, Dresden, Erfurt, Frankfurt Main, Hamburg, Hannover, Cologne Bonn, Leipzig Halle, Munich, Münster Osnabrück, Nürnberg, Saarbrücken, and Stuttgart.

[29] Allgemeinverfügung zur Erteilung von Flugverkehrskontrollfreigaben zur Durchführung von Flügen mit Flugmodellen und unbemannten Luftfahrtsystemen in Kontrollzonen von Flugplätzen nach § 27d Abs. 1 LuftVG an den internationalen Verkehrsflughäfen mit DFS-Flugplatzkontrolle [General Clearance for Flights of Model Aircraft and Unmanned Aerial Systems in Controlled Airspace of Airports According to § 27d, Para. 1 of the Air Traffic Act at International Airports Controlled by DFS], *published in* NfL I 681/16 (Feb. 23, 2016), http://www.dfs.de/dfs_homepage/de/Services/Luftsport%20&%20Freizeit/Flugmodelle%20|%20%22Drohnen%22/1-681-16.pdf, *archived at* http://perma.cc/4AMW-GL7U.

[30] Bundesdatenschutzgesetz [BDSG] [Federal Data Protection Act], Jan. 14, 2003, BGBL. I at 66, as amended, http://www.gesetze-im-internet.de/bundesrecht/bdsg_1990/gesamt.pdf, *archived at* http://perma.cc/T2Q4-2643, unofficial English translation *available at* http://www.gesetze-im-internet.de/englisch_bdsg/federal_data_protection_act.pdf, *archived at* http://perma.cc/Z2NZ-UH36.

[31] *Id.* § 3, para. 1.

Data Protection Act does not apply to the processing of personal data effected solely for personal or family activities.[32]

If a UAV is equipped with a video camera, the requirements of section 6b of the Federal Data Protection Act (video surveillance of public places) must be taken into account. Video surveillance of public places may only be conducted to fulfill public tasks, to exercise the right to determine who shall be allowed or denied access to a property, or to pursue rightful interests for precisely defined purposes—for example, protection against theft or vandalism.[33] If a UAS is merely used for recreational purposes and the surveillance is not of a lasting nature, the provision will not be applicable.[34]

If the UAV camera is surveilling a nonpublic area, section 4, paragraph 1 of the Federal Data Protection Act applies. In such a case, any collection, processing, and use of personal data is only admissible if permitted by law or if the person has consented. Furthermore, the subjects of the surveillance have to be informed of the identity of the data collector, purposes of collection, processing, or use of their personal data, and of possible recipients.[35]

B. Right to Control the Use of One's Image

Videos and photos that were taken with a camera installed on a UAS might also violate the right to control the use of one's image. Section 22, paragraph 1 of the Copyright Arts Domain Act[36] provides that images can only be disseminated with the express consent of the person concerned. Exceptions are listed in section 23—for example, for images that portray an aspect of contemporary society—on condition that the publication does not interfere with a legitimate interest of the person concerned. Dissemination includes public and private dissemination—for example, making an image available to a limited audience on the Internet.[37]

C. General Right of Personality

Data protection and the Right to Control the Use of One's Image are special codifications of the General Right of Personality, which is derived from article 2, paragraph 1 in conjunction with

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[32] *Id*. § 1, para. 2, no. 3.

[33] *Id*. § 6b, para. 1; Philip Scholz, *§ 6b, Beobachtung öffentlich zugänglicher Räume mit optisch-elektronischen Einrichtungen* [*§ 6b, Monitoring Publicly Accessible Areas with Optic-Electronic Devices*], *in* BUNDESDATENSCHUTZGESETZ [FEDERAL DATA PROTECTION ACT] 715, 743, para. 79 (Sprios Simitis ed., 2014).

[34] Scholz, *supra* note 33, at 738, para. 64; PETER GOLA & RUDOLF SCHOMERUS, BDSG, BUNDESDATENSCHUTZGESETZ KOMMENTAR [BDSG, FEDERAL DATA PROTECTION ACT COMMENTARY] 248, para. 12 (12th ed. 2015).

[35] Federal Data Protection Act § 4, para. 3.

[36] Gesetz betreffend das Urheberrecht an Werken der bildenden Künste und der Photographie [KUG] [Copyright Arts Domain Act], Jan. 9, 1907, REICHS-GESETZBLATT [RGBL.] [REICHS LAW GAZETTE] I at 7, as amended, http://www.gesetze-im-internet.de/bundesrecht/kunsturhg/gesamt.pdf, *archived at* http://perma.cc/QJY8-5V3X.

[37] Gunda Dreyer, *§ 22 KUG, Recht am eigenen Bild* [*§ 22, Right to Control the Use of One's Own Image*], *in* URHEBERRECHT [COPYRIGHT LAW] 1597, 1618 et seq., para. 12 (Gunda Dreyer et al. eds., 3d ed. 2013).

article 1, paragraph 1 of the German Basic Law.[38] Intrusions into someone's private sphere of life—for example, by repeatedly flying over a neighbor's property—might violate the General Right of Personality.[39]

D. Copyright Law

Section 2 of the Copyright Act[40] protects works of architecture. Utilizing a drone to take pictures of public buildings, bridges, sights, or statues is therefore only permissible if the image is made for private use.[41]

Furthermore, taking pictures of the outside of buildings and other art that are permanently located in a public place is generally permitted under copyright law.[42] This general permission does not extend to places that are not visible from the street—for example, an inside courtyard—and a drone can therefore not be used for such purposes.[43]

V. Proposed Legislation

The German Ministry of Transportation and Digital Infrastructure (BMVI) is currently working on legislation that would make changes to the existing drone regulation regime. All UAS weighing more than 0.5 kilograms (approximately 1 pound) would have to be registered in order to be able to hold the operator/owner accountable if the UAS is used in an unsafe manner or for illegal purposes.[44]

A. Private Use

The proposal would strictly prohibit UAS flights for private use that are

- more than 100 meters above ground;

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[38] GRUNDGESETZ FÜR DIE BUNDESREPUBLIK DEUTSCHLAND [GRUNDGESETZ] [GG] [BASIC LAW], May 23, 1949, BGBL. I at 1, unofficial English translation *available at* http://www.gesetze-im-internet.de/englisch_gg/basic_law_for_the_federal_republic_of_germany.pdf, *archived at* http://perma.cc/KC9J-TJA6.

[39] Amtsgericht Potsdam [AG Potsdam] [District Court of Potsdam], Apr. 16, 2015, Docket No. 37 C 454/13, http://www.gerichtsentscheidungen.berlin-brandenburg.de/jportal/portal/t/152n/bs/10/page/sammlung.psml?pid=Dokumentanzeige&showdoccase=1&js_peid=Trefferliste&documentnumber=1&numberofresults=1&fromdoctodoc=yes&doc.id=JURE160000030&doc.part=L&doc.price=0.0#focuspoint, *archived at* http://perma.cc/7APX-MY9Z.

[40] Urheberrechtsgesetz [Copyright Act], Sept. 9, 1965, BGBL. I at 1273, § 2, para. 1, no. 4, as amended, http://www.gesetze-im-internet.de/bundesrecht/urhg/gesamt.pdf, *archived at* http://perma.cc/J2MJ-D6UZ, unofficial English translation *available at* http://www.gesetze-im-internet.de/englisch_urhg/act_on_copyright_and_related_rights__copyright_act_.pdf, *archived at* http://perma.cc/WH66-N38U.

[41] Copyright Act § 53, para. 1.

[42] *Id.* § 59.

[43] *Id.*

[44] *Dobrindt plant neue Regelungen für Drohnen-Flüge* [*Dobrindt Is Proposing New Rules for Drone Flights*], FEDERAL MINISTRY OF TRANSPORTATION AND DIGITAL INFRASTRUCTURE (Dec. 29, 2015), http://www.bmvi.de/SharedDocs/DE/Artikel/K/151108-drohnen.html?nn=35602, *archived at* http://perma.cc/63YY-9WLS.

- outside of the visual line of sight of the operator;
- above industrial complexes, correctional facilities, military complexes, power plants, power generation and distribution facilities, or federal highways and railroads; and
- at the operation site of police or other security agencies or organizations.

B. Commercial Use

The BMVI proposal would also explore possibilities for the use of UAS for agriculture and traffic control.

Furthermore, according to the proposal, state aviation authorities would be authorized to allow the operation of commercial UAS outside of the operator's visual line of sight if safe operation can be demonstrated. Currently, operation outside of the line of sight of the operator is generally prohibited.

Additionally, the BMVI would require a pilot certificate for commercial UAS users. Aeronautic and aviation law knowledge would be tested. The certificate would be granted by the Federal Aviation Office.

Israel

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SUMMARY Israel's Aviation Law regulates the operation and manufacturing of all aircraft, including unmanned aircraft (UA) in Israel. The Law imposes licensing requirements on flight operators, aviation instructors, manufacturers, and all other persons engaged in aviation. Israel's Civil Aviation Authority (CAAI) controls the licensing and supervision of civilian flight operations, and maintains a special unit for UA operations. The CAAI has issued a number of directives to regulate various aspects of UA activities, including flight altitude and authorized routes, required transmission devices, and procedures for the preapproval of flights.

In addition to issuing operational directives, the CAAI has published a draft proposal for registration of UA. The proposed register would include all UA owned by Israeli citizens or by Israeli corporations that have received authorization to deal with UA in Israel. The proposal also calls for labeling UA with information confirming their Israeli registration, the name of manufacturer, and the registration number. In addition, the proposal would require fire-resistant license plates in all UA. The plates would contain specific identifying information including aircraft type, model, and serial number, as well as UA authorization status.

A concept paper issued by the CAAI incorporates licensing requirements under Circular 328 AN/190 of the International Civil Aviation Organization regarding UA systems. The concept paper calls for the issuance of UA licenses for various aviation operators, depending on flight type, category, and class.

Flying any aircraft, including UA, in Israeli airspace is subject to spatial and geographic restrictions. In addition to aircraft, the restrictions apply to unmanned powered or unpowered air devices weighing at least 300 grams (0.66 pounds), which are used or designed to be used for sports and leisure purposes.

I. Introduction

Having pioneered the modern use of unmanned aircraft (UA) for intelligence gathering and target identification in the mid-1970s, Israel was reportedly the world's largest exporter of UA between 2010 and 2014.[1] Foreign UA sales from 2005 to 2012 by Israeli companies were

[1] George Arnett, *The Numbers Behind the Worldwide Trade in Drones*, THE GUARDIAN (Mar. 16, 2015), http://www.theguardian.com/news/datablog/2015/mar/16/numbers-behind-worldwide-trade-in-drones-uk-israel, *archived at* https://perma.cc/8XE6-ZDUN; *see also* Josh Meyer, *Why Israel Dominates Global Drone Exports* (July 10, 2013), http://qz.com/102200/why-israel-dominates-global-drone-exports, *archived at* https://perma.cc/Z6FN-3ZDH.

estimated at over US$4.5 billion.[2] In addition to developing UA for military uses, several Israeli startups are currently working on exploring civilian uses for UA and on finding ways to make UA technology safe, simple, and affordable.[3] According to Israel's Civil Aviation Authority (CAAI), fifteen companies are now engaged in developing unmanned aircraft, and more than thirty platforms are in different stages of development.[4]

UA operations are subject to the application of the Aviation Law, 5771-2011 and related regulations.[5] Since the first UA flight in the mid-1970s, flight approvals for all unmanned aircraft in Israel have been controlled by the Israeli Airforce.[6] With the increased volume of experimental flights conducted by Israeli defense industries engaged in UA development for the Israeli Defense Force (IDF) and for foreign clients, the Airforce has reportedly decided to direct requests for civilian flight approval to the CAAI. This has resulted in a comprehensive review of relevant legislation on UA operations in Israel.[7]

In February 2005 the Knesset passed Israel's Civil Aviation Authority Law, 5765-2005. This Law establishes the CAAI as an agency under the Ministry of Transportation.[8] The CAAI is responsible for improving, regulating, and developing civil aviation in Israel in accordance with Israeli aviation laws.[9] The CAAI maintains a special unit for unmanned aircraft systems under the Department for Aerial Control.[10] The CAAI has issued a number of directives to regulate various aspects of UA flight operations.

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[2] Daniel Tepper, *Newest Trend for Israeli Drone Industry: Shooting Them Down*, VICE NEWS (Sept. 14, 2015), https://news.vice.com/article/newest-trend-for-israeli-drone-industry-shooting-them-down, *archived at* https://perma.cc/L3GP-XWZ7.

[3] Ora Coren, *As Civilian Market Booms, Drone Pioneer Israel Is Playing Catch Up*, HAARETZ, (Sept. 9, 2015), http://www.haaretz.com/israel-news/business/.premium-1.675178, *archived at* https://perma.cc/3L4U-BN5J.

[4] CAAI, *Concept for Licensing of Flyers of Unmanned Aircraft 2011/11*, at 3, http://caa.gov.il/index.php?option=com_docman&view=download&alias=5171-remote-pilot-licence-caai-1&category_slug=2015-10-13-06-38-50-7&Itemid=669&lang=he (last visited Mar. 22, 2016), *archived at* https://perma.cc/72MJ-VFCM. CAAI documents and all other legal sources cited in this report are in Hebrew.

[5] Aviation Law, 5771-2011, SEFER HAHUKIM [SH] [BOOK OF LAWS] (official gazette), 5771 No. 2296 p. 830, *as amended*, *available at* http://caa.gov.il/index.php?option=com_docman&view=download&alias=5307-1927-2016&category_slug=2015-10-13-06-39-02-8&Itemid=669&lang=he, *archived at* https://perma.cc/9LDH-X4VF.

[6] Ran Kleiner, *Flying Above the Law: Operating [Unmanned] Aircraft in Israel, Legal or Not?*, GEEKTIME (Aug. 4, 2015), http://www.geektime.co.il/does-using-drones-allowed-in-israel, *archived at* https://perma.cc/CKB7-AM4Z.

[7] *Id*.

[8] Israel's Civil Aviation Authority Law, 5765-2005, SH No. 1980 p. 130, *available at* http://caa.gov.il/index.php?option=com_docman&view=download&category_slug=2015-10-13-06-39-02-7&alias=4452-2005-1&Itemid=669&lang=he, *archived at* https://perma.cc/HC6Y-9AKK.

[9] *Id*. § 1.

[10] *Status and Organizational Structure*, CAAI, http://caa.gov.il/index.php?option=com_content&view=article&id=49&Itemid=820&lang=he (last visited Apr. 4, 2016), *archived at* https://perma.cc/L27V-T4TR.

II. Licensing Requirements

The Aviation Law regulates the operation of all "aircraft." According to the definition provided by the Law, an aircraft is any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface, excluding "paragliding tools" (PTs).[11]

Unlike PTs, UA are subject to the general provisions that apply to all "aircraft."[12] According to the Aviation Law, any person who "engages in an aviation profession," including by flying, conducting aircraft quality inspections, or providing aviation instruction or air control services, is required to be licensed.[13] The Law authorizes the Minister, with the approval of the Knesset (Parliament) Finance Committee, to adopt rules for the grant of aviation professionals' licenses. Items that may be considered for licensing include the applicant's age, proof of subject-matter knowledge, training and testing, medical certification, and criminal record.[14]

Aircraft operators must meet the specific requirements in their licenses.[15] To receive a license, operators of commercial aircraft must meet certain conditions, including residence in Israel while not having his/her primary business located abroad, or Israeli citizenship when the licensee's primary business is located in Israel.[16] In the case of a corporation, a license to operate commercial aircraft will only be issued if the corporation is incorporated in Israel; does not have its primary business activity outside of Israel; and is controlled by an Israeli citizen, an Israeli permanent resident, or another person in accordance with the provisions of an international aviation convention [the 1944 Convention on International Civil Aviation, including supplements and amendments as ratified by the State of Israel] to which Israel is a party.[17] Additional requirements for licensing of commercial operations include possession of the aircraft and necessary equipment for its operation, and authorization for flying and landing in designated areas in Israel.[18]

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[11] Aviation Law §§ 1 & 168(a)(8). The operation of hang gliders, powered hang gliders, paragliders, powered paragliders, and powered parachutes are subject to the Aviation (Paragliding Tools) Regulations, 5775-2015, KOVETZ HATAKANOT [KT] [SUBSIDIARY LEGISLATION] No. 7503 p. 1090, *available at* http://caa.gov.il/index.php?option=com_docman&view=download&category_slug=2015-10-13-06-39-02-8&alias=4841-takanot-cli-rhifa-2015&Itemid=669&lang=he, *archived at* https://perma.cc/PVS8-Y63L. The regulations impose licensing requirements on operators of PTs; set geographical restrictions; and list safety requirements for the general, commercial, and instructional operation of PTs.

[12] Kleiner, *supra* note 6.

[13] Aviation Law § 2.

[14] *Id*. §§ 3 & 6.

[15] *Id*. § 17(b).

[16] *Id*. § 18(a)(1)(a).

[17] *Id*. §§ 1 & 18(a)(1)(b); International Civil Aviation Organization, Convention on International Civil Aviation, Doc. 7300 (1944) (9th ed. 2006), http://www.icao.int/publications/Documents/7300_cons.pdf, *archived at* https://perma.cc/QA7K-WVN7.

[18] Aviation Law §§ 17 & 18.

In addition to regulating the operation of aircraft, the Aviation Law requires registration and preapproval of the use of any "flight auxiliary facility" (FAF). The Law defines an FAF as any device located outside of the aircraft that is used to assist the operation of the aircraft, including by navigation and flying.[19] The Law also imposes licensing requirements on the manufacture of all aircraft, including UA. Among the conditions for the issuance of a manufacturing license are the availability of equipment necessary for the production of aircraft and the operation of a system of quality control by the manufacturer. The Law further authorizes the Minister to issue regulations regarding specific aspects of the design and production of aircraft.[20]

III. Spatial Restrictions

The Aviation Law authorizes the Minister of Transportation and Road Safety, with the consent of the Minister of Defense, or the government in the absence of such consent, to designate areas for flights of civilian and military aircraft.[21] The decision regarding coordinates and routes through which aircrafts would enter, pass through or exit Israeli airspace, will similarly be made by the Ministers, having consulted with the Minister of Environment Protection, and by the government, in the absence of such consent.[22]

The Aviation Regulations (Operating Aircraft and Aviation Rules), 5742-1981,[23] issued by the Minister, accordingly divide Israel's Flight Information Region into areas where flying is permitted, areas where flying is prohibited or restricted, and areas that are considered dangerous.[24] The geographic restrictions under the regulations apply to all aircraft, including UA.[25] The restrictions also expressly provide that they are applicable to unmanned powered as well as unpowered air devices of at least 300 grams (0.66 pounds), which are used or designed to be used for sports and leisure purposes.[26]

Among those areas where flying under a specified altitude is prohibited are designated natural reserves and antiquities, locations of refineries and a power plant, the Biological Research Institute in Nes Tsiona, and firing ranges. Flying over the Temple Mount in Jerusalem is completely prohibited for all aircraft at any altitude except for commercial flights in aviation

[19] *Id*. §§ 1 & 35.

[20] *Id*. §§ 50–55.

[21] *Id*. § 80.

[22] *Id*. § 81.

[23] Aviation Regulations (Operating Aircraft and Aviation Rules) 5742-1981, §§ 1 & 164, KT 5742 No. 4276 p. 8, *as amended*, *available at* Nevo Legal Database, http://www.nevo.co.il (by subscription; last visited Apr. 1, 2016), *archived at* https://perma.cc/3BHC-TQJV.

[24] *Id*. §§ 50–53, *archived at* https://perma.cc/6UYB-L7EF.

[25] See the definition of "aircraft," Aviation Law, 5771-2011, § 1.

[26] Aviation Regulations (Operating Aircraft and Aviation Rules) 5742-1981, §§ 1 & 164. For specific restrictions issued by the CAAI, see CAAI, Areas Prohibited, Restricted and Dangerous for Flying (A-17-1), http://caa.gov.il/index.php?option=com_docman&view=download&category_slug=2015-10-13-06-39-29-7&alias=4043-alef-17-final-03-04-2014&Itemid=669&lang=he (last visited Mar. 23, 2016), *archived at* https://perma.cc/CHJ7-4STB.

routes to and from the Ben Gurion International Airport flying 8,000 feet above sea level.[27] In the case of other areas in Jerusalem, flying at 4,000 feet or higher may be authorized subject to satisfying security procedures at the airport, the use of an Israeli pilot who has completed special training at the Ministry of Transportation Security Department, and the preapproval of a detailed authorization request by that Department.[28] Flying over the nuclear reactor in Dimona is completely prohibited at any altitude.[29] A full prohibition similarly applies to flying over Gaza at any altitude.[30]

Areas where flying is restricted include certain firing ranges during weekdays.[31] The rules also designate two areas where flying is dangerous,[32] and prohibit flying within specific distances from Israel's borders.[33] Special requests to deviate from geographic restrictions other than those regarding distances from the borders may be submitted to the CAAI's operations unit for approval.[34]

IV. Regulation of UA Flights

UA flight operations are subject to specific rules issued by the CAAI. Accordingly, except for takeoff and landing, or by special prior approval, UA flights over a populated area can be conducted only at 5,000 feet or higher. Experimental flights also require prior approval. The rules prohibit the simultaneous remote operation of more than one UA by the same operator from the same remote pilot station in the absence of special authorization.[35] Special rules also apply to ensure that the UA operator maintains control over the UA flight at all times,[36] and to generally prevent the flying of UA in air space where manned aircraft fly.[37]

The rules require that specific equipment be located in or on the UA as well as in the pilot station during flight. For example, a UA is generally required to have a properly operating transponder. A communication signal and a code for identification of the transponder must be defined for every UA flight. A flight manual and radio devices with certain reception and transmission

[27] CAAI, Areas Prohibited, Restricted and Dangerous for Flying, *supra* note 26, § 1(11).

[28] *Id*. § 1(13).

[29] *Id*. § 1(15).

[30] *Id*. § 1(20).

[31] *Id*. § 2.

[32] *Id*. § 3.

[33] *Id*. § 4.

[34] *Id*. § 5.

[35] CAAI, Rules of Flights of Unmanned Aircraft (UA) § 2, http://caa.gov.il/index.php?option=com_docman&view=download&category_slug=2015-10-13-06-39-40&alias=4530-bet-09-final-11-12-14&Itemid=669&lang=he (last visited Apr. 5, 2016), *archived at* https://perma.cc/7UU7-7WU9.

[36] *Id*. § 3.

[37] *Id*. § 4.

abilities must be located at the pilot station.[38] Additional rules apply to flight procedures and flight approval requests.[39]

The CAAI has assigned specific geographic parameters to areas navigated by UA.[40] Maps for UA flight routes are provided on the CAAI website.[41]

CAAI directives further define and assign direct responsibility for UA flight operations,[42] determine the range that must exist between a UA and its transponder,[43] specify the information that must be included in a request for flight approval,[44] regulate automatic take-off and landing systems for UA,[45] and establish safety transportation procedures,[46] among other matters.

V. Registration and Labeling of UA

In preparation for specific regulations on the subject, the CAAI has published a draft proposal for registration and labeling of UA. Among the proposal's objectives are the encouragement of the use of UA for commercial activities by facilitating proof of ownership, providing the state with the ability to prevent the use of UA by criminal or terrorist players, encouraging proper operation

[38] *Id*. § 8.

[39] *Id*. §§ 5–6.

[40] *Id*. supp. C.

[41] Map of Aviation Areas for UA: Changes: CTRs, Training Areas, Routing (Dec. 11, 2014), *id*., supp. A, http://caa.gov.il/index.php?option=com_docman&view=download&category_slug=2015-10-13-06-39-40&alias=4528-bet-09-alef-11-12-14&Itemid=669&lang=he, *archived at* https://perma.cc/F2KW-FBKJ; Map for Mini UAs (UAs Weighing Between 1.5–15 kg (3.30693–33.0693 lb): Changes: CTRs, Training Areas, Routing, Altitudes (Dec. 11, 2014), http://caa.gov.il/index.php?option=com_docman&view=download&category_slug=2015-10-13-06-39-40&alias=4529-bet-09-bet-11-12-14&Itemid=669&lang=he, *archived at* https://perma.cc/CX6J-ZKHA.

