EASA
European Union Aviation Safety Agency

DRONE INCIDENT MANAGEMENT AT AERODROMES

PART 1:
The challenge of unauthorised drones in the surroundings of aerodromes

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1.1. Introduction and context

Unmanned Aircraft Systems (UAS), commonly referred to as "drones"[1], represent tremendous economic and innovation opportunities. It is estimated that by 2035, the European drone market will generate a value of EUR 10 billion a year[2]. With an ever-growing number of drones taking to the skies, their safe and secure integration into the airspace poses the main challenge to enabling the market. With this challenge in mind, it is noted that the number of incidents involving drones has steadily increased in Europe and around the globe over recent years. In most cases, unauthorised drones are being reported near or inside the perimeter of airports[3] (or in its immediate proximity) or in the arrival and departure paths of runways, which aircraft use at landing or take-off. Given the potential for disastrous effects following a collision between a manned aircraft and a UAS[4], aerodrome operators and Air Navigation Service Providers (ANPSs) may, in managing such an incident, often have no option but to stop or restrict runway operations, leading to a severe disruptions to air traffic.

1.2. The challenge posed to civil aviation by drones

Unauthorised drones in the surroundings of aerodromes already represented a latent/ potential risk for a couple of years, but it took the events at London Gatwick airport in December 2018 to bring it to attention of the public and the authorities. Between 19 and 21 December a total of 115 drone sightings over airport of London-Gatwick were reported lead to the closure of its single runway. During the disruption, which lasted 33 hours, over 1,000 flights had to be cancelled[5], thereby affecting some 140,000 passengers[6]. Since then, several other drone incidents took place across Europe, with a varying degree of disruptions on aerodrome operations. On 3 February 2020 for instance, three out of four runways at Madrid Barajas airport were temporarily inoperable on a Monday morning, following a drone sighting, with 26 flights being re-routed. At Frankfurt airport, one of Europe's busiest, runway operations and some flights were suspended twice within one month (8 February and 2 March 2020) due to the reported presence of drones. Since 2015, DFS, the German Air Navigation Service Provider (ANSP), has counted more than 500 such events. And even with the dramatic decrease of traffic in 2020 due to the COVID-19 crisis, still 92 drone interferences were observed in 2020[7].

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1 UAS is the legal and technical term used in the EASA Basic Regulation as well as in the delegated and implementing acts adopted on the basis thereof. 'Drones' is the popular term used to be understood by persons with no aviation background. Both terms are used interchangeably in this document.

2 European Drones Outlook Study, SESAR JU, available here;

3 In this document, and in the manual as whole, the term "airport" is used when both the landside and the airside is meant, while the term "aerodrome" is used when only the airside is meant, see glossary. That way, it is possible to talk about the whole facility (airport) on the one hand, and on the other hand, address the aviation infrastructure, by using the term aerodrome. The EASA rules found in Regulation (EU) 139/2014 currently only regulate the safety of aerodromes.

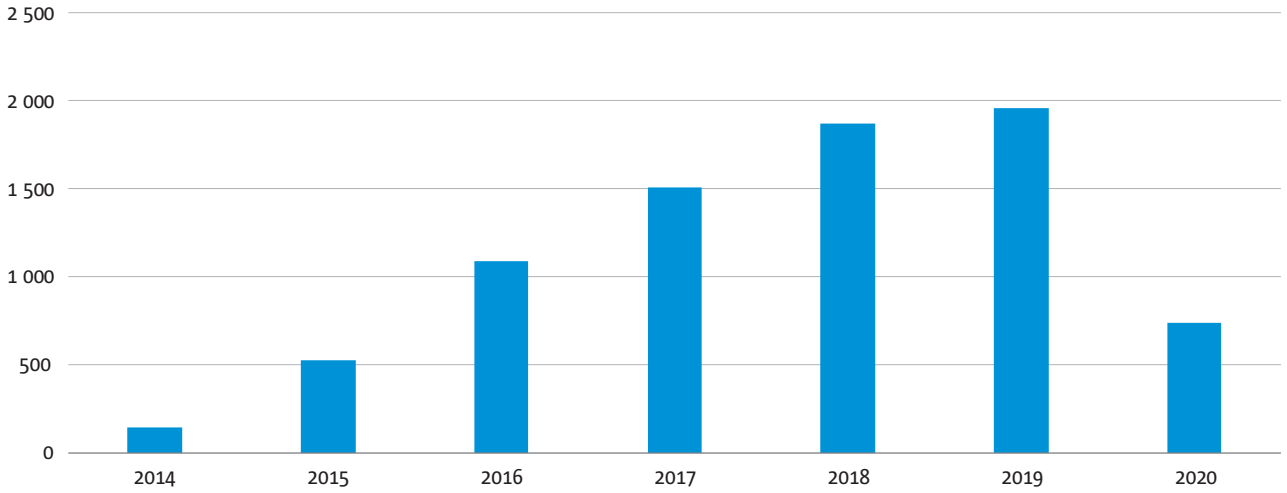
4 EASA has commissioned research into the collision risk leading all the way to 2023. However, a review of the present understanding of the problem is already available in a literature review "Vulnerability of manned aircraft to drone strikes" (RESEARCH PROJECT EASA.2020.C04);

5 The average cost of one hour of delay and one flight cancellation is stated as being EUR 6,600 and EUR 17,650 respectively.

6 „Mystery of the Gatwick drone ", The Guardian, 1.12.2020.

7 DFS according to FAZ, 18 January 2021. Incidents inside the 1.5-kilometre zone around the DFS airports were 26 in 2020.

Figure A: Reported UAS occurrences between 2014 and 2020 (Source: EASA query from the European Central Repository, ECCAIRS).[8]



While each incident[9] is specific and dynamic, certain common factors are often at play. Firstly, incidents tend to appear – and sometimes can escalate - very quickly. Readily available "race" drones can reach speeds of 80 kilometres per hour. At such a speed, it would, for example, take less than 4 minutes for a drone to move from being outside a 5-kilometre protection zone to the runway itself. Secondly, incidents are dynamic as drones continue to fly and move around with flight patterns much more agile than manned aviation. Thirdly, it is often difficult to confirm reliably a sighting as the drones cannot be individually identified, leading to uncertainty in determining if one or more drones caused the disruption. Lastly, it is often difficult to locate the remote pilot, especially at aerodromes that rely on the human based detection of drones.

Over time, commercial drone operations will be integrated in the air transport system. However, the unauthorised operation of a drone in the surroundings of aerodromes is not an integration problem. It is in fact similar to an unauthorised manned aircraft in the surroundings of an aerodrome, and in neither case has the aircraft been approved for the operation in that air space. Unfortunately, the identification of a small UAS in this situation is demonstrably far more difficult. Equally, the pilots/ operators of unauthorised UAS cannot be easily identified, nor tracked, and excluded from the airspace where they pose the greatest safety risk and even a potential security threat to civil aviation.

Besides the safety risks to passengers, crew and people on the ground, drone incidents can cause severe economic cost to airports and airlines. The 2018 Gatwick incident is estimated to have cost the industry up to EUR 64 million. Even incidents of a smaller scale can result in significant cost, especially if they lead to the closure of the runway. For the ten largest European airports, the delay cost of a 30 minutes runway closure is estimated to range from EUR 325,000 to EUR 514,000. This represents a real burden for the industry, particularly as the number of incidents has multiplied in the past years. Such incidents could also have a potential knock-on effect on the drone industry itself. The societal acceptance may decrease and stronger regulation (e.g. increase in prohibitions and restrictions) may result. Therefore, it is in the interest of the entire aviation community to tackle this safety issue.

8 The decrease in occurrences in 2020 can in part be explained by the general decrease in air traffic, because pilots report most drone sightings.

9 For the definitions of "occurrence", "incident" and "drone incident" please see under the glossary under section 1.11.1 below.

1.3. EASA´s Counter - UAS Action Plan

To address the risks and threat emanating from drones the stakeholders of the European Union Aviation Safety Agency (EASA) adopted in 2019 a Counter-UAS Action Plan proposed by the Agency, which has since been included into the European Plan for Aviation Safety (EPAS) [10]. The EPAS lists five concrete objectives for this action plan, which aim to ensure that the aviation sector is *"...prepared to prevent as far upstream as possible, and react to misuse of drones with minimum disruption of operations, while still being able to accommodate friendly (cooperative) drone operations"*.

Objective 2 of the Action Plan aims to better *"Prepare aerodromes to mitigate risks from unauthorised drone use"*. In terms of the means to achieve the objective, it was decided to address the issue firstly with the development of safety promotion material. A possible option could have been to initiate a formal rulemaking process based on the EASA Basic Regulation[11]. But in line with the "Better regulations policy" the Agency decided to issue guidance and best practices in the form of a manual aiming to assist aerodromes and other aviation actors to manage the new hazard and the associated safety risks by relying on the rules already in force for drones, drone operators, aerodrome operators, ANSPs and air operators; and to use the established safety risk management framework. At the same time the collaboration with local law enforcement authorities is also covered.

Objective 2: Prepare aerodromes to mitigate risks from unauthorised drone use[12]

Preparing aerodrome operators, key actors, and stakeholders to mitigate risks from incidents of unauthorised drones in the surroundings of aerodromes including the description of roles and responsibilities of all key actors for the following areas:

- Information gathering for a potential drone incident (including detection methods).
- Risk assessment taking into account airport security aspects.
- Sharing of information and decision-making during incidents.
- Coordination of responses and learning from incidents. and
- Personnel training and public awareness campaigns.

The objective of the proposed action #2 is to develop comprehensive guidance material on how to manage drone incidents at and in the surroundings of aerodromes, before, during and after they occur. The material takes account of and will be in line with the new ICAO guidance material in the ICAO Aviation Security Manual (Doc 8973).

This manual, titled "Drone Incident Management at Aerodromes", and its part 2 providing guidance and recommendations and its part 3, providing resources and practical tools, delivers on this objective. It provides guidance on how to develop appropriate arrangements and procedures which support an incident-response that is quick, effective, and proportionate. In this way, air traffic suspensions, or air space or runway closures, may be avoided or kept to a minimum and airports´ closure would remain a last resort.

10 See pages 52 of the EPAS 2021-2025 under the following link: EPAS 2021-2025; the related safety promotion task has the number SPT.091, page 176 (Vol. II). European safety promotion on civil drones: Coordinate European activities to promote safe operation of drones to the general public.

