“NOVEL INTEGRATED SOLUTION OF OPERATING A FLEET OF DRONES WITH MULTIPLE SYNCHRONIZED MISSIONS FOR DISASTER RESPONSES”

ResponDrone

D8.1 “The regulatory landscape, gaps and challenges” – second iteration

Project Deliverable Report

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Author(s): Niels Vandezande, Geert Somers, Jos Dumortier
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1. Executive Summary

As part of Task 8.2, Timelex has undertaken an extensive overview of applicable legislation on the EU level and national (implementing) legislation in a number of representative countries. Special focus was devoted to detecting gaps, overlaps or contradictions within the current legislation, either at European level or between the national level and the EU level. Based on this desk research, an analysis was made in order to show the lay of the land and to identify if the new technological solutions proposed in the RESPONDRONE project will present special advantages and/or challenges, given the state of the applicable regulation.

This deliverable presents the second iteration, which includes any developments that were not taken into account in the first iteration of the work.

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2. Introduction

This deliverable provides a detailed overview of the legal framework relevant to drone operations by first responders. First, the focus will be put on the EU's legal framework, adopted in 2019 (section 3). This framework was briefly presented earlier as part of Timelex' legal work in D12.2 and will be explained in greater detail here. Next, this deliverable will describe how a select number of Member States have implemented these rules, and whether they are applicable to first responders (section 4).

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3. EU Legal framework on drones

As already briefly introduced in D12.2, the European Union has recently adopted a new legal framework regarding the civil operation of unmanned aerial vehicles (UAV). This legal framework consists of a basic regulation on the safety of civil aviation, as well as an implementing and delegated regulation specifying the use of UAV. The reason for this legal framework was that the rules on drone use in the EU were very diverse, due to the lack of European harmonization in this field. These national rules will therefore be abolished and replaced by a European legal framework – set by these regulations and national implementing measures.

Important to note is that this European legal framework was set to become applicable from 1 July 2020 onward. However, due to the COVID-19 health crisis, Member States had not been able to take the necessary measures to abolish their own frameworks and implement the European framework. As a result, the European Commission amended the framework in the sense that it only became applicable from 1 January 2021 onward.[1] The timeline for implementation of the framework is therefore pushed back six months.

3.1 Basic Regulation

According to article 100(2) of the Treaty on the Functioning of the European Union, the EU has the competence to adopt appropriate rules for sea and air transport. To this end, a new basic Regulation for the safety of civil aviation was adopted in 2018.[2] This Regulation implements at the EU level the main principles of the aforementioned Chicago Convention. It repeals and replaces earlier regulations in this field.[3]

According to article 3(30) of the Regulation, an unmanned aircraft is "*any aircraft operating or designed to operate autonomously or to be piloted remotely without a pilot on board*". The Regulation sets out the essential requirements for the design, production, maintenance and

[1] Commission Implementing Regulation (EU) 2020/746 of 4 June 2020 amending Implementing Regulation (EU) 2019/947 as regards postponing dates of application of certain measures in the context of the COVID-19 pandemic, *OJ* L 176 of 5 June 2020, 13-14.

[2] 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, *OJ* L 212 of 22 August 2018, 1-122.

[3] E.g. 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, *OJ* L 79 of 19 March 2008, 1-49; Regulation (EC) No 552/2004 of the European Parliament and of the Council of 10 March 2004 on the interoperability of the European Air Traffic Management network (the interoperability Regulation), *OJ* L 96 of 31 February 2004, 26-42.

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operation of unmanned aircraft (article 55). This may be subject to certification (article 56). Annex IX to the Regulation provides more rules on unmanned aircraft. They must be designed fit for purpose and to avoid putting persons at risk. Their operators must be aware of applicable rules. Data protection rules must be respected. They must display adequate airworthiness and be piloted by sufficiently skilled and trained pilots. Safety of their operations must be ensured. However, further rules are to be determined by the European Commission by means of implementing and delegated acts. Those acts were adopted in 2019. They entered into force 1 July 2019. The European Union Aviation Safety Agency (EASA) has published further guidance material and predefined risk assessments.

The most important change brought by the new EU rules is a move toward risk-based regulation of Unmanned Aircraft Systems (UAS). As a result, recreational use and professional use of drones can be subjected to the same rules, depending on the type of UAS and their operations. The registration duty will ensure that all UAS operators are identified. Only drone operators using very small UAV without cameras – <250g – or UAV that fall under toy safety regulations will be exempted from registration. Operators of higher classes of UAV are subjected to more stringent requirements with both theoretical and practical tests and require certification.

The Basic Regulation does not specify whether a single pilot can operate multiple drones at the same time. The technical requirements of the following regulations and guidance by the EASA will clarify this matter.

3.2 Implementing Regulation 2019/947

First, there is an Implementing Regulation.[4] This Regulation establishes a risk-based approach, determining three categories of operations: open, specific and certified (article 3). Risk mitigation measures must be commensurate to the risk posed by a particular category of operations.

The Regulation provides the rules for the operation of UA as well as for personnel, including remote pilots and organisations involved in those operations (article 1). Indoor operations – for instance in houses, buildings, silos, caves or mines – are not subject to these rules.[5]

Certified UAV and operators must be registered in their home Member State (article 14). Member States must ensure that their registration systems are digital and interoperable. Registration is required in the open category in case of a UAV with a maximum takeoff mass (MTOM) of 250 g or more, or, which in the case of an impact can transfer to a human kinetic

[4] Commission Implementing Regulation (EU) 2019/947 of 24 May 2019 on the rules and procedures for the operation of unmanned aircraft, *OJ* L 152 of 11 June 2019, 45-71.
[5] EASA (2020) "Easy Access Rules for Unmanned Aircraft Systems (Regulations (EU) 2019/947 and (EU) 2019/945)", *easa.europa.eu,* 16.

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energy above 80 Joules; and for UAVs equipped with a sensor able to capture personal data, unless it complies with the EU's rules on toys. Any UAV in the specific category must be registered. The registration number must be displayed on the UAV, but this can also be in the format of a QR-code.

Member States may define UAS-free geographical zones for safety, security, privacy or environmental reasons (article 15). Within those zones, UAV operations may be prohibited, restricted, or subject to conditions.

Model aircraft clubs or organizations may obtain an authorization that allows all of their members to use their UAV at the club or organization (article 16).

3.2.1 Open category

The open category is not subject to prior operational authorization or an operational declaration. Aircraft in this category must have a take-off mass of less than 25kg and maintain visual line of sight (VLOS) at all times – except when operating in follow-me mode or when using an observer. They can in principle only be flown up to a height of 120m, must keep a safe distance from people and cannot fly over assemblies of people. Assemblies of people must be understood as a space where people cannot easily move out of the way due to the density of people present. This includes public spaces such as beaches and parks, public sport, cultural or political events, busy shopping streets and ski resorts.[6] Dangerous goods cannot be transported in operations in the open category, nor can they drop material. Medical samples including uncontaminated blood may be transported.

Pilots must be minimum 16 years, except when operating a toy UAV of C0 class, when using a privately built drone up to 250g, or when supervised by an adult. Member States may lower the age requirement in their territory to 12 years.