[42] State of Israel, Ministry of Transport, Directive SP002: UA Flyer/Operator – Commander, http://caa.gov.il/index.php?option=com_docman&view=download&alias=5199-2015-11-18-07-03-41-1&category_slug=2015-10-13-06-38-50-7&Itemid=669&lang=he (last visited Apr. 4, 2016), *archived at* https://perma.cc/N6EL-2DJ3.

[43] State of Israel, Ministry of Transport, Directive SP003: Maximum Range Between Aircraft and Radio Station When There Is No Wireless Transmitter in the Aircraft Itself, http://caa.gov.il/index.php?option=com_docman&view=download&alias=5198-2015-11-18-07-03-41&category_slug=2015-10-13-06-38-50-7&Itemid=669&lang=he (last visited Apr. 4, 2016), *archived at* https://perma.cc/J2LA-D8NT.

[44] State of Israel, Ministry of Transport, Directive SP004: Flight Opening Route, http://caa.gov.il/index.php?option=com_docman&view=download&alias=5197-2015-11-18-07-03-40-1&category_slug=2015-10-13-06-38-50-7&Itemid=669&lang=he (last visited April 4, 2016), *archived at* https://perma.cc/PKB9-VFSC.

[45] CAAI, UAV OPS.1.1.011A, Use of Automatic Take-off and Landing Systems (July 2012), http://caa.gov.il/index.php?option=com_docman&view=download&alias=5195-2012-11&category_slug=2015-10-13-06-38-50-7&Itemid=669&lang=he, *archived at* https://perma.cc/88MX-HY3A.

[46] State of Israel, Ministry of Transport, Directive SP013: Transporting Procedures, http://caa.gov.il/index.php?option=com_docman&view=download&alias=5194-2015-11-18-07-02-48&category_slug=2015-10-13-06-38-50-7&Itemid=669&lang=he (last visited April 4, 2016), *archived at* https://perma.cc/V8JY-WQLL.

by enabling third parties to identify and complain about improper UA use, and facilitating UA identification for purposes of investigating accidents.[47]

According to the proposal, the CAAI would maintain a register of all UA based on proof of ownership. Registration of UA would be authorized only for Israeli citizens or corporations that have received authorization to deal with UA. The registration of foreign-registered UA, however, would be prohibited, and UA sold to foreign countries would be deleted from the register.[48]

The proposal also calls for labeling of UA in a way that would confirm that they were registered in Israel, providing the name of the manufacturer, and providing their specific registration number. The registration number would be removed, however, if the UA were sold to a foreign country.[49] A conspicuous label is further proposed for any UA authorized to fly outside of a designated area and/or that weighs more than 200 kilograms (about 441 pounds) at the time of takeoff.[50]

In addition to general labeling, the proposal provides for the mandatory placement of a fire-resistant license plate in each UA. The license plate would contain identifying information on the type of UA system, model number, date of manufacture and identification of the manufacturer, numbers correlating to the relevant serial and UA authorization, and other information as required.[51]

VI. Licensing of UA Flight Operators

A concept paper published by the CAAI Unit for Unmanned Aircraft Systems[52] incorporates the requirements provided by Circular 328 AN/190 of the International Civil Aviation Organization (ICAO), titled *Unmanned Aircraft Systems (UAS)*, into a regulatory proposal.[53]

In addressing UA personnel licensing, the concept paper quotes the ICAO Circular as follows:

> Personnel licensing provides harmonization within a single airspace as well as across national and regional boundaries. The remote pilot of a UAS and the pilot of a manned aircraft have the same ultimate responsibility for the safe operation of their aircraft and therefore have the same obligation for knowledge of air law and flight performance,

[47] CAAI, Registration and Labeling of UA Systems – Draft for Comments CAAI (Version 4) § 1, http://caa.gov.il/index.php?option=com_docman&view=download&alias=753-2015-10-13-06-44-28&category_slug=2015-10-13-06-39-02-2&Itemid=669&lang=he (last visited Mar. 24, 2016), *archived at* https://perma.cc/5RDU-ZZ8Y.

[48] *Id.* § 2.

[49] *Id.* §§ 3.1–3.5.

[50] *Id.* § 3.2.

[51] *Id.* § 4.

[52] CAAI, *Concept for Licensing of Flyers of Unmanned Aircraft 2011/11*, *supra* note 4, at 3.

[53] ICAO, Unmanned Aircraft Systems (UAS), Circular 328 AN/190 (2011), https://www.trafikstyrelsen.dk/~/media/Dokumenter/05%20Luftfart/Forum/UAS%20-%20droner/ICAO%20Circular%20328%20Unmanned%20Aircraft%20Systems%20UAS.ashx, *archived at* https://perma.cc/J5EM-TSAY.

> planning and loading, human performance, meteorology, navigation, operational procedures, principles of flight and radiotelephony. Both pilots must obtain flight instruction, demonstrate their skill, achieve a level of experience, and be licensed. They must also be proficient in the language used for radiotelephony and meet medical fitness levels, although the latter may be modified as appropriate for the UAS environment.[54]

Accordingly, the concept paper proposes that flying a UA should require a license containing a specified authorization for the type of activity and equipment involved. Such a license would either be issued by the CAAI or by an ICAO member country, with authorization provided by the CAAI.[55] Conditions for the issuance of flight licenses would include a minimum number of prior takeoffs and landings, depending on the type of flight.[56] A license limited to flying subject to "visual line of sight" (VLOS), for example, would generally be issued only for flying a UA for commercial objectives if the operator had conducted at least three takeoffs and landings in the ninety days preceding the flight.[57] The type of licenses issued would be based on the characteristics of the operator (trainee, flyer of a UA subject to VLOS, UA flyer, and UA instructor); on the type of flight (domestic, external, experimental); and on the UA type, category, and class.[58]

VII. Enforcement

As UA are considered "aircraft" for purposes of applying Israeli aviation legislation, the violation of licensing requirements enumerated in the Aviation Law results in the same penalties that apply to manned aircraft. Such penalties range from imprisonment for a period of one to five years to administrative fines rendered by the CAAI.[59] An order to pay a fine is appealable to the circuit court.[60]

The CAAI has extensive authority to issue and withdraw licenses provided to flight operators. The CAAI's enforcement authority also extends to the prevention of imminent danger to personal or public security, and to property.[61]

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[54] *Id.* § 2.14.

[55] CAAI, *Concept for Licensing of Flyers of Unmanned Aircraft 2011/11*, *supra* note 4, § 3.1.

[56] *Id.* § 3.3.

[57] *Id.* § 3.2.

[58] *Id.* § 4.1.3.

[59] Aviation Law, 5771-2011, §§ 142–162.

[60] *Id.* § 159.

[61] CAAI, Enforcement Policy Directive (Revision 3) § 2.2 (Mar. 4, 2015), http://caa.gov.il/index.php?option=com_docman&view=download&category_slug=gen-directives&alias=4896-gen-3-0-201-rev-3&Itemid=669&lang=he, *archived at* https://perma.cc/7239-G4MP.

Japan

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SUMMARY Japan recently amended its Aviation Act and passed a new law to regulate the flights of unmanned aerial vehicles (UAVs). UAVs are prohibited from flying near airports and over densely populated areas and important facilities.

I. Overview

Legislation to regulate drones was recently proposed in Japan after an April 2015 incident in which a small drone was discovered on the roof of the Japanese Prime Minister's office building in Tokyo.[1] At that time, there was no regulation in place to prohibit the flying of such devices. The drone operator was indicted and received a suspended sentence of two years' imprisonment for the criminal act of forcible obstruction of business.[2]

Following this incident, the ruling Liberal Democratic Party (LDP) submitted a bill to the Diet (Japan's Parliament) in June 2015 to regulate flights of unmanned aerial vehicles (UAVs) over certain areas.[3] The second bill, which amended the Aviation Act,[4] was submitted by the Cabinet in July 2015.[5] The Diet passed both of these bills, whose provisions are discussed below.

II. Aviation Act

The Aviation Act amendment was the first of the two bills to be enacted. The amendment was promulgated on September 11, 2015,[6] and became effective on December 10, 2015.[7] Under the

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[1] *UPDATE: Radiation Detected on Drone Found on Roof of Prime Minister's Office*, ASAHI SHIMBUN (Apr. 22, 2015) (on file with author).

[2] Shusuke Murai, *Man Who Landed Drone on Roof of Japanese Prime Minister's Office Gets Suspended Sentence*, JAPAN TIMES (Feb. 16, 2016), http://www.japantimes.co.jp/news/2016/02/16/national/crime-legal/man-landed-drone-roof-japanese-prime-ministers-office-gets-suspended-sentence, *archived at* https://perma.cc/A3VV-KCXH; PENAL CODE, Act No. 45 of 1907, *as amended*, art. 234, English translation of the Act as amended by Act No. 54 of 2007 *available at* http://www.japaneselawtranslation.go.jp/law/detail/?printID=&ft=3&re=02&dn=1&ia=03&bu=16&_x=63&_y=28&ky=&page=9&vm=02, *archived at* https://perma.cc/6G88-HVY6.

[3] *History of House of Representatives (HR) Bill No. 24 of 189th Diet Session*, HR, http://www.shugiin.go.jp/internet/itdb_gian.nsf/html/gian/keika/1DBDDC2.htm (last visited Apr. 5, 2016), *archived at* https://perma.cc/78GZ-JE5A. *See also Japan's Lower House Passes Law Restricting Use of Drones*, RT (July 9, 2015), https://www.rt.com/news/272731-japan-law-drones-ban, *archived at* https://perma.cc/58SH-73GX.

[4] Aviation Act, Act No. 231 of 1952.

[5] *History of Cabinet Bill No. 75 of 189th Diet Session*, HR, http://www.shugiin.go.jp/internet/itdb_gian.nsf/html/gian/keika/1DBDE56.htm (last visited Apr. 5, 2016), *archived at* https://perma.cc/8J3B-U5C7.

[6] *Id*.

[7] Order to Set Enforcement Date of Partial Amendment of Aviation Act, Order No. 371 of 2015 (Oct. 30, 2015).

amendment, a UAV operator is prohibited from flying a UAV, absent permission from the Ministry of Land, Infrastructure and Transportation (MLIT), in the following areas:

- Where air traffic is expected, such as airports and their approach areas, and areas above 150 meters
- Densely populated residential areas[8]

The amendment also sets the conditions for UAV flights:

- UAV flights may be made only between dawn and dusk.
- An operator must monitor the UAV and its surroundings with his/her own eyes at all times.
- In-flight UAVs must keep more than 30 meters' distance from people and objects.
- UAVs must not fly over a place where an event attended by many people is being held.
- UAVs must not carry specified dangerous items, such as explosives and flammable objects.
- UAVs must not drop items while in flight.[9]

These conditions may not apply in emergency situations or when an operator obtains prior approval from the MLIT.[10] A UAV that weighs 200 grams (7 ounces) or less is not subject to the rules in the Aviation Act.[11]

The MLIT has requested that UAV operators report accidents, collisions, UAV falls, and near-miss incidents.[12] Eleven cases were reported between the enforcement date of the amendment to the Aviation Act and March 30, 2016.[13] Additional cases were reported to the police instead of the MLIT.[14]

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[8] Aviation Act art. 132, *amended by* Act No. 67 of 2015; Aviation Act Enforcement Ordinance, Ministry of Transport Ordinance No. 56 of 1952, *amended by* Ministry of Land, Infrastructure and Transport Ordinance No. 79 of 2015, arts. 236 & 236-2.

[9] Aviation Act art. 132-2, *inserted by* Act No. 67 of 2015; Aviation Act Enforcement Ordinance art. 236-4.

[10] Aviation Act arts. 132-2 & 132-3, *inserted by* Act No. 67 of 2015.

[11] *Id*. art. 2, para. 22, *inserted by* Act No. 67 of 2015; Aviation Act Enforcement Ordinance art. 5-2.

[12] *無人航空機（ドローン・ラジコン機等）の飛行ルール* [*Flight Rules for UAVs (Drones, Radio-Controlled Air Vehicles, etc.)*], *5. 無人航空機による事故等の情報提供* [*5. Incidents Reported Involving UAVs*], MLIT, http://www.mlit.go.jp/koku/koku_tk10_000003.html (last visited Apr. 5, 2016), *archived at* https://perma.cc/PQR7-6HHM.

[13] 平成27年度　無人航空機に係る事故等の一覧（国土交通省に報告のあったもの）[FISCAL YEAR 2015, CHART OF ACCIDENTS, ETC. OF UAVS (CASES REPORTED TO MLIT)], MLIT, http://www.mlit.go.jp/common/001125882.pdf, *archived at* https://perma.cc/TT3C-KYWV.

[14] *ニアミス・落下…ドローンのトラブル続々報告* [*Near Misses, Falls . . . Continual Reports of Drone Troubles*], YOMIURI ONLINE (Mar. 31, 2016), http://www.yomiuri.co.jp/national/20160331-OYT1T50086.html, *archived at* https://perma.cc/DJQ4-E3AQ.

Flying a UAV over a prohibited area or violating the conditions of flight is punishable by a fine of up to 500,000 yen (approximately US$4,000).[15]

III. Act on Prohibition of Flying UAVs over Important Facilities

The Act on Prohibition of Flying UAVs over Important Facilities and Their Peripheries was promulgated on March 18, 2016,[16] and becomes effective three months from the date of promulgation.[17] The Act prohibits flying UAVs over designated facilities, such as the Diet building, the Prime Minister's office building, buildings of designated government agencies that are involved in crisis management, the Supreme Court building, the Imperial Palace, embassies, and nuclear facilities.[18] These no-fly areas generally extend to within a 300-meter radius of such designated facilities.[19] Flying a UAV over a designated area is punishable by up to one year of imprisonment or a fine of up to 500,000 yen.[20]

When a police officer finds a person flying a UAV over a designated area, the police officer can order the person to stop the operation of the UAV.[21] If the person does not follow the order, the police officer can take necessary measures, such as obstructing the flight of and destroying the UAV in order to remove any danger it poses.[22] In addition, the person who did not follow the officer's order is punishable by up to one year of imprisonment or a fine of up to 500,000 yen.[23]

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[15] Aviation Act art. 157-4, *inserted by* Act No. 67 of 2015.

[16] *History of HR Bill 24 of 189th Diet Session*, HR, http://www.shugiin.go.jp/internet/itdb_gian.nsf/html/gian/keika/1DBE1E2.htm (last visited Apr. 5, 2016), *archived at* https://perma.cc/LK5U-XYM7.

[17] Act on Prohibition of Flying UAVs over Important Facilities and Their Peripheries, Act No. 9 of 2016.

[18] *Id*. arts. 2 & 8.

[19] *Id*. arts. 3–6 & 8.

[20] *Id*. art. 11, para. 1.

[21] *Id*. art. 9, para. 1.

[22] *Id*. art. 9, para. 2.

[23] *Id*. art. 11, para. 1.

New Zealand

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SUMMARY On August 1, 2015, new rules that apply to the operation of unmanned aerial vehicles (UAVs) came into force in New Zealand. They do not distinguish between commercial and recreational operations, but rather set out standard operating requirements for any UAVs that weigh under 55 pounds, with UAVs over this weight or operations that will exceed the standard operating requirements being subject to a certification process. The standard operating requirements include restrictions on, for example, the height at which UAVs can be flown and flying UAVs near airfields. Permission must be obtained to fly in certain areas, and the consent of the relevant persons must be obtained before flying over people or private property.

The certification process requires operators to clearly identify and assess hazards and associated risks arising from the operation, and to develop procedures to mitigate these risks. The rules require that the exposition accompanying the application include certain information that allows the regulatory agency to determine whether all criteria have been met. The agency may impose additional requirements or conditions on the certificate related to ensuring the safety of the operation.

Other relevant rules with respect to flying UAVs over public land or spaces may be established by local authorities and the Department of Conservation. In addition, principles contained in the Privacy Act 1993 can apply where an operation involves filming or recording of people.

I. Introduction

New Zealand introduced new rules pertaining to unmanned aerial vehicles (UAVs) in 2015.[1] The rules, which came into effect on August 1, 2015,[2] are intended to be an interim approach to regulating unmanned aircraft and to be generally permissive in nature. The Ministry of Transport notes that "[m]ore comprehensive rules may be developed in future once the International Civil Aviation Organization (ICAO) sets standards for this technology."[3] The rules

[1] *See generally* Kelly Buchanan, *New Zealand: New Rules on Drones Come into Effect*, GLOBAL LEGAL MONITOR (July 31, 2015), http://www.loc.gov/law/foreign-news/article/new-zealand-new-rules-on-drones-come-into-effect. UAVs are also referred to as remotely piloted aircraft systems (RPAS), unmanned aerial systems (UAS), "drones," and model aircraft.

[2] Director of Civil Aviation, Notification of Ordinary Rules (May 7, 2015), 47 *New Zealand Gazette* 2706, https://gazette.govt.nz/assets/pdf-cache/2015/2015-au2706.pdf, *archived at* https://perma.cc/4LX8-GAPT.

[3] *Unmanned Aerial Vehicles (or Drones)*, MINISTRY OF TRANSPORT, http://www.transport.govt.nz/air/unmanned-aerial-vehicles-or-drones (last updated July 29, 2015), *archived at* https://perma.cc/3UAE-9NAA.

were developed and are implemented by New Zealand's civil aviation regulatory agency, the Civil Aviation Authority (CAA).[4]

The current rules do not distinguish between commercial and recreational operations of UAVs.[5] The focus of the regulatory approach is on managing safety risks while also enabling varied and innovative uses of UAVs. The government states that it is

> committed to having a thriving and successful UAV sector in this country. UAV use in business is an innovative direction the Government is keen to support, as it will bring the commercialisation of new products and services, creating more jobs for New Zealanders.[6]

Callaghan Innovation, a government agency that seeks to "help New Zealand businesses succeed through technology,"[7] has implemented a range of initiatives aimed at supporting the development of drone technology for commercial purposes in the country.[8] In addition, "[a]ll New Zealand universities are now using UAVs as part of their research efforts."[9] One university offers training in piloting UAVs,[10] and another administers a large UAV test range that is open to external users.[11]

Airways New Zealand, the country's air navigation service provider,[12] has worked with the CAA, Callaghan Innovation, and UAVNZ (an industry organization) to develop "airshare," an

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[4] The CAA was established and is governed by part 6A of the Civil Aviation Act 1990, http://www.legislation.govt.nz/act/public/1990/0098/latest/whole.html, *archived at* https://perma.cc/X8G2-CPZN. The Act provides certain powers to the Director of the CAA. In this report, references to the Director have been changed to the CAA for the purpose of clarity.

[5] *Unmanned Aerial Vehicles (or Drones)*, *supra* note 3.

[6] *Id.*

[7] *About Us*, CALLAGHAN INNOVATION, http://www.callaghaninnovation.govt.nz/about-us (last updated Oct. 13, 2015), *archived at* https://perma.cc/98BY-TLAT.

[8] *See generally* search results for "UAV," CALLAGHAN INNOVATION, http://www.callaghaninnovation.govt.nz/search/node/UAV (last searched Mar. 30, 2016), *archived at* https://perma.cc/5JZD-K5Z9.

[9] *Unmanned Aerial Vehicles (or Drones)*, *supra* note 3.

[10] *Massey University School of Aviation RPAS Course*, MASSEY UNIVERSITY, http://www.massey.ac.nz/massey/learning/colleges/college-business/school-of-aviation/study/rpas-course.cfm (last updated Dec. 18, 2015), *archived at* https://perma.cc/YA86-RZRK.

[11] *Unmanned Aerial Vehicle Technology*, UNIVERSITY OF CANTERBURY, SPECIAL ENGINEERING RESEARCH CENTRE, http://www.serc.canterbury.ac.nz/research/unmanned.shtml (last visited Mar. 11, 2016), *archived at* https://perma.cc/AX94-793W.

[12] Airways Corporation of New Zealand is a state-owned enterprise established in 1987 under the State-Owned Enterprises Act 1986. *See generally* MINISTRY OF JUSTICE, DIRECTORY OF OFFICIAL INFORMATION: AIRWAYS CORPORATION OF NEW ZEALAND (Dec. 2013), http://www.justice.govt.nz/publications/global-publications/d/directory-of-official-information-2013/alphabetical-list-of-entries/a/airways-corporation-of-new-zealand, *archived at* https://perma.cc/RU7W-T87H; *Airways Corporation of New Zealand Ltd*, THE TREASURY, http://www.treasury.govt.nz/statesector/commercial/portfolio/bytype/soes/airways-corporation-new-zealand (last visited Mar. 15, 2016), *archived at* https://perma.cc/A5TF-ECXB.

online "UAV hub," where operators can find information on a range of UAV-related subjects, including regulatory matters.[13]

II. Civil Aviation Rules for Unmanned Aircraft

The Civil Aviation Rules, which are made under the Civil Aviation Act 1990,[14] are divided into groups of related rules called "Parts." The two Parts with rules directly related to UAVs are

- Part 101: Gyrogliders and Parasails, Unmanned Aircraft (including Balloons), Kites, and Rockets – Operating Rules;[15] and
- Part 102: Unmanned Aircraft Operator Certification.[16]

Part 101 was originally aimed at the regulation of traditional model aircraft. It was amended in 2015 to allow operators of small unmanned aircraft more generally to operate their aircraft without needing to seek approval from the CAA, provided they remain within the operating limits prescribed in the Part. Part 102 contains new rules applicable to unmanned aircraft operations that exceed the size and operating limits in Part 101. Such operations require certification from the CAA.[17]

The CAA has published advisory circulars that provide explanatory information and examples of how to comply with the two Parts.[18]

In addition to the specific Parts related to UAVs, other relevant Parts that may affect UAV use include Part 91: General Operating and Fight Rules and Part 71: Designation and Classification of Airspace.

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[13] *About Us*, AIRSHARE, https://www.airshare.co.nz/about-us (last visited Mar. 11, 2016), *archived at* https://perma.cc/ZZZ8-DZ9N.

[14] Civil Aviation Act 1990, pt 3.

[15] Civil Aviation Rules, Part 101: Gyrogliders and Parasails, Unmanned Aircraft (including Balloons), Kites, and Rockets – Operating Rules (CAA Consolidation, Sept. 24, 2015), https://www.caa.govt.nz/rules/Rule_Consolidations/Part_101_Consolidation.pdf, *archived at* https://perma.cc/GVE7-TGLC. Subpart E contains specific provisions related to unmanned aircraft.

[16] Civil Aviation Rules, Part 102: Unmanned Aircraft Operator Certification (CAA Consolidation, Sept. 24, 2015), https://www.caa.govt.nz/rules/Rule_Consolidations/Part_102_Consolidation.pdf, *archived at* https://perma.cc/AE5G-6BUX.

[17] *See generally*, *RPAS, UAV, UAS, Drones and Model Aircraft*, CIVIL AVIATION AUTHORITY (CAA), https://www.caa.govt.nz/rpas/index.html (last visited Mar. 11, 2016), *archived at* https://perma.cc/32JR-RRQ7; MINISTRY OF TRANSPORT, UAV REGULATION AND TESTING IN NEW ZEALAND, http://www.transport.govt.nz/assets/Uploads/Our-Work/Documents/NZ-UAV-Rules.pdf (last visited Mar. 11, 2016), *archived at* https://perma.cc/SQ5N-CD4Y.

[18] CAA, Advisory Circular AC101-1: Remotely Piloted Aircraft Systems (RPAS) Under 25 Kilograms – Operating in Compliance with Part 101 Rules (rev. 1, Sept. 24, 2015), https://www.caa.govt.nz/Advisory_Circulars/AC101-1.pdf, *archived at* https://perma.cc/FK55-UYQ2; CAA, Advisory Circular AC102-1: Unmanned Aircraft – Operator Certification (rev. 0, July 27, 2015), https://www.caa.govt.nz/Advisory_Circulars/AC102-1.pdf, *archived at* https://perma.cc/UU99-YWWX.

