【欧州】【航空】

Aviation - Policies on drones in the transport sector: The European Commission adopts U-space package on new rules and conditions for drone operations

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【概要：Summary】

Private or commercial utilization of unmanned aircraft systems (UAS) or drones is continuously growing, and they have the potential to improve the transport system in congested cities and sub-urban areas. However, the increased use of drones and the related safety problems for manned aviation increase in parallel, due to intentional or unintentional improper use of drones.

For years, there did not exist any EU-wide harmonised regulations on the safe utilisation of UAS. Regulations were fragmented and widely different in the individual EU Member States. Therefore, the European Commission together with the European Aviation Safety Agency (EASA) started to develop the basic legislation and measures for registration, e-identification, and geo-fencing for the safe utilisation of drones in the EU.

The opening of the aviation market to the civil use of remotely piloted aircraft systems and drones in a safe and sustainable manner is part of the 2015 Aviation Strategy for Europe COM (2015) 613 final. The aim is to ensuring safe operations of drones and to address security issues and environmental concerns as well as to facilitating the enforcement of citizen's privacy rights.

The 2016 Warsaw Conference on Drones further called for urgent action on the airspace dimension, in particular the development of the concept of a space, with a set of digital services enabling the safe scaling up of routine drone operations. The development of a UAS traffic management system (UTM) for Europe led to the development of the "U-space" concept. U-space is a set of new drone services relying on a high level of digitalisation and automation of functions and specific procedures designed to support safe and secure access to airspace for large numbers of drones. The objective of the U-space is to improve the overall awareness for drone operations, as well as to streamline and automate the flight authorisation process, to lift as many restrictions as safely possible, and to support the development of a competitive EU drone services market. At first, the U-space is planned to be implemented in urban and sub-urban environments, around logistic hubs and around airports.

On 22 April 2021, the European Commission adopted the U-space package, which includes three regulations that create the necessary preconditions for both, drones, and manned aircraft to operate safely in parallel in sections of the U-space airspace.

【記事：Article】

1. The introduction of EU-wide harmonised legislation on UAS

Drones or unmanned aircraft systems (UAS) are expected to offer many opportunities for new services and business models, particularly in the cities and sub-urban areas. While the market for drones grew quickly in the EU in the past years, existing regulations on drones were fragmented and widely different in the individual EU Member States. However, since the use of drones raises concerns about safety, security, and privacy, amplified by several incidents with drones and manned aviation in European airspace, the introduction of harmonised regulation on drones at EU level became necessary.

In December 2013, the European Council asked the Commission to develop a framework for the safe integration of civil drones (or "remotely piloted aircraft systems" - RPAS) into the EU's airspace. On 8 April 2014, the European Commission proposed new standards to regulate the operations of civil drones and in December 2015, the European Commission proposed the creation of an EU-wide harmonised legislation as part of its Aviation Strategy (COM (2015) 613, 2015/0277(COD)).

The new EU standards were aimed at covering all aspects of drone safety, security, privacy, data protection, insurance, and liability. In its "Technical Opinion" of December 2015, the EASA presented the "basic principles" for a "risk-based approach" for the regulation on the civil use of drones in the EU. Commercial use of drones in Europe would be divided into three categories of civil drones, depending on their weight and utilisation. Furthermore, since civil drones can be subject to potential unlawful actions and security threats, the EASA had also been tasked to develop necessary security requirements. To harmonise the EU's fragmented regulatory framework of safety rules for drones, the Regulation (EU) 2018/1139 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency (EASA) entered into force on 11 September 2018. This new so-called EASA Basic Regulation established, for the first time, EU-wide rules for a safe, secure, and environmental clean utilisation of drones and for the development of the EU's drone market. It empowers the European Commission to adopt delegated acts laying down detailed rules regarding the necessary features and functionalities for unmanned aircraft. The EASA Basic regulation (EU) 2018/1139 also enlarges EASA's role in areas such as in environmental protection, research, and development, and it empowers EASA with the technical expertise to regulate drones of all sizes to coordinate cybersecurity in aviation. Thereby, With the coming into force of the new Basic Regulation (EU) 2018/1139, a risk-based and operations-centric approach was established and the EASA's role in the domain of drones and urban air mobility was formalised.