The Annex to the Regulation provides more specific requirements for the operations. These can be classified at three levels. Important to note is that in this category, a pilot can only operate one UAV at a time.[7]

For A1, the pilot may not overfly assemblies of people and should not overfly uninvolved people – or reduce the time at which such overfly occurs. Follow-me mode can be used up to 50 m from the pilot. The pilot should be familiar with the UAV's manual and have completed online training and a theoretical examination. Such training should include subjects such as safety, airspace restrictions and regulations, human performance limitations, operational procedures, privacy, insurance and security. An electronic certificate will be issued by the competent authority. The UAV should have a MTOM, including payload, of less than 250 g and

[6] *Ibid.,* 18.
[7] *Ibid.*, 161.

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a maximum operating speed of less than 19 m/s, in the case of a privately built UAS, or be marked as C0 or C1 – in the latter case with active and updated direct remote identification and geo-awareness systems. The UAV may not be modified in a way that breaches its compliance with the relevant class requirements of the UAV.

For A2, the UAV may not overfly uninvolved persons and the operation takes place at a safe horizontal distance of at least 30 m from them; the pilot may reduce the horizontal safety distance down to a minimum of 5 m from uninvolved persons when operating a UAV with an active low speed mode function and after evaluation of the situation regarding weather conditions, performance of the unmanned aircraft, and segregation of the overflown area. The pilot must have completed theoretical and practical training. The UAV must be of C2 class.

For A3, operations must be conducted in an area where the remote pilot reasonably expects that no uninvolved person will be endangered within the range where the unmanned aircraft is flown during the entire time of the UAS operation, at a safe horizontal distance of at least 150 metres from residential, commercial, industrial or recreational areas. The pilot must have completed theoretical and practical training. The UAV must be marked as C2 or C3 and with active and updated direct remote identification and geo-awareness systems, marked as C4, or have an MTOM, including payload, of less than 25 kg, in the case of a privately built UAS.

3.2.2 Specific category

The specific category does require an operational authorization from the competent authority, subject to a prior risk assessment and the formulation of appropriate risk mitigation measures. Only when risks are sufficiently mitigated can an authorization be granted. The authorization can approve a single operation or multiple operations specified in time and/or location. Additionally, in case of cross-border operations, the competent authority of the other Member State must be notified in order for it to review and confirm the operation.

When the operation follows one of the standard scenarios, an operational declaration must be submitted, which negates the need for an authorization. Those holding a ‘light UAS operator certificate’ (LUC) are not required to submit an operational declaration or to receive operational authorization, nor do operations in the framework of authorized model aircraft clubs or associations.

Flights over assemblies of people may occur in the specific category, if the UAV has a dimension of less than 3 m and if no specific risks determine a classification in the certified category.

Authorizations may impose requirements on the UAV pilot, but generally they must be able to apply operational procedures (normal, contingency and emergency procedures, flight planning, pre-flight and post-flight inspections); able to manage aeronautical communication; manage the unmanned aircraft flight path and automation; demonstrate leadership, teamwork and self-

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management; be capable of problem solving and decision-making; have situational awareness; be able to manage workload; and be able to coordinate or hand over, as applicable. The minimum age is 16 years, which can be lowered to 14.

The operational risk assessment must state the specifics of the operation – e.g. whether it intends to fly over assemblies of people or controlled ground area – propose adequate operational safety objectives and robust risk mitigation measures. Specific risks to be taken into account include operations over assemblies of people, over areas with dense population, the dimensions of the UAV and whether the operations involve BVLOS. Several methodologies exist for such risk assessment, with the recommended one being based on specific operations risk assessment (SORA).[8] Potential risk mitigation measures include limiting the geographic scope of the operation, containment measures for ground personnel, mitigation by common flight rules, competency of personnel, limiting the risk of human error, or the design features of the UAV. Other aspects, such as security and privacy, should be assessed as well.

More specifics are contained in the Annex to the Regulation. These state that an operational declaration of conformity with a standard scenario may be submitted for operations of UAVs with maximum characteristic dimension up to 3 m in VLOS over controlled ground area except over assemblies of people, maximum characteristic dimension up to 1 m in VLOS except over assemblies of people; maximum characteristic dimension up to 1 m in BVLOS over sparsely populated areas; maximum characteristic dimension up to 3 m in BVLOS over controlled ground area; or in uncontrolled airspace (class F or G) unless different limitations are provided by Member States through UAS geographical zones in areas where the probability of encountering manned aircraft is not low; or in controlled airspace, in accordance with published procedures for the area of operation, so that a low probability of encountering manned aircraft is ensured. If this declaration is complete, the competent authority will notify its receipt without undue delay after which the operation may begin. When no standard scenario is followed, or when no LUC license is held, an authorization must be obtained. The Annex provides a number of requirements to obtaining such authorization, such as the basic elements of an operational manual. The pilot must have followed adequate training. It is for this category not specified whether a pilot could operate multiple UAVs at a time. This is an element that will have to be addressed in the risk assessment. The PDRA, for instance, assumes that a pilot will only control one UAV at a time.

[8] A predefined risk assessment (PDRA) is available for operations in the specific category with following characteristics: (1) UA with maximum characteristic dimensions (e.g. wingspan, rotor diameter/area or maximum distance between rotors in case of multirotor) up to 3 m and typical kinetic energies up to 34 kJ; (2) operated BVLOS of the remote pilot with visual air risk mitigation; (3) over sparsely populated areas; (4) less than 150 m (500 ft) above the overflown surface (or any other altitude reference defined by the state); and (5) in uncontrolled airspace. *Ibid.*, 117 *et seq.*

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3.2.3 Certified category

The certified category requires certification of the UAV and may require the licensing of the remote pilot, depending on the operation. This category includes operations over assemblies of people, involving the transport of people, or involving the carriage of dangerous goods, in other words the most high-risk operations.

3.3 Delegated Regulation 2019/945

Second, there is a Delegated Regulation.[9] This Regulation focuses more on the design and manufacture of the UAS themselves. It follows the three categories defined in the Implementing Regulation.

UAS in the open category can be marketed as toys, in which case they must follow product safety rules for toys.[10] When they are not toys, they must comply with general rules on machinery[11] and additional rules on UAS. UAS complying with these rules can be marketed freely in the EU (article 5). Manufacturers must document this compliance and apply the relevant CE-marking, name and serial number (article 6). Importers and distributors must ensure that any UAV they make available in the EU market complies with this as well (articles 8-9). When they place a product on the market under their own name, they will be considered as manufacturers (article 10).

Procedures are made available for manufacturers to conduct conformity assessments (article 13). Putting the UAV on the EU market is possible through a declaration of conformity. The CE-mark must be clearly visible on the UAV (article 16) and technical documentation must be available (article 17).

Member States must designate notifying authorities and conduct market surveillance to ensure compliance. Conformity assessment bodies will check compliance of manufacturers.

UAVs in the specific and certified categories can be designed to transport people or dangerous goods, to have dimensions of over 3m or to be used in the specific category of operations. When subject to certification, UAVs in this group must comply with general requirements for the airworthiness of aircraft.[12]

[9] Commission Delegated Regulation (EU) 2019/945 of 12 March 2019 on unmanned aircraft systems and on third-country operators of unmanned aircraft systems, *OJ* L 152 of 11 June 2019, 1-40.
[10] Directive 2009/48/EC of the European Parliament and of the Council of 18 June 2009 on the safety of toys, *OJ* L 170 of 30 June 2009, 1-37.
[11] Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC, *OJ* L 157 of 9 June 2006, 24-86.
[12] E.g. Commission Regulations (EU) No 748/2012, (EU) 2015/640, and (EU) No 1321/2014.