Part 71 provides for the CAA to designate airspace as either controlled airspace or special use airspace. Airspace that has not been designated under this Part is referred to as uncontrolled airspace. Controlled airspace "is designated where there is a need for an air traffic control service to be provided for the safety and efficiency of aircraft operations."[19] Special use airspace "is designated where there is a need to impose limitations on the operation of aircraft for aviation safety and security, or national security, or for any other reason in the public interest."[20] For example, such airspace includes "restricted areas, military operating areas, mandatory broadcast zones, volcanic hazard zones, danger areas, and low flying zones."[21]

A. Civil Aviation Rules Part 101

1. Application of Part 101 and Approval of Medium-Sized UAVs

Part 101 applies only to UAVs that weigh 25 kilograms (about 55 pounds) or less.[22]

Under the Part, UAVs weighing between 15 kilograms (33 pounds) and 25 kilograms may not be operated unless the aircraft is "constructed under the authority of, or inspected and approved by, an approved person or organization" and operated under the authority of such a person or organization.[23] The CAA has approved Model Flying New Zealand to exercise these functions.[24]

2. Requirements for Operating Part 101 Aircraft

The operating limits in Part 101 include requirements for an operator of a UAV to [25]

- ensure that the aircraft is safe to operate;
- take all practicable steps to minimize hazards to persons, property, and other aircraft;[26]
- only operate the aircraft during daylight hours, unless the operation is indoors or a "shielded operation" (see below);[27]

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[19] Civil Aviation Rules, Part 71: Designation and Classification of Airspace (CAA Consolidation, Oct. 23, 2008), at 2, https://www.caa.govt.nz/rules/Rule_Consolidations/Part_071_Consolidation.pdf, *archived at* https://perma.cc/CNR8-DKFY.

[20] *Id.*

[21] *Id.*

[22] Part 101 uses the term "remotely piloted aircraft," which is defined as a subset of unmanned aircraft, being "an unmanned aircraft that is piloted from a remote station and – (1) includes a radio controlled model aircraft, but (2) does not include a control line model aircraft or a free flight model aircraft." Civil Aviation Rules, Part 101, r 101.3.

[23] Civil Aviation Rules, Part 101, rr 101.202 & 101.215(b).

[24] Advisory Circular AC101-1, *supra* note 18, at 5 & 10.

[25] *See generally id.* at 6; *Unmanned Aerial Vehicles (or Drones)*, *supra* note 3.

[26] Civil Aviation Rules, Part 101, r 101.13.

[27] *Id.* rr 101.3 (definition of "shielded operation") & 101.211.

- ensure the aircraft remains clear of all manned aircraft both on the ground and in flight;[28]
- maintain an unaided visual line of sight with the aircraft;[29]
- not allow any object to be dropped in flight if this creates a hazard to other persons or property;[30]
- not fly the aircraft higher than 120 meters (400 feet) above ground level, unless certain conditions are met;[31]
- have knowledge of any airspace restrictions, classifications, and designations made under Part 71 for the area where the aircraft is to be operated;[32]
- not fly the aircraft closer than four kilometers (2.5 miles) from any airfield, unless certain conditions are met, including a requirement for an operator to have a pilot qualification;[33]
- obtain air traffic control clearance issued by Airways New Zealand before flying in controlled airspace, unless the operation is a "shielded operation" (see below);[34]
- not fly the aircraft in special-use airspace without the permission of the administering authority of the area;[35]
- obtain consent from anyone above whom the aircraft will be flown;[36] and
- obtain consent from the property owner or person in charge of the area above which the aircraft will be flown.[37]

3. Shielded Operations

A "shielded operation" is defined as "an operation of an aircraft within 100 m [328 feet] of, and below the top of, a natural or man-made object."[38] For example, this could include "a flight that takes place in a stadium below the height of the roof, or a flight that takes place in a forested area below the height of the trees."[39]

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[28] *Id.* r 101.213.

[29] *Id.* r 101.209.

[30] *Id.* r 101.15.

[31] *Id.* r 101.207(a)(3) & (c).

[32] *Id.* r 101.12.

[33] *Id.* r 101.205.

[34] *Id.* r 101.11.

[35] *Id.* r 101.7.

[36] *Id.* r 101.207(a)(1)(i).

[37] *Id.* r 101.207(a)(1)(ii).

[38] *Id.* r 101.3.

[39] Advisory Circular AC101-1, *supra* note 18, at 11.

As noted above, shielded operations of unmanned aircraft can be conducted at night. They can also be conducted within four kilometers of an airfield, without the authorization of air traffic control, provided that the shielded operation takes place "outside of the boundary of the aerodrome [airfield]" and "in airspace that is physically separated from the aerodrome by a barrier that is capable of arresting the flight of the aircraft."[40]

4. Manufacturing and Airworthiness Requirements

In terms of specific manufacturing or airworthiness standards, the CAA's advisory circular on Part 101 notes that

> [i]nternationally, no design or manufacturing standards currently exist for remotely piloted aircraft weighing less than 25 kg. Work is underway to develop standards, but until such time as these are recognised internationally and in New Zealand, no prescribed airworthiness standards apply to Part 101 operated aircraft.[41]

However, the types of imported UAVs that can be legally possessed and operated in New Zealand may be limited in practice due to radio and frequency and power requirements. The radio spectrum management agency states that "[r]emotely piloted aircraft systems (RPAS) must use the right radio frequencies, so they don't cause harmful interference to vital radio systems such as air traffic control, cellular phones, or emergency services."[42] Those who operate such aircraft using the wrong frequencies can be prosecuted under the Radiocommunications Act 1989 and the Radiocommunications Regulations 2001.[43]

B. Civil Aviation Rules Part 102

1. Application of Part 102

Part 102 applies to all unmanned aircraft that do not operate in accordance with Part 101[44]—that is, unmanned aircraft that weigh more than 25 kilograms or unmanned aircraft of any size that will be operated outside any of the operating limits specified in that Part. Operators of such aircraft must first obtain an unmanned aircraft operator certificate (UAOC) from the CAA.

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[40] Civil Aviation Rules, Part 101, 101.205(c).

[41] Advisory Circular AC101-1, *supra* note 18, at 7.

[42] *Remotely Piloted Aircraft Systems/Drones*, RADIO SPECTRUM MANAGEMENT, http://www.rsm.govt.nz/consumers/remotely-piloted-aircraft-systems-drones (last updated Nov. 3, 2015), *archived at* https://perma.cc/MVK8-3VPM.

[43] Radiocommunications Act 1989, http://www.legislation.govt.nz/act/public/1989/0148/latest/whole.html, *archived at* https://perma.cc/NC5V-NFSS; Radio Communications Regulations 2001, http://www.legislation.govt.nz/regulation/public/2001/0240/latest/whole.html, *archived at* https://perma.cc/U7JN-GR8Y.

[44] Part 102 uses the terms "unmanned aircraft" (defined as "an aircraft designed to operate with no pilot on board, including unmanned balloons, kites, control-line model aircraft, free flight model aircraft and remotely piloted aircraft") and "unmanned aircraft system" (defined as "an aircraft and its associated elements which are operated with no pilot on board").

The advisory circular for Part 102 states that the Part

> provides a framework for unmanned aircraft that is flexible, providing the Director [of the CAA] with the discretion to tailor fit-for-purpose safety and operational requirements to each proposed operation. Given the rapid advancements underway with unmanned aircraft technology, this approach ensures the regulatory regime can accommodate these aircraft, while addressing the risks relating to their activity.[45]

For example, under the new rules, operators using aircraft for innovative applications such as photography, precision agriculture and search and rescue are required to have their operation assessed by the CAA "to ensure the operation is safe."[46]

2. Applying for an Operating Certificate Under Part 102

In applying for a UAOC, a person must demonstrate to the CAA that the proposed operation will be safe, and that he or she is able to mitigate and control the risk associated with the operation.[47] The CAA has developed a detailed application form as well as a compliance matrix to assist with the drafting of an exposition that sets out the operational and safety procedures for the operation and covers various other matters listed in Part 102. The CAA is able to decide to require only some of the items; a precertification meeting is held with the applicant to discuss the operation and the CAA's likely application requirements.[48]

Part 102 requires that the exposition include information on the following items:[49]

- The name of the person with primary responsibility for the operation
- The name of any person who has control over any part of the operation
- Details of the physical locations to be used in the operation
- A hazard register that identifies "known and likely hazards to people property and other aircraft," an assessment of risks associated with those hazards, and a "description of the measures that can be implemented to mitigate or manage the risk"
- Procedures for reporting information to the CAA
- Operating requirements related to the knowledge and competence of the personnel involved, such as licensing, training, or qualifications (The Advisory Circular notes that, although there are currently no recognized international standards for licensing, qualifications, and training, the relevant rule contemplates the CAA being satisfied as to the level of general aviation knowledge and specific knowledge related to unmanned aircraft handling of personnel in the context of the role each person will be performing; this may be demonstrated

[45] Advisory Circular AC102-1, *supra* note 18, at 4 & 26.

[46] UAV REGULATION AND TESTING IN NEW ZEALAND, *supra* note 17.

[47] Civil Aviation Rules, Part 102, r 102.1; Advisory Circular AC102-1, *supra* note 18, at 13.

[48] Advisory Circular AC102-1, *supra* note 18, at 14.

[49] Civil Aviation Rules, Part 102, r 102.11.

by different qualifications/licenses and/or the completion of certain training, as well as evidence of relevant experience.[50])

- Details of the aircraft to be used, including any identification system used on the aircraft
- Details of the control system to be used to pilot the aircraft
- The aircraft maintenance program that will be implemented and measures to ensure continued airworthiness (The Advisory Circular states that these should be based on the manufacturer's maintenance instructions.[51])
- All inflight operational procedures that will be used, including minimum distances from persons or property
- Procedures for cargo handling and dropping of items
- Construction and design of the unmanned aircraft, to enable the CAA to undertake airworthiness assessments (As for Part 101, the Advisory Circular for Part 102 notes that "there are no internationally recognised design standards, configuration requirements or airworthiness certificates that apply to unmanned aircraft."[52] The CAA undertakes airworthiness assessments on a case-by-case basis, with reference to several factors. It may also require operators to conduct flight testing or proving flights.[53])

The exposition must also state the procedures for controlling, amending, and distributing the exposition, and whether other approvals are required to conduct the proposed operation.[54]

In addition to the above information and related assessment of the application, anyone applying for an aviation document, including a UAOC, must satisfy the CAA that they are a "fit and proper person" to hold that document. Other personnel involved in an operation may also have to undergo a fit and proper person assessment.[55] The criteria applied in this assessment are set out in the Civil Aviation Act 1990.[56]

The CAA may issue a UAOC if it is satisfied that all criteria are met. In doing so, it is able to apply any conditions and requirements it considers necessary, having regard to the complexity of the operation.[57] The certificate is issued with an "operations specification" that includes certain information, including the "privileges and operations" that the operator is permitted to perform.[58]

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[50] Advisory Circular AC102-1, *supra* note 18, at 16.

[51] *Id.* at 19.

[52] *Id.* at 21.

[53] *Id.* at 22.

[54] Civil Aviation Rules, Part 102, r 102.11(b)(13) & (14).

[55] Advisory Circular AC102-1, *supra* note 18, at 22.

[56] Civil Aviation Act 1990, s 10.

[57] Civil Aviation Rules, Part 102, r 102.13; Advisory Circular AC102-1, *supra* note 18, at 24–25.

[58] Civil Aviation Rules, Part 102, r 102.15.

Furthermore, although Part 102 has been designed as a stand-alone rule for unmanned aircraft, an operator must comply with the requirements in Part 101, unless the certificate states otherwise.[59]

The certificate may be issued for a period of up to five years;[60] however, for first-time applicants, the term is likely to be only two years.[61]

3. Approved Operations

In September 2015, the government announced that the first certification to operate a commercial UAV had been issued under the new Part 102, being a large (nearly 100 kilogram) unmanned aircraft designed for crop spraying. The announcement noted that, before the implementation of the new Part, the operation of such an aircraft would not have been allowed due to the size of the aircraft and the intention to use chemicals.[62]

As of March 30, 2016, the CAA website listed thirty-one Part 102 UAOC holders.[63]

C. Enforcement and Penalties

The CAA is responsible for investigating breaches of the Civil Aviation Act 1990 and the Civil Aviation Rules. It can issue warnings and infringement notices under the Act and the Civil Aviation (Offences) Regulations 2006 as well as initiate prosecutions for offenses.[64] General offenses under the Act include, for example,

- operating an aircraft in a careless manner (punishable by a fine of up to NZ$7,000 (about US$4,740) if an individual and NZ$35,000 (about US$23,700) if a company);[65]
- operating, maintaining, or servicing an aircraft in a manner that causes unnecessary danger to any person or property (imprisonment for up to twelve months or fine of up to NZ$10,000 (about US$6,770) if an individual; fine of up to NZ$100,000 (about US$67,670) if a company);[66] or

[59] Civil Aviation Rules, Part 102, r 102.21; Advisory Circular AC102-1, *supra* note 18, at 4 & 26.

[60] Civil Aviation Rules, Part 102, r 102.19.

[61] Advisory Circular AC102-1, *supra* note 18, at 25.

[62] Press Release, Simon Bridges & Craig Foss, First Certificate Issued Under New UAV Rules (Sept. 3, 2015), https://www.beehive.govt.nz/release/first-certificate-issued-under-new-uav-rules, *archived at* https://perma.cc/B9A6-M4XP.

[63] *Part 102 Unmanned Aircraft Operator Certificate Holders*, CAA, https://www.caa.govt.nz/Script/AvDocClientList.asp?Details_ID=8390 (last visited Mar. 30, 2016), *archived at* https://perma.cc/6U45-728P.

[64] Civil Aviation (Offences) Regulations 2006, http://www.legislation.govt.nz/regulation/public/2006/0168/latest/whole.html, *archived at* https://perma.cc/F76Z-2VET. *See generally* CAA, Regulatory Enforcement Policy (Nov. 21, 2013), https://www.caa.govt.nz/Policy_ops/ Regulatory_Enforcement_Policy.pdf, *archived at* https://perma.cc/KV9W-RTYH.

[65] Civil Aviation Act 1990, s 43A.

[66] *Id.* s 44.

- as an operator or pilot, failing to notify the CAA of an accident or incident (if an individual, fine of up to NZ$10,000 plus NZ$2,000 per day if the offense is a continuing one; if a company, up to NZ$50,000 plus $10,000 per day).[67]

A holder of an aviation document (which includes UAOCs) also commits an offense if he or she "does or omits to do any act or causes or permits any act or omission, if the act or omission causes unnecessary danger to any other person or to any property."[68] This is punishable by fines of up to NZ$10,000 and NZ$100,000 for individuals and companies respectively. In addition, a court may disqualify a person from holding an aviation document, or impose conditions on the document, for up to twelve months.[69] These offenses can also result in a court ordering a convicted person to pay up to three times the value of any commercial gain resulting from the commission of the offense, if it is satisfied that the offense was committed for the purpose of producing a commercial gain.[70]

In terms of breaches of Part 101 and Part 102 of the Civil Aviation Rules, the Civil Aviation (Offences) Regulations 1996 sets out the amounts that may be imposed as infringement fees by the CAA and as fines by courts upon conviction.[71] For example, operating a UAV above a height of 400 feet, in contravention of the relevant rule in Part 101, may be subject to infringement fees of NZ$500 (individual) or NZ$3,000 (company) (about US$338 or US$2,030), or to fines of up to NZ$2,500 (individual) or NZ$15,000 (company) (about US$1,670 or US$10,150).[72] The same amounts can be imposed with respect to, for example, operating above persons or property without consent.[73]

In terms of breaches of Part 102, performing an unmanned aircraft operation other than in accordance with a UAOC, or not complying with the conditions of a UAOC, for example, are punishable by infringement fees and fines of NZ$2,000 and NZ$5,000 (individuals) (about US$1,350 and US$3,380), or NZ$12,000 and NZ$30,000 (companies) (about US$8,120 and US$20,300).[74]

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[67] *Id.* ss 26 & 52B.

[68] *Id.* s 43.

[69] *Id.* s 45.

[70] *Id.* s 47.

[71] Civil Aviation (Offences) Regulations 1996, sch 1 (scroll to Part 101 or Part 102).

[72] *Id.* sch 1 (entry for Rule 101.207(a)(3)).

[73] *Id.* sch 1 (entries for Rules 101.207(a)(i) & (ii)).

[74] *Id.* sch 1 (entries for Rules 102.7 & 102.17).

III. Rules Regarding Operating UAVs over Public Land and Spaces

The Advisory Circular for Part 101 notes that

> [l]ocal authorities and the Department of Conservation (DoC) are best placed to understand the specific risks associated with RPAS-use in their territory. They are therefore best placed to engage with operators and provide the necessary consent.[75]

The Advisory Circular further notes that civil aviation rules do not trump any local government policies or bylaws regarding the use of RPAS or other policies on the use of public land.[76] Therefore, local authorities and DoC may decide how consent to operate unmanned aircraft in public areas within their jurisdiction may be obtained—for example, whether this is on a case-by-case or general basis, or whether there is open permission for, or a blanket prohibition on, unmanned aircraft operations in certain public areas.

The "airshare" website has a page that summarizes and provides links to local authority and DoC policies regarding UAV use in public spaces throughout the country.[77]

IV. Application of the Privacy Act 1993

The Privacy Act 1993 sets out privacy principles related to the collection, storage, security, accuracy, retention, use, and disclosure of personal information, and the ability of individuals to access and correct such information.[78] It provides a complaint mechanism for breaches of the principles, administered by the Privacy Commissioner.[79] The Act applies to "[a]lmost every person or organisation that holds personal information," including "government departments, companies of all sizes, religious groups, schools and clubs."[80] Those not covered include members of Parliament, courts and tribunals, and the news media (which are regulated through other mechanisms).

In 2015, the Office of the Privacy Commissioner published two blog posts that commented on potential privacy concerns arising from the use of UAVs fitted with photography, video, or other recording equipment. It noted that the Privacy Act is "technology neutral" legislation containing basic principles that allow for an assessment of the privacy implications of emerging

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[75] Advisory Circular AC102-1, *supra* note 18, at 13.

[76] *Id.*

[77] *Property Owner Consent Information*, AIRSHARE, https://www.airshare.co.nz/property-owner-consent-information (last visited Mar. 11, 2016), *archived at* https://perma.cc/V9KB-WPP9.

[78] Privacy Act 1993, pt 2, http://www.legislation.govt.nz/act/public/1993/0028/latest/whole.html, *archived at* https://perma.cc/B9LT-9D85. *See generally*, *Introduction*, PRIVACY COMMISSIONER, https://www.privacy.org.nz/the-privacy-act-and-codes/privacy-act-and-codes-introduction (last visited Mar. 30, 2016), *archived at* https://perma.cc/QQ8H-BB7C.

[79] Privacy Act 1993, pts 3 & 8.

[80] *Introduction*, *supra* note 78.

technology.[81] The Office's guidelines on the use of CCTV systems were said to similarly apply to drones fitted with cameras, with the main points for an operator to observe being the following:

- being clear about why you are collecting the information
- making sure people know you are collecting the information
- how you intend to use the information
- keeping the information safe and making sure only authorised people can see it
- disposing of the information after it has served its purpose
- right of access to the information by the individual or individuals concerned.[82]

The Office noted that other laws may also be relevant to using drones to film or record images or information about people. For example, there are provisions against making or publishing covert intimate recordings of people without their knowledge or consent,[83] and it is illegal to peer or peep into people's homes and record any activity within.[84]

The second post related to the first complaint received by the Privacy Commissioner regarding the use of a drone to make video recordings.[85] The case concerned the use of a drone at a sports stadium to film a game and, in doing so, flying close to the apartment of the complainant. The Commissioner found that, as the drone had not been recording at the time that it was near the apartment, no information was gathered and therefore there was no violation of the Privacy Act. The ruling did note that the drone had recorded coverage of two people on the balcony of the apartment, which was subsequently broadcast, but that the operator had "indicated by hand gestures that he wanted to film them and by return hand gestures they indicated their consent to that recording."[86]

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[81] Charles Mabbett, *Game of Drones*, PRIVACY COMMISSIONER (Jan. 21, 2015), https://www.privacy.org.nz/blog/drones, *archived at* https://perma.cc/H9CW-KMZM.

[82] *Id. See also* PRIVACY COMMISSIONER, PRIVACY AND CCTV: A GUIDE TO THE PRIVACY ACT FOR BUSINESSES, AGENCIES AND ORGANISATIONS (2009), https://www.privacy.org.nz/assets/Files/Brochures-and-pamphlets-and-pubs/Privacy-and-CCTV-A-guide-October-2009.pdf, *archived at* https://perma.cc/9BQK-LX98.

[83] Crimes Act 1961, ss 216G–216J, http://www.legislation.govt.nz/act/public/1961/0043/latest/whole.html, *archived at* https://perma.cc/Q5HE-863T.

[84] Summary Offences Act 1981, s 30, http://www.legislation.govt.nz/act/public/1981/0113/latest/whole.html, *archived at* https://perma.cc/HDQ4-CZCG.

[85] *Droning on Drones*, PRIVACY COMMISSIONER (July 6, 2015), https://www.privacy.org.nz/blog/droning-on-drones, *archived at* https://perma.cc/K5GH-MVEM.

[86] Case Note 267458 [2015] NZ PrivCmr 6: Man Objects to Drone Filming Near His Apartment (Aug. 12, 2015), https://www.privacy.org.nz/news-and-publications/case-notes-and-court-decisions/case-note-267458-2015-nz-privcmr-6-man-objects-to-drone-filming-near-his-apartment, *archived at* https://perma.cc/NX36-MHBH.

Poland

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SUMMARY In Poland the operation of unmanned aircraft systems for commercial purposes requires the pilot to obtain a certificate of competence. Systems weighing more than 25 kg must be certified and registered. Operation in the proximity of airports and other special zones is restricted. Flights below the visual line of sight of the operator are possible only in dedicated areas.

I. Legal Framework

The use of unmanned aircraft systems (UAS) in Polish airspace is regulated by the Aviation Law Act [1] and the following implementing regulations issued by the Minister of Transport, Construction and Maritime Economy:

- Regulation of March 26, 2013, on the Exclusion of Some Provisions of the Aviation Law Act for Certain Types of Aircraft and Determining the Conditions and Requirements Relating to the Use of Such Aircraft,[2] which sets out the rules for operation of UAS weighing less than 25 kg.
- Regulation of June 3, 2013, on Certificates of Competency[3] applicable to the operators of UAS.
- Regulation of April 26, 2013, on the Technical and Operational Rules on Aircraft of Special Category, Not Subject to the Supervision of the European Aviation Safety Agency,[4] which mostly applies to UAS weighing more than 25 kg.

Polish regulations do not address the issue of personal data protection and privacy concerning the use of UAS; however, flights above another person's property may constitute an infringement of personal rights.[5]

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[1] Ustawa z dnia 3 lipca 2002 r. Prawo lotnicze [Law of July 3, 2002, Aviation Law], DZIENNIK USTAW RZECZYPOSPOLITEJ POLSKIEJ [DURP] [OFFICIAL GAZETTE OF THE POLISH REPUBLIC], Aug. 16, 2002, No. 130/2002, item 1112, *available at* http://dziennikustaw.gov.pl/DU/2002/1112/1 (in Polish), *archived at* https://perma.cc/DRN6-492P.

[2] Regulation of the Minister of Transport, Construction and Maritime Economy of March 26, 2013, DURP, Apr. 10, 2013, item 440, *available at* http://dziennikustaw.gov.pl/DU/2013/440 (in Polish), *archived at* https://perma.cc/R576-G8C8.

[3] Regulation of the Minister of Transport, Construction and Maritime Economy of June 3, 2013, DURP, June 7, 2013, item 664, *available at* http://www.dziennikustaw.gov.pl/DU/2013/664/1 (in Polish), *archived at* https://perma.cc/39L9-K9CD.

[4] Regulation of the Minister of Transport, Construction and Maritime Economy of April 26, 2013, DURP, May 2, 2013, item 524, *available at* http://www.dziennikustaw.gov.pl/DU/2013/524/1 (in Polish), *archived at* https://perma.cc/E6S8-XMP9.