11 See article 38 Aerodrome surroundings in Regulation (EU) 2018/ 1139 and annex VII thereof.

12 As amended by issue 3 of Counter-UAS Action Plan dated 23 September 2020.

1.4. Audience and scope of the guidance and recommendations

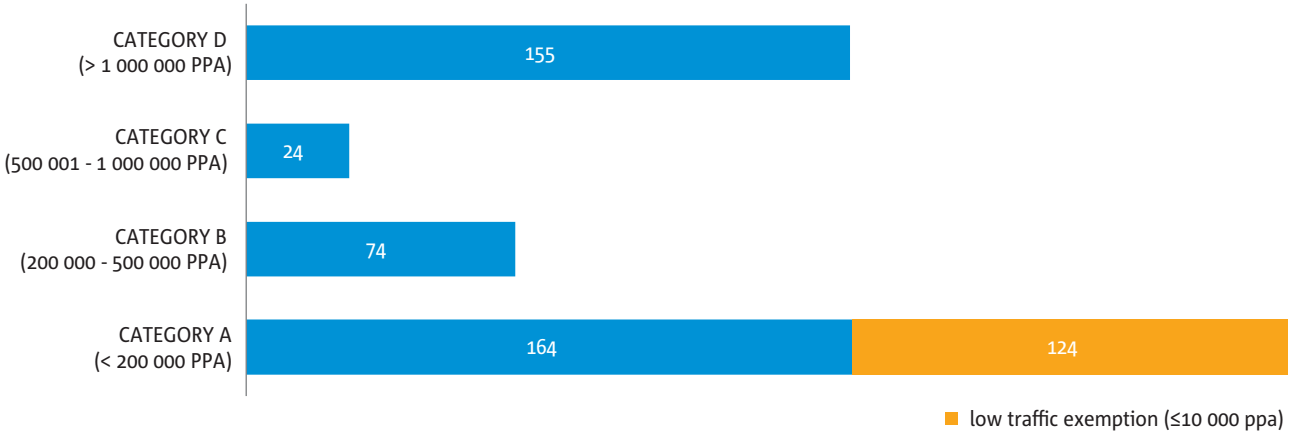
1.4.1. Aviation organisations addressed

In general, the material found in the manual aims to support European aerodrome operators, air navigation service providers (ANSPs) and air operator in their efforts to mitigate unauthorised drone activities.

In particular the manual addresses the operators of all aerodromes falling under the EASA Basic Regulation[13], i.e. aerodromes that are open to public use, serve commercial air transport, have a paved instrument runway of at least 800 metres, or exclusively serve helicopters using instrument approach or departure procedures. The manual aims at helping both larger and smaller aerodromes to prepare themselves for potentially disruptive drone incidents.

As illustrated by the chart below there are at moment 417 aerodromes that have implemented[14] the full set of the European rules for aerodrome safety. Of those 155 aerodromes are larger, as they had over 1 million passengers before the COVID-19 crisis. An almost equal number of aerodromes (164) have also implemented these rules but had under 200,000 passengers per year. An additional 124 aerodromes are exempt from the European rules due to having low traffic[15].

Figure B: Aerodromes in the scope of the European rules for aerodrome safety grouped by passenger numbers (based on normal recent year).



This manual advocates a risk-based approach to the problem, involving the tools of the Safety Management System (SMS) framework[16]. All aerodrome operators should study the extent of the problem in their surroundings. Depending on their individual risk profile, in terms of exposure (i.e. the traffic volume and number of occurrences of unauthorised drones[17] in their surroundings[18]), it is expected that aerodrome operators put in place procedures and measures that will protect the aerodrome from such incidents proactively and reactively.

13 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

14 With very few exceptions.

15 Exemption clause for aerodromes having less than 10,000 passengers per year, based on article 2(7) of Regulation (EU) 2018/1139.

16 As laid out in ICAO annex 19 “Safety Management” and ICAO Safety Management Manual, 4th edition, 2018 (Doc. 9859) and the European aviation safety rules..

17 The likelihood of a drone incident strongly correlates with the airport´s proximity to a conurbation, i.e. towns and cities where people might operate drones in the open category.

18 The type of traffic, i.e. general aviation, and helicopter operations versus large aircraft operations, needs to be considered, as the former aircraft are more vulnerable in a collision with a drone.

Moreover, the manual is also addressing ANSPs, who provide air traffic services at the above-mentioned aerodromes, because the control towers at these controlled aerodromes ensure the safe separation of air traffic from unauthorised airspace infringements. Aerodromes with only Aerodrome Flight Information Services (AFIS) are not the focus of the manual. At the time of writing, it is not clear how many of the aerodromes in the EASA scope are only serviced by AFIS[19].

Finally, the guidance material is also addressed to air operators and pilots, as they play a very important role in the reporting of drone sightings. Pilots are vital in notifying drone sightings to air traffic control (ATC) and play therefore a crucial role in the drone incident management process at the aerodrome. They have their direct radio access to the tower staff and thereby allow a first reaction to drone incidents by the ATC tower. However, when it comes to the decision-making and deployment of the comprehensive incident response to a drone incident, they have a more passive role, as they do not have the full picture of the incident. After the reporting of a suspected drone, the pilots are becoming recipients of traffic information and are required to abide by the air traffic instructions and information given to them by the ATC. On the other hand, the aircraft pilots are responsible for the safety of the flight and have the final authority to make a safe decision and can, on the basis of the information of ATC and depending on the circumstances, deviate from ATC instruction. Thus, the needs and concerns of air operators and pilots should be considered when the aerodrome operators (safety and security), ATC and the law enforcement authorities are devising their drone incident management processes.

1.4.2. National competent authorities[20] addressed

Besides the aviation organisations, this manual is relevant for all national competent and appropriate authorities in the EASA Member States[21] and beyond, who oversee aviation safety and aviation security. It seeks to help them to put all prerequisites in place at the national and local level to prepare themselves for the challenge and support the preparations of the aviation actors in their efforts to manage the threats emanating from unauthorised drones effectively.

1.4.3. Law enforcement authorities addressed

The document may also be informative for the law enforcement authorities (LEA) in the European Union, who are also challenged by drones with respect to public safety and security outside of the aviation context. Moreover, this document was prepared at the European level, and should therefore be interpreted with consideration given to the legal and constitutional arrangements that prevail in each Member State. Given this constraint, where law enforcement authorities are concerned, this document remains at a high level. This is because different arrangements may exist in the Member States resulting in more than one law enforcement authorities and services being responsible for the security of civil aviation and the protection of critical infrastructure from malicious acts. Nevertheless, the document offers some guidance material for first responders to drone incidents, be they from law enforcement or airport security.

1.4.4. Scope with respect to drones

In general, it needs to be understood that a drone is referred to as “unauthorised” when it is being operated in violation of the applicable rules and regulations applicable for the type of UAS operations, and or when a drone is operated outside of a permitted UAS geographic zones or outside the parameters of its authorisation.

19 Aerodrome Flight Information Services: According to information gathered by EASA in 2016, there are 241 AFIS aerodromes in the 18 States which declared having such service implemented. However, it is unclear how many of these aerodromes fall under the EASA rules for aerodrome safety.

20 National competent authority means one or more entities designated by a Member State and having the necessary powers and allocated responsibilities for performing the tasks related to certification, oversight and enforcement in accordance with this Regulation and with the delegated and implementing acts adopted on the basis thereof, and with Regulation (EC) No 549/2004.

21 Or other designated local competent and appropriate authorities for the oversight of aerodrome safety and airport security.

The manual for "Drone Incident Management at Aerodromes" seeks to mitigate risks from unauthorised civilian drones with a take-off mass up to 25 kg[22]. Such drones are normally permitted to be operated in the "open category"[23]. When operated away from protected installations maintaining visual contact between the drone pilot and drone and flown below 120m height, the operational risk under the "open category" is usually considered so low, that no prior authorisation is required before starting the flight.

Figure C: Categories of drone operations specified by the European rules on drones.

OPEN – low risk

- Operations at maximum height <120m and max. 25kg and only in Visual Line of sight (VLOS) and inside UAS zones;
- No pre-approval but minimum training;
- 3 Sub-categories: fly over, close, far from people

Example:

- General public / recreational purpose
- Model Flying, Photographers

SPECIFIC - higher risk

- Operations in very low airspace.
- Authorization by Nat. Comp. Auth.
- Based on specific operation risk assessment (SORA);
- Declaration in case of standard scenario;
- Light UAS operator certificate.

Example:

- Below VLOS operations (linear inspections, aerial work, ...)
- Transport of goods.

CERTIFIED - risk equal to manned aviation

- Operations in controlled airspace;
- Certification of UAS by EASA;
- Approval of the operator and licensed pilot by the NAAs, unless autonomous flight).

Example:

- Package delivery over people;
- Air Taxi;
- International IFR flights (cargo, passengers).

The problem is however that such drones, together with home-built drones, falling into the open category of UAS operations, as well as manipulated off-the-shelf drones, may pose a considerable risk/ threat to civil aircraft when these are landing or taking off. In such case the drone pilot is deliberately or unknowingly operating a drone in an airspace where drone operations are not permitted. This means that the existing preventative barriers against such situations arising, namely the minimum instructions/ training requirements for drone pilots, the operating limitations (120 m maximum height, VLOS) and the existent UAS geographic zones, would have already failed to prevent the situation from arsing[24]. Moreover, the fitting of a remote identification feature on most commercial drones becomes applicable only in 2023 and is not yet a standard feature on the drones in circulation before[25]. The recommendations in this document aim to address situations where such drones pose a threat to civil aviation and will not dwell much on the failure of these safety barriers.

22 With the CE markings categories C0 to C4, as well as privately built drones under 25 kg MTOW.

23 As per Regulation (EU) 2019/947 the "open category" addresses operations in the lower risk bracket, where safety is ensured by the drone operator complying with relevant requirements for its intended operation. For a more extensive explanation, please consult the EASA internet on the regulatory background, here.

24 For a full explanation of the operational restrictions of open category see dedicated EASA page here.

25 Mandatory for all UAS put on the market by 1 Jan 2023. Legacy drones may install a direct remote identification module that is also expected to be available on the market after 1 Jan 2023. However, the range of the emitters of the direct remote Identification on the drone might be initially limited to a few hundred meters, then the technology may evolve. By 2023 also a network remote ID is expected to be available, solving the range issue. Therefore, at least for the initial period, the remote identification has limitations as a mitigation for the problem of unauthorised drones in the surroundings of aerodromes.