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The Annex to the Regulation defines different classes of UAS, depending on their risk. These can be summarized in table 1.

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Table 1: Drone classes

Class	Weight	Distance from people	Registration	Pilot requirements	Technical
C0	<250g	Can fly over uninvolved people (limited), not over assemblies	No	Read the manual	Minimize injury, 24V DC, 50m follow-me range (unless toys, then follow EU rules on toy safety). Max. 19m/s, fly up to 120m
C1	<900g	Can fly over uninvolved people, not over assemblies	Yes	+ online training and test	Impact <80J, max. 19m/s, fly up to 120m, minimize injury, recover data link, max. sound level, 24V DC, remote ID (serial n°), geo awareness, battery warning, 50m follow-me mode, strength and safety features
C2	<4kg	Safe distance from uninvolved people	Yes	+ theoretical test in center	48V DC, low speed mode, min. 5m from people, rest same as C1
C3	<25kg	Fly where you reasonably expect no uninvolved people to be endangered	Yes	Manual + online training and test	Dimension <3m, 48V DC, rest same as C1
C4	<25kg	Fly where you reasonably expect no uninvolved people to be endangered	Yes	Manual + online training and test	Model aircraft, must be safely controllable

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3.4 Implementing Regulation 2020/639

On 12 May 2020, another implementing regulation was adopted.[13] This Regulation implements the two standard scenarios proposed by the European Union Aviation Safety Agency (EASA) late 2019. These concern operations executed in visual line of sight ('VLOS'), at a maximum height of 120 m over a controlled ground area in a populated environment using a CE class C5 UAS ('STS-01'), and operations that could be conducted beyond visual line of sight ('BVLOS'), with the unmanned aircraft at a distance of not more than 2 km from the remote pilot with the presence of airspace observers, at a maximum height of 120 m over a controlled ground area in a sparsely populated environment, and using a CE class C6 UAS ('STS-02').

These scenarios involve two new UAV classes – C5 and C6 – that were not included in the original framework. This implementing regulation expands the legal framework with the operations envisioned in the standard scenarios. An additional amendment was needed to expand the Delegated Regulation 2019/945 with the new classes of UAV.[14]

The Regulation reiterates that no authorization is needed when using one of the standard scenarios and that an operational declaration suffices. The annex provides a model for such declaration. When the holder of a LUC license plans operations across Member State borders, the competent authority of that Member State must be notified of its license and the details of the operation. Some additional transitional measures are implemented for the operation of non-compliant UAV in the open category for a period up to two years.

In terms of technical updates, the new Regulation requires UAV in the specific category to be equipped with at least one green flashing light for the purpose of visibility of the unmanned aircraft at night. An operational declaration will be valid for two years. Next, the Annex explains the two standard scenarios for which an operational declaration can be adopted.

3.4.1 STS-01

STS-01 concerns VLOS over a controlled ground area in a populated environment. In this scenario, the UAV must stay below 120 m from the closest point of the surface of the earth. When flying an UAV within a horizontal distance of 50 m from an artificial obstacle taller than 105 metres, the maximum height of the operation may be increased up to 15 m above the height of the obstacle at the request of the entity responsible for the obstacle. The maximum

[13] Commission Implementing Regulation (EU) 2020/639 of 12 May 2020 amending Implementing Regulation (EU) 2019/947 as regards standard scenarios for operations executed in or beyond the visual line of sight, *OJ* L 150 of 13 May 2020, 1-31.

[14] Commission Delegated Regulation (EU) 2020/1058 of 27 April 2020 amending Delegated Regulation (EU) 2019/945 as regards the introduction of two new unmanned aircraft systems classes, *OJ* L 232 of 20 July 2020, 1-27.

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height of the operational volume may not exceed 30 m above the maximum height allowed. No dangerous goods may be carried.

Operations in STS-01 must remain within VLOS at all times and within a controlled ground area comprising the flight geography area, the contingency area and a risk buffer area. The pilot must have followed theoretical training with regard to this scenario and hold accreditation of practical skill training – the precise topics to be covered in this training are specified as well.

An operations manual is required, with the necessary contingency and emergency procedures. Appendix 5 to the Annex provides the basis requirements for the operations manual. Geo-awareness must be active and updated, and all involved persons must be informed of the risks. UAV in this scenario must be of class C5. The pilot may only operate one UAV at a time.

According to the EASA opinion describing the standard scenarios, a class C5 drone builds forth on class C3.[15] It removes the height limitation and makes the geo-awareness requirement only mandatory in areas where Member States require it. It adds that the dimension of the UAV must be below 3 m and below MTOM of 25kg. It is limited to rotorcraft or tethered aircraft other than fixed-wing aircraft. The UAV must have reliable and predictable means for remote termination. It must provide information on the speed and flight height, as well as of the signal strength. It must have a low speed more of less than 5 m/s. An accessory kit may convert a C3 class UAV into a C5 class.

3.4.2 STS-02

Operations in STS-02 must remain within 120 m from the closest point of the surface of the earth – with an additional 15 m above the height of the obstacle when flying within a horizontal distance of 50 m from an artificial obstacle taller than 105 m but not exceeding 30 m above the maximum height – and may not carry dangerous goods. Also here, an operations manual and controlled ground area must be defined. Minimum visibility must be more than 5 km. During launch and recovery, the UAV must be within sight – unless an emergency termination is needed.

If no airspace observer is used in the operation, the UAV must remain within 1 km from the pilot, with the UAV following a pre-programmed trajectory when not in VLOS. When using an airspace observer, their positioning must allow for adequate coverage of the operational volume and surrounding airspace with the minimum visibility, the UAV cannot be operated further than 2 km from the pilot or further than 1 km from the closest observer. Observer and pilot must be within 1 km from each other and they must have robust and effective means of communication.

[15] EASA (2019) "Opinion No 05/2019 Standard scenarios for UAS operations in the 'specific' category", *RMT.0729,* 12-13.

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The pilot must have theoretical and practical training in this scenario. The UAV must be of class C6 and have active flight geography breach prevention.

In addition to the operational requirements found in STS-01, operations in STS-02 must have an effective emergency response plan (ERP) in place. Also here, the pilot may only operate one UAV at a time.

According to the EASA opinion describing the standard scenarios, a class C6 drone builds forth on class C3.[16] Here, the maximum dimension is limited to 3 m, MTOM to 25kg and ground speed to 50 m/s. Geo-caging is required. Flight termination means are required as well. Information must be provided on speed, flight height, signal strength, and geographic position. C6 class UAV cannot be developed by adding an accessory kit to a C3 class UAV, due to the specific software requirements.

3.5 U-Space Regulations

In April 2021, the European legislator adopted three texts related to the so-called U-Space.

A first text provides the general framework on U-Space.[17] Article 2 defines U-Space airspace as "*a UAS geographical zone designated by Member States, where UAS operations are only allowed to take place with the support of U-space services*". A U-Space service is "*a service relying on digital services and automation of functions designed to support safe, secure and efficient access to U-space airspace for a large number of UAS*".

