Aviation Safety Response to Unmanned Aircraft Systems Operations Through the Lens of International Air Law

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Abstract

The rapid increase of non-military operations of Unmanned Aircraft Systems (UAS) across the globe poses safety challenges to aviation, that require countermeasures. The applicable relevant international air law statute is the Chicago Convention, which created ICAO, with mandate to regulate air safety of international civil avia- tion. This article analyses the applicability of international aviation law from an international and national perspective. The Convention specifically provides the basis for the regime of special permission of aircraft crossing international borders in flight, intended at averting safety concerns arising from possible accidents or col- lisions. This article demonstrates that despite the existence of robust safety legisla- tion, and guidance materials plus circulars by ICAO, operation of UAS continue pos- ing safety challenges.

Like manned aircraft, operators of international UAS flights should comply or be within the realm of Annex 19 of the Chicago Convention on Safety Management and ICAO Manual Doc 9859, Annex 2 on Rules of the Air. Circular 328-AN/190, first pub-lished in 2011 is of a historical value, as the first ICAO document providing guidance to States and industry to initiate regulation of civil operations of UAS, addressing safety concerns. Annex 19 obligates ICAO Contracting States to ensure that safety measures are in place through establishment of State Safety Programme (SSP), while at the same time ensuring that UAS regulations speak to the needs to address aviation safety to avert danger.

Introduction

This article provides substantive elements of how existing international air law on air transport operations provides the basis to regulate aviation safety encompassing as well as the use of UAS. These provisions are located in different ICAO documents such as Annex 1, 2, 6, 7, 8, 13, 14 and 19 of the Chicago Convention and the ICAO RPAS Manual Doc 10019, whose first edition was published in 2015. The article dis- cusses how the rules of international air law including the Conventions, Annexes and other instruments address safety challenges that emanate from the operation of unmanned aircraft systems in different jurisdictions. Based on Article 44 of the Con- vention and spelled out in the ICAO RPAS CONOPS¹, domestic operations of UAS are not subject to ICAO provisions.

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International and Domestic Response to Aviation Safety in UAS Operations

Aviation safety is defined under ICAO Annex 19², Safety Management Manual Doc 9859, ICAO Annex 2 on Rules of the Air and RPAS Manual Doc 10109³ as the state in which the possibility of harm to persons or of property damage is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard

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tive and proactive approaches to management of safety concerns. Tomasello's pyramid, safety management includes also the levels of prescriptive safety, predictive safety and interorganisational safety.

The challenge of safety in the use of UAS arises from the lack of Detect and Avoid

(DAA) technology in some UAS. When such technology lacks in UAS, there are in- creased chances of collision, unless the risk is mitigated through ground based tech- nologies or procedural means. The international general principle is that the UAS

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Instructively, the Chicago Convention

identification and safety risk management.

obligation of ensuring the safety of UAS is a two-fold process. It involves identifying safety risk and managing the risk. The risk management aspects encapsulate reac-

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use and operation must be safe and not compromise the lives of others. alization of this general principle, a framework for redressing safety challenges was contemplated by the contracting parties through the establishment of frameworks

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for aviation safety in the Chicago Convention.

established the ICAO, with mandate to regulate air safety, communication and tech-

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nological aspects of international civil aviation, including aspects of UAS. , of course

when flying internationally. Article 8 of the Chicago Convention specifically provides the basis for regime of special authorisation of aircraft intending to cross national borders in flight, without pilot on board. The objective of the special authorisation is to prevent obvious safety concerns arising from possibility of accidents and colli- sions if the pilotless aircrafts are left to operate unregulated in the international context. For example, neither in the USA nor in the European Union this 'special authorisation' is applied to domestic flights, to avoid unnecessary bureaucratic bur- den on Small and Medium-sized Enterprises (SMEs).

From the definition, it emerges that the

According to the

Taxonomy of safety rules (pyramid of Tomasello – presented for the first time at Parthenope University in 2012)



In full re-

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Still under the Chicago Convention, the contracting parties to the Convention are

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obliged to allow flights of non-scheduled aircraft into their territories. this obligation, which translates into a right on the operators of the aircraft, may be limited, in case of movements where the States deem inaccessible. The limitation is at the discretion of the State, which can only be exercised on grounds of safety. In any case this provision applies only to 'manned' aircraft with the pilot on board. Otherwise the special authorisation would be necessary, unless it is waived by bi- or

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multilateral agreements of by law applicable on the regional scale

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Similarly, under Article 9(a) of the Chicago Convention, public safety considerations inform the basis upon which countries may restrict or prohibit the flying of aircraft. However, the discretion of the States has limitations and

cannot be exercised when it is unreasonable in terms of extent or rather prevent aviation. Other than prohibited areas, circumstances such as public safety and emergency, without express prohi- bitions communicated to ICAO, may warrant a limitation on the right for aviation

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The safety considerations are traced to the airports of member States, who are re- quired to have navigation facilities and meteorological service for safety of avia-

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"...such other matters concerned with the safety, regularity, and efficiency of air navigation as may from time to time appear appropriate."