In 2019, the Commission adopted a first set of detailed rules for the design and operation of drones in Regulation 2019/945 and Regulation 2019/947. These EU rules apply to all drones, regardless of weight and to all operators of drones - both professionals and those flying drones for leisure. The European Commission adopted the set of common and EU-wide rules on the technical requirements for drones, the Commission Delegated Regulation (EU) 2019/945 of 12 March 2019 on unmanned aircraft systems and on third country operators of unmanned aircraft systems (C/2019/1821). It was an important step towards implementing a comprehensive set of rules to ensure safe, secure, and environmentally friendly operations of drones in the EU.

On 24 May 2019, the European Commission also adopted Commission Implementing Regulation (EU) 2019/947. It contains procedures for the operation of unmanned aircraft to ensure increasing drone traffic across Europe towards

the operation of unmanned aircraft. It also lays down detailed provisions for the personnel, including remote pilots and organisations involved in those operations of unmanned aircraft. While UAS operations in the "open" category shall not be subject to any prior operational authorisation, nor to an operational declaration by the UAS operator before the operation takes place, UAS operations in the "specific" category shall require an operational authorization. UAS operations in the "certified" category shall require the certification of the UAS pursuant to Delegated Regulation (EU) 2019/945 and the certification of the operator and, where applicable, the licensing of the remote pilot. As of June 2020, operators of drones must register in the Member State where they reside or where they have their main place of business. Once authorised in one Member State, both professional and recreational operators can fly their drones across the EU.

However, the Delegated Regulation (EU) 2019/945 was amended by the Commission Delegated Regulation (EU) 2020/1058, as regards the introduction of two new unmanned aircraft systems classes. The Commission Implementing Regulation (EU) 2020/639 amends the Implementing Regulation (EU) 2019/947 as regards standard scenarios for operations executed in or beyond the visual line of sight. These technical and operational rules replaced any national rules on drones in the different Member States as of 1 January 2021. However, due to the COVID-19 pandemic, dates for the introduction of applications of certain measures in Implementing Regulation (EU) 2019/947 had to be postponed, based on the Commission Implementing Regulation (EU) 2020/746 of 4 June 2020, due to the COVID-19 pandemic. The application of the Implementing Regulation (EU) 2019/947 had been postponed from 1 July 2020 to an application from 31 December 2020 onwards.

In Article 20 of the Implementing Regulation (EU) 2019/947, regarding particular provisions concerning the use of certain UAS in the 'open' category, "when they have been placed on the market before 1 July 2022", this date is replaced by "1 January 2023". In Article 21, regarding the Adaptation of authorisations, declarations and certificates, the deadlines have been extended by six months in every case, as the deadline of 1 July 2021 is replaced by '1 January 2022", and the deadline 1 July 2022 is replaced by '1 January 2023'. Furthermore, the transitional period in Article 22 has been extended from two years to 30 months.

Finally, the date of application of measures in Paragraph 3 of Article 15 regarding Operational conditions for UAS geographical zones and the making of information on the UAS geographical zones, including their period of validity publicly available in a common unique digital format was also postponed from 1 July 2021 to 1 January 2022.

2. The U-space concept

Drones and U-space services have the potential to improve the transport opportunities in congested cities and their surroundings and they have the potential to create fast evolving investment opportunities. The opening of the EU's aviation market to the civil use of UAS or drones in a safe and sustainable manner was part of the 2015 Aviation Strategy for Europe COM (2015) 613 final. This Strategy was endorsed by the aviation community in the Riga Declaration and is regularly updated, like in the Warsaw Declaration of 2016, the Helsinki Declaration of 2017, and the Amsterdam Declaration of 2018 to take stock of the progress and to indicate new priorities.