The U-Space Regulation does not apply to operations of model aircraft clubs, to A1 operations in the open category, or to operations under the SERA.5015 instrument flight rules (article 1).

Member States may designate their own U-Spaces, according to an airspace risk assessment (article 3). Any operation within U-Spaces must provide the U-Space services regulated here, meaning network identification services, geo-awareness services, UAS flight authorization services, and traffic information services. Member States may require additional services to be offered. Member States will determine the requirements and conditions for operations within U-Spaces.

When a U-Space falls under controlled airspace, dynamic reconfiguration should be possible (article 4).

[16] *Ibid.,* 18-19.

[17] Commission Implementing Regulation (EU) 2021/664 of 22 April 2021 on a regulatory framework for the U-space, *OJ* L 139/161 of 23 April 2021.

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Member States must make certain information available to those operating in their U-Spaces, referred to as common information services (article 5). The annexes to the Regulation provide how this information should be made available, as well as data quality requirements.

UAS operators must comply with the requirements of the U-Space they operate in, as well as the general requirements set by the EU's legal framework on drones (article 6). Flight authorization requests must be directed to the U-Space service provider.

U-Space services may only be provided by certified service providers (article 7). Specific requirements are imposed on network identification services (article 8), geo-awareness services (article 9), flight authorization services (article 10), traffic information services (article 11), weather information services (article 12), and conformance monitoring services (article 13).

Any of these service providers must hold a valid certificate from the competent authority (article 14), subject to specific conditions (article 15) and validity (article 16).

An Implementing Regulation inserts U-Space in the general framework for the provision of air traffic management and air navigation services ('ATM/ANS') and other air traffic management network functions ('ATM network functions') for general air traffic and their oversight.[18] This requires air traffic service providers to provide the common information services required for U-Space.

A second Implementing Regulation similarly implements U-Space in the framework for the common rules of the air and operational provisions regarding services and procedures in air navigation applicable to general air traffic.[19]

[18] Commission Implementing Regulation (EU) 2021/665 of 22 April 2021 amending Implementing Regulation (EU) 2017/373 as regards requirements for providers of air traffic management/air navigation services and other air traffic management network functions in the U-space airspace designated in controlled airspace, *OJ* L 139/184 of 23 April 2021.

[19] Commission Implementing Regulation (EU) 2021/666 of 22 April 2021 amending Regulation (EU) No 923/2012 as regards requirements for manned aviation operating in U-space airspace, *OJ* L 139/187 of 23 April 2021.

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4. National legal frameworks

Before the adoption of the EU framework regarding drones, several Member States had already adopted their own rules in this field. Unlike a directive – which needs to be transposed into the national law of the Member States – a regulation is directly applicable. As a result, and following the adoption of the new EU regulations, Member States will have to bring their national legal framework in line with those new rules. Some implementing legislation will be needed, which at this stage is still to be adopted.

It is, however, important to assess how Member States have conducted this exercise. According to recital 10 of the Basic Regulation, it is possible for Member States to apply the EU framework to aircraft carrying out military, customs, police, search and rescue, firefighting, border control and coastguard or similar activities and services undertaken in the public interest. It will therefore need to be followed up to what extent Member States have used this option. If this option is taken, the aforementioned EU legal framework will also apply to operations by first responders. If not, national law will need to provide for alternative rules.

In this overview, we discuss the current drone regulations in the countries represented by the members of the ResponDrone consortium. For the EU Member States, we will discuss how the EU framework has been embedded in the national regulatory order and what residual national legislation may impact the project. For non-EU Member States, we discuss the general framework on drones.

4.1 Belgium

Before the European framework, the main rules with regard to drones could be found in the Royal Decree of 10 April 2016.[20] This decree was abolished at the end of 2020 by a Royal Decree implementing the European framework.[21]

The 2020 Royal Decree confirms the Directorate-General Air Traffic of the Federal Public Service Mobility and Transport as the competent authority in Belgium. Any registration as intended by the European framework must therefore be directed to this authority. The minister having competence over air traffic may propose the geographic UAS zones. A first decision here was adopted in December 2020.[22] The decree further provide that the authority will determine and regulate the pilot examination. It may designate entities that can offer pilot training and examination. The competent minister may also propose national standard scenarios for which

[20] Royal Decree of 10 April 2016 regarding the use of remote piloted aircraft in the Belgian airspace, *Belgian State Gazette* 15 April 2016.

[21] Royal Decree of 8 November 2020 executing the Implementing Regulation 2019/247 of the European Commission of 24 May 2019 regarding the rules and procedures for the exploitation of unmanned aerial systems, *Belgian State Gazette* 18 November 2020.

[22] Ministerial Decree of 21 December 2020 holding the establishment of the fixed geographic UAS zones and the conditions for access to the fixed UAS zones, *Belgian State Gazette* 24 December 2020.

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only an operational declaration is needed. A first one was adopted late 2020, BE-STS-01.[23] This scenario concerns low-speed (<5m/s) VLOS flights in controlled airspace. The drone must remain in VLOS at all times and pilots may not control multiple drones at the same time.

In October 2020, the Directorate-General of Aviation published a note clarifying its interpretation of 'state flights'.[24] In this note, the Directorate-General confirms that drone flights (1) conducted under the supervision of a state, (2) conducted in the public interest, and (3) conducted for activities regarding military, customs, police, search and rescue, firefighting, border control, coast guard, or similar activities, are not considered to fall under the scope of the new EU framework. For such drone flights, it is therefore up to the relevant state organs to develop their own rules. Belgium has therefore not made use of the option to regulate first responder drone flights under the EU framework.

Drone flights not falling under the scope of the EU framework should then be subjected to specific rules, to be adopted by the appropriate state organ. Such rules should in any case ensure the safety of air traffic and respect general air traffic rules.

On 7 December 2017, a Ministerial circular was adopted on the use of drones by police and first responders.[25] The Circular applied to the use of drones by all state actors such as police, firefighters and civil protection services – regardless of whether or not the drone is owned by such state actor. The Circular confirmed that some of the basic rules on drones of the 2016 Royal Decree did apply – such as the prohibition of passenger transport using RPA. The drone operator must continuously remain in control of the drone. General drone operations must maintain visual line-of-sight. Beyond line-of-sight operations may only be conducted by pilots specifically licensed to do so. Also the licensing and registration requirements of the 2016 Royal Decree applied, as did the risk analysis and operational manual. The conclusion of this is that while the 2016 Royal Decree principally excluded the use of drones for civil protection purposes, the Circular stated that many of the principles of that legal framework did in fact apply.

In June 2019, the 2017 Circular was replaced with a new version.[26] It contains an important restriction in that all flights – regardless of whether they are within or beyond visual line-of-sight – in controlled and non-controlled airspace are limited to 300ft. Under the previous Circular, flights in controlled airspace did not have an upper limit and only required notification by telephone to air traffic control before the flight. Flights within controlled airspace limited to

[23] Ministerial Decree of 29 December 2020 determining a national standard scenario, *Belgian State Gazette* 31 December 2020.
[24] https://mobilit.belgium.be/sites/default/files/resources/files/note_state_aircraft_nl_003.pdf.
[25] Ministerial Circular of 7 December 2017 on the use of drones by police and first responders, *Belgian State Gazette* 28 March 2018.
[26] Ministerial Circular of 25 June 2019 on the use of drones by police and first responders, *Belgian State Gazette* 8 July 2019.