Drones below 250 grams (among them most toy drones[26]) are considered too small to cause damage to large aircraft, while they may be hazardous to General Aviation aircraft[27]. Drones carrying out military, customs, police, search and rescue, firefighting, border control, coastguard or similar activities are outside the scope of European law.

Drones authorised to perform a defined mission in the airport environment[28], must be operated under the "specific category", assuming that most Member States create UAS geographical zones to protect the aerodromes. Such operations would normally require a prior authorisation[29], and the authorisation process foresees a safety assessment and the definition of mitigating measures if the control over the drone is lost (e.g. automatic return to take-off position). However, should these mitigating measures fail, the drone would cease to be authorised and become an unauthorised drone, and ATC should most likely immediately be warned about such an uncontrolled fly-away by the drone operator.

Finally, drones operated under the "certified" category in controlled airspace would fall outside the scope of this manual, as they should be integrated into the current air traffic management infrastructure, which means that they would have suitable equipment on-board and be linked with an operations centre on the ground.

1.4.5. Scope with respect to the hybrid nature of drone incidents

A drone incident can combine aviation safety and security aspects or morph from one to the other. For this reason, this document follows a holistic approach encompassing both safety and security considerations. In some cases, either the safety or security aspects may prevail over the other. If it can be established that a drone is "weaponized" for instance, the incident will be classified and treated as security related. This could justify the application of specific response procedures; as a last resort, it might be necessary for law enforcement authorities to neutralise the drone. However, for the most part, the intentions behind a drone incident are not known at the start of an incident and even after the incident, it could be difficult to clearly categorise it, because behind a drone incident there may be a variety of motivations (see below under 1.5 Categories of drone incident offenders).

1.4.6. Scope with respect to technological counter-UAS solutions

Finally, it must be understood that this manual is technology-neutral and does not recommend a specific detection technology or other technological C-UAS solutions. Such a recommendation is out of scope because there are various technological solutions available for the detection, classification, monitoring and the neutralisation of unauthorised drones around an aerodrome. At the time of drafting this manual, numerous technological C-UAS solutions are under development with varying degrees of maturity and reliability[30]. The suitability of such solutions depend also on aerodrome-related specificities, so that the document remains neutral as to which aerodrome operators should consider supporting their drone incident management processes with technological C-UAS solutions.,because the deployment of such solutions ought to be a risk-based decision, that should be left to the Member States and aerodromes locally responsible. However, the part 3 of the manual contains an overview and offers some guidance as to the procurement and testing of technological C-UAS solutions. See annex 3.7 b) Overview of technological C-UAS solutions and 3.7a) Advice for procurement and testing of technological C-UAS solutions.

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26 A drone is considered as a toy when it could be attractive to a child. More precisely, products designed or intended whether or not exclusively, for use in play by children under 14 years of age should be considered as a toy and comply with the Directive 2009/48/EC on the safety of toys. The compliance of a drone with that directive is declared in the corresponding EU declaration of conformity.

27 For more information see Annex 3.3 Preliminary conclusions on consequences of collisions of manned aircraft with drones.

28 More information for the use on authorised drones at airports, see the paper from ACI Europe "Drones in the airport environment: concept of operations and industry guidance", April 2020.

29 Except for certain standard scenarios where a declaration by the operator is enough or when the operator holds a light UAS operator certificate (LUC) with the appropriate privileges.

30 The many activities by industry standardisation bodies to develop the minimum performance requirements for such technological C-UAS solutions (e.g. such as the WG 115 of EUROCAE) are nevertheless noted and welcomed.

1.5. Categories of drone incident offenders

The document puts forth the view that there are three main categories of drone incident offenders causing the hazard to civil aviation: non-criminal motivation, gross-negligence, and criminal/ terrorist motivation). They relate to the intent[31] of the drone's remote pilot:

Table 1: Categorisation of intention/ motivation of pilots of unauthorised drones[32].

Negligence	Clueless individuals, who do not know or understand the applicable regulations and restrictions. As a result, they fly their drones in sensitive or prohibited areas. Their attitude can be described as "clueless" and they have no intent to disrupt civil aviation.
	Careless individuals, who know the applicable regulations and restrictions, but breach them through either fault or negligence. As a result, they fly their drones in sensitive or prohibited areas. These individuals have no intent to disrupt civil aviation.
Gross negligence	Reckless individuals, who do know the applicable regulations and restrictions, but deliberately do not follow the rules in order to pursue personal or professional gain (e.g. aggressive spotters). Their behaviour can be characterised as "reckless", because they disrupt civil aviation by totally disregarding the consequences of their actions.
	Activists/ protesters are individuals who, regardless of whether they know the applicable regulations and restrictions, actively seek to use drones to disrupt aerodromes and flight operations. To maximise impact, these individuals might even act as a group. While their acts can have unintended consequences for aviation safety, they have no intent to endanger human lives.
Criminal/ terrorist motivation	Criminals and terrorists are individuals who, regardless of whether they know the applicable regulations and restrictions, actively seek to use drones to interfere with the safety and security of civil aviation. Because their acts are deliberate and show no regard for human lives and property, these individuals are to be regarded as being criminally motivated or even as terrorists[33].

In practice, it is very challenging to identify a drone and even more difficult to ascertain the motivation and intent of the perpetrator/ offender behind the incident. For this reason, it is necessary to consider all drone incident offender categories in all the scenarios to be developed as part of the risk assessment to be conducted in the preparedness phase (see part 2 of the manual under 2.2.3 and part 3 under annex 3.4). Furthermore, it must be ensured that different types of motivations will be considered as a possibility in the threat-assessment during an incident, based on all available information so that the relevant aviation actors may respond appropriately and quickly to mitigate or neutralise the developing threat (see part 2 of the manual under 2.6 During Incident - Decision phase).

1.6. Regulatory context

From a regulatory perspective, there is not yet a dedicated EU instrument addressing the threat of unauthorised drones as such, because the threat cuts across the traditionally defined aviation safety and security policies. Due to this multi-faceted nature, there are however some relevant elements in the European *"Acquis Communautaire"*, which address the aviation safety and security angles of the problem.

31 Or absence of motivation or intent.

32 The categories do not cover drone incidents resulting from technical or operational circumstances that may cause an authorised drone to become an unauthorised drone.

33 The key document at the international level for this hazard case is the "Framework for responding to a drone incident" by Interpol issued in 2019.

1.6.1. Aviation safety in general

In terms of aviation safety, the EU regulatory system resides in Regulation (EU) 2018/ 1139, also called the EASA Basic Regulation. This instrument addresses the relevant subjects of the safety of unmanned aircraft systems, aerodromes, air operations and air traffic services, and EASA is tasked with the development and maintenance of appropriate and up to date rules to ensure that civil aviation is conducted safely. It is understood that new threats need to be recognised, analysed, and addressed by the regulatory framework provided by the EASA Basic Regulation and its related implementing rules.

And moreover, the various competent authorities designated in each Member State for the oversight of air operators, aerodrome operators and ANSPs are responsible for verifying the compliance of these aviation organisations with the applicable requirements[34].

1.6.2. Unmanned Aircraft Systems ("Drones")

To ensure the integration and safe operation of Unmanned Aircraft Systems (UAS), also called drones, into the aviation system, the European Union has adopted common European rules that were developed by EASA. The rules applicable to drones are found in the Regulation (EU) 2019/947[35] on the rules and procedures for the operation of UAS and Regulation (EU) 2019/945 on UAS and on third-country operators of UAS[36]. The rules aim to strike a balance between the opportunities represented by drones and the necessary obligations on drone manufacturers and operators, in terms of safety, respect for privacy, the environment, protection against noise, and public security. The new rules ensure that drone operators – whether for recreational or professional use – will have a clear understanding of what is and is not allowed. They cover each operation type from those not requiring prior permission, to those involving certified UAS and approved operators. While the rules also contain minimum requirements for remote pilot training for amateurs, they cannot prevent that drones are unintentionally operated near aerodromes, and in the worst-case scenario could even be used for malicious purposes[37].

The next 5 to 10 years Europe will see the safe, secure, and efficient integration of UAS in the airspace in certain areas (such as those with an expected large number of simultaneous UAS operations or areas where UAS operate alongside manned aircraft). This necessitates the introduction of additional specific rules and procedures for UAS operations and the organisations involved in those operations, as well as a high degree of automation and digitalisation. U-space[38] is a combination of U-space services, volumes of airspace and information exchange to support the air traffic management of UAS and mitigate the risks of collision between the UAS, and between UAS and manned aircraft in the shared U-space airspace.

Currently, the following mandatory U-space services are proposed: network identification, geo-awareness, UAS flight authorisation and traffic information. Additional U-space services will be progressively added after they have been demonstrated and validated. U-Space services, notably with a geo-awareness service, may contribute to mitigate the risk that unauthorised drones enter in any UAS restriction zones, such as those around sensitive infrastructure, oil pipelines, nuclear reactors, motorways, high-speed rail lines and airports.

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34 ARO.GEN.300 Oversight, ADR.AR.C.005 and ATM/ANS.ARC.010 are the respective rules in each of these domains.

35 Commission Implementing Regulation (EU) 2019/947 of 24 May 2019 on the rules and procedures for the operation of unmanned aircraft.

36 Commission Delegated Regulation (EU) 2019/945 of 12 March 2019 on unmanned aircraft systems and on third-country operators of unmanned aircraft systems.

37 While the 'U-space' system including the infrastructure, services and procedures to guarantee safe UAS operations and supporting their integration into the aviation system is in development, the current drone rules include requirements for the implementation of three foundations of the U-space system, namely registration, geo-awareness and remote identification, which will need to be further completed.

38 Harmonised rules for UAS operations in the U-space airspace, standardised services delivered to UAS operators as well as connectivity methods between providers of the common information services, the U-space service providers, the air traffic service provider and the UAS operators are expected to be established to ensure the safe, secure and efficient operation of UAS, while facilitating the free movement of services linked to UAS as well as U-space service providers in the European Union.