II. Certification of Operators

Polish law differentiates between commercial and noncommercial use of UAS flights. Operators of commercial UAS flights, including providers of photography and video-making services, must have a certificate of competency from the Civil Aviation Authority (CAA), which is issued to individuals who have passed a medical check-up, taken theoretical and practical tests, and have insurance.[6]

The certificate of competency can allow for operation in VLOS (visual line of sight) or BVLOS (below visual line of sight) conditions. Obtaining a VLOS operation certificate requires the applicant to sign a declaration of knowledge of relevant regulations and basic theory (airspace, emergencies, flight rules, etc.), and pass theoretical and practical tests conducted by a CAA examiner. A certificate of competency for BVLOS operation allows a pilot to fly beyond the line of sight and requires the applicant to take training courses in addition to successfully passing theoretical and practical tests.[7]

The certificate of competency can be limited to certain weight ranges (from less than 2 kg to less than 150 kg) and classes of UAS (airplane, helicopter, airship, or multirotor).[8] As of October 2015 more than 1,500 certificates of competency had been issued.[9]

III. Registration of UAS

Registration is not required for UAS weighing less than 25 kg. If the weight exceeds 25 kg a permit to fly is required and operational restrictions may be applicable (e.g., VLOS only and/or minimum distance from populated areas, people, and property).

Moreover, telecommunications law requires a license if the UAS uses certain frequencies for communication, although most UAS use frequencies that do not require a license.[10]

IV. Operational Restrictions

Operation in VLOS mode must allow the remote pilot to maintain separation and avoid collision with any other aircraft. Flights must be conducted outside the controlled zones (which

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[5] *Drones – Will the Law Allow Them to Crowd the Sky?*, CMS-LAW-NOW (Sept. 22, 2015), http://www.cms-lawnow.com/ealerts/2015/09/drones--will-the-law-allow-them-to-crowd-the-sky?cc_lang=en, *archived at* https://perma.cc/K59V-6G7Y.

[6] *Safe Sky – Regulations on Flying Drones in Poland*, CAA (Oct. 2, 2015), http://www.ulc.gov.pl/en/270-english/current-information/3806-safe-sky-regulations-on-flying-drones-in-poland, *archived at* https://perma.cc/NC5N-ZATP.

[7] CAA, CURRENT STATUS OF RPAS REGULATIONS IN THE REPUBLIC OF POLAND 2 (Oct. 2014), http://jarus-rpas.org/sites/jarus-rpas.org/files/current_status_of_rpa_regulations.pdf, *archived at* https://perma.cc/G6ZA-PA3Q.

[8] *Id*.

[9] CAA, *supra* note 6.

[10] CMS-LAW-NOW, *supra* note 5.

sometimes cover most of a town or a city[11]), airfield traffic zones, military airport zones, and other specific zones.[12] Advance notice and a special permit are required to operate a UAS in an airport controlled zone.[13] For flights in airport traffic zones or within 5 km of an airport/airfield border, the permission of the airport manager is required.[14]

Currently, BVLOS flights are possible only in dedicated and segregated airspace.[15] The rules for BVLOS operations, including the procedures for cooperation with air traffic service providers, are being developed by the CAA.[16]

Regulations require that the horizontal distance from people and structures on the surface must be sufficient to exclude any risk to people, property, or the environment, even after any possible failure. Moreover, operations in the city center of Warsaw require the consent of the Government Protection Bureau.[17] Following an incident in Warsaw's airport the authorities announced they were considering installing equipment that would disable UAS in the proximity of the airport.[18]

Penalties for failing to comply with these restrictions are set out in the Aviation Law Act and provide for up to five years of imprisonment.[19]

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[11] *Id.*

[12] CAA, *supra* note 6.

[13] *Id.*

[14] *Id.*

[15] *Id.*

[16] CAA, REMOTELY PILOTED AIRCRAFT SYSTEMS (RPAS) IN POLAND (July 2013), *available at* http://jarus-rpas.org/sites/jarus-rpas.org/files/rpas_poland.pdf, *archived at* https://perma.cc/5LJ4-X2AC.

[17] CAA, *supra* note 6.

[18] CMS-LAW-NOW, *supra* note 5.

[19] Ustawa z dnia 3 lipca 2002 r. Prawo lotnicze art. 212.

South Africa

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SUMMARY South Africa's Ministry of Transportation and Civil Aviation Authority (CAA) recently added a chapter on remotely piloted aircraft systems (RPAS) to the Civil Aviation Regulations and issued a number of other supplementary documents, including technical standards and aeronautical information circulars. Under these laws and standards, South Africa permits different forms of RPAS operations: private, commercial, corporate and nonprofit operations.

While there are some universally applicable rules and restrictions, the level of both technical and operational requirements appears to be in part tied to the form of the operation, with private operation on one side and all the other forms on the other. For instance, conducting a private operation is only permitted with a Class-1A or Class-1B RPAS, within the operator's visual line of sight, and at a maximum of 400 feet above ground, rules that are inapplicable to or can be waived for other forms of operations. Such private operations are exempt from a host of requirements applicable to other forms of operations, including requirements to obtain a letter of approval and a certification of registration, remote pilot license, and RPA operator certificate. The level of restrictions is also related to the complexity of the operation in question. Operations in a controlled airspace and beyond visual line-of-sight are subject to tighter restrictions.

The CAA is the RPAS regulatory agency. Its powers include the authority to enact aviation regulations, set safety and security standards, issue all required licenses and permits, and develop enforcement mechanisms to ensure compliance with all relevant laws and standards.

I. Introduction

South Africa's Constitution establishes a three-tiered government structure consisting of national, provincial, and local governments that are "distinctive, interdependent and interrelated," and vested both with legislative and executive authorities.[1] While this means that each level of government enjoys "legislative and executive autonomy of each sphere," aviation-related matters, including the regulation of remotely piloted aircraft (RPA), are under the exclusive jurisdiction of the national government.[2] However, local laws and authorities may govern aspects of RPA operations. For instance, the use of a public area as an RPA takeoff and landing strip may require compliance with local laws and obtaining permission from local governments.

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[1] S. AFR. CONST., 1996, § 40, http://www.gov.za/sites/www.gov.za/files/images/a108-96.pdf, *archived at* https://perma.cc/BXV2-8PUV; *Structure and Functions of the South African Government*, SOUTH AFRICAN GOVERNMENT, http://www.gov.za/node/ 537988 (last visited Apr. 4, 2015), *archived at* https://perma.cc/368Z-5N8Q.

[2] S. AFR. CONST. scheds. 4 & 5; Victoria Bronstein, *Legislative Competence*, *in* CONSTITUTIONAL LAW OF SOUTH AFRICA 15-i, 15-1 (2d ed. 2012).

This report describes the remotely piloted aircraft systems (RPAS) regulatory landscape, mainly focusing on the various requirements applicable to different uses of RPAS, specifically private, corporate, commercial and nonprofit operations. It also describes the RPAS regulatory agency and its powers.

II. National Legal Framework

The 2009 Civil Aviation Act[3] forms the basis for regulating RPAS. Based on the regulatory authority accorded to it under the Act (see Part III, below), the Ministry of Transportation and Civil Aviation Authority (CAA) have recently developed regulations, technical standards, technical guidance material, and circulars to govern RPAS.

Regulations governing RPAS were issued by the Minister of Transportation on May 27, 2015.[4] These regulations, which were issued as an amendment to the 2011 Civil Aviation Regulations,[5] now constitute part 101 of such Regulations, and are (when referenced separately) known as the Eighth Amendment of the Civil Aviation Regulations, 2015.[6] Under section 163 of the Act and part 11 of the 2011 Regulations, the Director of Civil Aviation also recently issued technical standards on RPAS known as the South Africa Civil Aviation Technical Standards (SA-CATS).[7] Both took effect on July 1, 2015.[8] In addition, the Director has issued a number of aeronautical information circulars (AICs) applicable to RPAS.[9] Further, the CAA issued technical guidance material, the Technical Guidance Material for RPAS−Part 101, in September 2015.[10]

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[3] Civil Aviation Act 13 of 2009, 4 BUTTERWORTHS STATUTES OF SOUTH AFRICA (updated through 2015), *available at* http://www.gov.za/sites/www.gov.za/files/32266_616.pdf, *archived at* https://perma.cc/8SPN-FNFA.

[4] Department of Transport, Civil Aviation Regulations (Eighth Amendment), 2015, GOVERNMENT NOTICE R444/2015 (May 27, 2015), *available at* http://www.caa.co.za/Legal%20Documents/PART%20101%20GAZETTE.pdf, *archived at* https://perma.cc/EM7G-7JZL.

[5] Department of Transport, Civil Aviation Regulations, 2011 (June 2012), available on the Southern African Power Flying Association (SAPFA) website, *at* http://www.sapfa.org.za/sites/default/files/CIVIL_AVIATION_REGULATIONS-2011.pdf, *archived at* https://perma.cc/5BJM-KFLP.

[6] Civil Aviation Regulations (Eighth Amendment) §§ 4 & 5.

[7] CAA, South Africa Civil Aviation Technical Standards 101 (SA-CATS 101) (date of operation, July 1, 2015), http://www.caa.co.za/Legal%20Documents/SA-CATS%20101%20approval.pdf, *archived at* https://perma.cc/2FR4-ST74.

[8] *Id.*; Civil Aviation Regulations (Eighth Amendment) § 5.

[9] CAA, Remote Pilot License: Training, Examination and Application For RPL Requirements, AIC Series C, 007/2015 (July 23, 2015), http://www.caa.co.za/RPAS%20AICs/AIC%20007-2015.pdf, *archived at* https://perma.cc/N5QP-6PTK; CAA, Aviation Training Organisations Conducting Remotely Piloted Aircraft Systems (RPAS) Training, AIC Series A, 008/2015 (July 23, 2015), http://www.caa.co.za/RPAS%20AICs/ AIC%20008-2015.pdf, *archived at* https://perma.cc/WU4H-34DZ; CAA, Publication in Terms of Regulation 11.04.4(3) of the Full Particulars of a General Exemption Granted by the Director of Civil Aviation from the Requirements of Part 101 Pertaining to Private Operations, AIC Series A, 009/2015 (July 23, 2015), http://www.caa.co.za/RPAS%20AICs/AIC%20009-2015.pdf, *archived at* https://perma.cc/B9G5-S2ZW.

[10] CAA, Technical Guidance Material (TGM) for RPAS−Part 101 (Sept. 30, 2015), http://www.caa.co.za/RPAS%20TGM/TGM%20for%20RPAS%20PART%20101.pdf, *archived at* https://perma.cc/SLX6-ZRRV.

A. Application

The Civil Aviation Regulations apply to what are known as Class-1 and Class-2 RPA and to owners, operators, pilots and those who maintain such RPA.[11] An RPA is "an unmanned aircraft which is piloted from a remote pilot station, excluding model aircraft[12] and toy aircraft."[13] These classes of RPA are defined in the SA-CATS, including in terms of their weight. Class-1 and Class-2 RPAs are further divided into subclasses: Class-1A (less than 1.5 kilograms/3.3 pounds), Class-1B (less than 7 kilograms/15.4 pounds), and Class-1C and Class 2A (less than 20 kilograms/44 pounds).[14] The application of the Regulations does not extend to

- autonomous unmanned aircraft,[15] unmanned free balloons and their operations, or other types of aircraft that cannot be managed on a real-time basis during flight;
- aircraft operated in terms of Part 94 of the Civil Aviation Regulations (which addresses the Operation of "Non-type Certificated Aircraft"[16]);
- model aircraft; and
- toy aircraft.[17]

Under the Regulations, different uses of RPA are permitted. RPA may be used for private, commercial, corporate, and nonprofit purposes.[18]

B. Private RPA Operations

A private operation is "the use of an RPA for an individual's personal and private purpose where there is no commercial outcome, interest or gain."[19]

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[11] Civil Aviation Regulations (Eighth Amendment) § 101.01.1.

[12] A "model aircraft" is

a heavier-than-air aircraft of limited dimensions, with or without a propulsion device, unable to carry a human being and to be used for competition, sport or recreational purposes rather than unmanned aeronautical vehicles (UAV) developed for commercial or governmental, scientific, research or military purposes, and not exceeding the specifications as set by the Federation Aeronautique Internationale as listed in Document SA-CATS 24. Civil Aviation Regulations, 2011, § 1.01.1.

[13] *Id*. A "toy aircraft" is "a product falling under the definition of aircraft which is designed or intended for use in play by children." *Id.*

[14] SA-CATS 101 § 101.01.5.

[15] This is "an unmanned aircraft that does not allow intervention in the management of the flight." Civil Aviation Regulations, 2011, § 1.01.1.

[16] A non-type certificated aircraft is

any aircraft that does not qualify for the issue of a certificate of airworthiness in terms of Part 21 and shall include any type of certificated aircraft that has been scrapped, of which the original identification plate should have to be removed and returned to the applicable aviation authority and is rebuilt as a full-scale replica. *Id.*

[17] Civil Aviation Regulations (Eighth Amendment) § 101.01.1.

[18] *Id.*

[19] *Id*. § 1.01.1

Private operations are subject to specific restrictions. They may only be conducted with a Class-1A RPA (less than 1.5 kilograms in weight) or Class-1B RPA (less than 7 kilograms in weight), both of which cannot be flown more than 400 feet above the ground.[20] All private operations must be conducted only in restricted visual line of sight (R-VLOS), specifically, "within 500 meters of the remote pilot and below the height of the highest obstacle within 300 meters of the RPA, in which the remote pilot maintains direct unaided visual contact with the RPA to manage its flight and meet separation and collision avoidance responsibilities."[21] In addition, RPA may only be operated over property owned by the operator or other property with the permission of the owner.[22]

The Regulations also impose restrictions on certain uses of RPA. An RPA may not tow another aircraft, perform aerial or aerobatic displays, or be flown in formation or swarm.[23] It may not be flown within a 10 kilometer (about 6.2 mile) radius of an airfield, within restricted or prohibited airspace, or above or near a sensitive area, including a nuclear power plant, correctional institution, police station, crime scene, or court.[24] An RPA may not be operated directly overhead of any person or within a lateral distance of 50 meters (164 feet) from any person.[25] It may not be used for the purpose of releasing, dispensing, dropping, delivering or deploying of an object or substance.[26] It may only be used in daylight and under clear weather conditions.[27]
Private RPA operations are exempt from various rules applicable to other forms of RPA operations. For instance, rules on the need for approval and registration of an RPA before operation, personnel licensing requirements, and RPA operator certificate and maintenance requirements do not apply to private operations of RPA (for more on these requirements, see Part II(C), below).[28] They are also exempt from rules governing the conveyance of dangerous goods and safety considerations (for instance, ensuring that an RPA is in a "fit-to-fly condition").[29] They are further exempt from regulations on the manner in which flight time is recorded and reported, and on the use of flight logbooks, power reserves, first-aid kits, and hand-held fire extinguishers.[30]

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[20] *Id*. §§ 101.01.2 & 101.05.10; SA-CATS 101 § 1.

[21] Civil Aviation Regulations (Eighth Amendment) §§ 1.01.1 & 101.01.2; *Remotely Piloted Aircraft Systems: RPAS Private Operations*, CAA, http://www.caa.co.za/Pages/RPAS/Private%20Operations.aspx (last visited Apr. 5, 2016), *archived at* https://perma.cc/DK5C-XEUQ.

[22] SA-CATS 101.01.7.

[23] Civil Aviation Regulations (Eighth Amendment) § 101.05.10.

[24] *Id*.

[25] *Id*. § 101.05.12.

[26] *Id*. § 101.05.4.

[27] *Remotely Piloted Aircraft Systems: RPAS Private Operations*, *supra* note 21.

[28] Civil Aviation Regulations (Eighth Amendment) § 101.01.2.

[29] *Id*. §§ 101.05.5 & 101.05.9.

[30] *Id*. §§ 101.05.21–101.05.25; Publication in Terms of Regulation 11.04.4(3) of the Full Particulars of a General Exemption, *supra* note 9.

C. Commercial, Corporate, and Nonprofit Operations

Commercial, corporate, and nonprofit RPA operations are subject to various restrictions.

1. Approval and Registration

An RPA cannot be operated for non-private purposes in South Africa unless the CAA Director has issued the operator an RPA letter of approval (RLA) and a certificate of registration.[31] In order for the Director to issue an RLA, the applicant must submit

(a) documentation regarding the standard to which the RPAS was designed; or

(b) equivalent documentation that demonstrates a level of safety acceptable to the Director; or

(c) documentation demonstrating system safety as prescribed in Document SA-CATS 101.[32]

An application for an initial approval of an RPA requires the submission of the RPA manufacturer's operating manual and, for Class-1 and Class-2 operations, submission of the following information about the RPA:

1.1 RPAS type
1.2 RPA structure
1.3 RPA composition
1.4 flight envelope capability
1.5 RPA dimensions/measurements and mass together with drawings
1.6 mass and balance
1.7 payloads (specific or generic)
1.8 use of frequencies
1.9 remote pilot station
1.10 ground support equipment
1.11 flight recovery system.[33]

The submission must also include the following information regarding performance characteristics of the RPA:

2.1 maximum altitude
2.2 maximum endurance
2.3 maximum range
2.4 Airspeed (take-off, cruise, landing, stall, maximum)
2.5 maximum rate of climb
2.6 maximum rate of descent
2.7 maximum bank angle

[31] Civil Aviation Regulations (Eighth Amendment) §§ 101.02.1 & 101.02.4.

[32] *Id*. §§ 101.02.1 & 101.02.2.

[33] SA-CATS 101 § 101.02.2.

2.8 turn rate limits
2.9 propulsion system (such as engine/motor, fuel, electrical, hydraulic, pneumatic, gas, solar).[34]

2. Identification Marks

An RPA registered in South Africa is considered to have South African nationality and it must be engraved with an identification plate including its nationality and registration marks.[35] The SA-CATS include additional particulars on the required identification plates, display of marks (including the appropriate colors and fonts), and location, as well as the allocation and specification of marks.[36]

3. Personnel Licensing

A valid remote pilot license (RPL) is required for commercial, corporate, and nonprofit operations of an RPA.[37] There are three categories of an RPL: Remote Pilot License (Aeroplane) (RPL(A)), Remote Pilot License (Helicopter) (RPL(H)), and Remote Pilot License (Multi-rotor) (RPL(MR)).[38] There are also three different ratings of an RPL: visual line-of-sight (VLOS) operations; extended visual line-of-sight (E-VLOS)[39] operations; and beyond visual line-of-sight (B-VLOS)[40] operations.[41] There are a number of requirements for obtaining an RPL, including the following:

1. An applicant should not be less than 18 years of age.
2. Applicants must hold current medical assessments.
3. An ATO [aviation training organization] for training must be identified.
4. Foreign theoretical training will be approved and validated (ASK).
5. Only successful completion will be accepted.
6. Applicants must pass the RPL practical assessment.

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[34] *Id*.

[35] Civil Aviation Regulations (Eighth Amendment) §§ 101.02.4; SA-CATS 101 § 101.02.4.

[36] SA-CATS 101 § 101.02.4.

[37] Civil Aviation Regulations (Eighth Amendment) § 101.03.1; CAA, REMOTELY PILOTED AIRCRAFT SYSTEMS (PART 101) REGULATIONS WORKSHOPS: RPAS REGULATIONS (PART 101) COMPLIANCE PROCESS FLOW 108, http://www.caa.co.za/Documents/RPAS/Part%20101%20-%20RPAS%20Workshops.pdf (last visited Apr. 1, 2016), *archived at* https://perma.cc/28WY-S56B.

[38] Civil Aviation Regulations (Eighth Amendment) § 101.03.1.

[39] This is "an operation below 400 feet above ground level in which an observer, maintains direct and unaided visual contact with the remotely piloted aircraft at a distance not exceeding 1,000 meters from the pilot." Civil Aviation Regulations, 2011, § 1.01.1.

[40] This is "an operation in which the remote pilot cannot maintain direct unaided visual contact with the remotely piloted aircraft to manage its flight and to meet separation and collision avoidance responsibilities visually." *Id*.

[41] Civil Aviation Regulations (Eighth Amendment) § 101.03.1.

7. Applicants must also pass Radiotelephony Examination.
8. Achieved English Language Proficiency (ELP) level 4 or higher.
9. All applications must be submitted to the CAA.[42]

An RPL is issued for a two-year period at the end of which the holder must submit to a "revalidation check" before the RPL can be renewed.[43]

4. RPAS Operator Certificate

An RPAS operator certificate (ROC) is also required for commercial, corporate and nonprofit operations of an RPA.[44] For a commercial operator, obtaining an air service license under the relevant law[45] is one of the conditions to getting an ROC.[46] The ROC application process is said to follow the International Civil Aviation Organization (ICAO) five-step process: pre-application, formal application, document evaluation, demonstration and inspection, and certification.[47] An ROC is issued for a one-year period at the end of which the holder of the certificate must apply for a renewal.[48]

An ROC holder has various responsibilities. The ROC holder is required to develop an operations manual to be approved by the Director.[49] The manual must include the "type and scope of operations, including the manner in which each type of RPAS and operation will be safely conducted," and any change to the type or scope of operations requires the prior approval of the Director.[50] The holder must also "establish a safety management system commensurate with the size of the organisation or entity and the complexity of its operations."[51] This must include

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[42] *Id*.; *Remotely Piloted Aircraft Systems: Pilot Licensing and Instructor Rating*, CAA, http://www.caa.co.za/Pages/RPAS/RPAS%20pilot%20licensing.aspx (last visited Apr. 14, 2016), *archived at* https://perma.cc/7TWT-R2BS; Remote Pilot License: Training, Examination and Application for RPL Requirements, *supra* note 9; SA-CATS 101 § 101.03.2.

[43] Civil Aviation Regulations (Eighth Amendment) § 101.03.6.

[44] *Id*. § 101.04.1

[45] Air Service Licensing Act No. 115 of 1990 (assented June 28, 1990; commenced July 1, 1991), available on the Comair Limited website, *at* https://www.comair.co.za/Media/Comair/files/level-playing-field/Air-Services-Licensing-Act-1990.pdf, *archived at* https://perma.cc/HRQ6-X98L.

[46] Civil Aviation Regulations (Eighth Amendment) § 101.04.1; *Remotely Piloted Aircraft Systems: RPAS Operators Certificate*, CAA (2016), http://www.caa.co.za/Pages/RPAS/RPAS%20operators%20certificate.aspx, *archived at* https://perma.cc/S8WH-FGEB.

[47] CAA, *supra* note 37, SUBPART 4, RPAS OPERATORS' CERTIFICATE, at 83–85; *Remotely Piloted Aircraft Systems: Pilot Licensing and Instructor Rating*, *supra* note 42.

[48] Civil Aviation Regulations (Eighth Amendment) § 101.04.3.

[49] This is "a manual containing Procedures, instructions and guidance for use by operational personnel in the execution of their duties." Civil Aviation Regulations, 2011, § 1.01.1 & Civil Aviation Regulations (Eighth Amendment) § 101.04.5.

[50] Civil Aviation Regulations (Eighth Amendment) § 101.04.5.

[51] *Id*. § 101.04.7.

> a process to identify actual and potential safety hazards and assess the associated risks, . . . a process to develop and implement remedial action necessary to maintain an acceptable level of safety . . . [and] . . . provision for continuous and regular assessment of the appropriateness and effectiveness of safety management activities.[52]

Further, the ROC holder is required to take various security measures, including conducting background checks and periodic criminal record checks on personnel that work with RPAS.[53] Further, the holder must always carry adequate third-party liability insurance.[54]

5. RPAS Operational Restrictions

There are various restrictions applicable to commercial, corporate, and nonprofit operations of RPAS. Some of these restrictions are summarized below:

a. Public Roads

Use of public roads as a takeoff and landing ground is not permitted unless the operator is an ROC holder and such use has been approved by the Director and the relevant local authority.[55]

b. Controlled Airspace

RPAS may be operated in controlled airspace only by an ROC holder and upon the approval of the Director.[56] The director may issue such approval only in a visual meteorological condition (VMC) in an airfield traffic zone (ATZ) and control zone (CTR) below 400 ft.[57] In addition, in order for an RPA to be used in an operation within an ATZ or CTR, it must

> (a) Be fitted with a mode C or S transponder capable of displaying the unique squawk code issued to them, unless otherwise exempted by the Director and/or the applicable ATSU or CAMU according to an FUA application;
>
> (b) Be fitted with an altimeter, capable of displaying to the operator on the RPS, the RPA's altitude above ground level, corrected for ambient pressure (QNH);
>
> (c) Be fitted with a functioning strobe light or lights, installed in such a way that such strobe lights are visible from both below and above the RPA; at all azimuth angles, and
>
> (d) In the instance of an aeroplane, be fitted with functioning navigation lights.[58]

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[52] *Id*.