The 2016 Warsaw Conference on Drones called for the development of the concept of a space for drones, within the European airspace including a set of digital services. The need for a UAS traffic management system (UTM) emerged in recent years to ensure safe operation of a large number of drones at low altitude (especially in urban

areas) as the ATM ensures the safety of aircraft operations at high altitude. The Commission, EASA and the SESAR Joint Undertaking are working on the development of a UAS traffic management system (UTM) concept for Europe, the "U-space". This is the term used for Unmanned Traffic Management (UTM), and the "U" in U-space could stand for "unmanned" or "urban", as the U-space will be first implemented in urban and sub-urban environments, around logistic hubs and around airports, where the complexity of traffic patterns and the demand for value-added drone services need specific traffic management solutions. The "U-Space airspace" means a geographical zone, designated by the EU Member States, where UAS operations can take place with the support of U-space services.

In support of the U-space initiative, in 2017 the SESAR Joint Undertaking drafted the U-space blueprint, a vision of how to make U-space operationally possible. The blueprint proposes the implementation of 4 sets of services. In U1 service, U-space foundation services cover e-registration, e-identification and geofencing. In U2 service, U-space covers initial services for drone operations management, including flight planning, flight approval, tracking, and interfacing with conventional air traffic control. In U3 service, U-space advanced services support more complex operations in dense areas such as assistance for conflict detection and automated detect and avoid functionalities. In U4 service, U-space full services offer very high levels of automation, connectivity, and digitalisation. The U-Space will be gradually deployed and the foundation elements like drone registration, electronic identification and geo-awareness will be set up. Additional functionalities will be progressively added until U-Space is operational in 2025, allowing fully autonomous operations.

The U-space is also included in the "Sustainable and Smart Mobility Strategy - putting European transport on track for the future" (COM/2020/789 final) of December 2020. This Sustainable and Smart Mobility Strategy COM (2020) 789 final lays the foundations for how all transport modes can become more sustainable and concrete milestones will keep the European transport system's on track towards a smart and sustainable future.

Regarding drones and unmanned aircraft, the Commission fully supports their deployment and will further develop the relevant rules, including on the U-space, to make it fit for enhancing safe and sustainable mobility. The Commission will also adopt a "Drone Strategy 2.0" setting out possible ways to guide the further development of this technology and its regulatory and commercial environment. The action plan for sustainable mobility under the Sustainable and Smart Mobility Strategy includes to further develop the regulatory framework for drones and unmanned aircraft in 2021-2023.

3. European Commission adopts the U-space package on new rules for drone operations

The European Commission is developing the institutional, regulatory, and architectural framework for the provision of U-space services. The common rules will help drone operators to have a clear understanding of the operation law at EU-wide level.

On 22 April 2021, the European Commission adopted the U-space package, which includes three regulations that create the necessary preconditions for both, drones, and manned aircraft, to operate safely in parallel in sections of the U-space airspace. The three regulations introduce new services for drone operators, which will allow longer-distance operations, within the low-level airspace of below 120 m altitude and when out of sight.

The Commission Implementing Regulation (EU) 2021/664 of 22 April 2021 on the framework for the U-space lays down rules and procedures for the safe operations of UAS in the U-space airspace, for the safe integration of UAS into the aviation

system and for the provision of U-space services. Furthermore, the Commission Implementing Regulation (EU) 2021/665 amends Implementing Regulation (EU) 2017/373 regarding the requirements for providers of air traffic management, air navigation services and other air traffic management network functions in the U-space airspace. Finally, the Commission Implementing Regulation (EU) 2021/666 of 22 April 2021 amends the Regulation (EU) No 923/2012 as regards requirements for manned aviation operating in U-space airspace.

The Commission Implementing Regulation (EU) 2021/664 of 22 April 2021 on the framework for the U-space lays down rules and procedures for the safe operations of UAS in the U-space airspace, for the safe integration of UAS into the aviation system and for the provision of U-space services.

The Regulation defines the U-space airspace as a UAS geographical zone designated by EU Member States, where UAS operations are only allowed to take place with the support of U-space services. It contains details regarding the U-Space services including network identification service, geo-awareness service and UAS flight authorisation service. The regulation also contains the details regarding the certification of U-Space service providers and single common information service providers. It applies to operators of UAS, U-space service providers and providers of common information services within the U-space airspace. However, the regulation shall not apply to operations of UAS conducted in the framework of model aircraft clubs and associations that have received an authorisation based on the Implementing Regulation (EU) 2019/947, among others.