1.6.3. Air operations

The Basic Regulation establishes essential requirements for the safety of air operations that are implemented by Regulation (EU) No 965/2012. Like other approved aviation organisations in the European aviation system, these air operators are required[39] to have a management system that identifies safety hazards in their operations, evaluate and manage the associated risks and take actions to mitigate the risk and assess their effectiveness. The pilot in command of manned aircraft (also called the "the commander") is responsible for the safe conduct of the flight[40] and has the ultimate authority in emergencies, to take any action he/she considers necessary under the circumstances. Furthermore, the commander has the duty to report as soon as possible to the appropriate air traffic services (ATS) unit any hazardous flight conditions encountered that are likely to affect the safety of other aircraft. For this purpose, the operator shall establish procedures in the Operations Manual for dealing with, notifying, and reporting accidents, incidents, and occurrences. This includes issuing procedures for the verbal notification of incidents to air traffic service units. After an occurrence the air operators are required to report[41] the event to the competent authority, and to any other organisation required to be informed by the State of the operator. Moreover, air operators would have to conduct risk assessments to identify the relevance of this kind of hazard to their operations, take actions to mitigate the risk and verify their effectiveness. Possible outcomes of this exercise may be safety promotion initiatives, additional training modules, or new or adapted operating procedures.

The SMS in the regulatory framework described above ensures that the flight crew is prepared to face and react to unauthorised drones in the surroundings of an aerodrome. In such a circumstance the commander would be responsible to notify ATC, follow ATC instructions, and in the worst case scenario the commander must take actions they deem necessary in the interest of the safety of the flight and of the occupants of the aircraft. These actions may include reducing speed or even collision avoidance manoeuvres. After such a drone incident, the commander must submit an occurrence report[42].

1.6.4. Aerodrome safety

Where hazardous activities in the surroundings of aerodromes are concerned, article 38 of the EASA Basic Regulation foresees the sharing of responsibilities between the authorities of the Member State and the aerodrome operator. In article 38(1) it is stated that Member States shall take the necessary measures to ensure that aerodromes located in their territory are safeguarded against activities and developments in their surroundings that may cause unacceptable risks to aircraft using the aerodrome. As per article 38(2) the aerodrome operator shall monitor activities and developments which may cause unacceptable safety risks to aviation in the surroundings of the aerodrome for the operation of which they are responsible[43]. The aerodrome operator shall take the necessary measures to mitigate those risks in as far as this responsibility lies within their control and, where that is not the case, bring those risks to the attention of the competent authorities of the Member State where the aerodrome is located. The newly emerging hazardous activity of operating unauthorised drones in the surrounding of aerodromes falls under article 38 and under the essential requirements for aerodrome surroundings, namely, "hazards related to human activities" that "need to be assessed and mitigated as appropriate"[44].

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39 ORO.GEN.200 Management System of Regulation (EU) 965/ 2012.

40 CAT.GEN.MPA.105 for CAT and similar rules for non-commercial air operations.

41 ORO.GEN.160 Occurrence reporting of Regulation (EU) 965/2012.

42 Also following Regulation (EU) No 376/2014.

43 This Basic Regulation article is implemented by ADR.OPS.B.075 Safeguarding of aerodromes in the implementing rules for aerodrome safety in Regulation (EU) No 139/ 2014.

44 Essential requirements for aerodromes, chapter 3, section 3.2, of the EASA Basic Regulation (EU) 2018/ 1139.

Moreover, there are other relevant obligations on the aerodrome operator contained in the aerodrome safety rules of Regulation (EU) No 139/2014. They include the aerodrome operator's responsibility to ensure that hazards in operations and new emerging risks are identified and managed by the operators own SMS[45]. Unauthorised drones suddenly appearing inside the aerodrome perimeter or in the arrival and departure routes of the aerodrome count as such a hazard and should be addressed by the aerodrome operator.

However, because the problem of unauthorised drones touches also upon the safety of the airspace around the aerodrome, the operator is not the only actor responsible for managing this new hazard and the associated risks, over which the aerodrome has very little control. Therefore, to address the hazard of unauthorised drones, there needs to be a collaborative and holistic approach with the provider of air traffic services (ATS). Such a collaboration should involve preventative measures, a risk assessment, the setting up of a drone sighting reporting mechanism and a decision-making process determining the appropriate mitigating responses and the joint and separate execution of these.

1.6.5. Safety of air traffic services

The EASA Basic Regulation and its various implementing rules also cover the safety of air traffic services (ATS). ATS include flight information service, alerting service, air traffic advisory service and air traffic control service. The latter have the task of preventing collisions between aircraft in the air, preventing collisions between aircraft on the manoeuvring area (at the aerodrome), and expediting and maintaining an orderly flow of air traffic. At controlled aerodromes, this service is provided by air traffic controllers (ATCOs) from ATC towers or even by remote tower units. The relevant detailing EU legislation covering this topic in line with ICAO Annex 11 are found in the rules for ATM/ANS, in Regulation (EU) 2017/373 and Regulation (EU) 2020/469[46]. Unauthorised drones also present a considerable challenge for ATCOs because drones are not (yet) integrated into the air traffic management systems. Moreover, smaller drones usually do not carry transponders and are therefore not visible on the ATCOs radar displays. In the future, the creation of areas with U-space services[47] will provide for the integration of cooperative drones and their distinction from non-cooperative drones. However, until that time and in areas where U-space services might not be deployed, the potential presence of unauthorised drones is, and will remain, a considerable challenge that must be managed.

In practice, for ATCOs an unauthorised drone is an incursion and poses a hazard to the arriving and departing air traffic. At this point in time no separation minima for drones are defined[48]. Nevertheless, ATCOs are always obliged to ensure the safe operation of air traffic in the area of their responsibility. Therefore, when such an incursion by an unauthorised drone (an airspace infringement) occurs, the ATCOs are required to undertake measures to maintain the safety of air traffic. Such measures may include issuing traffic information, increasing traffic separation[49], changing runway use, and finally ceasing to give take-offs and landing clearances altogether. Depending on the arrangements in a country, when ATCOs respond to such a hazardous situation with the cessation of runway operations, it might be that later only the law enforcement authorities can cancel this action. Moreover, there may be circumstances where a drone incident develops in such a way to require that incoming air traffic be diverted to other aerodromes, which would constitute a major disruption of normal air traffic.

Because of the described different responsibilities but shared overall objective to ensure safe operations of aircraft at the aerodrome the aviation actors (air operators, aerodrome operator and ATC) at each facility should jointly find reliable ways to deal with the threat of unauthorised drones in the aerodrome surroundings.

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45 The safety management system required by ADR.OR.D.005 of Regulation (EU) 139/ 2014.

46 Regulation (EU) 2020/ 469 amending Regulation (EU) 2017/ 373 and applicable in 2022.

47 U-space service means 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 numbers of UAS.

48 The Rules of the Air, Regulation (EU) No 923/2012, do not provide separation minima for ATC to apply between drones and conventionally piloted (manned) aircraft.

49 By increasing the time and distance between aircraft arriving at and departing from the aerodrome further than would normally be planned.

1.6.6. Aviation security

In the field of aviation security, Regulation (EC) No 300/2008[50] lays down common European rules and provides for a common interpretation of the Standards and Recommendations found in ICAO Annex 17[51]. The regulation contains common basic standards for safeguarding civil aviation against acts of unlawful interference and gives the EU the competence to adopt measures implementing those standards. Presently, there are no measures in place to specifically address the drone threat. However, Regulation (EC) No 300/2008 requires that each EU Member State creates, applies, and maintains a National Civil Aviation Security Programme (NCASP). The aim of this programme is to define responsibilities for the implementation of the common basic standards and to describe the measures required by operators and entities for this purpose. Some EU Member States have already decided to include drone-related provisions in their national civil aviation security programmes.

1.6.7. Law enforcement authorities[52] and law enforcement services

In light of the threats that unauthorised and non-cooperative drones pose to aerodromes and aircraft, persons and property[53], most European states have created new criminal and administrative offences pertaining to the protection of civil aviation, public safety, privacy and other realms, thereby handing law enforcement authorities and forces a significant role to play. These offences include:

- Violations of the restricted airspaces over aerodromes, military bases, critical infrastructure or city centres, without permission.
- Endangerment of civil aircraft (e.g. flying too high, or within an aerodrome/airport or restricted airspace).
- Failure by the operator to maintain visible contact with the drone under their control.
- Flight operations above specified maximum altitudes, mostly above 120 m in Europe.
- Flight operations in unsafe flight conditions (e.g. poor weather conditions). and
- Unauthorised use of a surveillance aircraft (e.g. using a drone for the purposes of surveillance, which can result in invasions of privacy).

Additionally, in some jurisdictions it is illegal for drones, especially those carrying payloads that they were not designed to carry, to be flown over people, and crowds. The release of those payloads is also explicitly forbidden in many such jurisdictions.

Security forces and law enforcement authorities are organised at the national level as per the EU´s subsidiarity principle[54], so that the Member States´ individual C-UAS strategies and the associated national operational arrangements dictate how law enforcement authorities respond to drone incidents. Despite coordination, these practices may vary somewhat from one Member State to another, involving different sets of actors, at various territorial levels, using different legislative instruments, and having access to different levels of resources.

Given the challenges and tasks, the parts 2 and 3 of the manual “Drone Incident Management at Aerodromes” seeks to assist the different aviation actors: aerodrome operators, ATC, air operators as well as law enforcement authorities in better managing this challenge. Parts 2 and 3 can be obtained from EASA upon request, see section 1.9.

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50 Regulation (EC) No 300/2008 of the European parliament and of the Council of 11 March 2008 on common rules in the field of civil aviation security and repealing Regulation (EC) No 2320/2002, as well as the associated secondary legislation

51 Annex 17 to the Convention on International Civil Aviation, on Security: Safeguarding International Civil Aviation Against Acts of Unlawful Interference.

52 “Competent law enforcement authority”, means a national police, customs or other authority authorized by national law to detect, prevent and investigate offences or criminal activities and to exercise authority and to take coercive measures in the context of such activities. Based on definition found in Council Framework Decision 2006/960/ JHA of 18 December 2006. The term may also include other specialised law enforcement services.

53 Also, to other critical infrastructure operators and sectors, state buildings, prisons, the defence sector, mass event organisers, and private persons, to name a few.

54 In areas in which the European Union does not have exclusive competence, the principle of subsidiarity, laid down in the Treaty on European Union, defines the circumstances in which it is preferable for action to be taken by the Union, rather than the Member States.

