

# Commercial Use of Drones: Commercial Drones Facing Legal Turbulence: Towards a New Legal Framework in the EU

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Recently, the market for the commercial use of drones has grown significantly as drones are a promising source for delivering innovative services. This article aims to summarize the European legal framework as well as outstanding legal questions and challenges for this new technology: the development of an international framework for the commercial use of drones and steps made in this respect in the EU as well as liability, insurance and the data protection issues in relation to drones. In the past months, the EU has given a new push to speed up the implementation of EU-wide rules since the need for an EU regulatory framework was becoming all the more pressing. To ensure the free circulation of drones and creating a level playing field within the EU, the new Regulation 2018/1139 has been adopted and will enter into force as from 1 January 2020 followed by the technical framework laid down in the Delegated Regulation (EU) 2019/945 and the Implementing Regulation (EU) 2019/947 which will both enter into force as from June 2020.

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# Introduction

#### Background

In the last years, the market for the commercial use of drones has really "taken off" and analysts predict that the commercial drone market will only continue to bloom, as drone technology is quickly advancing—making these Unmanned Aerial Vehicles (UAV) stronger, lighter, and more powerful. Apart from its most pioneered uses, namely package delivery and aerial photography, drones are also frequently used for other applications, such as agriculture inspection of infrastructures construction, surveillance, Internet service, and news broadcasting.

Goldman Sachs expects the sale of drones to exceed 7.8 units worldwide in 2020, 17 times more than in 2014 (Leijnse, 2017). In the beginning EU legislation (cf. EC Regulation 216/2008 of 20 February 2008 on common rules in the field of civil aviation) covered only those UAVs with a maximum take-off mass (MOTM) of more than 150 kg. Below this threshold, EU Member States were still the responsible regulators. This led to a diverging set of national rules, resulting in a fragmentation of the EU internal market. This formed an obstacle in the development of new products and the introduction of new technology due to a lack of legal certainty for companies engaged in cross-border drone operations. On top of that, the differences in safety standards among EU Member States could generate security hazards. The only possibility for the EU to maintain its strong

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position on the drone market was to ensure that the rights and interests of EU citizens and drone manufactures were upheld, which required legislative action at the EU level (European Commission, 2016). For this purpose, a regulation has been adopted providing the EU with the competence to establish the first EU-wide framework for drones (Council of the European Union, 2017). In the summer of 2018, a regulation has been adopted by the European Parliament and the Council (Regulation 2018/1139 of 4 July 2018 or Regulation 2018/1139)<sup>1</sup> setting up the basic framework necessary in order to streamline the regulation of drones in all EU Member States and encourage cross-border activities. However, under these new European rules, EU Member States still have the possibility to impose national rules on grounds of environmental protection, public security, or protection of privacy and personal data, which must be in accordance with EU law.<sup>2</sup>

Despite this new regulatory framework, the (commercial) use of drones still gives rise to a number of important legal questions and issues, which will have to be dealt with through careful legislative drafting. This article discusses some of these legal questions with regard to the commercial use of drones. More particularly, it elaborates on a number of important questions concerning the international framework, liability, insurance and the protection of privacy, such as: When can a drone be used? Who is liable in case of an incident? Which law will apply? And is an insurance mandatory or possible?

#### What Are Drones?

In a memo of the European Commission (2014), the term drone is used to describe any type of aircraft that is automated and operates without a pilot on board. Broadly speaking, there are two types of drones:

• "Remotely Piloted Aviation Systems" (RPAS) can be defined as a drone of which the aircraft is operated by a human pilot from a distance. This is the only type of drone that can be authorized to fly in European airspaces and under the current EU harmonized framework for drone use.

• Secondly, so-called "Unmanned Aerial Vehicles or Systems" (UAV or UAS) are drones which are automatically programmed, without being operated by a human in control. These are not yet authorized for use, neither by the International Civil Aviation Organization (ICAO) of the UN, nor under EU rules.

Notwithstanding this distinction between remotely controlled and fully automated drones, the terms drone, UAV, UAS, RPAS are often used interchangeably in practice to refer to drones in general.

Drones can be either tethered or untethered. So-called tethered drones use ultra-strong but lightweight cables connected to the ground to provide power, a data bank, or a physical restraint. This gives them distinct advantages over their free-flying cousins including hours long flight times, a better transmission of data and no risk of losing the drone. Untethered drones of course allow RPAS or UAS to fly beyond the visual line of sight of the drone operator, which provides for additional commercial possibilities.

When discussing the different commercial applications of drones and the legal issues they potentially give rise to, it is also important to distinguish between drone-operator interaction and, in particular, between drones operated "within the visual line of sight" (VLOS) and drones operated "beyond the visual line of sight" (BVLOS) of their operator. "Beyond the visual line of sight" or "BVLOS" means that the remote pilot flies the

<sup>&</sup>lt;sup>1</sup> Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No. 2111/2005, (EC) No. 1008/2008, (EU) No. 996/2010, (EU) No. 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No. 552/2004 and (EC) No. 216/2008 of the European Parliament and of the Council and Council Regulation (EEC) No. 3922/91 (Text with EEA relevance.)

<sup>&</sup>lt;sup>2</sup> Recital 21 of the Implementing Regulation (EU) 2019/947.

aircraft by instruments from a remote pilot station (or RPS), and does not keep the unmanned aircraft within its line of sight. As we will see, the regulatory framework in the EU and the US is now mainly restricted to VLOS but most commercial and revenue opportunities and added value will be in BVLOS. Some countries already offer a limited possibility of operations BVLOS, but due to the fragmented legal framework, this technology cannot yet be used on a larger scale.

The term "civil" drones refer to those RPAS that are used for civil purposes—as opposed to, for instance, military drones deployed in the public interest—and thus cover both the recreational use of drones by consumers as well as commercial applications of drones by businesses, such as mail delivery or the inspection of oil platforms or the infrastructure of bridges. As the main focus of this article is the commercial use of drones by large businesses (e.g., Google, Amazon, and UPS), drone use by individuals/consumers will not be further discussed hereinafter.