Based on above provision ICAO has already amended Annexes 1, 2, 7, 8 and 13 to standardise international operations of Remotely Piloted Aircraft Systems (RPAS), when under Instrument Flight Rules (IFR) higher than 500 ft above the ground and below Flight Level 600. Small UAS flying at Very Low Level (VLL) are hence not subject to the ICAO provisions.

From the above analysis, it is clear that the Chicago Convention's approach is estab-lishment of broader frameworks for safety. The mechanism contemplated under Arti- cle 44(a) as read with 44(h) are dependent on the ICAO's development of relevant SARPs. Regarding other restrictions and prohibitions of flights, the measures for their achievement are significantly dependent on discretionary regulations developed at State levels. An example is Article 9, which begins with the words,

"...each contracting State may, for reasons of military necessity or public safety, re- strict or prohibit."¹⁵

Lastly, the provisions of Article 15 of the Chicago Convention on requirement of fa- cilities and meteorological services at the airports for safety, largely excludes the UAS which have the capability of being launched from anywhere and not necessarily from an airport. This is hence another topic on which ICAO may not guide States. Nevertheless a comprehensive regulatory framework, based on the 'categories' of UAS operations is emerging in the European Union¹⁶, which could be a model to regu- late operations of UAS beyond the remit of ICAO, while pursuing a reasonable bal- ance between the need to protect citizens and the need to allow economic development, based similarly on SMEs.

provided there is no discrimination of the aircraft on nationality basis.

tion.

restrictions provided under Article 35(b) of the Chicago Convention. In order to breath more life into the stated provisions, ICAO is established with objective of en- suring 'safe and orderly growth of international aviation¹³ and to 'promote safety of flight in international air aviation.'¹⁴ Further, ICAO is mandated to adopt and amend SARPs from time to time, particularly, the Chicago Convention recognize that the standard may deal with, among others:

Similar considerations are to be made by the States when imposing the cargo

However,

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Other than the broader framework, the Convention recognizes and regulates two other practical activities that have a bearing on mitigating safety concerns for UAS use. The first one is the certification of airworthiness envisaged under Article 31 of the Chicago Convention, absolutely necessary for RPAS crossing international borders in flight, but not necessarily applicable to smaller UAS. This means that every air- craft engaged in international navigation shall be provided with a certificate of air-

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worthiness, issued or rendered valid by the State in which it is registered.

A certifi-

cate of airworthiness is a measure of an aircraft's suitability for safe flight, only ap-

plicable to certified UAS. It is conferred on an aircraft by the national aviation au-

thority of a respective State and is maintained, subject to performance of the re-

quired maintenance and continuing airworthiness actions. Until such a time that this

requirement is implemented, States continue to apply different criteria for certifica-

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tion.

For example, it has not been effectively possible to offer all UAS with certifi-

cates of airworthiness, due to rapid technological revolutions as many find them-

selves in the market without going through the procedural certification process.

More often, they are used in social gatherings to take photographs without airworthi-

ness authorization, a lacuna that has partly been associated with absence of effec-

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Clearly, it would be disproportionate to apply airworthiness certification to these small aircraft representing a reduced safety risk. And in fact in the European Union the certificate of airworthiness is not required for UAS in the 'open' category and not always in the 'specific' categories. Courses on this matter are provided at the

20 JAA-TrainingOrganisation .

The second practical regulation of safety is pegged on licencing requirements for the remote pilot. These requirements are made under Article 32 of the Chicago Conven- tion. The article provides that:

"pilot of every aircraft and the other members of the operating crew of every air- craft engaged in international navigation shall be provided with certificates of com- petency and licenses issued or rendered valid by the State in which the aircraft is registered"

Licensing is the authorisation of defined events otherwise prohibited out of the haz- ards that would occur if poorly performed. This means that the licensing has safety of operation as one of its prime considerations when a decision to grant a licence is made by competent authorities. Applicants for a license must meet certain standards

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However, ICAO Doc 10019 in 2015 clarified that Art. 32 does NOT apply to Remotely Piloted Aircraft Systems (RPAS). And in fact, amendment 175 to Annex, applicable on 03 November 2022, states that the Remote Pilot Licence (RPL) is issued by the State of the Operator and not by the State of Registry. Furthermore the Licence is never required in the European Union in the 'open' and 'specific' category'.