1.7. Overview of the results of the Counter-UAS Obj. 2 Task Force

In November 2019 EASA formed the Counter-UAS Task Force to work on the objective 2 of the EASA C-UAS Action Plan[55]. EASA and the Task Force delivers herewith to the aviation community and law enforcement stakeholders a manual in three parts:

- Part 1: Drone Incident Management at Aerodromes: The challenge of unauthorised drones in the surroundings of aerodromes (this document).
- Part 2: Drone Incident Management at Aerodromes – guidance and recommendations.
- Part 3: Drone Incident Management at Aerodromes – resources and practical tools.

Part 1 is published on the EASA webpage and therefore accessible to the public. Part 2 and part 3 of the manual are provided as one document, but their distribution is more restricted due to the sensitive nature of the subject.

The material in part 2 and 3 is suitable for use by small, midsize, and large aerodromes in the scope of the European aviation system and is suitable for those aerodromes which have not yet prepared for drone incidents. At the same time, even aerodrome operators who have already put in place some procedures, can also benefit from the resources and tools.

1.7.1. Overview of part 2: Drone Incident Management at Aerodromes – guidance and recommendations

Part 2 of the manual distinguishes three basic phases of a drone incident and provides guidance and recommendations for each of these. The resulting material is informed by the recent material from other regulatory bodies, in particular ICAO[56].

Before incident:

It is known that a circumspect preparation by the relevant aviation actors and law enforcement authorities at the national and local/ airport level is essential to safely deal with a drone incident. Before an incident the actors at both these levels should set up the appropriate restrictions against unauthorised drone operations around aerodromes; they may consider the use detection and neutralisation technologies, and they should clarify the roles and responsibilities of the aviation actors with respect to the management of drone incidents. Locally, the aerodrome operator should interface with ATC and Law Enforcement, as well as the appropriate and competent authorities for aviation security and safety, to establish a robust drone sighting reporting mechanism and develop procedures and response protocols that will later allow them to detect and manage drone incidents. It is recommended that the relevant aviation actors and the law enforcement authorities at each aerodrome plan for their close collaboration on the basis of a "memorandum of understanding" (MoU), which considers the relevant safety and security scenarios that were studied beforehand in a comprehensive risk assessment, and that the MoU describes the role of each actor in these scenarios, while also providing all necessary contact details.

During incident:

When a suspected drone sighting is reported at or near an aerodrome the key actors should closely collaborate using pre-agreed information gathering, information verification and communication methods to obtain the best situational awareness possible and to establish if the information on the drone is credible enough to declare a drone incident. To better illustrate the necessary checks and interactions of all actors during the incident, the manual provides a generic

55 Called "EASA C-UAS Obj. 2 Task Force" or "the Task Force", abbreviated by TF.

56 Most importantly, chapter 19 of the Aviation Security Manual (Doc 8973). In addition, the group consulted recently prepared regulatory material on the same subject prepared by ECAC, UK CAA, and Transport Canada, as well as the recommendations of the "Blue Ribbon Task Force" by ACI North America and AUVIS.

"Drone Incident Management flow chart", which helps to understand the steps that need to be followed. Very importantly and right from the start of an incident, the actors will use an aerodrome specific "threat zone map" that allows them to assign a base-line threat level to a suspected unauthorised drone based on its location and direction. As soon as the information about the drone can be verified and more details about the declared drone incident are shared, should the actors move to use an agreed "threat assessment method" to determine the threat level of the drone incident. The assigned threat level for the drone incident will be followed by pre-agreed, appropriate response measures by ATC and the security forces to ensure the safe operation of aircraft at and around the aerodrome. This threat assessment should be repeated as often as new information becomes available and should only be stopped towards the end of an incident, on the basis of solid intelligence, when the key actors are satisfied that the threat has been resolved or is no longer present, thereby allowing for the restoration of normal aerodrome and ATC operations to begin following an established procedure.

Post incident:

After a drone incident, the law enforcement authorities should collect all the evidence regarding the incident and investigate it as a criminal offence, while the aviation actors must prepare appropriate documentation and reports to their respective competent authorities. The same documentation can be used by them to analyse the incident to learn from it for future incidents and, if necessary, to review and update the mitigation measures and response procedures to improve the preparedness of all actors at the facility. Aerodrome operators should conduct information campaigns aimed at the public to prevent unintended drone operations inside UAS flight restricted zones at airports. Similarly, safety campaigns should be undertaken locally to solicit the assistance of the public in detecting and reporting drones as means to prevent serious disturbances and to better manage incidents. Meanwhile law enforcement forces might be able to identify and investigate offenders and later (if appropriate) prosecute them, which can be expected to have a dissuasive effect and help to prevent future incidents.

Limits of the recommendations:

Where technological C-UAS solutions are concerned it is important to point out that the manual does not make recommendations to necessarily deploy such solutions at all aerodromes. The deployment of drone detection systems and other technologies requires a risk-based approach and careful selection and testing of the most suitable technologies for a given location and environment.

1.7.2. Overview of part 3: Drone Incident Management at Aerodromes – resources and practical tools

Part 3 of the manual contains several practical tools and supporting resources in the form of stand-alone annexes on certain topics or containing tools recommended for use during an incident.

In particular, the annexes 3.2, 3.5 and 3.6 build on concepts and tools contained in chapter 19 of the ICAO Aviation Security Manual and develop these further for the European context. Regarding the collision risk between drone and manned aircraft, EASA had also organised an expert group dealing with objective 3 of the EASA C-UAS Action Plan. As a result of that work EASA provides in annex 3.3 the preliminary findings on the consequences of collisions of manned aircraft with drones. While some of findings presented in this annex will eventually be superseded by the research project on drone collision risk under the Horizon 2020 framework[57], they represent a valuable contribution to the understanding of the collision risk between different sizes of very small and small drones with civil aircraft built to different certification specifications. Moreover, the annex 3.4 provides a suggested methodology for a local risk assessment encompassing the safety and security dimension of the issue.

57 See project "Vulnerability of manned aircraft to drone strikes" under this link.

1.7.3. Annexes found in part 3: Drone Incident Management at Aerodromes - resources and practical tools

Annex 3.1 Resources for the information phase

Annex 3.2 Drone Incident Management flow chart

Annex 3.3 Preliminary conclusions on consequences of collisions of manned aircraft with drones (prepared by the expert group on obj. 3 of the EASA C-UAS Action Plan)

Annex 3.4 Suggested Methodology for local risk assessment

Annex 3.5 Identification, verification, and threat assessment forms

Annex 3.6 Threat Zones and ATC response

Annex 3.7a) Advice for procurement and testing of technological C-UAS solutions

Annex 3.7b) Overview of technological C-UAS solutions

Annex 3.8 Guidance for the Initial response to a drone incident by first responders

Annex 3.9 Tools for occurrence reporting and incident analysis

1.8. Working methods and contributors

The work was a cross-service task led by an expert of EASA's Aerodromes Section (FS 2.4) as part of the EASA C-UAS Action Plan coordinated by the Drones Section (ED 0.3). The working method was "expert group". The task description had prescribed a certain composition of experts to be invited.

Objective 2: Prepare aerodromes to mitigate risks from unauthorised drone use

Coordinator	EASA
Task Force members required	Member states (including from NAAs and law enforcement authorities), aerodrome operators, commercial air transport (CAT) operators, air navigation service providers (ANSPs, representatives from pilot and air traffic controllers' associations, European Commission (DG MOVE and DG HOME), as well as EUROCONTROL.
Timeline	Task Force from 11/2019 to 11/2020
Start	November 2019
Deliverables	EASA guidance (in the form of a manual) describing the roles and responsibilities of the actors, and best practices on how to respond to unauthorised drones in the surroundings of an aerodrome.

A related call for interest to participate in the "EASA C-UAS objective 2 Task Force" was published in October 2019 and received much interest by the different stakeholders in the aviation domains and national competent authorities. EASA then selected suitable group members based on their expertise, experience, and knowledge. During the selection, EASA strived to ensure the best representation of job profiles and viewpoints, experience with the hazard, as well as geographic representation. The eventual Task Force (TF) consisted of 28 experts[58] representing the following stakeholder organisations:

- EASA Member States´ national competent authorities represented by AESA of Spain, ANAC of Portugal and ENAC of Italy.
- European institutions and bodies, namely the European Commission represented by DG MOVE, DG HOME and the Joint Research Centre, as well as EUROCONTROL.
- Law enforcement authorities from Norway (Norwegian Police), Spain (Ministry of Interior), and Belgium (Belgian Federal Police).
- Aerodrome operators represented by Airports Council International (ACI-Europe) and the member airports AENA Spain, Frankfurt, Fraport Greece, Milan, Munich, Paris / Groupe ADP, and Zurich.
- Air navigation service providers represented by Civil Air Navigation Services Organisation (CANSO represented by Deutsche Flugsicherung).
- Air traffic controllers represented by International Federation of Air Traffic Controllers' Associations (IFATCA).
- Commercial air transport operators represented by the International Air Transport Association (IATA).
- Pilots represented by the European Cockpit Association (ECA).

The TF held its first meeting at the end of 2019 at the EASA premises in Cologne, but for most of 2020 had to work using remote working methods, due to the impact of the COVID-19 pandemic. In December 2020, the comprehensive draft material was submitted for a two-week consultation of the Member States Advisory Board (MAB) and those members of the Stakeholder Advisory Body (SAB) who requested to comment on all parts. The comments received were duly analysed by EASA and considered in the final version of the manual. The publication of the manual was accompanied by a webinar.

1.9. Limited distribution part 2 and part 3 of the manual

Due to the sensitive nature of the subject matter, EASA decided that material found in parts 2 and 3 of the manual should only be made available to the relevant stakeholders and the national competent authorities of the EASA Member States, so that they share it with the relevant aviation organisations under their oversight. Meanwhile, the entire manual will also be made available to DG HOME and DG MOVE and EASA´s partner countries. Besides this distribution list other duly motivated requests for access to all parts of the manual may be sent to:

Aerodromes@easa.europa.eu

EASA wishes to thank all individuals as well as their organisations who participated in the work leading to the publication of the manual for their valuable insights, contributions and commitment to the group and its work under the challenging circumstances of 2020.