#### **Drone Applications**

Drones are already being used to take over repetitive and dangerous tasks, which can be more effectively or safely performed by a machine, such as safety inspections of infrastructure, disaster relief actions, precision farming, distribution of medicine, and transport of organs. For example, since September 2019, hospitals in Antwerp (Belgium) are using drones to carry out medical transports, such as blood and urine samples and even medicines, while in Helsinki (Finland), Alphabet launched a food delivery service by drones.

Drone experts believed that it would still take at least three to four years before so-called "delivery drones" are allowed to fly freely beyond visual line of sight (BVLOS) of the drone operator. However, in August 2019, the University of Alaska Fairbanks has successfully conducted the first BVLOS drone flight over an oil pipeline in the US that's been approved by the US Federal Aviation Administration (FAA). Fully automated parcel deliveries by drones are to be expected in 10 years or more, having regard to the recent developments in drone technology and the EU's progress on the establishment of an automated Air Traffic Management (ATM) framework for drones, also referred to as "UTM" (UAV Traffic Management). Some experts expect these deliveries to take place earlier, as some EU Member States, such as Estonia have already focused their attention on the creation of their own national legal framework for automatic deliveries, outside of any European legislation.

The future applications for the commercial usage of drones can be divided in the following six main categories:

- Aerial photography/filming (journalism, entertainment, real estate management, and tourism);
- Security (safety of buildings, individual sites or entire industrial parks, and docks in the port);

• Surveillance/monitoring (land surveyors, geographic mapping of inaccessible terrains and locations, building site control, and precision crop monitoring);

• Inspection/monitoring (building safety inspection, inspection of industrial sites, windmills, solar farms and power lines, and remote managed inspection and remote center of expertise);

- Logistics (express shipping and delivery, unmanned cargo, and small port-to-port transport);
- Transportation (cf. Dubai's Road and Transportation Agency).

## **International Framework**

#### Lack of International Rules

At present, there is no overall international framework for the civil use of drones. Most rules governing

drone use are currently set at the UN level, by the International Civil Aviation Organization (ICAO), which is the UN body dealing with civil aviation. In this respect, reference must be made to the Convention on International Civil Aviation, signed in Chicago on 7 December 1944 (Chicago Convention), which introduces a fly-over prohibition for aircrafts without a specific authorization of the state over which they fly over.<sup>3</sup> The pre-conditions to obtain authorization from the flown-over state differ from country to country and involve a cumbersome process in order to guarantee the safety of the concerned drone operations as set forth by the Chicago Convention. In this respect, international rules require submission of the relevant authorization request demonstrating that the drone complies with the requirements of airworthiness (cf. Articles 20 and 29 of the Chicago Convention).<sup>4</sup>

# Fragmentation and Harmonization in the EU

Although the authorization procedures for manned aircrafts have been streamlined in the EU, until recently, there were no specific rules for unmanned air vehicles with respect to the recognition by the contracting States and release of the relevant authorizations. However, since July 2018, a basic framework has been set up by the European Parliament and the Council for the regulation of drones in all EU Member States with the adoption of new a regulation (Regulation 2018/1139 of 4 July 2018, or Regulation 2018/1139) (Council of the European Union, 2017). This Regulation 2018/1139 has amended the existing Regulations and provided the European Union Aviation Safety Agency with additional powers, such as the ability to regulate the use of drones under the 150 kg threshold. In accordance with this Regulation, basic rules have been set up for unmanned aircrafts, and the EU Commission has been given the task to set out the technical and operational details, which will enter into force as from 1 January 2020.

It should be noted, however, that prior to the aforementioned Regulation most EU Member States<sup>5</sup> have adopted regulations for simple light-weight drone operations on their own as to avoid a case-by-case authorization process. However, it is important to keep in mind that these national authorizations currently do not benefit from mutual recognition within the EU. Moreover, these national authorization procedures also lack coherency as regards the required standards of safety, security, privacy, and liability to be built in the drones (European Commission, 2014).

Until the adaption of the Regulation 2018/1139 (which will enter into force on January 2020) drones in the European airspace are subject to a fragmented set of rules that fail to address a number of key safeguards in a coherent way. Given the virtual lack of borders for these flying objects, legislation concerning the allocation of jurisdiction, conflict of laws, and cross-border enforcement is also indispensable in case of drone incidents. This fragmented system furthermore also hindered the development of a single EU market for drones and the usage of drones for cross-border activities. The European legislator acknowledged this lack of harmonization by including all unmanned aircraft in the scope of Regulation 2018/1139 in order to better pursue safety and compliance with rights guaranteed by EU law.<sup>6</sup>

<sup>&</sup>lt;sup>3</sup> Chicago Convention, Article 8 states: "No aircraft capable of being flown without a pilot shall be flown 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 ensure 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".

<sup>&</sup>lt;sup>4</sup> Article 20 (Nationality mark) of the Chicago Convention requires all aircraft to display a nationality and registration mark. The following Article 29 lists the documents that all aircrafts of the contracting States must carry on board.

<sup>&</sup>lt;sup>5</sup> For an overview of national drone legislation, visit https://droneregulations.info.

<sup>&</sup>lt;sup>6</sup> Recital 26 of the Regulation 2018/1139.

Within the framework of the preparation and development of Regulation 2018/1139, the European Aviation Safety Agency (EASA) has issued an Opinion (Opinion No. 01/2018, hereinafter the "EASA Opinion") (EASA, 2018). In this EASA Opinion, a proposal was made for the further development of the legislative framework, with consideration to the expansion of competences due to the reform of Regulation 216/2008. EASA proposed that the European Commission should adopt two legislative acts: a delegated act with regard to market product legislation as well as the technical requirements, and a second implementing act with regards to the requirements for drone usages and drone registration. The European Commission has now adopted both Regulations: the Delegated Regulation<sup>7</sup> as well the Implementing Regulation<sup>8</sup>, respectively on 12 March 2019 and 24 May 2019. The primary objectives are the following: (1) to ensure an operation-centric, proportionate, and risk- and performance- based regulatory framework for all UAV operations conducted in the open; (2) to ensure a high and uniform level of safety for UAVs; (3) to foster the development of the UAV market; and (4) to increase awareness for EU citizens' rights with regard to safety, privacy, data protection, and the environment. The new rules therefore provide basic principles with respect to safety and security, but also with respect to privacy and the protection of personal data.