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a range of 500m around a stationary pilot can be allowed if prior authorization by air traffic control is obtained and following certain procedures and conditions. If the drone is owned by an external operator, this operator must receive a written confirmation from civil protection services authorizing its use within the operation.

While the 2019 Circular is technically still in force today, it will have to be replaced as it substantially references the 2016 Royal Decree which has now been abolished.

Nevertheless, even with the Ministerial Circular, the use of drones by law enforcement is not without controversy. Late 2020, the Belgian Data Protection Authority and the Control body for Police Information investigated the use of drones in a local police zone, alleging that the intended drone use there was too broad.[27]

4.2 Bulgaria

References to the EU drone framework have been included in the 1999 Civil Aviation Act.[28] Those are, of course, the principles applicable to the civil use of drones. Non-civil use of drones may fall under different rules. The Bulgarian civil aviation framework includes many derogations for police and State use, search and rescue operations, etc.

The competent authority in Bulgaria is the General Directorate "Civil Aviation Administration". It has set up a platform for the registration of drone activities.[29] Interactive maps are provided to identify prohibited or restricted areas.[30] A large number of sample documents – such as operational manuals, emergency response plans, etc. – are made available as well.[31] An online training platform has been developed for pilots in the open category.[32]

Authorities have, in any case, already been using drones. During the COVID-19 crisis, authorities in Burgas used drones equipped with thermal cameras to conduct temperature checks within the Roma population.[33]

4.3 Germany

Germany adopted its drone rules in 2017.[34] An updated framework was adopted in June 2021.[35] It maintains the 2017 framework, but brings it in line with the new European rules.

[27] Hiroux, D., Goedgebeur, H. (2020) "Privacycommissie onderzoekt inzet van drones tijdens eindejaarsperiode: wat mag de politie en wat mag ze niet?", *VRT News* 10 December 2020.
[28] Закон За Гражданското Въздухоплаване от 05.07.1999 г.
[29] https://drones.caa.bg/.
[30] https://www.caa.bg/bg/page/interaktivni-karti.
[31] https://www.caa.bg/bg/category/803.
[32] https://x-tesla.caa.bg/home.
[33] https://www.euractiv.com/section/health-consumers/short_news/bulgaria-update-covid-19/.
[34] Verordnung zur Regelung des Betriebs von unbemannten Fluggeräten, *BGBl*. I 2017 S. 683.

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Under the 2017 rules, no permission was needed for done flights by or under the supervision of authorities in the fulfilment of their duties or by organizations tasked with matters of emergencies, disasters, or accidents. This provision thus exempted civil protection services from compliance with the rules. Furthermore, they were not subjected to the licensing requirements. While the new drone action plan, adopted in May 2020, did not specify whether the German government intended to continue this practice under the new EU framework, the priorities set out in the plan did seem to indicate that this would be the case.[36] Indeed, the 2021 amendments do not change this provision. So-called BOS-services[37] – which include police, fire brigade, technical relief organization, and other authorities that perform special tasks – are exempted from the EU framework. However, Member States must ensure that the safety objectives of the EU framework are duly taken into account when carrying out activities and services with non-civil aircraft. Therefore, also drone flights by BOS-services must comply with some aspects of general EU airspace safety and traffic laws, but not the general drone registration and permission requirements. They may deviate from the rules insofar as needed for the performance of their tasks and where justifiable from a safety perspective.

Drones have been used in civil protection in Germany for quite some time. Already a decade ago the AirShield project was launched, in which drones were equipped with lightweight gas sensors. Civil protection falls under the ambit of the Federal Office of Civil Protection and Disaster Assistance. It was this government agency that advocated the use of drones by civil protection services, as included in the 2017 drone regulation.[38]

4.4 France

The main legal texts in France with regard to drones were two Orders of 17 December 2015.[39] These were repealed late 2020.[40] The 2020 Order also sets out the national standard scenarios for cases not falling under the scope of the European rules.

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[35] https://www.bundesrat.de/SharedDocs/beratungsvorgaenge/2021/0301-0400/0376-21.html?cms_templateQueryString=luftfahrzeugen&cms_fromSearch=true.

[36] Gesetz vom 14. Juni 2021 zur Anpassung nationaler Regelungen an die Durchführungsverordnung (EU) 2019/947 der Kommission vom 24. Mai 2019 über die Vorschriften und Verfahren für den Betrieb unbemannter Luftfahrzeuge, *BGBl*. I S. 1766.

[37] Authorities and organizations with special tasks, in German "*Behörden und Organisationen mit Sonderaufgaben*".

[38] German Federal Office of Civil Protection and Disaster Assistance (2017) Services for modern civil protection, Rheinbach: WM Druck + Verlag, 30.

[39] 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, *JORF* n°0298 du 24 décembre 2015 page 23897; Arrêté du 17 décembre 2015 relatif à l'utilisation de l'espace aérien par les aéronefs qui circulent sans personne à bord, *JORF* n°0298 du 24 décembre 2015 page 23890.

[40] Arrêté du 3 décembre 2020 relatif à la définition des scénarios standard nationaux et fixant les conditions applicables aux missions d'aéronefs civils sans équipage à bord exclues du champ d'application du règlement (UE) 2018/1139, *JORF* n°0298 du 10 décembre 2020.

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The 2020 Order applies to unmanned aircraft and their operators when carrying out military, customs, police, search and rescue, fire-fighting, border control and surveillance, coast patrol, or similar activities or services under the control and responsibility of the State, undertaken in the general interest by a body vested with prerogatives of public power or on behalf of it.

The Minister responsible for civil aviation maintains control over all operations, and may also grant authorization even if the conditions of the standard scenarios are not met and as long as safety measures are respected. Operations by the State and first responders may be allowed even if the conditions of the scenarios are not met and when circumstances justify it.

The 2020 Order recognizes three standard scenarios:

- S-1: use outside populated areas, without overflight by third parties, operation in sight and at a maximum horizontal distance of 200 meters from the remote pilot;
- S-2: use outside populated areas, with no third party on the ground in the movement area, not meeting the criteria of scenario S-1, at a maximum horizontal distance of one kilometre from the remote pilot;
- S-3: use in populated areas, without overflight of third parties, in direct view operation and at a maximum horizontal distance of 100 meters from the remote pilot.

Such operations require an operational manual, declaration, and – where applicable – the authorization to use restricted airspace.

The 2020 Order provides the rules on the drones that may be used under the national standard scenarios. During operations, specific rules govern day-time and night-time beaconing. Rules for pilots may differ depending on the scenario.

The 2020 Order also includes conditions specific to military, customs, police, search and rescue missions, fire fighting, border control, coastal surveillance or similar activities or services. These include that the operator must ensure that the operations manual is known and strictly applied by the mission personnel. Only pilots having completed their required training may be registered. Pilot certificates and competency assessments must be kept on file. Drone must be maintained in an airworthy state at all times. In case an operation endangers the safety of third parties, the operator must declare this to the Minister responsible for civil aviation. Flight data may have to be transmitted as well.