European Union Aviation Safety Agency (EASA)

March 2021

58 Working based on the Code of Conduct for external experts supporting EASA.

1.10. Applicable regulations and standards

EASA BASIC REGULATION, i.e. **REGULATION (EU) 2018/1139** of the European Parliament and of the Council, on common rules in the field of 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.	Easy Access Rules
EUROPEAN PLAN FOR AVIATION SAFETY 2021 - 2025	EPAS 2021 - 2025
COMMISSION DELEGATED REGULATION (EU) 2019/945 of 12 March 2019 on unmanned aircraft systems and on third-country operators of unmanned aircraft systems.	
COMMISSION IMPLEMENTING REGULATION (EU) 2019/947 of 24 May 2019 on the rules and procedures for the operation of unmanned aircraft. *(Amended by 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)* *Amended by 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.)*	Easy Access Rules
COMISSION REGULATION (EU) No 139/2014 of 12 February 2014 laying down requirements and administrative procedures related to aerodromes pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council. *(amended by a few Implementing rules)*	Easy Access Rules
COMMISSION IMPLEMENTING REGULATION (EU) 2020/469 of 14 February 2020 amending Regulation (EU) No 923/2012, Regulation (EU) No 139/2014 and Regulation (EU) 2017/373 as regards requirements for air traffic management/air navigation services, design of airspace structures and data quality, runway safety and repealing Regulation (EC) No 73/2010.	
COMMISSION REGULATION (EU) 2017/373 of 1 March 2017 laying down common requirements for providers of air traffic management/air navigation services and other traffic management network functions and their oversight, repealing Regulation (EC) No 482/2008, Implementing Regulations (EU) No 1034/2011, (EU) No 1035/2011 and (EU) 2016/1377 and amending Regulation (EU) No 677/2011.	
COMMISSION IMPLEMENTING REGULATION (EU) No 923/2012 laying down the common rules of the air and operational provisions regarding services and procedures in air navigations and amending Implementing Regulation (EU) No 1035/2011 and Regulations (EC) No 1265/2007, (EC) No 1794/2006, (EC) No 730/2006, (EC) No 1033/2006 and (EU) No 255/2010.	
REGULATION (EC) No 549/2004 of the European Parliament and the Council of 10 March 2004 laying down the framework for the creation of the single European sky (the framework Regulation).	
COMMISSION REGULATION (EU) No 965/2012 of 5 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council.	
REGULATION (EC) No 300/2008 of the European parliament and of the Council of 11 March 2008 on common rules in the field of civil aviation security and repealing Regulation (EC) No 2320/2002.	

Annex 17 on the Convention on International Civil Aviation, Security, Safeguarding International Civil Aviation Against Acts of Unlawful Interference.	
Aviation Security Manual (Doc 8973 – Restricted) *(Not publicly available)*	
Council Framework Decision 2006/960/JHA of 18 December 2006 on simplifying the exchange of information and intelligence between law enforcement authorities of the Member States of the European Union.	
REGULATION (EC) No 785/2004 of the European Parliament and of the Council of 21 April 2004 on insurance requirements for air carriers and aircraft operators	
COMMISSION REGULATION (EU) No 255/2010 of 25 March 2020 laying down the rules for air traffic flow management.	
REGULATION (EU) No 996/2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation.	
REGULATION (EU) No 376/2014 of the European Parliament and of the Council of 3 April 2014 on the reporting, analysis and follow-up of occurrences in civil aviation, amending Regulation (EU) No 996/2010 of the European Parliament and of the Council and repealing Directive 2003/42/EC of the European Parliament and of the Council and Commission Regulations (EC) No 1321/2007 and (EC) No 1330/2007 Text with EEA relevance.	Easy Access Rules
COMMISSION IMPLEMENTING REGULATION (EU) 2015/1018 of 29 June 2015 laying down a list classifying occurrences in civil aviation to be mandatorily reported according to Regulation (EU) No 376/2014 of the European Parliament and of the Council. Annex IV Occurrences related to aerodromes and ground services Annex III Occurrences related to Air Navigation Services and facilities	
PANS-ATM Procedures for Navigation Services – Air Traffic Management (Doc 4444)	

1.11. Glossary and abbreviations

1.11.1. Glossary

Term	Description	Reference
accident	Laypersons understanding: an unfortunate incident that happens unexpectedly and unintentionally, typically resulting in damage or injury. For a precise definition of accident of accident please refer to the detailed definition in the EU legislation.	Regulation (EU) No 996/2010, Art. 2, Definitions (1).
actor	Participant in an action or process. This can be a person or a group of persons representing an organisation. (see also stakeholder definition)	Common dictionary definition and used in the ACI Publication "Drones in the airport environment", p. 71[59].
aerodrome	A defined area, on land or on water, on a fixed, fixed offshore or floating structure, including any buildings, installations and equipment thereon, intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.	Regulation (EU) No 2018/1139 (Basic Regulation), Art. 3 (16).
aerodrome control tower	Unit established to provide air traffic control service to aerodrome traffic.	Commission Implementing Regulation (EU) No 2020/ 469, annex I Definitions (110), applicable in 2022.
aerodrome flight information service	Flight information service and alerting service for aerodrome traffic at an aerodrome.	Regulation (EU) No 2017/ 373, Annex I Definitions (6).
aerodrome operator	Any legal or natural person operating or proposing to operate one or more aerodromes.	Regulation (EU) No 2018/1139 (Basic Regulation), Art. 3 (14).
air navigation service provider	Any public or private entity providing air navigation services for general air traffic.	Regulation (EC) No 549/2004, Art. 2(5).
air navigation services	Air traffic services; communication, navigation and surveillance services; meteorological services for air navigation; and aeronautical information services.	Regulation (EC) No 549/2004, Art. 2(4).
air traffic control	A service provided for the purpose of: a) preventing collisions between aircraft and in the manoeuvring area between aircraft and obstructions; and b) expediting and maintaining an orderly flow of air traffic.	Commission Implementing Regulation No (EU) 923/2012. Art. 2 (30).

59 ACI Europe Drones in the airport Environment, 2020, found under this link.

Term	Description	Reference
air traffic control (ATC) unit	A generic term meaning variously, area control centre, approach control unit or aerodrome control tower. (see air traffic services unit)	Commission Implementing Regulation (EU) 2020/469, Annex I Definitions (132), applicable in 2022.
air traffic control instruction	Directive issued by ATC for the purpose of requiring a pilot to take a specific action;	Commission Implementing Reg. (EU) 2020/469, Annex I Definitions (131), applicable in 2022.
air traffic control clearance (also ATC clearance)	An authorisation for an aircraft to proceed under conditions specified by an air traffic control unit.	Commission Implementing Regulation (EU) 2020/469, Annex I Definitions (130), applicable in 2022.
air traffic services	The various flight information services, alerting services, air traffic advisory services and ATC services (area, approach and aerodrome control services)	Regulation (EC) No 549/2004.
air traffic services unit	Meaning variously air traffic control unit, flight information centre, aerodrome flight information service unit or air traffic services reporting office; (see air traffic control (ATC) unit)	Commission Regulation (EU) No 2017/373, Annex I Definitions (21).
aircraft	Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.	Regulation (EU) 2018/1139, (EASA Basic Regulation).
airport	Any land area specifically adapted for the landing, taking-off and manoeuvring of aircraft, including the ancillary installations which these operations may involve for the requirements of aircraft traffic and services, including the installations needed to assist commercial air services.	Directive 2009/12/EC of the European parliament and of the Council of 11 March 2009 on airport charges, art. 2(2).
airport environment	The conditions in which the airport activities operate. The airport environment is referring to the areas inside the airport perimeter.	ACI Publication "Drones in the airport environment"[1].
airport operator	An air transport undertaking operating a commercial airport.	EUROSTAT definition. In this document the term is used interchangeably with aerodrome operator.
airport security committee	A committee at each airport serving civil aviation responsible for assisting the airport security authority in its role of coordinating the implementation of security controls and procedures as specified in the airport security programme.	ICAO Aviation Security Manual (Doc. 8973).
airprox	A situation in which, in the opinion of a pilot or air traffic services personnel, the distance between aircraft as well as their relative positions and speed have been such that the safety of the aircraft involved may have been compromised.	ICAO Procedures for Air Navigation Services ATM PANS-ATM (Doc. 4444).

Term	Description	Reference
airside	means the movement area of an airport, adjacent terrain and buildings or portions thereof, access to which is restricted;	Regulation (EC) No 300/2008, Article 3 (11), on common rules in the field of civil aviation security.
appropriate authority	Where, within a single Member State, two or more bodies are involved in civil aviation security, that Member State shall designate a single authority (hereinafter referred to as the appropriate authority) to be responsible for the coordination and monitoring of the implementation of the common basic standards referred to in Article 4 of Regulation (EC) No 300/2008.	Regulation (EC) No 300/2008 on common rules in the field of civil aviation security.
authorised drone	Any drone activity (in the aerodrome and its environment) with authority or permission to fly and not considered as a safety/security risk.	ACI Publication "Drones in the airport environment"[1].
aviation security	the combination of measures and human and material resources intended to safeguard civil aviation against acts of unlawful interference that jeopardise the security of civil aviation;	Regulation (EC) No 300/2008, Art. 3 (2), on common rules in the field of civil aviation security.
Automatic terminal information service	ATIS a continuous broadcast of recorded aeronautical information in busier terminal areas, i.e. aerodromes and their immediate surroundings. ATIS broadcasts contain essential information (weather information, active runways, available approaches, and even important NOTAMs). Pilots usually listen to an available ATIS broadcast before contacting the local control unit, which reduces the controllers' workload and relieves frequency congestion.	Commission Regulation (EU) 965/2012 on technical requirements and administrative procedures related to air operations.
certified category	Operations that require certified unmanned aircraft, an authorised operator and licensed remote-crew, and it is based on principles similar to those of manned aviation.	Implementing Regulation (EU) 2019/947.
competent authority	Authority designated within each Member State with the necessary powers and responsibilities for the certification and oversight of aerodromes, as well as personnel and organisations involved therein.	Commission Regulation (EU) 139/2014, Art. 2(8).
controlled airspace	An airspace of defined dimensions within which air traffic control service is provided in accordance with the airspace classification.	Commission Implementing Regulation (EU) No 923/2012, Art. 2, (59).
counter unmanned aircraft systems	Deployment of technological responses to UAS, aimed at providing a capability to detect, track, identify and mitigate the risks posed by unmanned aircraft.	Chapter 19 ICAO Aviation Security Manual (Doc. 8973) Doc 8973.
detection	The process of discovering or noticing something, especially that is not easy to see, hear etc.	New terminology used by the EASA C-UAS TF.