In this respect, the legal framework intends to include safety regulations both for commercial and non-commercial activities and it introduces three categories of operations as already proposed in the EASA Concept of Operations for Drones published earlier in 2015.<sup>9</sup> These three categories are based on the risk the operation is posing to third parties (persons and property) and are divided into a category with a low risk ("open category"), a medium risk ("specific category"), and a high risk ("certified category"). At present, the Implementing Regulation (EU) 2019/947 also refers to these three categories:

The "low risk" or "open" category: This category is for simple and low-risk experience-gathering operations, for lightweight drones that do not fly on high altitudes and have a maximum take-off mass of less than 25 kg. In this case, no prior authorization or declaration is required by the operator before the start of the flight. However, in case the UAS weighs more than 250 grams, the operator will be required to register in the national registration system. Therefore, each operator will have its own individual identification number. Operators will be required to upload this number onto the identification add-on of its drone as well attach their registration number physically on their UAS.

Safety for all third parties (individuals and property) is guaranteed through a minimum set of rules, operational limitations, industry standards, and certain functionality requirements, without presenting a regulatory burden for innovative drone uses.<sup>10</sup>

In the Implementing Regulation, a further categorization of the "open" category is made to allow for three different types of activities: (i) flights over people (but not crowds) (A1); (ii) flights close to people whereby a safe distance is kept (A2); and (iii) flights far away from people (A3), where different technical requirements are used depending on the activity. Enforcement is done mainly by the police.

The "medium risk" or "specific" category: In the Implementing Regulation, the scope of the specific category is described as to comprise all activities that do not fall within those of the "open category". This

<sup>&</sup>lt;sup>7</sup> Commission Delegated Regulation (EU) 2019/945 of 12 March 2019 on unmanned aircraft systems and on third-country operators of unmanned aircraft systems, *OJL 152*, 11.6.2019, pp. 1-40.

<sup>&</sup>lt;sup>8</sup> Commission Implementing Regulation (EU) 2019/947 of 24 May 2019 on the rules and procedures for the operation of unmanned aircraft, *OJL 152*, 11.6.2019, pp. 45-71.

<sup>&</sup>lt;sup>9</sup> See http://www.easa.europa.eu/system/files/dfu/204696\_EASA\_concept\_drone\_brochure\_web.pdf.

<sup>&</sup>lt;sup>10</sup> Article 4 of the Implementing Regulation (EU) 2019/947.

category requires prior authorization by the competent national aviation authority (NAA) after an assessment of the mitigation measures identified in an operational risk analysis by the drone operator, except for certain standard scenarios where a declaration by the drone operator is sufficient or in case the operator holds a light drone operator certificate with privileges. Important, in this regard, is the mutual recognition by EU Member States.<sup>11</sup>

The "risk as manned aviation" or "certified" category: Operations shall be classified in this category if the UAS has a dimension of more than three meters or in case of transportation of dangerous goods or people. This category also applies to operations that in principle fall under the specific category, but the competent authority, based on the risk assessment, considers that the risk of the operation cannot be adequately mitigated without the certified UAS or licensed pilot.<sup>12</sup> The EASA has proposed that EU Member States designate which of their authorities (or other organizations) will be responsible for the enforcement of the rules.<sup>13</sup>

Additionally, the legal framework (consisting of the aforementioned Regulation 2018/1139, the Implementing Regulation and its Delegated Regulations) includes market product legislation (CE marking), which aims to ensure compliance with the technical requirements for mass-produced UAS. In the Delegated Regulation (EU) 2019/945, technical requirements have been included that address the risks posed by the operations of those UAS. The drone products are divided into separate classes, with stricter requirements for higher risks. Requirements include (depending on the risk that the drone or the purpose of its usage would form) information duties to consumers, speed limits, a restriction on sharp edges, the inclusion of visibility lights in the drone design, online training for users, a mandatory registration, etc. (EASA, 2017).

Furthermore, a registration requirement is introduced for all operators of drones with a take-off mass of 250 grams or more as well in case the drones are equipped with sensors able to capture personal data.

Importantly, this legislative harmonization across all EU Member States, which will enter into force in June 2020, will significantly reduce the costs of the UAVs by allowing cross-border operations and create a single EU market for UAVs in line with the EU's Aviation Strategy.

In the beginning of October 2019, a major breakthrough in the regulation of UAS operations was achieved with the publication of the Acceptable Means of Compliance (AMC)<sup>14</sup> and Guidance materials (GM)<sup>15</sup> for the Regulation on UAS operations in the "open" and "specific" category.<sup>16</sup> The main objective pursued by EASA with this publication is to ensure that UAS operators and EU Member States comply with the adopted EU regulation and so maintain a high level of safety for UAS operations in the "open" and "specific" category is called "Specific Operation Risk Assessment" (SORA) which was developed by the "Joint Authorities for Rulemaking on

<sup>&</sup>lt;sup>11</sup> Article 5 of the Implementing Regulation (EU) 2019/947.

<sup>&</sup>lt;sup>12</sup> Article 6 of the Implementing Regulation (EU) 2019/947.

<sup>&</sup>lt;sup>13</sup> EASA's A-NPA 2015-10: "Introduction of a Regulatory Framework for the Operation of Drones" (https://www.easa.europa.eu/system/files/dfu/205933-01-EASA\_Summary%20of%20the%20ANPA.pdf).

<sup>&</sup>lt;sup>14</sup> Recital 2 of the Executive Director Decision 2019/021/R of 9 October 2019: "AMC are non-binding standards issued by EASA which may be used by persons and organizations to demonstrate compliance with Regulation 2018/1139 and the delegated and implementing acts adopted on the basis thereof".