Rules on the use of airspace by drones are laid down in a second 2020 Order.[41] These rules also apply to operations by the State and first responders, although derogations may be granted when the mission justifies it.

[41] Arrêté du 3 décembre 2020 relatif à l'utilisation de l'espace aérien par les aéronefs sans équipage à bord, *JORF* n°0298 du 10 décembre 2020.

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Drones are already being used by civil protection services. The most well-known example of such use occurred during the fire at the Notre-Dame de Paris cathedral, where images captured by a drone helped firefighters to prioritize and to mount a more effective response to the fire.[42] Drones are also being used to combat forest fires or to map flooding.[43] During the COVID-19 pandemic, police forces have also been deploying drones to monitor compliance with the restrictions in place.[44] Here, drones were used to monitor larger public areas and to guide patrols on the ground. In Nice, drones emit similar warnings to citizens violating lockdown measures. Nevertheless, since the drones could still be used to identify people, and because these operations were conducted without a specific legal framework thereto in place, this use of drones was challenged before the French Council of State. In its decision, the Council of State ordered the French State to cease this kind of drone surveillance.[45] In January 2021, the French data protection authority, the *Commission nationale de l'informatique et des libertés* (CNIL), gave a similar ruling on the matter.[46]

4.5 Greece

The main legal framework on drones in Greece is the Decision of 21 September 2016.[47] While Greece does apply the EU framework now, as of September 2021 there have been no amendments to the national framework.

The national legal framework principally did not apply to the use of drones by military or other government agencies. However, the respective government agencies carrying out drone operations could decide to comply with the legal framework. If the national framework remains in place for drone operations not falling under the scope of the EU framework, it can be assumed that the same principle remains in force for State flights.

The Greek framework defines the same three categories as the EU framework: open, specific, and certified. Any flight going beyond 50m from the pilot must be registered. Pilots require medical certification and theoretical and practical training.

[42] https://www.numerama.com/tech/481413-notre-dame-de-paris-le-drone-precieux-allie-des-pompiers.html.
[43] https://www.interieur.gouv.fr/Archives/Archives-des-dossiers/2016-Dossiers/Les-drones-au-service-de-la-securite/Identifier-en-temps-reel-les-contours-d-un-sinistre.
[44] RFI 'French police deploy drones to enforce coronavirus restrictions' *RFI.fr* (Issy Les Moulineaux, 22 March 2020) <http://www.rfi.fr/en/france/20200322-french-police-deploy-drones-helicopters-to-enforce-coronavirus-restrictions-covivd-19-lockdown> accessed 24 February 2021.
[45] Etienne Wery, 'Covid : l'État sommé par la CNIL de renoncer aux drones' *Droit & Technologies* (Brussels, 19 January 2021) <https://www.droit-technologie.org/actualites/covid-letat-somme-par-la-cnil-de-renoncer-aux-drones> accessed 24 February 2021.
[46] CNIL 12 January 2021, Délibération SAN-2021-003.
[47] Αριθμ Δ/ΥΠΑ/21860/1422 Κανονισμός - γενικό πλαίσιο πτήσεων Συστημάτων μη Επανδρωμένων Αεροσκαφών-ΣμηΕΑ (Unmanned Aircraft Systems - UAS), *ΦΕΚ* Β 3152/30.09.2016.

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Flights in the open category must remain in VLOS. They may only have a limited reach and cannot fly over crowds. As in the EU framework, there are different classes within this category, depending on the MTOM of the drone.

Flights in the specific category require a risk assessment, an operations manual, and operational authorization. Also a certificate of airworthiness is needed, as well as insurance. BVLOS flights are possible. Flights in this category require a hazard and conflict avoidance recognition system.

Flights in the certified category require authorization as well. Registration is needed in a special register. Also a special certificate of airworthiness is needed. BVLOS flights are possible. Flights in this category require a hazard and conflict avoidance recognition system.

Commercial operations require a special license. Additionally, professional operators must be insured against material damages up to EUR 150.000 and bodily injuries up to EUR 1.000.000.

4.6 Latvia

Latvia has updated its legal framework on drones in 2019 with a new Cabinet Regulation.[48] As of September 2021, drone operations falling under the scope of the EU framework are regulated by that framework, with some additional rules following from the national framework. Drone operations not falling under the scope of the EU framework, will continue to be regulated by the national framework. New rules were adopted in 2021 to further align the two frameworks.[49]

The 2019 Cabinet Regulation defines State unmanned aircraft as unmanned aircraft used by a State institution for the performance of extraordinary and urgent tasks, as well as operational activities in accordance with the State functions and tasks delegated in regulatory enactments customs, police, national security, search and rescue, firefighting, civil protection, detention as a security measure and deprivation of liberty as a criminal sanction, border control and coastguard. Military unmanned aircraft is defined as unmanned aircraft used by a State

[48] Ministru kabineta noteikumi Nr. 368, Rīgā 2019. gada 13. augustā (prot. Nr. 34 27. §), Kārtība, kādā veicami bezpilota gaisa kuģu un cita veida lidaparātu lidojumi, *Latvijas Vēstnesis*, 166, 16.08.2019.

[49] Ministru kabineta noteikumi Nr. 374, Rīgā 2021. gada 15. jūnijā (prot. Nr. 48 14. §), Atzīto struktūru statusa iegūšanas un uzraudzības kārtība, Latvijas Vēstnesis, 116, 17.06.2021; Ministru kabineta noteikumi Nr. 429, Rīgā 2021. gada 29. jūnijā (prot. Nr. 50 18. §), Bezpilota gaisa kuģu lidojumu noteikumi, Latvijas Vēstnesis, 123A, 30.06.2021; Ministru kabineta noteikumi Nr. 436, Rīgā 2021. gada 29. jūnijā (prot. Nr. 50 38. §), Tālvadības pilotu kvalifikācijas noteikumi, Latvijas Vēstnesis, 123A, 30.06.2021; Ministru kabineta noteikumi Nr. 437, Rīgā 2021. gada 29. jūnijā (prot. Nr. 50 39. §), Specifiskās kategorijas bezpilota gaisa kuģu sistēmu ekspluatantu sertifikācijas un uzraudzības kārtība, Latvijas Vēstnesis, 123A, 30.06.2021; Ministru kabineta noteikumi Nr. 447, Rīgā 2021. gada 29. jūnijā (prot. Nr. 50 17. §), Noteikumi par civiltiesiskās atbildības obligāto apdrošināšanu bezpilota gaisa kuģu lidojumiem, Latvijas Vēstnesis, 124, 01.07.2021; Ministru kabineta noteikumi Nr. 457, Rīgā 2021. gada 29. jūnijā (prot. Nr. 50 40. §), Bezpilota gaisa kuģu, bezpilota gaisa kuģu sistēmu ekspluatantu, tālvadības pilotu un gaisa kuģu modeļu klubu un apvienību reģistra noteikumi, Latvijas Vēstnesis, 125, 02.07.2021.

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institution for the performance of tasks in accordance with the State functions and tasks in the field of defence delegated in regulatory enactments. Also under the 2021 rules, State aircraft can obtain derogations from the national framework.