Term	Description	Reference
direct remote identification	A system that ensures the local broadcast of information about a unmanned aircraft in operation, including the marking of the unmanned aircraft, so that this information can be obtained without physical access to the unmanned aircraft.	Implementing Regulation (EU) 2019/947, Art. 2 (13).
drone	"Unmanned aircraft systems" is the legal and technical term in the delegated and implementing acts 2019/945 and 947 adopted on the basis thereof. "Drones" is the popular term used to be understood by persons with no aviation background.	European Plan for Aviation Safety 2020-2024, p. 38, footnote 36.
drone incident	In the context of the Drone Incident Management Manual for Aerodromes, the sighting of a suspected drone becomes a drone incident, when the verified drone has no clearance and has moved into or is present inside the flight restricted zone (possibly declared as UAS geographical zone) and is therefore located in one of the "threat zones" at or around the aerodrome for which the drone is not authorised[60].	New terminology used by the EASA C-UAS TF. See also definitions for incident, serious incident, and accident as well as occurrence.
drone incident management cell	Term used to refer to a group that responds to the (threat of) unauthorised drone activity in the airport environment	New terminology used by the EASA C-UAS TF.
drone operator	UAS operator is the legal term, but drone is the popular term to be understood by people with no aviation background. Therefore, it is any legal or natural person operating or intending to operate one or more drones (same concept as UAS operator).	European Plan for Aviation Safety 2020-2024, p. 38, footnote 36.
drone pilot	Remote pilot is the legal term, but drone is the popular term to be understood by people with no aviation background. It is natural person responsible for safely conducting the flight of an unmanned aircraft by operating its flight controls, either manually or, when the unmanned aircraft flies automatically, by monitoring its course and remaining able to intervene and change the course at any time.	Adapted from Basic Regulation (EU) 2018/1139 definition of Remote pilot.
entity	A person, partnership, organisation, or business that has a legal and separately identifiable existence.	ACI Publication "Drones in the airport environment"[1].

60 Eventually a drone incident would be subject to being reported as an occurrence as per 376/2014 in the appropriate taxonomy (incident, serious incident, or accidents as per 996/ 2010 (ICAO annex 13). A drone sighting that remains unverified or is further away from the aerodrome and does not constitute an airspace incursion (or a risk to aviation safety or security) would be reported as an "occurrence without safety impact".

Term	Description	Reference
European Plan for Aviation Safety	A safety issues assessment and the related action plan at European level;	Regulation (EU) No 376/2014, Art 2 (16).
European Aviation Safety Programme	An integrated set of regulations at Union level, together with the activities and processes used to jointly manage the safety of civil aviation at European level	Regulation (EU) No 376/2014, Art 2 (17).
flight restriction zone	Zones where drone operation are subject to approval or subject to a prohibition or limitation.	Adaptation of Regulation (EU) 2019/947 to set up UAS geographic zones.
geo-awareness	A function the, based on the data provided by Member States, detects a potential breach of airspace limitations and alerts the remote pilots so that they can take immediate and effective action to prevent that breach.	Implementing Regulation (EU) 2019/947 and 2019/945.
geo-fencing	A function primarily used to provide the remote pilot with information on the UA position, as well as on the related airspace requirements and limitation; additionally, this function may limit the access of the UA to certain areas.	Skybrary - Geofencing Basics.
geographical zones (UAS)	A portion of airspace established by the competent authority that facilitates, restricts, or excludes UAS operations in order to address risks pertaining to safety, privacy, protection of personal data, security or the environment, arising from UAS operations.	Regulation (EU) No 2019/947, Art 15.
harm	The consequence of an occurrence. Categories of harm considered in SORA are: – Fatal injuries to third parties on the ground – Fatal injuries to third parties in the air – Damage to critical infrastructure	Taken from Specific Operations Risk Assessment by Joint Authorities for Rulemaking of Unmanned System (SORA – JARUS).
hazard	A situation or an object with the potential to cause death or injury to a person, damage to equipment or a structure, loss of material, or a reduction of ability to perform a prescribed function	Regulation (EU) No 376/2014, Art 2 (10).
hot spot	A location on an aerodrome movement are with a history or potential risk of collision or runway incursion, and where heightened attention by pilots/driver is necessary.	ICAO Manual on the Prevention of Runway incursions (Doc. 9870).
identity	Information that is unique within a security domain and which is recognized as denoting a particular entity of t hat domain.	ICAO – Air Traffic Management Security Manual (Doc. 9985).
impact	Qualitative scale, ranging from 0-5, with the lowest score being “negligible”. The vulnerability to a particular threat, the likelihood of a threat producing an attack and the associated impacts are used for determining risk.	ICAO – Air Traffic Management Security Manual (Doc. 9985).

Term	Description	Reference
incident	An occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.	Regulation (EU) No 996/2010.
Just Culture	A culture in which front-line operators or other persons are not punished for actions, omissions or decisions taken by them that are commensurate with their experience and training, but in which gross negligence, wilful violations and destructive acts are not tolerated.	Regulation (EU) No 376/2014, Art 2 (12).
kinetic	A system intended to bring down UAS including net-based systems, lasers, electromagnetic pulses etc.	Holland, A., 2019, *Counter-Drone Systems* (2nd ed.), Centre for the Study of the Drone at Bard College.
landside	means those parts of an airport, adjacent terrain and buildings or portions thereof that are not airside.	Regulation (EC) No 300/ 2008, Art. 3 (12), the so called AvSec Regulation.
law enforcement authority	A national police, customs or other authority that is authorised by national law to detect, prevent and investigate offences or criminal activities and to exercise authority and take coercive measures in the context of such activities. Law Enforcement Authorities are responsible to counteract non-cooperative drones and any illegal drone activity and take appropriate mitigating actions.	Council Framework Decision 2006/960/JHA.
local runway safety team (LRST)	Team dealing with runway safety and the safety of the operations at the aerodrome in general whereby all relevant organisations operating or providing services at the aerodrome should participate to. It should, together with the local aerodrome safety committees, convene regularly, identify and review local safety issues, and examine possible solutions and need for action.	Commission Regulation No 139/ 2014, Annex III, ADR.OR.D.027 Safety Programmes.
national competent authority or "competent authority"	one or more entities designated by a Member State and having the necessary powers and allocated responsibilities for performing the tasks related to certification, oversight and enforcement in accordance with this Regulation and with the delegated and implementing acts adopted on the basis thereof, and with Regulation (EC) No 549/2004.	Regulation (EU) 2018/1139, Basic Regulation, Art. 3 (34).
night operating restriction (night curfew)	Restrictions imposed at airports on aircraft operators that prohibit aircraft take-offs and/or landings during a specified period of time. Also known as `night curfew'.	Adapted from Regulation (EU) No 598/2014 on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions.

Term	Description	Reference
'non-cooperative' drone	A drone/ UAS exhibiting behaviour to suggest non-compliance with applicable rules and regulations, including, for instance, flight operations in restricted airspace or carriage of non-permitted payload or failure to interact with ATC (e.g. respond to instructions, provide identification).	Definition for the purpose of this manual.
non-kinetic	Intended to disable UAS by interfering or blocking the communication link between the UAS and its operator or taking control of the UAS (e.g. jamming, hacking).	Counter-Drone Systems (2nd ed.), Holland, A., 2019, Centre for the Study of the Drone at Bard College.
`Normal´operations	Routine service provision within a non-significant variation in Quality of Service.	Eurocontrol Guidelines for contingency planning of Air Navigation Services (2009).
open category	Operations that do not require a prior authorization by the competent authority, nor a declaration by the operator before the operation takes place. Safety is ensured through a combination of operational limitations (the most important being that only VLOS operations are allowed), technical requirements for the drone, and the competency of the remote pilot.	Commission Implementing Regulation (EU) 2019/947.
occurrence	any safety-related event which endangers or which, if not corrected or addressed, could endanger an aircraft, its occupants or any other person and includes in particular an accident or serious incident;	Regulation (EU) No 376/2014, Art 2 (7).
payload	instrument, mechanism, equipment, part, apparatus, appurtenance, or accessory, including communications equipment, that is installed in or attached to the aircraft and is not used or intended to be used in operating or controlling an aircraft in flight, and is not part of an airframe, engine, or propeller;	Commission Implementing Regulation (EU) 2019/947, Art. 2 (12).
perpetrator	Someone who has committed a crime or a violent or harmful act.	Cambridge Dictionary.
pilot-in-command	The pilot designated as being in command and charged with the safe conduct of the flight. For the purpose of commercial air transport operations, the 'pilot-in-command' shall be termed the 'commander'.	Commission Regulation (EU) 965/2012, Annex I, definition (93).
procedure	A series of steps followed in a methodical manner to complete an activity or a process, describing what should be done, when and by whom; where and how each step should be carried out; what information, documentation and resources should be used; and how it should all be controlled.	ICAO Air Traffic Management Security Management Manual (Doc 9985).

Term	Description	Reference
process	A set of interrelated or interacting activities that transforms inputs into outputs. Processes within an organization or programme are generally planned and carried out under controlled conditions to add value.	ICAO Air Traffic Management Security Management Manual (Doc 9985).
qualified observer	In this manual the term is used for someone who is due to his/her job profile or their training a trusted source when it comes to sighting of drones/ UAS in the surroundings of an aerodrome.	Term introduced by EASA C-UAS TF.
remote pilot	A natural person responsible for safely conducting the flight of an unmanned aircraft by operating its flight controls, either manually or, when the unmanned aircraft flies automatically, by monitoring its course and remaining able to intervene and change the course at any time.	Regulation (EU) 2018/1139.
remotely piloted aircraft	Remotely piloted aircraft is an unmanned aircraft which is piloted from a remote pilot station.	ICAO RPAS Manual (Doc 10019).
remotely piloted aircraft system	A remotely piloted aircraft, its associated remote pilot station(s), the required command and control links and any other components as specified in the type design.	ICAO RPAS Manual (Doc 10019).
risk	It means the combination of the overall probability, or frequency of occurrence of a harmful effect induced by a hazard and the severity of that effect.	Regulation (EU) No 1035/2011 laying down common requirements for the provision of air navigation services).
risk assessment	A risk-assessment identifies plausible threat or hazard scenarios and quantifies their level of risk by analysing their likelihood, reasonable worst-case consequences, the current mitigating measures, and the remaining vulnerabilities. A risk assessment may contain safety- and security elements, or both.	ICAO – Global Aviation Security Plan (Doc 10108).
Safety risk management (SRM)	Safety risk management encompasses the assessment and mitigation of safety risks. The objective of safety risk management is to assess the risks associated with identified hazards and develop and implement effective and appropriate mitigations. Safety risk management is therefore a key component of the safety management process at both the State and product/service provider level.	ICAO Safety Management Manual (Doc 9859), 3rd edition.
safety management system	a systematic approach to managing aviation safety including the necessary organisational structures, accountabilities, policies and procedures, and includes any management system that, independently or integrated with other management systems of the organisation, addresses the management of safety.	Regulation (EU) No 376/2014, Art 2 (18).