<sup>&</sup>lt;sup>15</sup> Recital 3 of the Executive Director Decision 2019/021/R of 9 October 2019: "GM is non-binding material issued by EASA which helps to illustrate the meaning of a requirement or specification and is used to support the interpretation of Regulation (EU) 2018/1139, the delegated and implementing acts adopted on the basis thereof, certification specifications and acceptable means of compliance".

<sup>&</sup>lt;sup>16</sup> Executive Director Decision 2019/021/R of 9 October 2019 "issuing Acceptable Means of Compliance and Guidance Material to Commission Implementing Regulation (EU) No. 2019 947: "Rules and procedures for the operation of unmanned aircraft" (https://www.easa.europa.eu/document-library/agency-decisions/ed-decision-2019021r).

Unmanned Systems" (JARUS)<sup>17</sup>. Additionally, a first pre-defined risk assessment (PDRA) will assist operators during the application procedure for an authorization in the specific category for special UAS operations.<sup>18</sup> Finally, in the upcoming years, additional pre-defined risk assessments will likely be developed as a result of the cooperation between national aviation authorities and UAS operators.

In November 2019 the publication of the AMC and GM, was followed by the adoption of an opinion of the EASA regarding "standard scenarios and providing cost-efficient rules for low-risk for UAS operations in the 'specific' category" (EASA, 2019). The ultimate aim of this Opinion is to increase the cost-effectiveness for UAS operators, manufacturers and competent authorities. It is expected that this will benefit the harmonization of UAS operations in the EU Member States.

# Liability and Insurance

Another important issue that has to be addressed is user liability in general. Past experience has shown that emerging technology often suffers some degree of malfunction or failure. Liability in the event of damage or bodily injury is subject to some uncertainty. Regulatory requirements generally dictate that a human operator retains active control of the aircraft, which implies liability on the side of the operator. However, a technical malfunction or failure beyond the operator's ability to control could lead to a product liability claim against the manufacturers. Neither can it be excluded that a third party would be liable, if it has caused the incident. National legislation that provides clarity for drone incidents becomes indispensable, as well as a harmonized international framework.

Currently, in order to cover these liability risks, insurance solutions are becoming more and more available from specialist insurers, who rely very strongly on drone manufacturers adopting robust testing, quality control, and risk assessment procedures.

# **Potential Liability Issues**

**Damage by drone-person/property interaction.** Liability arising from a drone hitting a person or their property (for example a drone crashing into cars) is likely to be the largest source of liability claims. Drones can develop considerable speed when falling freely from a certain altitude. Many of the design strategies used for safety, such as guarding of the propellers or the provision of a parachute, are not always possible for these drone aircrafts considering the need to be light to fly.

Secondly, a drone could collide with another aircraft (including another drone), a moving vehicle, a building, an animal, or power lines. Most of the commercially available drones cannot yet detect and avoid obstacles on their own.

A registration requirement in order to identify owners and operators is thus indispensable in order to offer an adequate compensatory framework. However, in the event of a serious drone accident, it is very likely that the drone is completely destroyed and the registration details cannot be recovered. This identification problem could be overcome by the UTM framework "U-space"<sup>19</sup> that the EU has launched in 2017 (SESAR Joint Undertaking, 2017) and is planning to have in place in the near future. References to the "U-space" have been

<sup>&</sup>lt;sup>17</sup> Recital 5 of the Executive Director Decision 2019/021/R of 9 October 2019: "JARUS is a group of experts gathering regulatory expertise from all around the world, including from EASA and EU Member States".

<sup>&</sup>lt;sup>18</sup> Such as operations beyond visual line of sight (BVLOS).

<sup>&</sup>lt;sup>19</sup> Article 3.6 of the Initial draft Regulation on U-space: "U-space airspace is the airspace structure/volume designated by the MS where U-space services are provided or where certain capabilities and actions from the unmanned aircraft operators are required or both".

made in the Implemented Regulation which includes requirements for the registration, geo-awareness, and remote identification of UAS.<sup>20</sup>

Even the EASA Opinion already took this future development into account, taking care not to propose any legislation that could conflict with the future U-space framework. Broadly speaking, to assess who is responsible for a drone incident and the damage resulting from it, U-space will provide an electronic identification system on which a drone user will first have to log on in order to be able to operate the registered drone. In addition, drones will be increasingly equipped with a "black box" in the future as to enable law enforcement and investigators to gather information on the cause of an incident, as is currently already the case for most manned aerial vehicles.

**Damage by loss or theft.** Drone flights, which are most frequently used for photo documentation these days (e.g., pipeline inspection and crop monitoring by agricultural businesses), inevitably gather other photographic information along the way that may be protected by current or future privacy laws. In the scenario in which a drone is lost, the data are also lost with it, which creates a liability risk. This risk of data loss needs to be taken into account in an IT security plan of drone-operating businesses and countered via mitigation measures, such as encryption, especially in the light of the strict EU General Data Protection Regulation 2016/679 (GDPR).

These privacy and cyber security concerns are inextricably linked with the question of liability in case someone suffers damages due to privacy or cyber security incidents with drones. Not rarely, drones that collect sensitive information might become targets for malicious software users seeking to steal data. Drones could also be subject to hacking and high jacking in order to carry out other wrongful or illegal activities.

#### Drone Liability in the EU

Generally speaking, there is no uniform liability framework for drones in the EU and businesses must look at the domestic liability systems, which differ from fault-based to strict (i.e., no fault or negligence has to be proven) and from limited to unlimited liability (S. D. Gleave for the European Commission, 2014). The lack of a cross-border liability and insurance framework in respect of drone use gives rise to a number of issues, such as the identification of the liable party, the liability regime applicable to the liable party and insurance provisions applicable to civil drones.