[53] *Id*. § 101.04.8.

[54] *Id*. § 101.04.12.

[55] *Id*. § 101.05.2.

[56] *Id*. § 101.05.3.

[57] *Id*.

[58] SA-CATS § 101.05.3.

All of the abovementioned components must be "serviceable and functioning" during the entire period of the operation and the failure of one of them would result in the termination of the operation.[59]

In addition to the above technical requirements imposed on the RPA, operation in an ATZ or CTR requires an ROC holder to fulfill certain operational requirements.[60]

c. Objects or Substances

The Civil Aviation Regulations prohibit the use of an RPA for releasing, dispensing, dropping, delivering, or deploying any object or substance unless it is done by an ROC holder and with the Director's approval.[61]

d. General Restrictions

This category includes various restrictions. For instance, operators are banned from using RPAS to tow other aircraft, perform aerial or aerobatic displays, or for the purpose of flying them in formation or swarm.[62] In addition, unless done by an ROC holder and with the Directors approval, an RPAS operator is prohibited from flying an RPAS

- above 400 feet above ground;
- within a 10 kilometers radius of an airfield;
- within restricted or prohibited airspace; or
- near or above sensitive areas, including a nuclear power plant, prison, police station, crime scene, or court.[63]

e. Beyond Visual Line of Sight

A B-VLOS operation is permitted only for ROC holders approved for such operations by the Director.[64] The Director may approve such operations only if the operator meets certain requirements, which vary depending on whether the operation is in or outside of a controlled airspace.[65] If the intended operation is outside a controlled airspace, the operator must show compliance with the following technical requirements:

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[59] *Id*.

[60] *Id*.

[61] Civil Aviation Regulations (Eighth Amendment) § 101.05.4.

[62] *Id*. § 101.05.10.

[63] *Id*.

[64] *Id*. § 101.05.11.

[65] *Id*.; SA-CATS § 101.05.11.

(i) that the APA will only be operated using command inputs;

(ii) has met the requirements prescribed in Technical Standard 101.02.2 [see Part II(C)(1), above];

(iii) that the APA has the ability to remain clear from obstacles and any other hazards and can take appropriate action to execute collision avoidance from such obstacles or other aircraft where necessary. This ability shall be applicable for normal and lost/degraded C2 links unless:

(aa) The area is void of other air traffic; or

(bb) The operation occurs in specifically delimited or segregated airspace; or

(cc) Any other mitigation is in place to avoid other aircraft, obstacles or any hazards.

(iv) the C2 data link frequency to be used for data link is deemed appropriate by the Director; and

(v) the C2 performance requirements as specified in Technical Standard 101.05.8 (this relates to command and control link operational requirements) are acceptable to the Director.[66]

In addition, the operator must demonstrate operational capabilities, including the ability to command the RPA to "follow a predetermined course or group of way-point inputs."[67]

For operations inside a controlled airspace, the operator must fulfill additional technical requirements (see Part II(C)(5)(b), above).[68]

f. Operation in Vicinity of People, Property, or Public Roads

Operating an RPA directly overhead or a lateral distance of 50 meters from any person is permitted only by an ROC holder and with the approval of the Director.[69] The same rule applies to the operation of an RPAS in the vicinity of structures or buildings; however, in this instance it is also possible to operate an RPA by simply obtaining the permission of the owner of the structure or building in question.[70]

Operating an RPA along the length of a public road or at a distance of less than 50 m from a public road in use is permitted only for an ROC holder upon obtaining the Director's approval.[71]

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[66] SA-CATS § 101.05.11, *as referenced in* Civil Aviation Regulations § 101.05.11.

[67] Civil Aviation Regulations (Eighth Amendment) § 101.05.11; SA-CATS § 101.05.11.

[68] Civil Aviation Regulations (Eighth Amendment) § 101.05.11.

[69] *Id*. § 101.05.12.

[70] *Id*.

[71] *Id*. § 101.05.15.

g. Radio Communication Requirements

All operations of RPAS (R-VLOS, VLOS, E-VLOS, and B-VLOS) must be conducted within a radio line of sight (RLOS).[72] An RLOS is a direct, electronic, point-to-point contact between a transmitter and receiver.[73] The Regulations require that "the air-band radio shall have the required output and be configured in such a way that the range, strength of transmission and quality of communication extends beyond the furthest likely position of the RPA from the pilot."[74] Additional requirements may apply depending on the specific operation in question.[75]

D. Sale and Labeling

The requirements applicable to the sale or resale of RPAS are limited to labeling. The Regulations state that "[n]o RPA shall be sold within the Republic unless the seller, by way of a packaging label, or in the case of the resale thereof, by way of written notification, notified the buyer of the requirements as prescribed in Document SA-CATs101."[76] This is applicable to all RPA regardless of their intended use.

III. National Enforcement Agency

The CAA is the country's RPAS regulatory agency. Its stated objectives include overseeing "the functioning and development of the civil aviation industry" and issuing regulations mandated by the Civil Aviation Act.[77] To that end, the CAA has various functions, including

> *(a)* developing and promoting appropriate, clear and concise regulatory requirements, and technical aviation safety and security standards;
>
> *(b)* developing effective enforcement strategies to ensure compliance with aviation safety and security standards;
>
> *(c)* issuing certificates, licences, registrations and permits; [and]
>
> . . . .
>
> *(h)* formulating and approving supporting regulations and technical standards through a consultative process with the aviation industry . . . .[78]

The standards, technical guidance material, and circulars described above were all issued by the CAA on the basis of this authority.

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[72] TGM § 6.3.1; SA-CATS § 1.

[73] Civil Aviation Regulations (Eighth Amendment) § 1.01.1

[74] *Id*. § 101.05.16.

[75] *Id*.

[76] *Id*. § 101.01.5.

[77] Civil Aviation Act § 72.

[78] *Id*. § 73(1)(a)–(c), (h).

It appears that functions, duties, and powers of the CAA are shared between the Civil Aviation Authority Board and the Director. The Director, who is appointed by the Minister of Transportation for a renewable five-year term, is the head of the CAA and in charge of its administration.[79] The Director is responsible for carrying out the functions of the CAA.[80] The Board, which consists of the Director and seven other members appointed by the Minister, has various responsibilities including matters relating to corporate governance, human resources, and conditions of employment and remuneration.[81]

The Director answers to the Minister with regard to matters relating to civil aviation safety and security and he is responsible to the Board on matters under the Board's purview.[82] Members of the Board are restricted from interfering in the aviation safety and security oversight functions of the Director.[83]

IV. Local Regulatory Framework

Every operation that needs the approval of the Director may require the approval of local authorities.[84] For instance, as noted above, the use of a public road as a takeoff or landing ground requires necessary permissions from local authorities.[85] In addition, all local laws that relate to various aspects of RPAS operation are applicable. No specific local laws governing the use of RPAS were located, however.

[79] *Id*. §§ 85 & 86.

[80] *Id*. § 87.

[81] *Id*. §§ 76 & 77.

[82] *Id*. § 86.

[83] *Id*. § 76.

[84] TGM § 7.

[85] Civil Aviation Regulations (Eighth Amendment) § 101.05.2.

Sweden

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SUMMARY Sweden regulates the manufacture, sale, import, export, and use of drones. Regulations vary depending on the nature of the drone. Heavier drones are more strictly regulated. Drones must only be operated during daylight within visible range from the operator, 120 meters off the ground and 50 meters away from other people, buildings, and other objects or areas worthy of protection. Drones are not permitted in restricted airspace, such as airports and over prisons. Swedish airports have had to close because of incidents where civilian drones have entered into restricted airspace. The use of drones in certain areas requires prior permits. The question of the permissibility of using drones for commercial photography purposes is currently pending before the Administrative Supreme Court. The enforcement of drone-use violations has been low, with fifteen serious incidents during 2015. Approximately 1,000 individuals and corporations are registered with the Swedish Transport Agency and may use drones commercially.

I. Background

The use of drones for noncommercial and commercial purposes is on the rise in Sweden. During the Christmas sales of 2014 more than 20,000 drones for civilian use were sold, including quadcopters without the capability of carrying cameras.[1] The cost of drones (*drönare*) for personal use ranges from SEK249 (about US$30) for mini-drones to SEK35,495 (about US$4,350) for advanced drones.[2] The Swedish Transport Agency has issued more than 1,000 permits to use drones commercially for photographic purposes.[3]

Swedish drone manufacturers include the government contractor Saab, which manufactures large drones for military use.[4] Other Swedish companies also make smaller, unmanned aircraft for civilian use.[5]

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[1] Viktor Mölne, *Explosionsartad försäljning av drönare*, DAGENSINDUSTRI (Feb. 23, 2015), http://www.di.se/artiklar/2015/2/6/explosionsartad-forsaljning-av-dronare, *archived at* https://perma.cc/TUC3-4GSH (click "See the Screeshot View").

[2] *Produkter*, TEKNIKMAGASINET, http://www.teknikmagasinet.se/sokresultat?q=dr%C3%B6nare (last visited Apr. 4, 2016), *archived at* https://perma.cc/CS4K-JR2Z. For information on UAV products from Hobbex, reportedly the largest Swedish supplier of drones for civilian use, see *Avancerade modeller*, HOBBEX, http://www.hobbex.se/sv/ artiklar/radiostyrt/multirotor/avancerade-modeller/index.html (last visited Apr. 4, 2016), *archived at* https://perma.cc/8CA9-U78E.

[3] TRANSPORTSTYRELSEN, TILLSTÅNDSINNEHAVARE: LISTA ÖVER TILLSTÅNDSINNEHAVARE FÖR VERKSAMHET MED UAS [PERMIT HOLDERS: LIST OF PERMIT HOLDERS FOR OPERATING UAS] (Dec. 1, 2015), http://www.transportstyrelsen.se/sv/luftfart/Luftfartyg-och-luftvardighet/Obemannade-luftfartyg-UAS/Lista-over-godkanda-UAS-operatorer, *archived at* https://perma.cc/MZ4X-PKKX.

[4] Press Release, Saab, Saab och UMS Aero Group AG i strategiskt samarbete inom obemannat flyg (Dec. 21, 2015), http://saabgroup.com/globalassets/cision/documents/2015/20151221-saab-och-ums-aero-group-ag-i-strategiskt-samarbete-inom-obemannat-flyg-sv-1-1087874.pdf, *archived at* https://perma.cc/FWP7-R596.

II. Legal Framework

Large civilian drones exceeding 150 kg (about 330 lb) are regulated by European Union Law[6] and monitored by the European Aviation Service Agency.[7] Smaller drones are largely unregulated at the EU level and are thus regulated by EU Member States. The European aviation community, including the Swedish, agreed on principles for drone use in the 2015 Riga Declaration on Remotely Piloted Aircraft.[8]

A. Permitting, Classification, and Technical Requirements

The construction, manufacture, modification, and maintenance of unmanned civilian aircraft, including drones, requires a permit from the Swedish Transport Agency.[9] Hobby construction of drones for personal use is exempted.[10]

1. Categories

Regulations on unmanned aircraft and drones establish several categories based on weight and usage.[11] Category 1a includes drones lighter than 1.5 kg (approximately 3.3 lb) that do not create more than 150 joules (J) of energy. Category 1b includes drones of at least 1.5 kg but not exceeding 7 kg (approximately 15.4 lb). To fall within category 1b, a drone must not create more than 1,000 J of kinetic energy. Category 2 includes drones weighing more than 7 kg that are flown within the view of the operator, while category 3 includes unmanned aircraft certified for use outside the view of the operator/pilot.[12]

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[5] Sten Sjögren, *Svenska drönarbolag på krigsstigen*, VECKANSAFFÄRER (Oct. 18, 2013), http://www.va.se/nyheter/2013/10/18/svenska-dronarbolag-pa-krigsstigen, *archived at* https://perma.cc/8CGA-6PN7.

[6] Regulation (EC) No 216/2008 of the European Parliament and of the Council of 20 February 2008 on Common Rules in the Field of Civil Aviation and Establishing a European Aviation Safety Agency, and Repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC, 2008 O.J. (L 79) 1, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:079:0001:0049:EN:PDF, *archived at* https://perma.cc/U3PM-QK5T.

[7] *The Agency*, EUROPEAN AVIATION SAFETY AGENCY, http://www.easa.europa.eu/the-agency/the-agency (last visited Apr. 5, 2016), *archived at* https://perma.cc/7DZN-ERZ9.

[8] Riga Declaration on Remotely Piloted Aircraft (Drones), "Framing the Future of Aviation," Mar. 6, 2015, http://ec.europa.eu/transport/modes/air/news/doc/2015-03-06-drones/2015-03-06-riga-declaration-drones.pdf, *archived at* https://perma.cc/7UV9-P9XE. For developments within the industry, see GUNNAR FRISK, SAAB AB, UAS FORUM SWEDEN – ATT ÖPPNA EUROPAS OCH SVERIGE LUFTRUM FÖR UAS (May 19, 2015), http://www.uasforumsweden.se/pdf_2015/01_Oppna%20luftrummet%20_UAS%20Forum_2015-05-19_v1.0.pdf, *archived at* https://perma.cc/V3TC-JR5C.

[9] 2 ch. 2 § Transportstyrelsens föreskrifter om verksamhet med obemannade luftfartyg (UAS) (konsoliderad elektronisk utgåva) [Regulations on Activities with Unmanned Aircraft (UAS) (Consolidated Electronic Version)] (Transportstyrelsens Författningssamling [TSFS] 2009:88), https://www.transportstyrelsen.se/TSFS/TSFS%202009_88k.pdf, *archived at* https://perma.cc/44TL-KGXM.

[10] *Id*. 1 ch. 1 §.

[11] *Id*. 2 ch. 1 §.

[12] *Id*.

2. *Technical Specifications*

All uses of drones, irrespective of the category, require that the drone be equipped with an emergency device, enabling shutdown of the drone if needed.[13] Moreover, if the drone is equipped with an automated flight system, there must always be an override system available under which the pilot regains control of the drone.[14] Category 2 and 3 drones should be constructed in a manner to prevent damage in the case of a collision.[15]

In addition, Category 3 drones must be equipped with technology that prevents unauthorized control of the drone, including protection against misleading signals either from an outside source or from weather phenomena.[16] Category 3 drones are subject to a number of additional requirements—for example, they must have transponders, an ability to detect other aircraft, compatible anticollision systems, and systems to interpret weather conditions.[17]

No publicly available information was located as to whether Swedish protected areas such as prisons, airports, or government buildings have electric fencing in force to protect against incursions by drones.

B. Drones for Use by Civilians

The operation of aircraft is regulated by law in Sweden.[18] Applicable legislation encompasses unmanned aircraft, including drones.[19] In addition, the use of drones by civilians is specifically regulated by the Swedish Transport Agency.[20]

1. *Permit Requirement for Certain Uses*

Drones used for commercial and research purposes, and drones flown outside the sight of the operator, require licenses from the Swedish Transport Agency[21] and the payment of a fee.[22]

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[13] *Id*. 3 ch. 3 § 3 item (category 1b) & 4 ch. 9 § (category 2) (TSFS 2009:88).

[14] *Id*. ch. 3 § 8 item (categories 1a, 1b) & 4 ch. 9 § 10 item (category 2).

[15] *Id*. 4 ch. 15 §.

[16] *Id*. 5 ch. 44 §.

[17] *Id*. 5 ch. 45–48 §§.

[18] LUFTFARTSLAG [AIRCRAFT ACT] (Svensk författningssamling [SFS] 2010:500), http://www.riksdagen.se/sv/Dokument-Lagar/Lagar/Svenskforfattningssamling/Luftfartslag-2010500_sfs-2010-500, *archived at* https://perma.cc/U65X-G98D; *see also* Luftfartsförordning [Aircraft Regulation] (SFS 2010:770), http://www.riksdagen.se/sv/Dokument-Lagar/Lagar/Svenskforfattningssamling/Luftfartsforordning-2010770_sfs-2010-770, *archived at* https://perma.cc/5GKQ-JTH3.

[19] *Id*.

[20] Transportstyrelsens föreskrifter om verksamhet med obemannade luftfartyg (UAS) (konsoliderad elektronisk utgåva) [Regulations on Activities with Unmanned Aircraft (UAS) (Consolidated Electronic Version)] (TSFS 2009:88), https://www.transportstyrelsen.se/TSFS/TSFS%202009_88k.pdf, *archived at* https://perma.cc/44TL-KGXM, unofficial English translation *available at* http://www.transportstyrelsen.se/globalassets/global/luftfart/luftfartyg/the-swedish-uas-regulation-tsfs-2009-88.pdf, *archived at* https://perma.cc/S5FY-PQ8H.

Category 1 drones flown only for personal use do not require permits.[23] The Swedish Transport Agency has published an easy-to-read guideline for the use of civilian drones for personal entertainment.[24] The general guidelines and ordinance for the operation of aircraft issued by the Swedish Transport Agency also apply to operators of drones.[25]

Permit terms vary depending on the relevant drone category.[26] Category 1a and 1b permits are valid for two years at a time.[27] For categories 2 and 3 the initial permit is valid for one year only, whereas subsequent permits are valid for up to two years at a time.[28] Permit holders are required to notify the Swedish Transport Agency if the activity has stopped.[29] To transport goods by drone a prior permit must first be obtained from the Swedish Transport Agency.[30] No such permits are currently issued.

Companies that become certified and receive a permit must be available for inspection by the Swedish Transport Agency.[31] All operators must have insurance.[32] As of November 30, 2015, more than a thousand companies and private persons had been certified by the Swedish Transport Agency to fly drones.[33]

2. Age Requirements

There is no age requirement to fly category 1a and 1b drones, but the operator must be fit to operate the drone. To fly category 2 drones the operator must be eighteen years old.[34] Category

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[21] *Id*. 2 ch. 2 §; *see also Sök tillstånd för obemannade luftfartyg*, TRANSPORTSTYRELSEN, https://www.transportstyrelsen.se/sv/luftfart/Luftfartyg-och-luftvardighet/Obemannade-luftfartyg-UAS/Sok-tillstand-for-UAS (last visited Apr. 3, 2016), *archived at* https://perma.cc/YRP8-UBPE.

[22] *Obemannade luftfartyg (UAS)*, TRANSPORTSTYRELSEN, https://www.transportstyrelsen.se/sv/Om-transportstyrelsen/Finansiering/Avgifter/Luftfart/Flygoperativ-verksamhet/Obemannade-luftfartyg-UAS (last visited Apr. 3, 2016), *archived at* https://perma.cc/A828-THPQ.

[23] 2 ch. 2 § *e contrario* (TSFS 2009:88).

[24] TRANSPORTSTYRELSEN, FLYG SÄKERT MED DIN DRÖNARE – SNABBA RÅD OCH REGLER, http://www.transportstyrelsen.se/globalassets/global/publikationer/luftfart/dronare_ts201505_a5.pdf (last visited Apr. 3, 2016), *archived at* https://perma.cc/5X3M-QD8X.

[25] Transportstyrelsens föreskrifter och allmänna råd om trafikregler för luftfart (konsoliderad elektronisk utgåva) [Swedish Transport Agency's Ordinance and General Guidelines on Traffic Rules for Aircraft (Consolidated Electronic Version)] (TSFS 2014:71), http://www.transportstyrelsen.se/TSFS/TSFS%202014_71k.pdf, *archived at* https://perma.cc/5XHV-HMZ6.

[26] 2 ch. 4, 5, 6 §§ (TSFS 2009:88).

[27] *Id*. 2 ch. 7 §.

[28] *Id*.

[29] *Id*. 2 ch. 9 §.

[30] *Id*. 2 ch. 10 §.

[31] *Id*. 2 ch. 11 §.

[32] *Id*. 2 ch. 12 §.

[33] TRANSPORTSTYRELSEN, *supra* note 3.

[34] 4 ch. 8 § (TSFS 2009:88).

3 requires that the pilot/operator be at least twenty-one years old and no more than sixty-seven years old.[35] In addition, category 3 drone pilots must hold a medical class 3 certificate.[36]

3. In-Flight Requirements

a. General

All drones must be marked either with the name and telephone number of the operator as well as the certification number (where applicable), or with the registration number (category 3).[37] Moreover, operators of drones must have the appropriate insurance.[38]

Drones must be flown at a minimum of 50 meters (164 feet) away from animals, people, and buildings.[39] The distance should take into account the size and nature of the drone.[40] All frequencies used by drones must be preapproved by the Post-och Telestyrelsen (PTS, the Swedish Post and Telecom Authority).[41]

b. Category 1 Drones

Category 1 drones generally may only be flown during daylight hours (not in the dark).[42] Special permits are required for flight of category 1 drones in the dark.[43] Category 1a and 1b drones must be flown within visual sight of the operator; consideration should be given to the weather, outside effects on the radio connection, interruptions on the frequency, and other factors affecting the safety of the flight.[44] The pilot must make sure that the flight can be completed safely.[45] A designated pilot must be assigned to each flight.[46] Prior to starting the operation of the drone the operator should also develop a flight plan.[47] Once completed, the flight should be recorded in a log book,[48] specifying "the date, pilot, the [drone], place of start and landing, flight time, assignment, and any deviations."[49] All incidents must be reported to the Swedish

[35] *Id*. 5 ch. 25 §.

[36] *Id*. 5 ch. 24 §.

[37] *Id*. 2 ch. 13 §.

[38] *Id*. 2 ch. 12 §.

[39] *Id*.

[40] *Id*.

[41] *Id*. 4 ch. 22 §, 5 ch. 54 §.

[42] 3 ch. 1 § 3 item (TSFS 2009:88).

[43] *Id*.

[44] *Id*. 3 ch. 1 § 1 item.

[45] *Id*. 3 ch. 1 § 4 item.

[46] *Id*. 3 ch. 1 § 5 item.

[47] *Id*. 3 ch. 1 § 2 item.

[48] *Id*. 3 ch. 1 § 10 item.

[49] *Id*. 3 ch. 1 § 10 item.

Transport Agency.[50] Guidelines from the Swedish Luftfartsverket (LFV, Air Navigation Services of Sweden) specify that drones should not be flown more than 120 meters (400 feet) off of the ground or 500 meters (547 yards) away from the operator.[51]

c. Category 2 Drones

All provisions related to category 1a and 1b also apply to category 2. In addition, to receive a category 2 permit there must be a designated person responsible for the entire operation of the company, and this person must be approved by the Swedish Transport Agency.[52] He or she must be aided by a flight chief and a technology chief.[53] For each flight a responsible pilot must be assigned.[54] He or she must be at least eighteen years old and prior to being certified by the Swedish Transport Agency must complete an Unmanned Aerial System educational program certified by the Swedish Transport Agency.[55]

There are also general guidelines that supplement the regulation, which include that the pilot should have knowledge of the flight safety standards laid down by the Executive Director of the European Aviation Safety Agency.[56] There are restrictions on flying in restricted airspace.[57] There are also additional requirements for technical maintenance, maintaining a handbook for personnel, and for how to create a flight map.[58]

d. Category 3 Drones

Category 3 drone pilots must meet the requirements of category 2 drone operators and several additional requirements, including increased age, safety, and educational requirements, and internal requirements for education, oversight, and other measures aimed at increasing the safety of the flight.[59]

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[50] *Id*. 3 ch. 1 § 9 item.

[51] TRANSPORTSTYRELSEN, *supra* note 24.

[52] 4 ch. 1 § (TSFS 2009:88).

[53] *Id*. 4 ch. 3 §.

[54] *Id*. 4 ch. 7 §.

[55] *Id*. 4 ch. 7 & 8 §§.

[56] *Id*. 4 ch. 7 §.

[57] *Id*. 4 ch. 18 §.

[58] *Id*. 4 ch. 16, 17, 19 §§.

[59] *Id*. 5 ch.