The two practical activities of certification of airworthiness and licencing, without more, do not inspire full safety with regard to the Detect and Avoid technologies. From a plain reading of the provisions of Articles 31 and 32 of the Convention, the provisions focus on the 'international aviation'. This technically leaves out of its scope, the concerns relating to safety of domestic uses of UAS. Particularly, Article 32 of the Convention addresses the 'crew members' in licencing subjects despite

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tive UAS regulations or proper enforcement mechanisms in some jurisdiction.

that are commensurate with complexity of the event to be performed.

that being uncommon for UAS.

Ideally, aviation safety demands that remote pilots and other UAS crew need to be trained and competent in safety, with proper qualifications, appropriate licenses or certificates of competence to provide a modicum of integrity in safety of the civil

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aviation system they eventually are part of. With little focus on the main conven- tional law, some States continue to operate without clear guidelines regarding pilots

More practically, the ICAO has also developed Annex 2 on the Rules of the Air and a manual known as Safety Management Manual Doc 9859 providing guidance to States to develop their domestic legal framework supporting Annex 19 on Safety Manage- ment, this Annex. Also relevant to safety is the ICAO's RPAS Manual 10019. The Man- ual is instrumental since it has rationalised the application of safety considerations

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Annex 19 was developed to, among others; help achieve the two dimensions of safe- ty. The Annex consisted of two programmes and systems, the first one being State Safety Programme (SSP) and Safety Management System (SMS). The two concepts are divided as between operators of UAS and the State, and are both aimed at ensuring that the sky is safe to all users.

State Safety Programme (SSP) is a programme through which ICAO ensures that States set of regulations and activities, with objective to improve safety of the air-

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operating UAS.

tion Authority is not required to alleviate the workload on the administration, never- theless attestations of competency issued by accredited and independent third par- ties (e.g. Qualified Entities²⁵) are still required.

to UAS to member States.

space.

The Programme as a mandatory system recognizes the acceptable levels of

Conversely, in the EU, while a formal licence issued by the Avia-

safety in aviation practice. It is a system through which the civil aviation authorities,

having regard to size and resource of the aviation system, regulate, monitor and ad-

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management, conduct of stakeholder awareness and internal audits.

The programme is very vital since it supports rule-making processes in the 193 ICAO member States in matter safety. Particularly, SSP supports an analysis of potential effects of safety of UAS and other third parties such as service providers regulated by

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Second, the Safety Management System (SMS) is a system to be adopted by the stakeholders. It flows from the SSP for each State on the basis of which it instructs

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The SSP and SMS are, therefore, inseparable. Persons, be they pilots of UAS or manned aircraft, are required to bear similar responsibilities of being knowledgeable about rules of the air, flight performance, planning and loading, human perfor-

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minister safety.

prises monitoring of elements of safety oversight functions like areas of significant safety concerns and high safety risks. Others are risk management, safety assurance and safety promotion. It, therefore, contemplates the conduct policy formulation based on safety information such as identification of hazards and safety arising from

The key areas of regulation include oversight of safety, which com-

civil aviation authorities.

level safety' and 'acceptable means of compliance' in their possession. The SSP pro- cesses on safety assurance, risk management, and promotion are designed to be pro- active in addressing hurdles that the use and operation of UAS pose while in the air; in other words, they are part of countermeasures from a legal perspective that address challenges regarding UAS safety operations.

This is in addition to determining the role of 'equivalent

the stakeholders to develop their respective SMS.

under oversight of the State's implementation of ICAO Annex 19 that requires all contracting States to domesticate safety management measures within their jurisdic- tion establish the system, which targets a systematic approach to management safe- ty through creating efficiency in organizational structures, accountability, policies and procedures, the SMS.

mance, navigation, operation procedure and principles of flight.

Service providers and operators

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They have to get flight instruction, demonstrate skill and expertise as well as being licensed. Of necessity, correspondingly, they would need to be proficient in the lan- guage of radiotelephony as well as meet the required medical fitness levels. For pur- poses of UAS, the latter could be modified through integration of regulations to en- sure that those who operate UAS meet the basic levels of space proficiency.

Further, SSP and SMS, require States to establish bodies with oversight of the safety mandate at the national level. The authorities specifically are responsible for ex- tending safety considerations to UAS responsibility of giving assurance of introduction

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nization in a single airspace across national and regional boundaries.