In the EU, a directive concerning liability for defective products exists (Directive 85/374/EEC of 25 July 1985 on the approximation of the laws, regulations, and administrative provisions of the Member States concerning liability for defective products). The scope of this liability is however limited to the liability of the producer for defective products, which does not cover the full scope of all possible liability issues concerning damages that could be caused by the use of drones. Another hindrance under this regime relates to defenses, which might allow manufacturers to escape liability and leave the burden of the economic consequences of the accident on the victim (European Parliament, 2018). For example, the possible manufacturer's "state of art" defense<sup>21</sup> and the exoneration of the manufacturer in case the defect, which caused the damage, did not exist at the moment the product was put into circulation.<sup>22</sup> With regard to commercial transportation,<sup>23</sup> it only applies

<sup>&</sup>lt;sup>20</sup> Recital 26 of the Implementing Regulation (EU) 2019/947.

<sup>&</sup>lt;sup>21</sup> It implies that a product conformed to all safety standards required at the time it was made so that no further safety investment could be demanded from the manufacturer (Article 6.1 (c) and 7 (e) of the Directive 85/374).

Article 7(b) of the Directive 85/374.

<sup>&</sup>lt;sup>23</sup> Article 11§2 of the Product Liability Act.

to loss of goods for private use and with the exclusion of the damage to the defective product itself (Bernauw, 2017).

In the absence of international conventions regarding the use of drones, the only solid legal ground for any type of liability system is the vast regulatory framework of the aviation sector, including the Rome Convention of 1952 establishing a strict liability regime for aircraft operators.

The Rome Convention of 1952. For lack of differentiation one could argue that the Convention on Damage Caused by Foreign Aircraft to Third Parties on the Surface, signed in Rome on 7 October 1952 ("Rome Convention") equally applies to incidents caused by drones or unmanned aircraft. The Rome Convention prescribes a strict liability (no-fault liability) regime for operators of aircrafts, which entails that the operator of the aircraft will be liable for the damage caused to third parties by his aircraft, even without proof of the operator's intent or negligence.

The Rome Convention was drafted before the rise of drone technology, but considering the fact that it does not define the term "aircraft", it could rightly be presumed that the original definition of the Chicago Convention applies, which states: "an aircraft is any machine that can derive support in the atmosphere from the reactions of the air". This definition is broad, and could include drones, which are generally thought to be aircrafts designed to be operated without a pilot on board.

Although, on a global scale, there are currently 49 parties to the Rome Convention<sup>24</sup>, this Rome Convention has been ratified by only four EU Member States (i.e., Belgium, Italy, Luxembourg, and Spain). Therefore, the impact of this convention on the EU framework for drone liability should definitely not be overestimated. Its relevance should be more nuanced even more taking into account that its scope is limited to cross-border flights.<sup>25</sup> Since the operation of drones is currently still a domestic rather than an international matter, the Rome convention is seldom applicable to drone incidents.

**Drone regulations of the EU Member States.** As mentioned above, most of the national aviation authorities (NAA) of the EU Member States have currently provisions in place that govern the use of drones below 150 kg with respect to certification, licensing, third-party liability and insurance. Not rarely, these national regulations refer to the EC Regulation 785/2004 on insurance for air carriers and aircraft operators, which defines requirements for third-party liability insurance for manned aircraft operators and, in connection therewith, has set forth a regime of strict liability.

A comprehensive study by S. D. Gleave for the European Commission on third-party liability and insurance requirements of RPAS found that "in the majority of EU Member States, but not all, national law defines that the liability regime for RPAS is strict (meaning that the defined party is automatically liable for damage, without there being any need to attribute fault)"<sup>26</sup>.

The way forward: Is harmonization a realistic option? Although, as discussed above, the Rome Convention was only ratified by four Member States (see Section "The Rome Convention of 1952"), its legal

<sup>&</sup>lt;sup>24</sup> The Rome Convention is ratified by the following states: Algeria, Angola, Argentina, Azerbaijan, Bahrain, Belgium, Benin, Bolivia, Brazil, Cameroon, Cuba, Ecuador, Egypt, El Salvador, Gabon, Gambia, Guatemala, Guinea, Haiti, Honduras, Iraq, Italy, Kenya, Kuwait, Lebanon, Luxembourg, Madagascar, Maldives, Mali, Mauritania, Moldova, Morocco, Niger, Oman, Pakistan, Papua New Guinea, Paraguay, Russia, Rwanda, Seychelles, Spain, Sri Lanka, Suriname, Togo, Tunisia, United Arab Emirates, Uruguay, Vanuatu and Yemen (cf. https://www.icao.int/secretariat/legal/List%20of%20Parties/Rome1952\_EN.pdf).

<sup>&</sup>lt;sup>25</sup> Rome Convention, Article 23: "... damage caused in the territory of a Contracting State by an aircraft registered in the territory of another Contracting State".

<sup>&</sup>lt;sup>26</sup> "Study on the Third-Party Liability and Insurance Requirements of Remotely Piloted Aircraft Systems (RPAS)". Final Report November 2014, London, 22603201 SI2.661592, prepared by S. D. Gleave for the European Commission.

principles are familiar to those applied in different EU Member States, as they are also embedded in various international conventions on civil liability for damage which the EU Member States all adopted. For example, reference can be made to the principles of strict liability, regardless of the negligence of the liable party, which implies the identification of the (sole) liable party in order to channel the liability and the capped compensation regime for damages with parallel compulsory insurance requirements by the liable party.<sup>27</sup> One could therefore righty argue that these principles of strict but limited liability would be able to characterize a future harmonized EU framework for a third-party liability regime for drones (Masutti, 2016).

However, there are still several other issues to be dealt with before one can speak of one harmonized EU liability framework for drone use within the EU.

*Applicable jurisdiction.* Firstly, given the complexity of RPAS which generally involve a vehicle and a ground infrastructure or dock station which could be located in multiple jurisdictions, there should be a set of conflict-of-law rules which enable drone users or victims of damage caused by drones to identify the applicable jurisdiction and applicable law with regard to an alleged drone incident. In many legal systems, the place in which the incident occurs is the criterion for establishing the applicable jurisdiction and this is also what Article 20 of the Rome Convention establishes.