Drone flights under the national framework are only possible during the day, up to an altitude of 120m, within VLOS, and using drones up to 25kg. BVLOS flights are possible if the drone is equipped with cameras, weighs no more than 1,5kg, using observers and not more than 250m from the remote-control point. Drones must be marked with the operator's name or business name. Distance from third parties depends on the weight and speed of the drone, but not closer than 50m from crowds. Operations close to events or infrastructure require consent from the owner or organiser. Dangerous goods may not be transported.

A single pilot may not operate multiple drones at a time under the national framework. Pilots must pass theoretical and practical tests, as well as medical certification. Drone pilots and observers must be identifiable and wear a reflective vest. High risk flights require a prior risk assessment and receive a permit.

State drones must comply with the general requirements, as well as with the requirements for pilots and observers. The more specific requirements of the Cabinet Regulation – mainly those describing distance from certain infrastructures – do not apply to high-risk State flights. While ensuring a safe flight, State operators may deviate from the legal framework to the extent allowed by specific legal norms applicable to them.

4.7 Netherlands

In the Netherlands, drone rules were first adopted in 2015.[50] Updated rules were introduced late 2020.[51]

Military drone flights are in any case excluded from the legal framework. Moreover, the existing national rules of 2015 will continue to apply to drone operations not falling under the scope of the EU framework, such as drone operations by first responders.

Under the 2015 rules, defence forces, police and first responders can use drones for various purposes, such as combatting fires, monitoring large events, looking for missing persons or preventing disasters such as levee failures. First responders will need to follow the rules on the professional use of drones. However, they may in certain circumstances receive a waiver for use that would normally not be allowed – for instance flying over crowds.

[50] Regeling van de Staatssecretaris van Infrastructuur en Milieu, van 23 april 2015, IENM/BSK-2015/11533, houdende de vaststelling van regels voor op afstand bestuurde luchtvaartuigen, *Stcrt*. 2015, 12034.

[51] Regeling van de Minister van Infrastructuur en Waterstaat, van 21 december 2020, nr. IENW/BSK-2020/247616, houdende de vaststelling van regels met betrekking tot onbemande luchtvaartuigen (Regeling onbemande luchtvaartuigen), *Stcrt*. 2020, 66578.

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The pilot of a professional drone must be certified (RPA-L certification). This requires theoretical and practical training. The pilot must be an adult, have undergone medical certification and must be insured. The drone must be registered and certified for its airworthiness (S-Bvl). Operators must be certified as well (ROC). An operational manual must be maintained.

Drones can be operated up to a maximum height of 120m and outside controlled airspace. Distance between pilot and drone can be up to 500m. Waivers can be obtained for operating a drone in controlled airspace, at greater heights, or in close distance (<50m) to obstacles. Drones cannot be operated beyond visual line of sight or in the dark. Distance must be obtained from obstacles and crowds. A deviation is included in the legal framework for first responders, in the sense that they can operate flights at night. Other deviations exist for microdrones (<1kg) and minidrones (<4kg).

4.8 Portugal

The main legal framework on drones in Portugal was set by a Regulation of 2016.[52] As of 2021, this framework only remains in place temporarily for holding the provisions on matters not regulated by the EU framework.

The 2016 legal framework explicitly excluded State operations from its scope. Such State operations include aircraft used in military, customs, and police services. However, this exception has still left a number of drone uses by first responders subject to the national legal framework. Given that the 2016 framework will only still apply temporarily, new national rules for these operations will have to be drafted.

Another act, Decree-Law No. 58/2018, regulates the civil liability registration and insurance system applicable to drones. Also here, State aircraft and unmanned aircraft used under the direction and supervision of the National Civil Protection Authority are excluded from the scope. A new ordinance on civil liability insurance for drone users was adopted in 2021.[53]

[52] Regulamento n.º 1093/2016, de 14 de dezembro, aprova as condições de operação aplicáveis à utilização do espaço aéreo pelos sistemas de aeronaves civis pilotadas remotamente (drones), *D.R.* n.º 238 (Série II - Parte E), de 14 de dezembro de 2016.

[53] Portaria n.º 2/2021, de 4 de janeiro, define as coberturas, condições e capitais mínimos aplicáveis ao seguro de responsabilidade civil previsto no artigo 10.º do Decreto-Lei n.º 58/2018, de 23 de julho, a celebrar pelos operadores de aeronaves civis não tripuladas («operadores de UAS» Unmanned Aircraft System). *D.R.* n.º 1/2021, Série I de 2021-01-04.

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4.9 Spain

The Spanish national legal framework on drones is set by a Royal Decree of 15 December 2017.[54] A new Royal Decree was adopted in 2020 to further complete the framework.[55] The national framework remains in force for drone operations not covered by the scope of the EU framework.

The 2017 Royal Decree does not apply to military operations. It does apply to drone operations, regardless of MTOM, that carry out customs, police, search and rescue, firefighting, coastguard, or similar activities where appropriate. For these State operations, the legal framework therefore also applies when the MTOM is higher than 150kg. Nevertheless, a few exceptions apply. Police operations attributed to the Security Forces and Corps, customs operations, road traffic surveillance carried out directly by the Directorate General of Traffic, and the operations carried out by the National Intelligence Center, are exempted from the airspace limitations, operational requirements and pilot requirements of the Royal Decree. Also, the overflight of certain facilities can be allowed to them. These operations will, however, still be subject to their own protocols developed by those authorities in order to ensure that the public, properties and other airspace users are not put at risk. The relevant public body must therefore adopt rules on authorizing such drone operations, on pilot qualifications, and on general operational safety.

The 2020 Royal Decree includes provisions on notification systems. Article 4 specifically concerns the notification of firefighting events and search and rescue activities. Such activities must be notified as part of the State Agency for Aviation Safety's notification system.

Drones are subjected to identification, registration, and a certificate of airworthiness. The unique identifier must be visible and legible on the drone. Registration applies to drones with a MTOM above 25kg. To obtain the certificate of airworthiness, specific design and production rules must be followed. This includes providing a maintenance manual.

Drone flights must comply with the general rules on the use of airspace, including airspace restrictions. Specific restrictions apply to drones without airworthiness certificate – for instance

[54] Real Decreto 1036/2017, de 15 de diciembre, por el que se regula la utilización civil de las aeronaves pilotadas por control remoto, y se modifican el Real Decreto 552/2014, de 27 de junio, por el que se desarrolla el Reglamento del aire y disposiciones operativas comunes para los servicios y procedimientos de navegación aérea y el Real Decreto 57/2002, de 18 de enero, por el que se aprueba el Reglamento de Circulación Aérea, *BOE* núm. 316, de 29 de diciembre de 2017, 129609-129641.

[55] Real Decreto 1088/2020, de 9 de diciembre, por el que se completa el régimen aplicable a la notificación de sucesos de la aviación civil y se modifica el Real Decreto 1036/2017, de 15 de diciembre, por el que se regula la utilización civil de las aeronaves pilotadas por control remoto, y se modifican el Real Decreto 552/2014, de 27 de junio, por el que se desarrolla el Reglamento del aire y disposiciones operativas comunes para los servicios y procedimientos de navegación aérea y el Real Decreto 57/2002, de 18 de enero, por el que se aprueba el Reglamento de Circulación Aérea, *BOE* núm. 322, de 10 de diciembre de 2020.