The EU Member States must determine the UAS capabilities and performance requirements, the U-space services performance requirements and the applicable operational conditions and airspace constraints. Where EU Member States decide to establish a cross-border U-space airspace, they shall jointly decide on the designation of the cross-border U-space airspace, the provision of U-space services and the provision of common information services.

The regulation also defines the U-space service providers duties and responsibilities such as to establish arrangements with the air traffic services providers to ensure adequate coordination of activities, as well as the exchange of relevant operational data and information. They also ensure that the information is exchanged in accordance with the data quality, latency, and protection requirements, among others. It defines the capabilities of the competent authorities and their tasks. The Commission Implementing Regulation (EU) 2021/664 shall apply from 26 January 2023.

On 22 April 2021, the Commission also adopted the Commission Implementing Regulation (EU) 2021/665. It amends Implementing Regulation (EU) 2017/373 regarding the 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. This Commission Implementing Regulation (EU) 2021/665 also contains rules for the dynamic airspace reconfiguration. This means that the designated U-space airspace is temporarily modified to accommodate short-term changes in manned traffic demand. This is achieved by adjusting the lateral and vertical geographical limits of that U-space airspace. The Air traffic control units shall ensure that the relevant U-space service providers or single common information service providers are notified in a timely and effective manner of the activation, deactivation, and temporary limitations of the U-space, among others.

Finally, the Commission Implementing Regulation (EU) 2021/666 of 22 April 2021 amends Commission Implementing Regulation (EU) 2017/373 as regards requirements for manned aviation operating in U-

space airspace. It contains SERA.6005 requirements for communications, SSR transponder and electronic conspicuity in U-space airspace, including definitions for airspace designated as Radio mandatory zone (RMZ), in which continuous air-ground voice communication watch needs to be maintained and two-way communication established. All flights operating in a Transponder mandatory zone (TMZ) airspace designated by the competent authority need to carry and operate SSR transponders. Furthermore, in U-space airspace designated by the competent authority, manned aircraft operating in a U-space airspace and not provided with an air traffic control service by the ANSP, shall continuously make themselves electronically conspicuous to the U-space service providers. This Implementing Regulation shall apply from 26 January 2023.

4. Conclusion

According to the Commissioner for Transport Adina Vălean, drones are a part of the future transport and logistics landscape and they have a vast potential for new cargo and delivery services, as well as other innovative applications like drone passenger flights.

The U-space creates EU-wide harmonised conditions needed for manned and unmanned aircraft to operate safely in the same airspace. It is necessary to prevent and to mitigate the risks of drone traffic in the air and on the ground. In this context, the U-space package is an important step towards creating the well-functioning, trusted and safe environment for drones.

By adapting the U-space package on 22 April 2021, the European Commission has fulfilled the objectives in the 2015 strategy and the 2016 Warsaw declaration. The U-space related regulatory package will become applicable as of 26 January 2023. The EASA is preparing the technical specifications (Acceptable Means of Compliance/Guidance Material) to allow the industry and competent authorities to implement the rules. Although the U-space package has now been adopted, due to the COVID-19 pandemic, several steps had to be postponed until 2022 or 2023 and therefore, the application of the U-space package will not start before 2023. However, this postponement gives the EU Member States the time to prepare the necessary steps without haste, while currently there are pandemic-related pressing issues in the focus.

References

Commission Delegated Regulation (EU) 2019/945 of 12 March 2019 on unmanned aircraft systems and on third country operation of unmanned aircraft's systems. In: Official Journal of the European Union L 152, Volume 62 11 June 2019. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L:2019:152:TOC, p. 1, retrieved 17 June 2019

Commission Implementing Regulation (EU) 2019/947 of 24 May 2019 on the rules and procedures for the operation of unmanned aircraft (Text with EEA relevance). In: Official Journal of the European Union L 152, Volume 62 11 June 2019. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32019R0947, retrieved 26 April 2021