What will be compensable "damage". Secondly, there is no harmonized concept of "damage" to be compensated. Identifying which parties are eligible for compensation and the extent to which victims' claims can be accepted is therefore quite difficult. Moreover, there might be disparity among EU Member States in treating parties that have suffered damages who, in some national legal systems, will benefit from indemnity for indirect damage and, in other national jurisdictions, will only be indemnified for damage that is a direct and immediate consequence of the drone incident.

At present, compensation mechanisms in respect of aircraft incidents in general are too often based on the weight of the aircraft, which is not suitable for determining the compensation limitation for damage caused by the drone operator, as even light weight drones could cause considerable damage. There should therefore be a specific framework for the compensation of damage caused by drone incidents.

Who should be held liable? Having regarded to the technologically advanced nature of a UAV system, it is not always straightforward who should be held liable for a drone incident. Applying the general principles of civil liability to damages suffered by a third party on drone incidents would come down to distinguishing liability between the pilot in command, the drone operator and, if applicable the owner of the drone, if the drone is owned by another party. The pilot is usually liable in case of non-compliance with certain public law obligations, such as pilot licenses, airworthiness certificates, etc. On the other hand, liability for any other obligations, whether contractual or extra-contractual, is likely to fall on the operator's part. Because of these different liability exposures, it is crucial to discern the person who has direct control over the flight of the drone, i.e., pilot in command, from the legal entity operating the drone, i.e., the operator (Amazon or UPS). Whereas the pilot in command would incur liable under criminal law, the drone operator is likely to be liable under civil law.

Until recently, the EU promoted the idea of regarding UAVs (vehicle, control stations, communication links, launch, and recovery equipment, etc.) as a single entity. Nowadays, experts suggest considering the drone and the ground station as two separate entities.

<sup>&</sup>lt;sup>27</sup> These principles can also be found in the Convention on Civil Liability for Oil Pollution Damage of 1979, the Convention on Civil Liability for Nuclear Damage of 1963 and the International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea of 1996.

Pursuant to Article 2 of the Rome Convention, the operator of the drone is accountable for damage caused by the flying vehicle on the surface. The drone operator is considered to be the person or the legal entity that has set up the UAV system, manages its functioning, and makes its capacity as operator known by logging onto a ATM system (or UTM in relation to drone traffic), so that the person who is registered as owner of the drone will not wrongly be held responsible. The operator's liability is a form of strict liability (no-fault liability) based on the inherent risk of flying a drone, which means that it does not depend on his personal responsibility (negligence or willful misconduct) and damage must be compensated, even for accidents beyond the operator's control.

The producer of the drone can also be held liable for damages caused by a defect in his products. The producer has strict liability for defective products. If it can be shown that the damage caused by the drone is caused by a defect in the product itself, the injured party can hold the producer liable, without needing to prove any fault, and without prejudice to the possible liability of any other person. According to Directive 85/374/EEC, a product is defective when it does not offer the safety which can legitimately be expected of it. All circumstances are taken into account, including the expected use of the product. Important for a product such as a drone, for which technological progress is made at a fast pace, is that a producer cannot be liable if it can be proven that he could not have known of the existence of the defect based on the state of the scientific and technical knowledge at the time when he put the product into circulation. If the product shows a defect, it is presumed that this defect was already present on the moment that the producer had put the product into circulation. Hence, it will be up to the producer to show that the defect has been caused by someone else, e.g., the drone operator or pilot.

#### Insurance

Given the considerable chance of incidents occurring as a result of drone use, it is also interesting to see to what extent liability insurance companies will play an important role in damage claims brought against drone operators and manufacturers. At present, there are only few insurances available covering the drone user's liability due to the fact that insurers have no information on the number of accidents and the damage which is likely to arise. Nowadays, insurance premiums are usually based on piloted aviation.

At present, the EU has already implemented some sort of a compulsory insurance requirement for operators of "aircrafts" heavier than 20 kg under the Regulation (EC) 785/2004 on Insurance Requirements for Air Carriers and Air Operators. Although this regulation does not mention drones and drone-specific issues specifically, the wording suggests that the third-party liability insurance requirements apply to "each and every aircraft" within the EU and thus also to drones. The main goal of this Regulation is to guarantee that victims of a drone accident have access to adequate compensation by way of establishing a minimum level playing field regarding insurance requirements.

This Regulation establishes minimum third party insurance requirements linked to the size  $(MTOM)^{28}$  of any aircraft, including drones. Given their relatively small size and light weight, one could rightly argue that the Regulation will rarely apply to drones.<sup>29</sup> This exclusion of Regulation 785/2004 was criticized because the damaging potential of a device does not depend so much on the nature of its use (recreational or professional). The cover ceiling based on the weight category of a device also does not necessarily correspond with its

<sup>&</sup>lt;sup>28</sup> "Maximum take-off weight".

<sup>&</sup>lt;sup>29</sup> Article 2 of Regulation 785/2004.

damaging capability. Hence, the weight category of the aircraft is not a suitable parameter for its risk profile as criterion for the insurance cover limitation (Bernauw, 2017). On the other hand, if a drone does have a MTOM of 20 kg or more, it will fall within its scope, requiring a third-party liability insurance coverage of at least 0.75 million SDR (Special Drawing Right as defined by the  $IMF^{30}$ ) or approximately O30,179.96, which is only the lowest category of insurance requirements.<sup>31</sup> As it is uncertain whether drone operators actually comply with these insurance requirements, it can be argued that victims of drone accidents run the risk of not being fully compensated, and this issue should therefore be resolved by additional legislation. Besides that, some authors also argue that the classification of an insurance requirement linked only to the MTOM is not adequate, since there are still other factors, such as the pilot's experience or the performed operation which should be taken into account to determine appropriate insurance cover (European Parliament, 2018). In many EU Member States, national legislation also reprises such a mandatory insurance.

At present, specialists often advise large businesses to opt for even higher limits of coverage. A number of insurance companies are addressing the need for third-party liability coverage for drone users by extending their general liability policies. Specialized aviation insurers, such as Global Aerospace, on the other hand, have introduced specific drone insurance policies to cover a wide range of exposures, including physical damage.