Term	Description	Reference
safety	The state, in which risks associated with aviation activities, related to, or in direct support of the operation of aircraft, are reduced and controlled to an acceptable level.	ICAO Annex 19 – Safety Management , chapter 1.
security	Safeguarding civil aviation against acts of unlawful interference. This objective is achieved by a combination of measures and human and material resources.	ICAO Annex 17 – Security, chapter 1.
serious incident	An incident involving circumstances indicating that there was a high probability of an accident and is associated with the operation of an aircraft, which in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time it comes to rest at the end of the flight and the primary propulsion system is shut down.	Regulation (EU) No 996/2010.
sighting	An instance of seeing or catching sight of something, typically something unusual or rare that lasts for only a short time.	New terminology used by the EASA C-UAS TF.
specific category	Operations that requires an authorization by the competent authority before the operation takes place. Here, safe operations are guaranteed through a system in which the drone operator is required to carry out an operational risk assessment and put in place the resulting mitigation measures to obtain an authorization to fly the drone. For high risk operation, the drone shall be certified. Examples of this category are flights where the operator can no longer see the drone (so-called beyond visual line of sight (BVLOS)) and operations with drones heavier than 25 kg. For high risk operation, the drone shall be certified.	Commission Implementing Regulation (EU) 2019/947.
stakeholder	'Operational stakeholders' means the civil and military airspace users, civil and military air navigation service providers, airport operators, airport slot coordinators and operating organisations and any additional stakeholder groups considered relevant for the individual functions. (see also actor definition)	Common dictionary definition and p. 73 of ACI Publication "Drones in the airport environment"[1].
Task Force (TF)	EASA C-UAS Objective 2 Task Force formed to work on the objective 2 of the EASA C-UAS Action Plan. Name of the group working on the "Drone Incident Management at Aerodromes" manual.	Also called EASA C-UAS TF.

Term	Description	Reference
threat	A man-made occurrence, individual, entity, or action that has, or indicates, the potential to harm life, information, operations, the environment and/or property.	ICAO Risk Assessment Manual for Civil Aircraft Operations Over or Near Conflict Zones (Doc 11084).
threat assessment	The estimation of the probability for an attack to be enacted against a target during a specific time frame, that will help to determine the threat level that a UAS may pose and will help decision makers to select the appropriate and most effective countermeasure.	New terminology used by the EASA C-UAS TF and adapted from ICAO Annex 17.
threat level	Indicates the likelihood of a safety / security incident caused by drone operations.	New terminology used by the EASA C-UAS TF and adapted from ICAO Aviation Security Manual (Doc 8973).
threat under control	The objective for the reiterative response process is for the DIMC to jointly agree at which point the threat is deemed resolved ("Threat resolved"). This should be based on pre-agreed incident cancellation criteria (e.g. drone found, drone pilot identified, time factor or other suitable criterion)	New terminology used by the EASA C-UAS TF.
Threat zone A	Covering the areas of the runway/s, their immediate surroundings, immediate arrival and departure sections.	Recommendation from the EASA C-UAS TF based on ICAO Aviation Security Manual (Doc 8973).
Threat zone B	Covering the areas within the airport perimeter and the arrival/departure path/s affected.	Recommendation from the EASA C-UAS TF based on ICAO Aviation Security Manual (Doc 8973).
Threat zone C	Covering the areas outside of the airport perimeter in the surroundings of the airport.	Recommendation from the EASA C-UAS TF based on ICAO Aviation Security Manual (Doc 8973).
threat zone map	Map utilized during an drone/UAS incident to identify the location and classify the risk of an drone/UAS incursion in real time and along the incident's dynamic evolution.	ICAO Term – Chapter 19 of Aviation Security Manual (Doc 8973).
UAS geographical zone	A portion of airspace established by the competent authority that facilitates, restricts, or excludes UAS operations in order to address risks pertaining to safety, privacy, protection of personal data, security or the environment, arising from UAS operations.	Commission Implementing Regulation (EU) 2019/947, Art. 15.
unauthorised drone	Any drone/ UAS activity (in the aerodrome environment) without authority or permission, and which could result in safety/security risk and/ or have a negative impact on business continuity and/or reputation.	p. 73 of ACI Publication "Drones in the airport environment".[1]

Term	Description	Reference
uncontrolled airspace	Airspace which is not a "controlled airspace"	CORUS ConOps - SJU The term is implicitly defined in ICAO Annex 2 [10] and SERA [12] as all airspace which is not Controlled Airspace.
unmanned aircraft	Any aircraft operating or designed to operate autonomously or to be piloted remotely without a pilot on board	Commission Implementing Regulation (EU) 2019/947.
unmanned aircraft-system	An unmanned aircraft and the equipment to control it remotely.	Commission Implementing Regulation (EU) 2019/947, and Commission Delegated Regulation (EU) 2019/945.
unmanned aircraft system operator	Any legal or natural person operating or intending to operate one or more UAS.	Commission Implementing Regulation (EU) 2019/947, and Commission Delegated Regulation (EU) 2019/945.
U-space service	Means 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 numbers of UAS.	Modified definition after EASA Opinion 01-2020. Voted on in February 2021.
U-space airspace	Means a UAS geographical zone designated by Member States, where UAS operations are only allowed to take place with the support of U-space services.	Modified definition after EASA Opinion 01-2020. Voted on in February 2021.
UTM/U-space service provider	UTM/U-Space service providers are entities that are certified by the relevant competent authority to provide U-Space services to unmanned aircraft and UAS operators in the U-Space airspace(s) designated by the Member States either in controlled or uncontrolled airspace. These services may support an operator's compliance with their safety obligation and associated Risk Assessment [61]	EASA Opinion 01/2020 – for a new IR on a regulatory framework for the U-Space.
vulnerability	Factors or attributes that render an entity, asset, system, network or geographic area open to successful exploitation or attach or susceptible to a given threat or hazard.	ICAO – Risk Assessment Manual for Civil Aircraft Operations Over or Near Conflict Zones (Doc 10084).

61 See Annex D 'Risk Assessment' and E (Workflow/Checklist)

1.11.2. Abbreviations

AAIB	Aviation Accident Investigation Body
ACI	Airports Council International
ADR	Aerodrome (EASA shorthand for aerodrome)
AFIS	Aerodrome Flight Information Service
AIP	Aeronautical Information Publication
AIS	Aeronautical Information Service
AMC	Alternative Means of Compliance
ANSP	Air Navigation Service Provider
APOC	Airport Operations Centre
ARO	Authority Requirements for Air Operations
ASP	Airport Security Programme
ASSURE	Alliance for System Safety of UAS through Research Excellence
ATC	Air Traffic Control
ATM	Air Traffic Management
ATIS	Automatic terminal information service
ATS	Air Traffic Service
BR	Basic Regulation
C2	Command and Control link
CAA	Civil Aviation Authority
CANSO	Civil Air Navigation Services Organization
CAP	Civil Aviation Publication
CAT	Commercial Air Transport operations
CE	Conformité Européenne
CNS	Communication, Navigation and Surveillance
CONOPS	Concept of Operations
CS	Certification Specification
C-UAS	Counter-Unmanned Aircraft System
DA	Delegated Act
DDS	Drone Detection Systems
DfT	Department for Transport
DIMC	Drone Incident Management Cell
EASA	European Union Aviation Safety Agency
EASA C-UAS TF	EASA Task Force on the objective 2 of the EASA Counter UAS action Plan
EC	European Commission
ECCAIRS	European Coordination Centre for Accident and Incident Reporting System

eID	Electronic Identification
EMP	Electromagnetic Pulse
EO	Electro-optical
EPAS	European Plan for Aviation Safety
EU	European Union
EUROCAE	European Organisation for Civil Aviation Equipment
EUROCONTROL	Supporting safe and seamless air traffic management across Europe
FAA	Federal Aviation Administration (USA)
GA	General Aviation
GEN	General requirements
GM	Guidance Material
GNSS	Global Navigation Satellite System
HEC	Hazard Effect Classification
HMI	Human Machine Interface
HTP	Horizontal Tail Plane
IA	Implementing Act
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ID	Identification
IEA	Impact Effect Assessment
IFR	Instrument Flight Rules
INTERPOL	The International Criminal Police Organization
IR	Infrared Electro Optical
ISO	International Organization for Standardization
JARUS	Joint Authorities for Rulemaking on Unmanned Systems
KPI	Key Performance Indicators
LAANC	Low Altitude Authorization and Notification (USA)
LEA	Law Enforcement Authority
LoA	Letter of Agreement
LRST	Local Runway Safety Team
MAA	Military Aviation Authority
MAB	EASA Member States Advisory Body
MAC	Mid-air collision
MTOM	Maximum Take-Off Mass
NAA	National Aviation Authority
NCASP	National Civil Aviation Security Programme

NM	Nautical Mile (1,852 km)
NSA	National Supervisory Authority
ORO	Organisation Requirements for Air Operations
OSO	Operational Safety Objectives (SORA)
RF	Radio Frequency
RP	Remote Pilot (‘drone pilot’)
RPA	Remotely Piloted Aircraft
RPAS	Remotely Piloted Aircraft System (‘drone’)
RPS	Remote Pilot Station
SAB	EASA Stakeholders Advisory Board
SAG	Safety Action Group
SARPs	Standard and Recommended Practices
SAIL	Specific Assurance and Integrity Levels (SORA)
SC	Safety Committee
SMS	Safety Management System
SORA	Specific Operations Risk Assessment
SPT	Safety Promotion Task
SRB	Safety Review Board
STS	Standard Scenario
TAS	True Airspeed
UA	Unmanned Aircraft
UAS	Unmanned Aircraft System (‘drone’)
UAV	Unmanned Aircraft/Aerial Vehicle
UTM	Unmanned Aircraft System Traffic Management
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions
VTOL	Vertical Take-off and Landing
VTP	Vertical Tail Plane