Commission Implementing Regulation (EU) 2020/639 amending Implementing Regulation (EU) 2019/947 as regards standard scenarios for operations executed in or beyond the visual line of sight. In: https://eur-lex.europa.eu/eli/reg_impl/2020/639/oj, 12 May 2020, retrieved 27 April 2021

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. In: https://www.easa.europa.eu/document-library/regulations/commission-implementing-regulation-eu-2020746, retrieved 27 April 2021

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. C/2020/1991. In: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020R1058, OJ L 232, 20.7.2020, p. 1-27, retrieved 27 April 2021

Commission Implementing Regulation (EU) 2021/664 of 22 April 2021 on a regulatory framework for the U-space (Text with EEA relevance). In: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32021R0664&qid=1619438487049, C/2021/2671, retrieved 27 April 2021

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 (Text with EEA relevance). C/2021/2672. In: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32021R0665&qid=1619438487049, OJ L 139, 23.4.2021, p. 184-186, retrieved 27 April 2021

Commission Implementing Regulation (EU) 2021/666 amending Regulation (EU) No 923/2012 as regards requirements for manned aviation operating in U-space airspace. C (2021) 2673 final. In: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32021R0666, OJ L 139, 23.4.2021, p. 187-188, retrieved on 27 April 2021

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Sustainable and Smart Mobility Strategy - putting European transport on track for the future. COM/2020/789 final. In: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0789, 9.12.2020, retrieved 27 April 2021

EASA (2015): Technical Opinion - Introduction of a Regulatory Framework for the Operation of Unmanned Aircraft, http://easa.europa.eu/system/files/dfu/Introduction%20of%20a%20regulatory%20framework%20for%20the%20operation%20of%20unmanned%20aircraft.pdf, retrieved 27 April 2021

European Commission: COMMISSION IMPLEMENTING REGULATION (EU) .../... of 22.4.2021 on a regulatory framework for the U-space. C(2021) 2671 final In: https://ec.europa.eu/transport/sites/transport/files/c20212671-u-space.pdf, 22.4.2021, retrieved 27 April 2021

European Commission: COMMISSION IMPLEMENTING REGULATION (EU) .../... of 22.4.2021 amending Commission 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. C(2021) 2672 final. In: https://ec.europa.eu/transport/sites/transport/files/c20212672-u-space.pdf, 22.4.2021, retrieved 27 April 2021

European Commission: COMMISSION IMPLEMENTING REGULATION (EU) .../... of 22.4.2021 amending Regulation (EU) No 923/2012 as regards requirements for manned aviation operating in U-space airspace. C(2021) 2673 final. In: https://ec.europa.eu/transport/sites/transport/files/c20212673-u-space.pdf, 22.4.2021, retrieved 27 April 2021

European Commission: Drones: Commission adopts new rules and conditions for safe, secure and green drone operations. In: https://ec.europa.eu/transport/modes/air/news/2021-04-22-drones_en, 22/04/2021, retrieved 27 April 2021

European Commission: EUROPEAN COMMISSION April 2021 Drones: Commission adopts new rules and conditions for safe, secure and green drone operations -Questions and Answers. In:

https://ec.europa.eu/transport/sites/transport/files/2021-04-06-qa-uspacereg.pdf, retrieved 27 April 2021

European Commission: Mobility Strategy. A fundamental transport transformation: Commission presents its plan for green, smart and affordable mobility. In: https://ec.europa.eu/transport/themes/mobilitystrategy_en, retrieved 27 April 2021

European Commission: Unmanned aircraft. In: https://ec.europa.eu/defence-industry-space/eu-defence-industry/unmanned-aircraft_en, retrieved 27 April 2021

One step closer to harmonised rules for safe drones operation in Europe. In: https://www.easa.europa.eu/newsroom-and-events/news/one-step-closer-harmonised-rules-safe-drones-operation-europe, retrieved 3 June 2019

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, 22.8.2018, p. 1-122. In: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32018R1139, OJ L 212, 22.8.2018, p. 1-122, retrieved 27 April 2021

WARSAW DECLARATION. In: https://ec.europa.eu/transport/sites/transport/files/drones-warsaw-declaration.pdf, 24 November 2016, retrieved 27 April 2021