C. Restricted Airspace

The Swedish Transport Agency decides which areas should be classified as restricted airspace.[60] Local authorities and municipalities can apply to the Swedish Transport Agency and provide the applicable reasons warranting an airspace restriction.[61]

The LFV maintains a drone map illustrating where the flying of drones is restricted, typically around airports.[62] Complete prohibitions are in force over prisons, national parks, and nuclear power plants.[63]

III. Privacy and Security Concerns Related to Camera-Equipped Drones

The operation of drones may be restricted because of privacy rights considerations. The Swedish Administrative Supreme Court is set to decide whether the use of cameras on drones constitutes "camera surveillance" as defined in Swedish law.[64] Under Swedish law camera surveillance is regulated and requires prior authorization from the local county administrative board,[65] unless the contemplated use involves only personal use on property where the public does not enjoy access.[66]

The case before the Supreme Administrative Court turns on whether a drone equipped with a camera can be said to be *uppsatt* (installed) in such a manner as to constitute camera surveillance.[67] For the use of a camera to constitute camera surveillance, there must be a certain degree of permanence associated with its use.[68] The Administrative Court of Appeal of Jönköping has previously found that photographing properties for commercial purposes

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[60] *Inskränkning av eller förbud mot luftfart*, TRANSPORTSTYRELSEN, https://www.transportstyrelsen.se/sv/luftfart/Flygplatser-och-flygtrafiktjanst/Flygtrafiktjanst/Inskrankning-av-eller-forbud-mot-luftfart (last visisted Apr. 5, 2016), *archived at* https://perma.cc/3TP2-B8AX.

[61] *Id*.

[62] *Dronechart*, LFV, http://daim.lfv.se/echarts/dronechart (last visited Apr. 3, 2016), *archived at* https://perma.cc/46NV-FKMF (click "See the Screenshot View").

[63] Förordning om restriktioner för luftfart inom vissa områden [Regulation on Restrictions on Aircraft in Certain Areas] (SFS 2005:801), https://www.notisum.se/rnp/sls/lag/20050801.htm, *archived at* https://perma.cc/QN2M-KFSW.

[64] Press Release, Högsta förvaltningsdomstolen, Prövningstillstånd meddelat i mål om kameraövervakning (Mar. 30, 2016), http://www.hogstaforvaltningsdomstolen.se/Om-Hogsta-forvaltningsdomstolen/Nyheter-fran-Hogsta-forvaltningsdomstolen/Provningstillstand-meddelat-i-mal-om-kameraovervakning1, *archived at* https://perma.cc/GZU2-P867.

[65] 8 §, 16 § KAMERAÖVERVAKNINGSLAG [CAMERA SURVEILLANCE ACT] (SFS 2013:460), https://www.notisum.se/rnp/sls/lag/20130460.htm, *archived at* https://perma.cc/V33S-N9E2.

[66] *Id*. 5 §.

[67] *Id*. 8 §.

[68] Kammarrätten [KR] [Administrative Court of Appeals] Jönköping, Case No. 1369-15, Dec. 15, 2015, at 4 (on file with author); KR Göteborg, Case No. 2156-15, Nov. 12, 2015, at 3 (on file with author).

constitutes camera surveillance.[69] In that case, the County Administrative Board of Jönköping had found that the public's need for privacy outweighed the operator's need to operate the drone for commercial photographic purposes. Legislators had previously said that cameras mounted on vehicles have the degree of permanence required to make them subject to the camera surveillance legislation.[70] If the Swedish Administrative Supreme Court finds that operating drones with cameras constitutes camera surveillance, the local county administrative boards will be required to weigh on a case-by-case basis whether the operator's interest in operating a drone equipped with a camera outweighs the interest of the public in having its privacy rights protected.[71]

Meanwhile, the Swedish Parliament is also in an initial phase of considering amendments to legislation regarding privacy in connection with camera surveillance, with the Justice Department having published a Committee Directive in 2015.[72]

While taking landscape pictures from the air in unrestricted airspace is legally permitted, the dissemination of such photographs requires prior approval from the Swedish Defense (Swedish Armed Forces).[73]

IV. Drone Incidents

There have been several incidents involving drones in Sweden. Protected airspace was reportedly breached a total of fifteen times during 2015, which led to forced temporary closures of Stockholm's two airports—the Arlanda Airport and the Bromma Airport.[74] For example, Bromma Airport outside of Stockholm was shut down for half an hour following a drone incident in May 2015, where an unidentified drone entered the airport's restricted airspace.[75]

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[69] KR Jönköping, Case No. 1369-15, Dec. 15, 2015, at 5–6; *see also* Monica Kleja, *Ny dom: Drönare med kameror behöver tillstånd*, NYTEKNIK (Dec. 21, 2015), http://www.nyteknik.se/nyheter/ny-dom-dronare-med-kameror-behover-tillstand-6342959, *archived at* https://perma.cc/3Q7M-LXAU.

[70] Proposition [Prop.] 2012/13:115 En ny kameraövervakningslag [New Camera Surveillance Act] [government bill], at 26, http://data.riksdagen.se/fil/23B4801D-BF01-4649-993E-C2B19C8D30C6, *archived at* https://perma.cc/WBE6-F385.

[71] 9 § KAMERAÖVERVAKNINGSLAG (SFS 2013:460).

[72] Kommittédirektiv: Kameraövervakning – brottsbekämpning och integritetsskydd [Committee Directive: Camera Surveillance – Law Enforcement and Privacy] (Dir. 2015:125), http://www.regeringen.se/contentassets/85d73a5e3e9c46bbb0725901752edb92/kommittedirektiv-kameraovervakning_webb.pdf, *archived at* https://perma.cc/2G4B-MNRU.

[73] 9 § Förordning om skydd för landskapsinformation [Regulation on Protection of Landscape Information] (SFS 1993:1745), http://www.notisum.se/rnp/sls/lag/19931745.htm, *archived at* https://perma.cc/SYX7-37XZ, *to be replaced by* Förordning om skydd för geografisk information (SFS 2016:320), http://www.notisum.se/rnp/sls/sfs/20160320.pdf, *archived at* https://perma.cc/PB5G-KJTZ. *See also Flygfotografering och tillstånd för bildspridning*, FÖRSVARSMAKTEN, http://www.forsvarsmakten.se/sv/om-myndigheten/tillstand/flygfotografering (last visited Apr. 6, 2016), *archived at* https://perma.cc/3XUT-NPQE.

[74] *Drönarförare riskerar skadestånd*, SVT (July 25, 2015), http://www.svt.se/nyheter/lokalt/stockholm/dronarforare-riskerar-skadestand, *archived at* https://perma.cc/6LT6-EAZS.

[75] *Drönare stängde ner Bromma flygplats*, LFV (May 12, 2015), http://www.lfv.se/nyheter/nyheter-2015/dronare-stangde-ner-bromma-flygplats, *archived at* https://perma.cc/V9CX-6JDQ.

Under Swedish law all incidents with drones that result in harm to animals, people, or property must be reported to the Swedish Transport Agency.[76] There are no public reports of any such incidents.

The prevalence of drones has been described as a growing problem by the Swedish media, as users are unaware of the relevant regulations surrounding drone use.[77] There is no legal requirement for foreign sellers who export drones to Sweden to inform buyers of Swedish law on drones. The Swedish Transport Agency has introduced a cooperation effort with certain importers aimed at the importer including a pamphlet in the package setting out applicable regulations in Sweden.[78] So far the initiative has garnered little success as most drones are imported online directly from exporters with whom the Swedish Transport Agency does not cooperate.[79] The organization Unmanned Aerial System Sweden, whose members are registered commercial drone users, hopes to remedy the situation by introducing mandatory educational courses for hobby enthusiasts and by working with sellers of drones to increase awareness.[80]

V. Enforcement

The Swedish Transport Agency is responsible for the oversight of the rules regarding drones and can issue exemptions from the regulations.[81]

Violations of drone rules are sanctioned in the Aircraft Act and include possible imprisonment for up to two years for intentionally maneuvering a drone in a manner that puts people's lives at risk, and monetary fines and a possible prison sentence for flying in restricted airspace, not marking the drone with the necessary information, or failing to comply with other requirements mentioned above.[82] Enforcement has been low, however, even as incidents connected with the use of drones have been on the rise. Swedish drone forums display a disregard for rules on drones. Swedish airports, which have sustained considerable costs resulting from drone-related airport closures, say that if the drone operators involved in airport incidents are identified, the airports will seek damages from them.[83]

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[76] 3 ch. 1 § item 9 (categories 1a & 1b), 4 ch. 28 § (category 2), 5 ch. 24 § (category 3) (TSFS 2009:88).

[77] Sandra Fonnisson, *Obemannade farkoster ett växande problem*, SVT (July 24, 2015), http://www.svt.se/nyheter/lokalt/stockholm/obemannade-farkoster-ett-vaxande-problem, *archived at* https://perma.cc/8WCA-Z74M.

[78] *Id*.

[79] *Id*.

[80] Sandra Fonnisson, *Organisation vill införa obligatorisk drönarutbildning*, SVT (July 24, 2015), http://www.svt.se/nyheter/lokalt/stockholm/dronaragare-kan-sakna-kompetens-for-flygning, *archived at* https://perma.cc/5QQS-ERAL.

[81] 6 ch. 1 § (TSFS 2009:88).

[82] 13 ch. 1 § & 13 ch. 4 § 3 item LUFTFARTSLAGEN (SFS 2010:500).

[83] *Drönarförare riskerar skadestånd*, SVT (July 25, 2015), http://www.svt.se/nyheter/lokalt/stockholm/dronarforare-riskerar-skadestand, *archived at* https://perma.cc/6LT6-EAZS (click "See the Screenshot View").

Meanwhile, the Stockholm Chamber of Commerce has presented a report advocating less regulation of the airspace to enable innovations.[84]

VI. Trade in Products with Dual Uses

Depending on their size, drones may be considered products with dual civilian and military uses, and trade in such products that fall under the definition of *krigsmateriel* (war materiel) is regulated in a special regulation.[85] The export of certain drones may therefore require preapproval from the Swedish Inspectorate of Strategic Products, as they can be used for both civilian and military purposes.[86] The export of drones has sparked criticism, mainly that such exports aid totalitarian regimes.[87]

[84] Press Release, Stockholm Chamber of Commerce, Ny rapport: Släpp fram drönarna (May 18, 2015), http://www.chamber.se/nyheter/ny-rapport-slapp-fram-dronarna.htm, *archived at* https://perma.cc/5AH8-E7ZC.

[85] Förordning om krigsmateriel [Regulation on War Matériel] (SFS 1992:1303), http://www.tullverket.se/download/18.156454ca12c96d03cf28000696/1451373905500/53f01_2.pdf, *archived at* https://perma.cc/HG53-4RZ5.

[86] *Id*.

[87] *See* Angelica Söderberg, *Kritik mot försäljning av svenska drönare till Kina*, NYTEKNIK (Aug. 5, 2015), http://www.nyteknik.se/nyheter/fordon_motor/flygplan/article3921412.ece, *archived at* https://perma.cc/2M3Q-3VWY.

Ukraine

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SUMMARY Despite the widespread use of unmanned aerial vehicles (UAVs) in Ukraine, no active steps to regulate the use of drones have been taken. The only special rule applicable to drones is found in the Regulation on the Use of Airspace of Ukraine, which requires that those who use drones for aerial photography obtain special permission for UAV flights from the State Aerial Department and coordinate their flights with the General Headquarters of the Armed Forces. This is in keeping with the Convention on International Civil Aviation of 1944, which Ukraine joined in 1992. Apart from this rule, the general aviation regulation regime is applicable to UAV operations.

I. Introduction

The Ukrainian unmanned aerial vehicle (UAV) industry is relatively young. Serious research in the field of drones started in the country in the early 2000s.[1] Presently, about thirty variations of domestically manufactured UAVs are available for commercial use in Ukraine.[2] In 2015 about 1,500 drones were reportedly being used for commercial purposes in the country.[3]

A remote vehicle pilot training program was started in Ukraine in August 2014. Its curriculum was designed to provide future drone pilots a general theoretical knowledge in the design, function, and operation of unmanned aircraft systems (UAS) as well as practical skills for piloting a UAV with the active use of an autopilot. This program complies with the pilot training program of piloted aircraft and is approved by the Civil Aviation Administration of Ukraine. It is also coordinated with other programs of domestic and foreign organizations dealing with UAV pilot training.[4] In 2016, Ukraine began manufacturing its own military drones.[5]

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[1] *Research and Development Center of Unmanned Aviation "Virage,"* NATIONAL AVIATION UNIVERSITY, CENTER OF UNMANNED AVIATION, http://uav.nau.edu.ua/history.html (in Russian; last visited Apr. 11, 2016), *archived at* https://perma.cc/FBL9-DNHU.

[2] NATIONAL AVIATION UNIVERSITY, RESEARCH AND DEVELOPMENT CENTER OF UNMANNED AVIATION "VIRAGE" OF THE NATIONAL AVIATION UNIVERSITY DESIGNED A NUMBER OF UNMANNED AERIAL VEHICLES, http://i2msystems.com/documents/UAS_capabilities.pdf (last visited Apr. 11, 2016), *archived at* https://perma.cc/HV2K-JV6Z.

[3] Victoria Pokatis, *Vne Zakona: Pochemy Rynok Bespilotnikov v Ukraine est, a Zakonodatelstva pod nikh net* [*Outside the Law: Why Do We Have a Drone Market in Ukraine and No Relevant Legislation*], DELO.UA (May 19, 2015), http://delo.ua/business/vne-zakona-pochemu-rynok-becpilotnikov-v-ukraine-est-a-zakonod-296812/?supdated_new=1459644911 (in Russian), *archived at* https://perma.cc/W2XN-TYY3.

[4] NATIONAL AVIATION UNIVERSITY, *supra* note 1.

[5] *Ukraine Will Manufacture Its Own Military Drones – Turchynov*, EUROMAIDAN PRESS (Jan. 27, 2016), http://euromaidanpress.com/2016/01/27/ukraine-begins-manufacturing-military-drones, *archived at* https://perma.cc/XHK7-U73X.

II. Legislation on UAV

A. Legal Framework

The legal status of drones is not specifically determined by Ukrainian law. Instead, general aviation regulations are applicable to UAV operations.[6] The main legal acts regulating air traffic and the use of air space and aerial vehicles are the following:

- The Air Code of Ukraine,[7] a national law that establishes all major norms concerning the use of the airspace of Ukraine.
- The Rules of Civil Aircraft Registration in Ukraine,[8] which defines the procedure and requirements for maintaining the State Registry of Civil Aircraft of Ukraine and rules for registration and re-registration of new, modified, and repaired aircraft in the possession of legal entities and persons resident in Ukraine.
- The Regulation on Use of the Airspace of Ukraine,[9] which establishes procedures for using airspace by legal and physical persons, and defines the functions of the airspace and air traffic control authorities.
- The Rules of Civil Aircraft Flights in the Airspace of Ukraine,[10] which provides general regulation of flights and the maneuvering of aircraft, including in the classified air space of Ukraine and the airspace over the high seas, where the responsibility for air traffic control services is assigned to Ukraine by international agreements.

B. Definition of UAV

According to the Air Code of Ukraine the term "unmanned aerial vehicle" is defined as any aircraft intended to fly without a pilot on board. The flight and control of such vehicles are performed by a special control station not located onboard the vehicle.[11] The Rules of Civil Aircraft Registration state that UAV include unmanned, untethered balloons and remotely piloted aircraft.[12]

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[6] V. M. Borovenko, *Povitriane Sudno* [*Aircraft*], *in* VELYKYII ENTSIKLOPEDYCHNYI IURYDYCHNYI SLOVNIK [GREAT ENCYCLOPEDIC LEGAL DICTIONARY] 655 (Yuri Shemshuchenko ed., Kyiv, 2012) (in Ukrainian).

[7] AIR CODE OF UKRAINE, Law No. 3393-VI of May 19, 2011, with the Latest Amendments of Dec. 23, 2015, http://zakon3.rada.gov.ua/laws/show/3393-17 (in Ukrainian), *archived at* https://perma.cc/BF9F-CM7W.

[8] Ministry of Infrastructure of Ukraine, Resolution No. 636, Oct. 25, 2012, on Approval of Aviation Regulation in Ukraine, Part 47 on Rules of Civil Aircraft Registration in Ukraine, http://zakon3.rada.gov.ua/laws/show/z1926-12 (in Ukrainian), *archived at* https://perma.cc/P29U-XHJS.

[9] Cabinet of Ministers of Ukraine, Regulation No. 401 of March 29, 2002, on Use of Airspace of Ukraine, with the Latest Amendments of June 4, 2014, http://zakon2.rada.gov.ua/laws/show/401-2002-%D0%BF (in Ukrainian), *archived at* https://perma.cc/6DSD-PA4B.

[10] Ministry of Infrastructure of Ukraine, Resolution No. 478, Oct. 28, 2011, on Approval of Rules of Civil Aircraft Flights in the Airspace of Ukraine, with the Latest Amendments of July 11, 2013, http://zakon5.rada.gov.ua/laws/show/z1327-11 (in Ukrainian), *archived at* https://perma.cc/3HWQ-5QMN.

[11] AIR CODE OF UKRAINE art. 1.23.

[12] Ministry of Infrastructure of Ukraine, Resolution No. 636, art. 1.3.

III. Registration of UAV

The Rules of Civil Aircraft Registration provide that an aircraft must be included in the State Registry of Civil Aircraft of Ukraine if it is owned by a legal entity incorporated in Ukraine or a natural person resident in Ukraine, or rented or leased by a Ukrainian operator from the nonresident owner.[13] Unmanned, untethered balloons without a payload and remotely piloted aircraft having a maximum take-off weight not exceeding 44 lb (20 kg) that are used for entertainment and sports activities are not subject to registration in the State Registry.[14] The Air Code states that these types of unregistered aircraft must be governed by rules established by professional organizations regulating this type of activity.[15]

IV. Air Navigation Restrictions

The Regulations on the Use of Airspace of Ukraine[16] and the Rules of Civil Aircraft Flights in the Airspace of Ukraine[17] do not mention drones specifically, but all rules applicable to piloted aircraft apply to UAVs if they are subject to aircraft registration.

The only special rule applicable to drones was found in paragraph 74 of the Regulation on the Use of Airspace of Ukraine, which requires that those who use drones for aerial photography obtain special permission for UAV flights from the State Aerial Department and coordinate their flights with the General Headquarters of the Armed Forces.[18] This requirement appears to be in compliance with the Convention on International Civil Aviation of 1944, which states that

> [n]o aircraft capable of being flown without a pilot shall be flown without a pilot over the territory of a contracting State without special authorization by that State and in accordance with the terms of such authorization. Each contracting State undertakes to insure that the flight of such aircraft without a pilot in regions open to civil aircraft shall be so controlled as to obviate danger to civil aircraft.[19]

Ukraine joined the Convention in 1992.[20]

The Ukrainian State Air Traffic Service Enterprise (UkSATSE), a government institution responsible for providing air traffic control across Ukrainian airspace and over the Black Sea, provides airspace management, air traffic flow management, en route meteorological services for

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[13] *Id*. art. 3.1.1.

[14] *Id*. art. 2.15.

[15] AIR CODE OF UKRAINE art. 39.8.4.

[16] Cabinet of Ministers of Ukraine, Regulation No. 401.

[17] Ministry of Infrastructure of Ukraine, Resolution No. 478.

[18] Cabinet of Ministers of Ukraine, Regulation No. 401, para. 74.

[19] *Id*. art. 8.

[20] Convention on International Civil Aviation, Dec. 7, 1944, 15 U.N.T.S. 295, https://treaties.un.org/doc/Publication/UNTS/Volume%2015/volume-15-II-102-English.pdf, *archived at* https://perma.cc/7FPV-ZCF7, Ukrainian translation *available at* http://zakon2.rada.gov.ua/laws/show/995_038, *archived at* https://perma.cc/H8QQ-ML3L.

air navigation, and preflight information services.[21] UkSATSE is responsible for designating and reserving airspace where unmanned flights can be performed. Requests from drone users are to be submitted to UkSATSE.[22]

While current Ukrainian legislation does not regulate the use of drones specifically, the Air Code of Ukraine and the Rules of Civil Aircraft Registration mention UAVs among civil and commercial aircraft. This means that rules and air navigation restrictions apply to all users of the airspace, including drone operators.[23]

Civil aircraft are not allowed to fly over the following areas:

- Special Use Airspace – areas established along the border.
- Restricted Areas –a part of the airspace where flights of aircraft are prohibited for the purpose of protecting important government buildings and key industrial sites (e.g., nuclear power plants, chemical enterprises, etc.).
- Flight Restriction Zones – parts of the airspace over land or territorial waters that are limited to aircraft flights during specific time periods due to military exercises, rocket launches, research, or controlled explosions.
- Danger Zones – parts of the airspace where, during a specified period of time, activities dangerous to air traffic occur.
- Temporarily Reserved Airspace – airspace where air traffic is not allowed within a specified time because of a threat to regular aviation flights or for other reasons.
- Areas with a Special Airspace Use Regime – a 15.5 mile (25 kilometer)-wide part of the airspace along the Ukrainian state border where a special procedure for flight operations and control is established by the Ukrainian Air Force.[24]

Operators of UAVs are subject to the same liability rules as other air traffic operators.[25] Drone operators may be held criminally liable under the Criminal Code of Ukraine for creating a danger to human life or causing other conditions that threaten the safety of air flights.[26]

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[21] *Ukrainian State Air Traffic Service Enterprise (UkSATSE)*, CAPA, CENTER FOR AVIATION, http://centreforaviation.com/profiles/air-traffic-management/ukrainian-state-air-traffic-service-enterprise-uksatse (last visited Apr. 11, 2016), *archived at* https://perma.cc/T53T-MTAW.

[22] *Sogodni v Ukraerorisi Obgovoryly Problemu Zakonodavchogo Vreguliuvannia Polotiv Bezpilotnykh Povitrianykh Suden v Ukraine* [*Today UkSATSE Discussed Problem of Legislative Regulation of Remotely Piloted Aircraft Flights in Ukraine*], UKRAINIAN STATE AIR TRAFFIC SERVICE ENTERPRISE (May 18, 2015), http://uksatse.ua/index.php?s=e4dfc02bb78ef51cfebc3e751801ea2f&act=Part&CODE=247&id=314 (official website, in Ukrainian), *archived at* https://perma.cc/GE6S-SAG5.

[23] V.V. Luts, *Povitrianne Porstranstvo* [*Air Space*], *in* VELYKYII ENTSIKLOPEDYCHNYI IURYDYCHNYI SLOVNIK [GREAT ENCYCLOPEDIC LEGAL DICTIONARY] 654 (Yuri Shemshuchenko ed., Kyiv, 2012) (in Ukrainian).

[24] Cabinet of Ministers of Ukraine, Regulation No. 401, para. 2.

[25] 2 KRYMINALNYI KODEKS UKRAINY. NAUKOVO-PRAKTYCHNYI KOMENTAR [SCHOLARLY AND PRACTICAL COMMENTARIES ON THE CRIMINAL CODE OF UKRAINE] 551 (V.Ia. Tatsii & V.P. Pshonka eds., Kharkiv, 2013) (in Ukrainian).

Violations of the rules related to the safety of aircraft flights by persons other than air transport workers are punishable by a fine or imprisonment for up to three years if they expose human lives to danger or cause a risk of any other grave consequences. In cases of injury, death, or other serious consequences, violations of air traffic rules are punishable by imprisonment from five to twelve years.[27] The same punishment is prescribed for violations of rules related to the use of airspace, including the unlawful launch of a drone.[28]

[26] CRIMINAL CODE OF UKRAINE, Law No. 2341-III of Apr. 5, 2001, with the Latest Amendments of Nov. 26, 2015, http://zakon3.rada.gov.ua/laws/show/2341-14/page9 (in Ukrainian), *archived at* https://perma.cc/4WL5-5FTY.

[27] *Id.* art. 281.

[28] *Id.* art. 282; *see also* 2 KRYMINALNYI KODEKS UKRAINY, *supra* note 25, at 552.

United Kingdom

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SUMMARY The UK has a system of air navigation laws that apply to the use of drones. These regulations aim to ensure the safety of individuals around drones. There are stricter regulations in place for drones that carry a camera on board and record data. The rules are actively enforced by the Civil Aviation Authority. While no new legislative initiatives are currently pending, the UK is in the process of exploring additional options for the regulation of drone use.