As regards cybercrime liability, only few insurance policies provide full coverage for all foreseeable exposures. Whereas specialized aviation liability insurance companies might indemnify physical injury or property damage claims, their policies generally do not foresee coverage for invasion of privacy, data theft, or "hacking" claims.

#### **Drones and Data Protection**

#### **Applicable Data Protection Laws in the EU**

Equipped with a camera, drones are likely to collect a considerable amount of personal data during their flight. Needless to say, data collection and retention are important aspects to balance against the right of privacy of individuals. Civil drone users should take into account these fundamental rights, as protected by European data protection instruments currently in place, such as the European Convention on Human Rights, the EU Charter of Fundamental Rights, and the General Data Protection Regulation (GDPR).<sup>32</sup> This supranational data protection framework is supplemented by the constitutions, laws and EU law transpositions of the EU Member States, which apply to the extent that they cover drone activities and on the basis of national jurisprudence.

<sup>&</sup>lt;sup>30</sup> SDR refer to "an international type of monetary reserve currency created by the International Monetary Fund in 1969 that operates as a supplement to the existing reserves of member countries".

<sup>&</sup>lt;sup>31</sup> Article 7 of Regulation 785/2004.

<sup>&</sup>lt;sup>32</sup> These protection instruments include: Article 8 of the Council of Europe Convention on Human Rights and related jurisprudence (ECHR). These guarantees apply to any drones' use in relation to privacy and the related data protection implications; Council of Europe Convention 108, Recommendation R (87) 15 of the Committee of Ministers of the Council of Europe on the use of personal data in the police sector, Recommendation CM/Rec (2010) 13 of the Committee of Ministers to Member States on the protection of individuals with regard to automatic processing of personal data in the context of profiling; Article 7 (privacy) and 8 (data protection) of the Charter on Fundamental Rights of the EU; 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 ("Data Protection Directive"), replaced by the EU General Data Protection Regulation 2016/679 (GDPR) upon its entry into force on 25 May 2018; Council Framework Decision 2008/977/JHA of 27 November 2008 on the protection of personal data processed in the framework of police and judicial cooperation in criminal matters; Regulation (EC) 45/2001 of 18 December 2000 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data; Directive 2002/58/EC of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications).

The GDPR is applicable to processing of personal data via drones, either by private or public entities for purposes other than law enforcement. Before sharing Internet images or videos captured with a drone, it is necessary that civil drone users ensure that they do not contain images or data relating to persons, vehicles, residences or other objects that may lead to the identification of data subjects. As a precaution, they should treat any footage capturing people as personal data. Therefore, in some cases, it will be necessary that they apply anonymization techniques to their recordings, such as blurring of people, their faces and any recognizable clothing they might be wearing, to mitigate risks to individuals and to their operation.

Currently, the lawful derogations from the protection provided by the GDPR include the following (European Parliament, 2015):

• Activities by private individuals on the basis of the "household exception" (Recital 18 of the GDPR). This exemption refers to activities that have no connection with professional or commercial activities. However, if the capturing and processing of personal data is carried out by drones in public spaces, they will not be covered under this exception and therefore the GDPR will be applicable. Hence, if they use drones for leisure or hobby activities and such activities are performed on private property, the household exception can be applied.

• Law enforcement activities that collect and process personal data at national level via drones fall outside of EU law. The processing activities must however have a legal basis, serve a legitimate goal, and be necessary in a democratic society and proportionate to the purpose pursued (proportionality principle), following the ECHR and related jurisprudence.

• Article 4(2) of the Treaty of the European Union prescribes that "national security remains the sole responsibility of each EU Member State", so activities by intelligence services fall outside the scope of EU competences, including when these imply the collection of data through drones.<sup>33</sup>

• Media and journalists' activities fall under the exception provided in Article 85(2) of the GDPR, which allows EU Member States to provide for derogations to some parts of the GDPR provided that they are necessary to reconcile the right to privacy with the rules governing freedom of expression and information and that the processing activities are carried out for "journalistic purposes or the purpose of academic, artistic or literary expression".

#### **Recommendations and the Entry Into Force of the GDPR**

The GDPR, which has already been in force since around 19 months, has provided more tools to address the privacy and data protection concerns related to the use of drones. The GDPR contains, amongst others, rules on privacy by design and by default and also foresees data protection impact assessments that must be made in case of a high risk to privacy. These rules will drone manufacturers and operators to deal with privacy concerns (European Parliament, 2015).

Privacy by design, for instance, should be understood as taking into account privacy and data protection throughout the whole engineering process. In this context, the Belgian Data Protection Authority advises that drones are only equipped with material that is proportionate to their specific purpose (e.g., a recreational drone should have a limited operational height), or that they contain software which automatically blurs the faces of people that are filmed during data acquisition or that erases the recorded material once a task is completed.<sup>34</sup>

<sup>&</sup>lt;sup>33</sup> The EDPS nonetheless underlines that this exception must be interpreted strictly and that such activities as regulated in domestic law have to comply with the proportionality and necessity principles and with the ECHR and ECJ jurisprudence.

<sup>&</sup>lt;sup>34</sup> "Drones-FAQ", https://www.gegevensbeschermingsautoriteit.be/faq-themas/drones.

The Implementing Regulation 2019/947 also deals with privacy concerns, as it, amongst others, stipulates that the EU Member States must maintain registration systems for UAS operators whose operation may present a risk to safety, security, privacy, and protection of personal data or environment.