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they may be used indoors or outdoors in non-crowded areas for VLOS or observer-enhanced VLOS. Some specialized BVLOS operations may be allowed.

Drone operators must be insured, have prepared an operational manual, and conduct a safety study.

The 2017 Royal Decree does impose a 'one pilot, one drone' rule. Dangerous goods may not be transported. A protection and recovery area must be foreseen. Facilities of national defence and State security may not be overflown. Pilots must be at least 18 years old, have a medical certificate, undergo theoretical training, and demonstrate practical knowledge of the specific UAV they will pilot. Observers must also undergo theoretical training.

Specialized air operations outside controlled airspace or flight information zones and experimental flights by aircraft whose MTOM is equal to or less than 25 kg are subjected to prior notification. Specialized air operations and experimental flights by aircraft whose MTOM is greater than 25 kg, certain specialized air operations, including those that intend to operate in controlled airspace or in a flight information area, including the aerodrome transit area, specialized air operations or experimental flights carried out at night, and any other operations are subject to authorization.

4.10 Armenia

Armenia is not an EU Member State and will therefore not be impacted by the new EU legal framework. At the present moment, Armenia does not have specific rules on the operation of drones. The Civil Aviation Committee of the Republic of Armenia is working on a new regulation.[56] This regulation would not cover the operation of drones of <250g, toy drones, or drones operated in private closed areas. Pilots under the age of 14 years must be supervised by adults.

A few general rules do apply.[57] Drones may not be flown above 50m without permission. They may not be operated at night, in overcrowded areas, over buildings or power lines or within 7km from airports. Privacy laws must be respected. Insurance is required and drones must be in good and unaltered operational condition. Visual line of sight must be maintained.

4.11 Israel

Israel is not an EU Member State and will therefore not be impacted by the new EU legal framework. Drones are subject to the 2011 Aviation law.[58] Civil flight authorizations are granted by the Civil Aviation Authority (CAA). New drone regulations are being prepared and are

[56] http://www.gdca.am/page/DRONE.
[57] *Id.*
[58] חוק הטיס, תשע"א–2011,

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expected to include a registration duty and the possibility for night-time flights for commercial operators. Temporary permits can be obtained.[59]

General principles include taking into account no-fly zones – which include Jerusalem, the Gaza Strip and most of the West Bank – flying up to 50m altitude, not closer than 2km from airports, at least 250m from buildings or people, as well as taking into account general safety measures.

Pilots must be licensed and can only operate one drone at a time. This requires theoretical and practical training, as well as medical certification and security clearance where applicable. Only people holding the Israelian nationality can be licensed. Even with a foreign license, the drone operation would have to be supervised by a licensed Israelian pilot. Commercial operations require a commercial license. Insurance is required.

In terms of radiocommunication, drones may only use the 2,4GHz frequency. The manufacturing of aircraft is subject to licensing as well. Flights must in principle stay within VLOS. BVLOS requires special permission.

As of September 2021, the new framework is still being drafted.[60] It will include a provision banning the use of drones within 5km of firefighting and rescue operations unless explicit authorization has been obtained from the appropriate authorities. The aim of that provision is to ensure that only drone operation by or authorized by appropriate authorities – such as police, firefighting and rescue workers – can be conducted in the vicinity of such an event. The legal framework will draw substantially from the new EU framework, as well as from the US's 14 CFR Part 107.[61]

4.12 Republic of Korea

The Republic of Korea is not an EU Member State and will therefore not be impacted by the new EU legal framework. The former Aviation Act was in 2016 replaced by three frameworks: the Aviation Business Act, the Aviation Safety Act, and the Airport Facilities Act.[62] Drones are considered as ultra-light aircraft under this legal framework.

With a few exceptions, the legal framework also applies to aircraft of State agencies where the drone is used to perform certain duties such as search and rescue operations in response to disasters and accidents, suppression and prevention of wildfires, first aid activities, and other duties necessary to ensure public security and to maintain public order. State agencies include

[59] https://www.gov.il/he/departments/policies/uav-flight-protocol.
[60] https://www.gov.il/he/departments/general/fourth-public-distribution-uav.
[61] 86 FR 4314.
[62] 항공사업법, 신규제정 2016. 3. 29 법률 제 14115 호; 항공안전법, 신규제정 2016. 3. 29 법률 제 14116 호; 공항시설법, 신규제정 2016. 3. 29 법률 제 14113 호.

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the State, a local government, or any public agency as defined by the Act on the Management of Public Institutions. This does not include aircraft used for military, police, and customs services.

The commercial operation of drones requires a license. For drones with a MTOM above 25kg, this requires a minimum capital of KRW 30 million. There is also an insurance requirement with listed coverages for property damages and personal injuries.

Initially, non-commercial drone flights up to a MTOM of 12kg did not require a license or registration. Flights in restricted airspace do require permission, as do BVLOS flights. An operator's license is required for drones with a higher MTOM than 12kg.

General rules include keeping distance from crowds, no night-time flights or flights in low visibility, remaining within VLOS, remaining below the 150m altitude limit, and keeping a 9,3km distance from airports. No-fly zones include dense urban areas – such as most of Seoul – energy plants, State and military infrastructure, and the Korean DMZ.

Since 2021, all drones with an MTOM over 2kg for non-commercial use and every commercial use drone regardless of MTOM must be registered. Mandatory testing and licensing have been introduced. Pilots of drones weighing over 12kg must be certified. Insurance remains mandatory. For drones over 25kg, stricter pilot certification is required, as is safety certification of the drone itself. For drones under 2kg, only online training is required. Drones over 25kg require flight approval. All drones flying in restricted airspace require flight approval, as do night-time flights and special higher risk flights. Operational and safety manuals are required.

Additional provisions on drones were adopted in 2020.[63] It sets out the wider policy objectives to support the drone industry.

[63] 드론 활용의 촉진 및 기반조성에 관한 법률 (약칭: 드론법), 시행 2020. 5. 1.법률 제 16420 호.

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5. Conclusion

As noted, the EU legal framework will principally not apply to UAV operations by police and first responders. Nevertheless, Member States do have the option to also apply this legal framework to such use cases. It is, therefore, important to identify the option chosen by Member States, or the alternative rules they apply in their own jurisdiction. This exercise was conducted under section 4 of this deliverable.

If the EU rules on UAVs were to apply to Respondrone, it is clear that the operations envisioned cannot be classified under the 'open' category. Neither can the standard scenarios STS-01 and STS-02 suffice, as they impose operational requirements – such as limited distance between the UAV, the pilot and observers and that any pilot can only operate one UAV at a time – that do not correspond to the operations envisioned within Respondrone. Respondrone operations should therefore be classified under the 'specific' category and require an operational authorization – unless operated under the holder of an LUC licence.

The current laws on drones in the States analysed in section 4 of this deliverable show that in several cases the national legal framework will also apply to the use of drones by first responders, subject to a few exceptions. Nevertheless, there are also cases where this legal framework does not apply to police and first responders, and where different sectoral rules may apply. However, it does not seem that many EU Member States will subject the use of drones by first responders to the EU legal framework. Furthermore, several Member States were found to have implemented the 'one pilot, one drone' rule in their national legal frameworks. Also here, it must be followed up whether legislative developments will influence this matter, given its importance to the Respondrone solution.

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