I. Introduction

Drones, frequently referred to as "small unmanned aircraft" in the UK,[1] or unmanned aerial vehicles (UAVs), are a rapidly emerging technology that has gained considerable popularity over the past few years. They are covered under a patchwork of English laws, including aviation laws, which are regulated by the Civil Aviation Authority (CAA). Other areas of law that come into play, particularly if the drone has a camera mounted on it, are data protection, privacy, liability, insurance, export, and intellectual property laws, as well as the common-law torts of nuisance and trespass.[2]

II. Laws Regulating Drones

The primary piece of legislation that covers drones is the Civil Aviation Act 1982[3] and the Air Navigation Order 2009 made under the Act. Breaches of these aviation laws are criminal offenses, enforced by the CAA. There are also "rules of the air" that apply to airspace over the UK, as discussed below. These rules are similar to the Highway Code for roads.

It is the responsibility of the operator of the drone to ensure that the aircraft is flown safely and that applicable laws are complied with. Article 138 of the Air Navigation Order provides that any person undertaking aviation activity "must not recklessly or negligently cause or permit an aircraft to endanger any person or property."[4] The CAA policy requires that drones meet the same safety and operational standards as manned aircraft to ensure that they do not "present or

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[1] This is defined in article 255 of the Air Navigation Order 2009, SI 2009/3015, http://www.legislation.gov.uk/uksi/2009/3015/pdfs/uksi_20093015_en.pdf, *archived at* https://perma.cc/J99H-C454, as "any unmanned aircraft, other than a balloon or a kite, having a mass of not more than 20kg without its fuel but including any articles or equipment installed in or attached to the aircraft at the commencement of its flight."

[2] Peter Lee, *Some Thoughts on the Drone Sector*, DRONES AND THE LAW (blog) (Feb. 4, 2016), http://dronelaw.blogspot.co.uk, *archived at* https://perma.cc/9NK8-MV5T.

[3] Civil Aviation Act 1982, c. 16, http://www.legislation.gov.uk/ukpga/1982/16, *archived at* https://perma.cc/VDB5-2VW2.

[4] Air Navigation Order 2009 art. 138.

create a greater hazard to persons, property, vehicles, or vessels . . . than that attributable to the operations of manned aircraft of equivalent class or category."[5]

The conditions contained in articles 166 and 167 of the Air Navigation Order specifically apply to small drones and permit them to be flown without complying with the other terms of the Air Navigation Order, such as airworthiness and flight-crew licensing requirements.[6] These laws are intended to be "as 'light touch' and proportionate as possible, so there is a great deal that can be done (especially for private or recreational flights) without the need to approach the CAA at all."[7] Permission from the CAA is not required for flights that are not flown in return for any "valuable consideration," provided the flight is not close to people and/or buildings.[8]

III. Restrictions

A. Weight Restrictions – Aircraft 20 Kg and Under

Aircraft that weigh 20 kilograms or less are covered by articles 166 and 167 of the Air Navigation Order. These articles provide basic safety measures, such as

- prohibitions on dropping articles or animals from the drone that would endanger persons or property;[9]
- requirements that direct, unaided, visual contact be maintained that is sufficient to monitor the flight path of a small unmanned aircraft "in relation to other aircraft, persons, vehicles, vessels and structures for the purposes of avoiding collisions;"[10]
- prohibitions on aircraft being flown above 400 meters in altitude or farther than 500 meters horizontally away from the operator without explicit permission from the Civil Aviation Authority; and
- requiring the operator to ensure that he or she only fly the drone if it can be done safely.

Drones with cameras attached must not be flown within 150 meters of a congested area or 50 meters of a person, vessel, vehicle, or structure that is not under the control of the pilot. This makes it difficult for people to fly UAVs with cameras inside parks or other public areas and remain in compliance with the regulations.

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[5] Civil Aviation Authority, *Unmanned Aircraft System Operations in UK Airspace – Guidance*, Cap. 722, ¶ 1.1, http://publicapps.caa.co.uk/docs/33/CAP%20722%20Sixth%20Edition%20March%202015.pdf, *archived at* https://perma.cc/9W8R-K7Z7.

[6] *Id.* ¶ 2.19.

[7] Leicester City Council, Drone and Model Aircraft Policy 2015, at 5, https://www.leicester.gov.uk/media/180601/drone-policy.pdf, *archived at* https://perma.cc/9ZYR-8NNE.

[8] *Id.*

[9] Air Navigation Order 2009, art. 166.

[10] Civil Aviation Authority, Small Unmanned Aircraft: Specific Regulations About Small Drones, https://www.caa.co.uk/Commercial-Industry/Aircraft/Unmanned-aircraft/Small-unmanned-aircraft (last visited Mar. 14, 2016), *archived at* https://perma.cc/65GF-DU7Y.

B. Aircraft Over 20 Kg

Unmanned aircraft that weigh between 20–150 kg are subject to all articles of the Air Navigation Order, and the operators of these aircraft are required to obtain a certificate of airworthiness, have a permit to fly, have a licensed flight crew, and follow the rules of the air.[11] If the operator is unable to meet all the requirements, he or she may apply to the CAA for an exemption under article 242 of the Air Navigation Order. Exemptions are issued on a case-by-case basis. As with aircraft under 20 kg, aircraft between 20–150 kg may not drop articles or animals, regardless of whether a parachute is used, that would endanger persons or property.[12]

C. Geographical Restrictions

As noted above, the UK has many restrictions on where drones can be operated that serve in practice to limit the available areas to use such devices. The Air Navigation Order provides that, without explicit permission from the CAA, drones may not be flown

- within 150 meters of, or over, a congested area;
- within 150 meters of, or over, an organized open-air assembly of 1,000 or more people;
- within 50 meters of any vehicle, structure, or vessel that is not under the control of the operator; or
- within 50 meters of any person not under the control of the operator.[13]

In addition to these requirements, there are also a vast number of specified no-fly zones for drones. These fall into the following four categories:

- restricted areas that may never be flown over, such as prisons and nuclear power stations;
- controlled airspace that should not be flown into without explicit permission from air traffic control, which covers airports and airfields;
- "prohibited areas," which are zones that operators are highly recommended against flying into for their safety and the safety of others, such as high-intensity radio transmission areas that could cause interference with the aircraft; and
- "danger areas," which are locations used for military weapons and pilot training, as well as testing military equipment.[14]

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[11] HOUSE OF LORDS, EU SELECT AFFAIRS COMMITTEE, 7TH REPORT OF SESSION 2014–15, CIVILIAN USE OF DRONES IN THE EU, 2014–15, HL 122, at ¶ 40, http://www.publications.parliament.uk/pa/ld201415/ldselect/ldeucom/122/122.pdf, *archived at* https://perma.cc/3BHD-93ZU.

[12] Air Navigation Order art. 129.

[13] *Id.* arts. 166 & 167.

[14] Mary-Ann Russon, *Drone No-fly Zones in the UK Explained – Where in Britain Can You Pilot a UAV?*, INTERNATIONAL BUSINESS TIMES (Apr. 15, 2015), http://www.ibtimes.co.uk/drone-no-fly-zones-uk-explained-where-britain-can-you-pilot-uav-1496386, *archived at* https://perma.cc/5E7P-BN3U.

The Secretary of State has authority under the Air Navigation Order to make regulations to restrict or prohibit flying in certain areas if it is necessary in the public interest where there is a gathering or movement of a large number of people, an aircraft race, or a contest or flying display; for the purposes of national defense; or for any other reason that affects the public interest. Failing to comply with the regulations issued by the Secretary of State in these circumstances is an offense.

D. Commercial Use

Any person that uses a drone for commercial purposes must obtain a license from the Civil Aviation Authority. To obtain the license, the operator must demonstrate that he or she is sufficiently competent. The House of Lords estimates that there are tens of thousands of drones in the UK, with approximately 500 small drones under 20 kg licensed for commercial use. There are currently two units between 20–50 kg in commercial use in the UK.[15]

E. Insurance

Most operators of aircraft that weigh over 20 kg are required to obtain adequate levels of insurance to cover their liability in case of an accident.[16] Model aircraft under 20 kg are exempt from these requirements.[17]

F. Privacy Concerns

The use of cameras on drones to record images, including people without their consent, poses issues of compliance with current laws. Recording such information could potentially breach the obligations contained in the Data Protection Act[18] and the CCTV Code of Practice,[19] which address certain aspects of the use of drones that collect information about individuals. While the Code of Practice distinguishes between private and commercial users, and notes that commercial operators must comply with data protection obligations, it further states that "it will be good practice for domestic users to be aware of the potential privacy intrusion which the use of [unmanned aerial systems] can cause to make sure they're used in a responsible manner."[20]

The privacy and data protection obligations that arise can be further complicated if images are then posted on social media and evolve from private content into public content. A number of

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[15] HOUSE OF LORDS, *supra* note 11, tbl. 1.

[16] Civil Aviation (Insurance) Regulations 2005, http://www.opsi.gov.uk/si/si2005/20051089.htm, *archived at* https://perma.cc/ZPY5-XKZ2.

[17] Civil Aviation Authority, *Unmanned Aircraft System Operations in UK Airspace – Guidance*, *supra* note 5, ¶ 2.19.

[18] Data Protection Act 1998, c. 29, http://www.legislation.gov.uk/ukpga/1998/29, *archived at* https://perma.cc/9333-S9LM.

[19] Information Commissioner's Office, *In the Picture: A Data Protection Code of Practice for Surveillance Cameras and Personal Information*, Version 1.1 (May 21, 2015), https://ico.org.uk/media/for-organisations/documents/1542/cctv-code-of-practice.pdf, *archived at* https://perma.cc/NT63-39EZ.

[20] *Id*. at 30.

social networks state in their terms and conditions that they can license user content to third parties.[21]

Any aircraft that is registered in any other country is not permitted to fly over the UK for the purposes of aerial photography or aerial surveys, regardless of whether valuable consideration is given for the flight, unless the operators have the permission of the Secretary of State and comply with the conditions attached to such permission.[22]

IV. Regulation of Drones Controlled by Multiple Operators

No separate regulations were located that apply to the recreational use of drones controlled by multiple operators. All operators would be required to abide by the regulations of the Air Navigation Order and operate the drone within the limits of these laws.[23]

V. Requirements for Installation of Software During Manufacture to Prohibit Drones from Flying in Restricted Areas

There does not appear to be a requirement for software to be installed in drones to prohibit them from flying into restricted areas, and the UK does not appear to use an "electric fence" linked to the frequencies of drones that would prevent them from entering a restricted area. While there is no requirement for this technology, some major drone manufacturers are including the technology as part of the manufacturing process on their own initiative.[24]

The UK focuses on existing legislation, which provides that flying a drone in a restricted area is an offense, and these offenses are actively investigated and prosecuted by the CAA.[25]

VI. Import and Export Requirements for Drones

Certain aspects of unmanned aerial vehicles are on UK's Strategic Export Control List, which, as its subtitle indicates, is a list of "strategic military and dual-use items that require export authorisation."[26] UAVs capable of carrying a payload over a certain weight, or exceeding a

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[21] Sophie Curtis, *Drone Laws in the UK – What Are the Rules*, TELEGRAPH (London) (Apr. 16, 2015), http://www.telegraph.co.uk/technology/news/11541504/Where-is-the-legal-line-in-flying-drones.html, *archived at* https://perma.cc/78T7-MFT8.

[22] Air Navigation Order 2009, art. 225.

[23] *Id*. arts. 166–167.

[24] *See, e.g.*, Emily Reynolds, *DJI Update Enforces Drone No-fly Zones Across Europe and USA*, WIRED.CO.UK (Nov. 18, 2015), http://www.wired.co.uk/news/archive/2015-11/18/dji-drone-restricted-airspace, *archived at* https://perma.cc/CRX6-EMLT.

[25] Air Navigation Order 2009, arts. 166–167.

[26] Department for Innovation, Business and Skills, *UK Strategic Export Control Lists: The Consolidated List of Strategic Military and Dual-Use Items That Require Export Authorisation*, Dec. 2015, at 1, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/488993/controllist20151225.pdf, *archived at* https://perma.cc/5P2M-5MGQ.

distance of 300 km, may not be exported without a proper license.[27] As relevant to this report, the Military List specifically includes and prohibits the export without authorization of

> c. Unmanned aircraft and related equipment, as follows, and specially designed components therefor:
>
> 1. "UAVs", Remotely Piloted Air Vehicles (RPVs), autonomous programmable vehicles and unmanned "lighter-than-air vehicles";
> 2. Launchers, recovery equipment and ground support equipment;
> 3. Equipment designed for command or control;
>
> d. Propulsion aero-engines and specially designed components.[28]

VII. Allocation of Frequencies for Drones

Drones are considered to be model control equipment[29] by Ofcom, the UK communications regulator, and are required to operate within certain frequency bands, as designated by Ofcom. Air model control devices are required to use frequencies (MHz) 34.945 to 35.305, and not exceed an effective radiated power of 100 mW. The 35 MHz band is solely dedicated to aeronautic modeling, and there is a prohibition on the use of airborne transmitters.[30] Regulations require that model control equipment must not "cause undue interference to other wireless telegraphy equipment."[31]

The use of these specific frequencies for model control is exempt from the requirement to hold a license under the Wireless Telegraphy Act 2006[32] as long as the model meets certain conditions, such as operating within the designated frequencies, and the equipment must be marked lawfully in accordance with the CE marking (which indicates European Union regulatory standards are met) and comply with all relevant EU directives. A license to operate is not required for equipment that complies with all applicable regulations.

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[27] *Id.* at 9.

[28] Department for Business, Innovation & Skills, UK Military List ML 10(c), (d) (Apr. 2015), https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/422370/militarylist20150417.pdf, *archived at* https://perma.cc/27Y5-NFQA.

[29] *OfW 311 – Radio Controlled Models*, OFCOM, http://stakeholders.ofcom.org.uk/spectrum/information/licence-exempt-radio-use/licence-exempt-devices/ofw311 (last visited Apr. 12, 2016), *archived at* https://perma.cc/HNM3-QVDH. "EU harmonised decision 2013/752/EU for Short Range Devices (SRD) defines model control as; 'Model control devices are a specific kind of telecommand and telemetry radio equipment that is used to remotely control the movement of models (principally miniature representations of vehicles) in the air, on land or over or under the water surface.' " Ofcom, *IR 2030 – UK Interface Requirements 2030 Licence Exempt Short Range Devices*, 98/34/EC Notification No. 2011/0401/UK (Dec. 2011), http://stakeholders.ofcom.org.uk/binaries/spectrum/spectrum-policy-area/spectrum-management/research-guidelines-tech-info/interface-requirements/IR_2030.pdf, *archived at* https://perma.cc/L949-4CUT.

[30] *OfW 311 – Radio Controlled Models*, *supra* note 29.

[31] *Id.*

[32] Wireless Telegraphy Act 2006, c. 36, http://www.legislation.gov.uk/ukpga/2006/36/contents, *archived at* https://perma.cc/6M6Y-JD82.

These regulations are enforced by Ofcom, which prioritizes maintaining public safety communication services its top priority, and maintaining the safety of business radio and communications its second priority. For model control equipment, Ofcom aims to ensure that noncompliant radio equipment is kept off the market and that the use of radio frequencies conforms to license requirements.[33] Using equipment that does not meet the conditions of the license exemption is an offense under the Wireless Telegraphy Act. These offenses are investigated and prosecuted by Ofcom, and the penalties include a fine of up to £5000 (approximately US$8,000) and/or six months' imprisonment. The courts may also order the confiscation of any property used in connection with the offense.[34]

Ofcom has field operation teams that investigate and take action to prevent undue interference with frequencies. It may undertake enforcement actions, including informal warnings, formal cautions, or more formal criminal proceedings involving fines and imprisonment.[35]

VIII. Role of Local Authorities in Drone Regulation

The approach of local authorities towards the use of drones varies. Some local authorities appear not to have published any guidance on the use of drones in their localities. Other local authorities specifically require drone owners to comply with the Air Navigation Order and the CAA requirements for licenses for commercial flights.[36]

Local authorities have the ability to introduce policies to regulate the use of drones on any land owned by the authority. For example, Leicester City Council prohibits the use of drones, both for recreational and commercial purposes, on City Council lands.[37] The reason behind this policy is concern over the authorities' liability for any legal action as a result of the activities of a drone and its operator, including accident or injury and the close proximity of the land to private properties.[38] Any person caught using a drone on the property of the local authority will be requested to stop. If they refuse, the police will be called and the person removed from the property in accordance with the by-laws.[39]

IX. Enforcement

The CAA is responsible for ensuring compliance with the Air Navigation Order and it works with the police and other agencies in carrying out this responsibility. The laws and regulations

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[33] Ofcom, *IR 2030 - UK Interface Requirements*, *supra* note 29.

[34] Wireless Telegraphy Act 2006, c. 36, §§ 8, 45, 46, 96 & scheds. 4–6, http://www.legislation.gov.uk/ukpga/2006/36/contents, *archived at* https://perma.cc/6M6Y-JD82.

[35] *Id*. ch. 4.

[36] *See*, *e.g.*, Leicester City Council, *supra* note 7, at 3–5.

[37] *Id*. at 7.

[38] *Id*.

[39] *Id*. at 9.

are being actively enforced by the CAA. A number of individuals have been prosecuted for violating the restrictions contained in the regulations.[40]

The majority of enforcement actions by the CAA are aimed at individuals who use drones for commercial purposes and are not licensed. However, safety is the overriding concern of the regulations contained in the Air Navigation Order, and the CAA will take action against individuals using a drone for personal purposes when it causes a safety hazard.[41]

In December 2015, the CAA announced that it would take action against individuals operating drones on a recreational basis if they did not follow the regulations—in particular the prohibition on flying over congested areas or within 50 meters of buildings or people without official permission.[42] Failing to observe these regulations can result in a criminal prosecution and a fine of up to £5,000.

In the first conviction in the UK for a violation of aviation laws by a drone operator, the CAA prosecuted an individual in 2014 after he lost control of his drone near a nuclear submarine facility. The individual was subsequently convicted for dangerous use of a recreational drone. In May 2014 an individual was fined for flying a drone over rides at Alton Towers, an amusement park.[43] Other prosecutions include the prosecution of an operator who flew drones with a camera over multiple premiere league soccer grounds, the Houses of Parliament, a memorial at Buckingham Palace, and parts of the River Thames. This individual was charged with breaching articles (2)(a), 166(3), and 167(1) of the Air Navigation Order. The defendant pled guilty to flying a small unmanned aircraft over a congested area and not maintaining direct visual contact with a drone. He was fined £1,800 (approximately US$2,500), ordered to pay £600 (approximately US$1,000) in costs, and required to forfeit his drones and cameras.[44]

X. Proposed Reforms

The House of Lords has been actively considering whether legislation is needed to better regulate the civilian use of drones since 2014, when the EU Select Affairs Committee began an inquiry into their use.[45] The House of Lords issued a report as a result of this inquiry, in which it noted that advances in technology and a decrease in the cost of drones has led to an inconsistent regulatory framework that currently distinguishes between the commercial and noncommercial

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[40] *Safety Warning for Drones Given as Christmas Gifts*, TELEGRAPH (London) (Dec. 25, 2014), http://www.telegraph.co.uk/news/uknews/law-and-order/11313110/Safety-warning-for-drones-given-as-Christmas-gifts.html, *archived at* https://perma.cc/DH2S-MCDK.

[41] *Id.*

[42] *Id.*

[43] Charles Arthur, *UK's First Drone Conviction Will Bankrupt Me, Says Cumbrian Man*, THE GUARDIAN (London) (Apr. 2, 2014), http://www.caa.co.uk/application.aspx?appid=7&mode=detail&nid=2348, *archived at* https://perma.cc/XB53-KGTM.

[44] Press Release, Crown Prosecution Service, Man Convicted for Illegally Flying Drone over Football Stadiums and Landmarks (Sept. 15, 2016), http://www.cps.gov.uk/london/press_releases/man_convicted_for_illegally_flying_drone_over_football_stadiums_and_landmarks, *archived at* https://perma.cc/CP8S-CVQQ.

[45] HOUSE OF LORDS REPORT, *supra* note 11.

use of drones.[46] This distinction operated on the basis that noncommercial users had a pre-existing knowledge of aviation and the rules of the air; however, advances in technology mean that similar aircraft are being used by commercial and recreational users, but under different regulations.[47] The report made a number of recommendations, including the creation of an online database where pilots of drones can record their flight plans, and the necessity in the future of creating a mandatory system of registration for all commercial and civil drones.[48]

There are currently no pending legislative initiatives, but the UK is in the process of inquiring into legislative and other measures to further regulate the use of drones.

[46] *Id*. ¶ 18.

[47] *Id*.

[48] *Id*. at 248.

European Union

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SUMMARY Currently, the European Union (EU) does not regulate the civilian use of remotely piloted aircraft (RPA) with a mass of 150 kg or less. Such aircraft are governed by national rules adopted by the EU Member States. RPA above the threshold of 150 kg fall within the mandate of the European Aviation Safety Agency (EASA). Since 2014, the European Commission has been engaged in promoting the integration of remotely piloted aircraft systems (RPAS) into the European civil aviation airspace beginning in 2016. Following the EASA's Technical Opinion adopted in 2015 that recommended a risk-based regulatory approach to govern the operation of drones, the Commission introduced a proposal to replace the current regulation governing drones. The proposal is designed to integrate all drones, regardless of their size, into the EU aviation safety framework. A key objective of the proposal is to ensure that the design, production, maintenance, and operation of unmanned aircraft complies with the essential requirements of manned aircraft. The European Parliament and other EU bodies strictly regulate the processing of personal data and the right to private life. Operators of drones will be subject to tougher standards and requirements contained in the Data Protection Regulation, adopted by the European Parliament in April 2016, which will take effect in the summer of 2016. Once the proposal on drones is approved by the Parliament and the Council of the EU, it will contribute towards the integration of drones into the European aviation airspace and provide the Commission with the legal authority to adopt delegated acts in compliance with the EASA's standards.

I. Introduction

At the European Union (EU) level, no uniform terminology is used to denote what is commonly known as drones. The European Parliament uses the term "civil drones" to differentiate civilian drones from those intended for military purposes.[1] The European Commission uses the term "remotely piloted aircraft systems" (RPAS).[2] The European Aviation Safety Agency (EASA), an EU body established in 2002[3] with the mandate to issue implementing rules and approve airworthiness standards, defines drones as "unmanned aircraft . . . which includes any aircraft

[1] European Parliament Briefing PE 571.305, Civil Drones in the European Union (Oct. 2015), http://www.europarl.europa.eu/RegData/etudes/BRIE/2015/571305/EPRS_BRI%282015%29571305_EN.pdf, *archived at* https://perma.cc/4UG8-4336.

[2] European Commission, *Communication from the Commission to the European Parliament and the Council, A New Era for Aviation*: *Opening the Aviation Market to the Civil Use of Remotely Piloted Aircraft Systems in a Safe and Sustainable Manner*, COM (2014) 207 final (Apr. 8, 2014), http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52014DC0207, *archived at* https://perma.cc/WC2E-9YT2.

[3] *The Agency: Facts and Figures*, EASA, https://www.easa.europa.eu/the-agency/the-agency (last visited Apr. 13, 2016), *archived at* https://perma.cc/XJT4-DZTU.

operated or designed to be operated without a pilot on board."[4] This term also includes machines that are normally not perceived by the general public as aircraft, such as flying toys, small tethered balloons, or kites.[5] The EASA uses the term "drones" in all its communications to the general public.[6] The EASA's definition of a drone is in line with the definition of "unmanned aerial vehicle" (UAV) provided by the International Civil Aviation Organization (ICAO), which is in charge of implementing the 1944 Chicago Convention on International Civil Aviation.[7] The ICAO defines a UAV as "a pilotless aircraft, in the sense of Article 8 of the Convention on International Civil Aviation, which is flown without a pilot-in-command on-board and is either remotely and fully controlled from another place (ground, another aircraft, space) or programmed and fully autonomous."[8] UAVs are further divided into two categories: (1) those that are remotely piloted by a human and hence are designated as RPAS; and (2) those that are "autonomous," meaning those that are controlled by a computer without pilot intervention after take-off. This second category is outside the scope of the EU's regulation.[9]

The EU does not regulate drones whose mass is 150 kg or less, because the current governing regulation, Regulation 216/2008 on Common Rules in the Field of Civil Aviation, only covers aircraft whose mass is above that size.[10] Such large drones fall within the competence of the EASA. Drones whose mass is less than 150 km may be regulated at the Member State level. Indeed, several Member States, including Austria, the Czech Republic, Denmark, Germany, France, Italy, Poland, Spain, Sweden, and the United Kingdom, have already adopted national rules.[11] Because of differing national rules on criteria and conditions for the operation of drones and related safety issues, operators must apply for a separate authorization in each EU Member

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[4] EASA, Technical Opinion: Introduction of a Regulatory Framework for the Operation of Unmanned Aircraft, at 4, RMT.0230 (Dec. 18, 2015), http://www.easa.europa.eu/system/files/dfu/Introduction%20of%20a%20regulatory%20framework%20for%20the%20operation%20of%20unmanned%20aircraft.pdf, *archived at* https://perma.cc/JW2X-ZREK.