In this context, reference must be made to the Drone Rules Pro project, funded by the European Commission, which has developed interesting materials to assist the drone industry in meeting their privacy and data protection obligations. It has even created an interactive e-course on privacy for drone professionals. Further, the project has provided an extensive Data Protection Impact Assessment template for drone missions and a pre-flight checklist as a check for privacy and data protection questions. Manufacturers can also benefit from a guide on privacy by design. It proposes, for instance, that, for the benefit of transparency, a drone has design elements which signal to people on the ground that the drone's sensors are active and capturing data. The aforementioned materials have been recognized as official guidance by the European Union Aviation Safety Agency (EASA).<sup>35</sup>

The European Data Protection Board (EDPB) (formerly known as the Article 29 Working Party [WP29]) issued in June 2015 its Opinion on Privacy and Data Protection Issues relating to the Utilization of Drones to address the privacy risks to individual's privacy and civil and political liberties as a result of the opening of the aviation market to drones.<sup>36</sup> Notwithstanding the fact that EU privacy law has since then undergone changes with the entry into force of the GDPR, many of the principles set out in the Opinion remain highly relevant.

With regard to the commercial use of drones, the EDPB emphasizes that operators of drones should:

• first check whether national laws allow operating drones and verify the need for a specific authorization from the Civil Aviation Authorities and the roles of possible different actors, data controllers and processors, during the flight of the UAV.

• evaluate the data protection impact and consider the purpose of the operations and the type of drones (dimension, visibility, etc.); identify the most suitable legal basis (consent of the data subjects, performance of a contract, legal obligation, legitimate interest, etc.); and the possible need to notify/consult the competent DPAs according to national data protection law.

• choose the most proportionate technology on-board and adopt all suitable measures of privacy by default and set services and products in such a way as to avoid the collection and the further processing of unnecessary personal data.

• find the most appropriate way to give advance notice to those who can be impacted by the data processing and inform through signposts information sheets, a website, whereby the information notice should contain a clear indication of the controller and the purposes of the processing and should give data subjects clear and specific indications for exercising the right to access visual and non-visual records concerning them.

• take all the appropriate technical and organizational measures to ensure a level of security appropriate to the risks represented by the processing and the nature of the data to be protected, in particular, to prevent any unauthorized processing also during the "transmission" phase.

• delete or anonymize any unnecessary personal data soon after the collection or as soon as possible. Finally, recommendations of the EDPB for manufacturers and/or operators included the following:

<sup>&</sup>lt;sup>35</sup> "Privacy, data protection and drone operations: the new EASA Guidance",

https://trilateralresearch.co.uk/privacy-data-protection-and-drone-operations-the-new-easa-guidance/.

<sup>&</sup>lt;sup>36</sup> "Opinion 01/2015 on Privacy and Data Protection Issues relating to the Utilization of Drones", http://ec.europa.eu/DocsRoom/documents/11481.

• embed privacy friendly design choices and privacy friendly defaults as part of a privacy by design approach;

• involve a Data Protection Officer in the design and implementation of policies related to the use of drones;

• promote and adopt Codes of conduct that can help the industry and different categories of operators prevent privacy infringements;

• make the drone visible as far as possible and when in line of sight, and make the operator clearly visible and identifiable;

• avoid as much as possible to fly over or near private areas and buildings.

## Forecast

Recently, the EU has given a new push to speed up the implementation of EU-wide rules regarding the use of drones. Having regard to the number of reported safety incidents in Europe in 2016, the need for an EU regulatory framework was becoming all the more pressing. It is for these reasons that the new Regulation 2018/1139 as well as the technical framework laid down in the Delegated Regulation and the Implementing Regulation have been adopted. In the meantime, the Single European Sky Air traffic management Research Joint Undertaking or (SESAR)<sup>37</sup> is testing so-called "geo-fencing" services that automatically prevent drones from flying into restricted zones (e.g., airports) (European Commission, 2017).

In November 2016, the European Commission proposed to create an automated ATM system for drones operating at low-level, referred to as the "U-space". The U-space will be governed by a system similar to existing ATM for manned aircrafts, which will be automated using tools like e-identification and, as a key component, geo-fencing, so that the information can always be accessed even by autonomous drones. The active geo-fencing of drones requires that users are provided with up-to-date information on no-fly zones as well as real-time alerts if they enter one. Other exploratory projects that have been conducted pertain to the automatic identification of drones or drone-to-drone communication (European Commission, 2017).

While the current EU legislative framework in development does not yet include specific regulation specifically concerning the U-Space, this will be taken into account. The publication of the Opinion of the EASA on "U-space" was expected for December 2019. However, according to the latest communications, the Draft Opinion on U-Space regulations for comment by EU Member States and aviation stakeholders will be postponed until the end of February 2020. The EASA Pre-draft Opinion on U-Space has received over 2,800 comments which will be taken into account in the development of the U-Space.

U-space is the important and necessary next step in the development of EU legislation for the drone market. Therefore, further U-space services and their corresponding standards will need to be developed. U-space is an indispensable building block to keep low level drone traffic safe—and to offer a structure to introduce real priority measures like registration and identification—hence tackling privacy and security issues. This is also where the most dynamic part of the drone service markets can develop in short term, allowing for a denser traffic of operated drones, including in cities (European Commission, 2016).

The current drone legislation is, considering the speed at which technological progress is booked, no longer sufficient to safeguard the innovative use of drones. As the use of drones and the further development thereof can foresee in a significant amount of new commercial opportunities and services, the legislation

<sup>&</sup>lt;sup>37</sup> The expert task force established under the auspices of the European Commission for the development of future European Air Traffic Management (ATM).

regulating this market can no longer be postponed, as an adequate framework is necessary for this new technology. This framework must be broad enough to encourage the commercial growth of drones. In this regard, a broad, harmonized European framework, as is currently in the process of being developed, is indispensable. It is also of the utmost important that increased attention is given to the safe use of drones and the protection of citizens, but also to the consequences of cross-border use of drones and the incidents this may cause.

The EU Commissioner for Transport, Ms. V. Bulc, has also emphasized the benefits of civil drone use but also gave due consideration to the safety of the EU citizens, stating (European Commission, 2017):

Drones offer tremendous opportunities for new services and businesses. That is why we want Europe to be a global leader. I am confident our modern and flexible regulatory framework will give rise to new European champions in this sector. But safety always comes first. If we don't move fast enough, the near misses between drones and airplanes could one day have disastrous consequences.

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