[5] *Id*. at 5.

[6] *Id*.

[7] Convention on International Civil Aviation, Dec. 7, 1944, 15 U.N.T.S. 102, https://treaties.un.org/doc/Publication/UNTS/Volume%2015/volume-15-II-102-English.pdf, *archived at* https://perma.cc/L7KU-HBTQ.

[8] International Civil Aviation Organization (ICAO), Unmanned Aircraft Systems (UAS) para. 2.1, Cir 328/AN/190 (2011), http://www.icao.int/Meetings/UAS/Documents/Circular%20328_en.pdf, *archived at* https://perma.cc/56AY-FFPZ.

[9] European Parliament Briefing, *supra* note 1, at 3.

[10] Regulation (EC) Regulation No. 216/2008 of the European Parliament and of the Council of 20 February 2008 on Common Rules in the Field of Civil Aviation and Establishing a European Aviation Safety Agency, and Repealing Council Directive 91/670/EEC, Regulation (EC) No. 1592/2002 and Directive 2004/36/EC, Annex II(f), 2008 O.J. (L 79) 1, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:079:0001:0049:EN:PDF, *archived at* https://perma.cc/563R-DGH7.

[11] European Parliament Briefing, *supra* note 1, at 5. *See also* European Parliament, Committee on Transport and Tourism, *Report on Safe Use of Remotely Piloted Aircraft Systems (RPAS), Commonly Known as Unmanned Aerial Vehicles (UAVs), in the Field of Civil Aviation*, A8-0261/2015 (Sept. 25, 2015), http://www.europarl.europa.eu/sides/getDoc.do?type=REPORT&reference=A8-2015-0261&format=XML&language=EN, *archived at* https://perma.cc/HZS7-YBSU.

State. In the Commission's view, the current fragmented regulatory framework inhibits the further proliferation of drones and overall growth of the EU market in drones.[12]

The Riga Declaration on Remotely Piloted Aircraft, "Framing the Future of Aviation,"[13] which was adopted on March 6, 2015, by Commission representatives, civil aviation officials, data protection national authorities, and representatives from the manufacturing industry, recognized the following key guiding principles to be taken under consideration in the future regulation of drones:

- Drones must be dealt with as a new type of aircraft and any safety rules imposed must be proportional to the risk of each operation.
- There is a critical need for the EU to establish safety rules immediately and also to lay down technologies and standards for the integration of drones within civil aviation.
- The protection of privacy of individuals will lead to greater public acceptance.
- The operator of a drone bears responsibility for its use.[14]

In connection with the last principle, the Declaration raised the issue of insurance, third-party liability, and compensation schemes for victims, all of which fall within the domain of the individual EU Members.[15]

II. European Aviation Safety Agency

The EASA provides opinions and formulates technical rules relating to the construction, design, and operational aspects of aircraft, and is also responsible for assisting the Commission by providing technical, administrative, and scientific support.[16]

In May 2015, the EASA adopted a document titled *Concept of Operations for Drones: A Risk Based Approach to Regulation of Unmanned Aircraft*,[17] which urged regulation of the operation of drones in a manner proportionate to the risk of the specific operation, and also proposed to establish three categories of drone operations—Open, Specific, and Certified—with associated regulatory regimes.[18] To mitigate privacy concerns, the EASA suggested the installation of

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[12] European Commission, COM (2014) 207 final, *supra* note 2, para. 3.

[13] Riga Declaration on Remotely Piloted Aircraft (Drones), "Framing the Future of Aviation," Mar. 6, 2015, http://ec.europa.eu/transport/modes/air/news/doc/2015-03-06-drones/2015-03-06-riga-declaration-drones.pdf, *archived at* https://perma.cc/8XRT-9L6H.

[14] *Id*. at 5.

[15] *Id*.

[16] *The Agency: Facts and Figures*, EASA, *supra* note 3.

[17] EASA, CONCEPT OF OPERATIONS FOR DRONES: A RISK BASED APPROACH TO REGULATION OF UNMANNED AIRCRAFT (May 2015), https://www.easa.europa.eu/system/files/dfu/204696_EASA_concept_drone_brochure_web.pdf, *archived at* https://perma.cc/NJM6-7W6H.

[18] *Id*. at 3.

chips/SIM cards in drones.[19] Other suggestions included the self-registration of drone operations in a Web-based application maintained by the local authorities.[20]

At the request of the Commission, the EASA on December 18, 2015, issued a Technical Opinion on Introduction of a Regulatory Framework for the Operation of Unmanned Aircraft.[21] The Opinion contains twenty-seven specific proposals for a regulatory framework and for low-risk operations of all unmanned aircraft irrespective of their size. The Technical Opinion divides drones into three categories depending on risk:

- Open (low risk): Safety is ensured through compliance with operational limitations, mass limitations as a proxy of energy, product safety requirements, and a minimum set of operational rules.
- Specific (medium risk): Authorization is given by a national aviation authority (NAA), possibly assisted by a qualified entity (QE), following a risk assessment performed by the operator. A manual of operations lists the risk mitigation measures.
- Certified (higher risk): The requirements applicable to this category are comparable to those for manned aviation. Oversight is provided by the NAA (issue of licenses and approval of maintenance, operations, training, Air Traffic Management/Air Navigation Services (ATM/ANS), and airfield organizations) and EASA (design and approval of foreign organizations).[22]

III. Position of EU Institutions

The Commission has been supporting the development of the drones industry since the early 1990s. Its long-term objective is to establish a strong European aviation market in drones. According to a report by the European Parliament's Committee on Transport and Tourism, the EU holds a leading edge in the civilian sector, with 2,500 operators (400 in the UK, 300 in Germany, 1,500 in France, 250 in Sweden, etc.) compared to 2,342 operators in the rest of the world.[23] It is estimated that within the next ten years the drone industry could be worth 10% of the aviation market, or €15 billion (about US$16.89 billion) per year.[24] The Aerospace and Defense Industries Association of Europe forecast that about 150,000 drone-related jobs will be created in Europe by 2050, excluding employment generated through operator services.[25]

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[19] *Id.* at 8.

[20] *Id.*

[21] EASA, Technical Opinion, *supra* note 4.

[22] *Id.* Exec. Summary.

[23] European Parliament, Committee on Transport and Tourism, *supra* note 11, paras. 1 & 2.

[24] European Commission Press Release IP/14/384, European Commission Calls for Tough Standards to Regulate Civil Drones (Apr. 8, 2014), http://europa.eu/rapid/press-release_IP-14-384_en.htm, *archived at* https://perma.cc/LLF9-YR4L.

[25] European Commission, COM (2014) 207 final, *supra* note 2, § 2.

The Commission, in its 2014 Communication, *Opening the Aviation Market to the Civil Use of Remotely Piloted Aircraft Systems in a Safe and Sustainable Manner*, explained its strategy to establish an EU aviation market in drones gradually and emphasized that such a market can only be fully developed if standards are adopted at the EU level and if the aircraft can fly in nonsegregated airspace without affecting the safety and the operation of the wider civil aviation system.[26] The Communication addressed the issues of third-party liability and insurance. In addition, it identified privacy, data protection, and security as critical aspects that must be safeguarded in order to ensure public acceptance and further development of a European market on drones. Furthermore, it announced the EU's intentions to support European drone industries.[27] The Commission's latest Communication on an Aviation Strategy for Europe,[28] adopted in 2015, reemphasized the economic significance of drones, especially for small and medium-sized companies in the aeronautical manufacturing industry, while at the same time stressing the need to establish a risk-based legal approach and address privacy, safety, security, and liability concerns.[29]

The Council of the EU, and specifically the transport, telecommunications, and energy ministers in charge of the aviation market, advocate a harmonized EU approach to civil drone use while emphasizing the need to take into consideration the experience gained in this field by the Member States, according to their comments at a public hearing. Most of the ministers opined that the EASA was the entity best suited to develop technical and safety standards, licenses, and certificates, and agreed on the gradual and progressive integration of drones into civil aviation.[30]

In September 2015, the European Parliament's Transport and Tourism Committee adopted, on its own initiative, the *Report on Safe Use of Remotely Piloted Aircraft Systems (RPAS), Commonly Known as Unmanned Aerial Vehicles (UAVs), in the Field of Civil Aviation*.[31] In the Report, the Committee endorsed the key principles agreed to in the Riga Declaration and the Commission's intention to remove the 150-kg threshold and replace it with a comprehensive EU regulatory framework. The Committee also approved the EASA's new competence to regulate drones and urged the EASA to budget funds for drone-related activities.[32]

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[26] *Id*. § 3.

[27] *Id*.

[28] European Commission, *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, An Aviation Strategy for Europe*, COM (2015) 598 final (Dec. 7, 2015), http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM:2015:598:FIN, *archived at* https://perma.cc/2PDX-XEP4.

[29] *Id*. § 2.6.

[30] Council of the European Union Press Release 13851/14, Transport, Telecommunications and Energy, Civil Use of Remotely Piloted Aircraft Systems (Drones) (Oct. 8, 2014), http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/trans/145012.pdf, *archived at* https://perma.cc/8395-ZCRM.

[31] European Parliament, Committee on Transport and Tourism, *supra* note 11.

[32] *Id*. paras. 21 & 22.

IV. Proposed Regulation

In December 2015, the Commission introduced a proposal to adopt EU rules on drones and to repeal Regulation 216/2008.[33] The main objective of the proposed Regulation is to establish and maintain the same civil aviation safety standards for manned and unmanned aviation throughout the EU, and at the same time to ensure a high and uniform level of environmental protection.[34] It also seeks to expand the EASA's competence to include RPAS with a mass below 150 kg. The proposed Regulation would apply, inter alia, to

> the design, production, maintenance and operation of unmanned aircraft, their engines, propellers, parts and non-installed equipment, as well as the equipment to control unmanned aircraft remotely, where such aircraft are operated within the Single European Sky airspace by an operator established or residing within the territory to which the Treaties apply.[35]

A. Requirements for Unmanned Aircraft

Pursuant to article 45 of the proposed Regulation, the design, production, maintenance, and operation of unmanned aircraft and their engines, propellers, parts, noninstalled equipment, and equipment to control them remotely would need to comply with the essential requirements set out in Annex IX.[36]

B. Compliance of Unmanned Aircraft

The Commission would be given the authority to adopt delegated acts concerning the specifications for the design, production, maintenance, and operation of unmanned aircraft. Drones would be subject to certifications and declarations that they comply with such specifications.[37] A drone's certificate would specify its safety-related limitations, operating conditions, and privileges.[38]

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[33] European Commission, *Proposal for a Regulation of the European Parliament and of the Council on Common Rules in the Field of Civil Aviation and Establishing a European Union Aviation Safety Agency, and Repealing Regulation (EC) No. 216/2008 of the European Parliament and of the Council* (Commission Proposal), COM (2015) 613 final (Dec. 17, 2015), http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A52015PC0613, *archived at* https://perma.cc/8YBW-VFNJ.

[34] *Id*. art. 1.

[35] *Id*. art. 2, para. 1(h).

[36] *Id*. art. 45.

[37] *Id*. arts. 46 & 47.

[38] *Id*. art. 46, para. 1.

C. Market Surveillance Mechanisms

Mass-produced unmanned aircraft that pose a very low risk would be subject to the existing market surveillance mechanisms provided in Regulation 765/2008[39] and Decision No. 768/2008.[40] The national aviation authorities would remain indirectly involved, as the operational capability limitations that would be imposed (e.g., that the unmanned aircraft should not fly higher than, for instance, 50 meters to minimize risks) would have to stem directly from traditional aviation requirements. The market surveillance mechanism would rely on justified complaints filed from citizens or undertakings to detect noncompliant products. Findings of noncompliance in one particular Member State would then be communicated throughout the single EU market. The EASA, which would assume additional responsibilities, would not be responsible for the oversight of the market surveillance mechanisms. The Commission, in exercising its authority as the EU body in charge of implementation, would be authorized to verify if the Member States were fulfilling their responsibilities.[41]

D. Delegated Acts

The proposed Regulation does not set forth specifications for the design, production, maintenance, and operation of unmanned aircraft. Such specifications would be promulgated by the Commission in delegated acts, pursuant to article 47 of the proposed Regulation. When the Commission adopts such acts, it would be required to immediately notify the Parliament and the Council simultaneously.[42] This authority would be granted to the Commission for an indefinite period of time and would enter into force only if no objection was expressed by the European Parliament or the Council within two months after they received notification of that act or if, before the expiration of that period, the European Parliament and the Council had both informed the Commission that they did not object.[43] Until the delegated acts are adopted, the relevant provisions of Regulation (EC) 216/2008 would continue to apply.[44]

In delegated acts the Commission would determine the

- conditions and procedures for issuing, maintaining, amending, suspending, or revoking the certificates for the design, production, maintenance, and operation of unmanned aircraft;

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[39] Regulation (EC) No. 765/2008 of the European Parliament and Council of 9 July 2008 Setting Out the Requirement for Accreditation and Market Surveillance Relating to the Marketing of Products and Repealing Regulation (EEC) No. 339/93, 2008 O.J. (L 218) 30, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:218:0030:0047:en:PDF, *archived at* https://perma.cc/4RYJ-FLSA.

[40] Decision No. 768/2008/EC of the European Parliament and of the Council of 9 July 2008 on a Common Framework for the Marketing of Products, and Repealing Council Decision 93/465/EEC, 2008, O.J. (L 218) 82, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32008D0768, *archived at* https://perma.cc/PH37-UGVR.

[41] Commission Proposal, COM (2015) 613 final, *supra* note 33, Detailed Explanation on the Specific Provisions of the Proposal, arts. 45–50.

[42] *Id*. art. 117, para. 7.

[43] *Id*. art. 117, para. 5.

[44] *Id*. art. 126, para. 6.

- conditions for situations in which, with a view to achieving the objectives of the Regulation and while taking account the nature and risk of the particular activity concerned, such certificates must be required or declarations must be permitted;
- conditions and procedures under which an operator of an unmanned aircraft must rely on the certificates or declarations issued in accordance with airworthiness and environmental standards, and other essential requirements;
- conditions under which the requirements concerning the design, production, and maintenance of unmanned aircraft and their engines, propellers, parts, noninstalled equipment, and equipment to control them remotely shall not need to meet certain other specifications in the Regulation;
- marking and identification of unmanned aircraft; and
- conditions under which operations of unmanned aircraft must be prohibited, limited, or subject to certain conditions in the interest of safety.[45]

V. Third–Party Liability Issues

Currently, all insurance obligations for aircraft operations are governed by Regulation 785/2004, which requires all commercial operators of aircraft to purchase third-party liability insurance. Regulation 785/2004 contains limits for the minimum amount of third-party liability insurance based on the mass of aircraft during take-off. For drones that weigh less than 500 kg, the minimum cover required is €660,000 (about US$743,688). Drones that weigh less than 20 kg are not subject to insurance requirements.[46]

VI. Privacy Issues

The EU and its Member States have adopted strict privacy and personal data rules, contained in the 1995 Data Protection Directive[47] and based on articles 7 and 8 of the binding 2009 Charter of Fundamental Rights of the European Union,[48] and on article 16 of the Treaty on the Functioning of the European Union.[49] EU Members are also bound by article 8 of the Council of Europe

[45] *Id.* art. 47(a)–(e).

[46] Regulation (EC) No. 785/2004 of the European Parliament and of the Council of 21 April 2004 on Insurance Requirements for Air Carriers and Aircraft Operators, 2004 O.J. (L 138) 1, http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32004R0785&from=EN, *archived at* https://perma.cc/RL7Y-GS3Z.

[47] Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the Protection of Individuals with Regard to the Processing of Personal Data and on the Free Movement of Such Data, 1995 O.J. (L 281) 31, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.1995.281.01.0031.01.ENG, *archived at* https://perma.cc/8HKR-4D2Q.

[48] Charter of Fundamental Rights of the European Union, 2012 O.J. (C 326) 391, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:12012P/TXT, *archived at* https://perma.cc/ZE2V-ZCSY.

[49] Consolidated Version on the Treaty on the Functioning of the European Union, Jan. 30, 2015, 6655/8/08 REV 8, at 62, http://data.consilium.europa.eu/doc/document/ST-6655-2008-REV-8/en/pdf, *archived at* https://perma.cc/8T7T-PCFV.

Convention on Human Rights.[50] In addition, Members have their own constitutional and statutory rules on privacy, and domestic legislation implementing EU legislation.

Commercial users of drones appear to fall under the EU legislation on personal data protection. Thus, commercial operators of drones have to comply with the applicable data protection principles, such as those concerning purpose limitations, data minimization, and proportionality, as well as the transparency principle, which requires individuals to be informed of any processing carried out during the operation of a drone. On the other hand, private users of drones for hobby and leisure purposes may be exempt from the scope of the Data Protection Directive based on the household exemption.[51] Other exemptions contained in the Directive concern processing for journalistic purposes and for law enforcement purposes.[52] Possible criminal uses of civil drones would fall within the competence of EU Member States, since they are allowed to not apply the data protection rules on grounds of public safety, public security, and public order.

A study commissioned by the Committee on Civil Liberties, Justice and Home Affairs (LIBE) of the European Parliament addressed the privacy implications of the civil use of drones because of potential infringements on personal data protection. The study noted that drones normally carry video cameras to enable pilots to fly them or have other technological installations to record and store data that can eventually be uploaded on the Internet.[53] Consequently, the private life and property of individuals may be interfered with and violated when drones capture images of people in their houses or gardens. Also, surveillance equipment installed on drones would make possible the gathering and processing of personal data and thus interfere with and potentially violate the right to privacy and data protection of individuals.[54] The study urged that future regulation of the manufacturing and trade of drones, including the production, selling, buying, internal and international trade, and notice for buyers on risks and hazards, be designed in a manner to minimize any risks to citizens and their rights.[55]

In his opinion on the Commission's Communication *A New Era for Aviation*,[56] the European Data Protection Supervisor clarified that RPAS, being aircraft systems, do not on their own

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[50] Convention for the Protection on Human Rights and Fundamental Rights art. 8, Nov. 4, 1950, E.T.S. No. 005, http://www.echr.coe.int/Documents/Convention_ENG.pdf, *archived at* https://perma.cc/67SA-28PQ.

[51] European Parliament, Directorate General for Internal Policies, Citizens Rights and Constitutional Affairs, *Privacy and Data Protection Implications from the Civil Use of Drones*, at 8, PE 519.221 (June 2015), http://www.europarl.europa.eu/RegData/etudes/IDAN/2015/519221/IPOL_IDA%282015%29519221_EN.pdf, *archived at* https://perma.cc/JM4N-GCNG.

[52] Directive 95/46/EC, *supra* note 47, art. 9 & art. 13, para. 1.

[53] European Parliament Briefing, *supra* note 1, at 2; *see also* European Parliament, *supra* note 51, at 9.

[54] European Parliament, *supra* note 51, at 9.

[55] *Id.*

[56] Opinion of the European Data Protection Supervisor, *On the Communication from the Commission to the European Parliament and the Council on "A New Era for Aviation – Opening the Aviation Market to the Civil Use of Remotely Piloted Aircraft Systems in a Safe and Sustainable Manner*" (Nov. 26, 2014), https://secure.edps.europa.eu/EDPSWEB/webdav/site/mySite/shared/Documents/Consultation/Opinions/2014/14-11-26_Opinion_RPAS_EN.pdf, archived *at* https://perma.cc/X72A-3GYX.

process personal data, but once they are equipped with other technologies may give rise to very diverse commercial, professional, law enforcement, intelligence, and private uses. The Data Protection Supervisor reached the following conclusions with regard to the use of drones that involve the processing of personal data:

- Such use in most cases constitutes an interference with the right to the respect for private and family life guaranteed by article 8 of the Council of Europe Convention on Human Rights and article 7 of the Charter of Fundamental Rights of the European Union, "as they challenge the right to intimacy and privacy guaranteed to all individuals in the EU and can therefore be allowed only under specific conditions and safeguards."[57]
- When used by individuals for private activities, drones will normally be subject to Directive 95/46/EC requirements and only on rare instances will come within the scope of the household exemption.[58]
- The processing of personal data by drone operators for commercial or professional purposes must comply with national legislation implementing Directive 95/46/EC.[59]
- The mere publication of data on the Internet or in a newspaper without any aim to disclose to the public information, opinions, or ideas is not sufficient for it to fall under the journalism exception of article 9 of Directive 95/46/EC.[60]
- Law enforcement uses of drones must comply with the right to privacy and be based on law, serve a legitimate goal, be necessary in a democratic society, and be proportionate to the purpose pursued.[61]
- The use of drones for intelligence purposes must respect the principles of necessity and proportionality.[62]

The Data Protection Regulation adopted by the European Parliament on April 14, 2016,[63] which will take effect in the summer of 2016, will repeal Directive 95/46/EC and require any commercial operation that processes personal data to perform a Privacy Impact Assessment Study.[64] Moreover, the requirements of "privacy by design" and "privacy by default" will become mandatory.[65] Under the privacy-by-design requirement, the controller will be required

[57] *Id*. para. 67.

[58] *Id*. para. 68.

[59] *Id*. para. 69.

[60] *Id*. para. 70.

[61] *Id*. para. 71.

[62] *Id*. para. 72.

[63] Nikolaj Nielsen, *EU Parliament Passes Grand Data Protection Law*, EU OBSERVER (Apr. 14, 2016), https://euobserver.com/justice/133060, *archived at* https://perma.cc/FED6-5DH8.

[64] *Proposal for a Regulation of the European Parliament and of the Council on the Protection of Individuals with Regard to the Processing of Personal Data and on the Free Movement of Such Data (General Data Protection Regulation)* art. 33, COM (2012) 11 final (Jan. 25, 2012), http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:52012PC0011, *archived at* https://perma.cc/6HM2-Z35C.

[65] *Id*. art. 23.

to implement appropriate technical and organizational measures to ensure that data processing complies with the proposal. Privacy by default means that, based on certain mechanisms used, only those personal data will be processed that were necessary for each specific purpose of the processing and such data will not be collected or retained beyond the minimum period necessary. In particular, those mechanisms will be required to ensure that, by default, personal data are not made accessible to an indefinite number of individuals.[66]

In addition, in its Opinion 01/2015 on Privacy and Data Protection Issues Relating to the Utilization of Drones, which was adopted in 2015, the article 29 Data Protection Working Party established by Directive 95/46/EC issued specific recommendations to policy makers; sector regulators, manufacturers, and operators; and police and other law enforcement authorities. To policy makers and sector regulators the Working Party recommended that a legal requirement be introduced at the European and/or national level to only market small drones in a package containing sufficient information (for example, within the operating instructions) relating to the potential intrusiveness of these technologies on the privacy and personal data of individuals.[67] To manufacturers and operators, the Working Party recommended that they embed privacy-friendly design choices and privacy defaults as part of a privacy-by-design approach.[68] With regard to the use of personal data for law enforcement authorities, the Working Party urged compliance with the necessity, proportionality, purpose limitation, data minimization, and privacy-by-design principles, and with a strict and justified retention period. It also added that the use of drones for intelligence and law enforcement purposes must be subject to judicial review, in accordance with national law.[69]

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[66] *Id.*

[67] Article 29 Data Protection Working Party, *Opinion 01/2015 on Privacy and Data Protection Issues Relating to the Utilization of Drones* § 5.2, 01673/15EN WP 231 (June 16, 2015), http://ec.europa.eu/justice/data-protection/article-29/documentation/opinion-recommendation/files/2015/wp231_en.pdf, *archived at* https://perma.cc/ZAF7-YJSC.

[68] *Id.* § 5.3.

[69] *Id.* § 5.4.

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