Without a pilot, the SSP and SMS aside, UAS may still experience challenges in meet-

ing safety requirements such as introduction of technology for detection and avoid-

ance, command and control, communication with ATC and prevention of unlawful

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In addition to ICAO Annex 19, the Annex 2 on the Rules of the Air³⁶ is instrumental in ensuring safety in civil aviation. The Rules stipulate the responsibilities of the pilot- in-command to ensure the operation of the aircraft complies with rules of the air and punishes those who violate them. The pilot-in-command of unmanned aircraft

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of UAS within the civilian airspace.

of personal licencing in some ICAO member States, in effect helping to achieve inte- gration of UAS into civilian application. This translates to personnel licensing harmo-

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to undertake a handing over process even where the aircraft is in flight.

Others are

taining of air traffic control clearances.

Further, SSP and SMS have influenced regulation

interference.

there may be no capacity to communicate with ATC and seek clearance before land- ing at an airport. The Chicago Convention attempts to resolve this challenge by im- posing UAS regulation and stipulation of conditions under which UAS can operate. The import of Article 8 of the Convention is to prohibit flying of pilotless aircraft over territories of other States without authorization.

The interference may occur because UAS have no pilot on board and

systems is the person controlling it while airborne and has final authority over it. The rules apply whether the pilot is on board or at a remote location in the case of unmanned aircraft systems. Further, it is the responsibility of a pilot operating a UAS

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avoidance of collisions and development of flight plans, provision of signals and ob-

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However, there is a challenge as regards the difficulty of implementing the ICAO An- nex 2. This is so, since in UAS, remote pilots may be separated by long distances and expected to hand over to pilots in far-off places. Addressing hand over responsibili- ties by remote pilots is made even more complex by the reality that remote pilots

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41 the EU, EUROCONTROL in 2018 proposed an ewset of 'Low-level Flight Rules' (LFR).

Further, safety considerations also underpin the power of the States under interna- tional air law which according to Cooper, include jurisdiction over airspace and uni- lateral right to admit or deny entry, freedom over high seas, right of innocent pas-

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may be operating from completely different States or even the high seas.

er obvious challenge brought about by ubiquity in the use of UAS is the difficulty to develop and submit a flight plan, to be used for filming, for example. As it stands, therefore, there are impediments to the full attainment of safety in licensing and regulation of UAS. It is notable that this might be a missed opportunity since rules of the air are, by nature, binding upon member States to the Chicago Convention. Fur- thermore, flights of manned aviation below 500 ft above ground are not standardised in Annex 2. Below that height, each State should establish its own rules of the air. In

sage, nationality of aircrafts, among others.

SARPs and the international customary law are supported by court opinions that con- sider safety as the basis for regulation of UAS.

The above position in conventional,

The oth-

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For instance, the Libyan Arab Jamahiriya v United Kingdom⁴³ also known as the Lock-

erbie case has been instrumental in defining safety laws in the aviation sector.

Though this case was applicable to manned aircrafts, the principles developed by the

court would still apply to the UAS in the current framework under the Chicago Con-

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Safety concerns are also addressed through traffic clearances, which ensure flight completeness. In regards to the traffic management, it is clear that when the Chica- go Convention was adopted, there was an agreement between parties that relates to traffic management. The Agreement stipulated at Article 12 of the Convention partly states as follows:

Each contracting State undertakes to adopt measures to ensure that every aircraft flying over or manoeuvring within its territory and that every aircraft carrying its nationality mark, wherever such aircraft may be, shall comply with the rules and regulations relating to the flight and manoeuvre of aircraft there in force.

The reference to 'aircraft carrying the nationality marks' under Article 12 of the Convention applies extraterritorially. This is a major achievement in ensuring that foreign UAS do not cause mayhem or disruptions in the aviation airspaces of other countries. However, the implementation of the provision is heavily dependent on development of laws at national levels and consequent harmonization of the said

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ture of the judgments are limited to those specific cases and respective parties

vention.

Perhaps, the only notable limitation is that the effect of the binding na-

alone.

⁴⁶ Further, the Chicago Convention requires aircraft that are engaged in international

laws that are to be implemented through the enforcement of the criminal laws.

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These documents include: certificate of registration, certificate of airworthiness,

appropriate licenses for each crew member, journey logbook, aircraft radio station

license; if carrying passengers, a list of their names, places of embarkation and des-

tination, and if it is for cargo, a manifest and detailed declarations of the cargo

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ensure that only legal and not contraband cargo is carried.

The above regulatory approaches under Article 29 of the Chicago Convention may, however, prove difficult to enforce when dealing with UAS as at the moment, there are no cases of them carrying people. In fact, Doc 10019 proposes the alternative of fulfilling the documentation requirements of Article 29 of the Convention through electronic documents, some of them just at the level of the Remote Pilot Station and not in the aircraft. For example, whereas it would be easy for manned aircraft to carry specified documents on board the aircraft, carrying paper-based documents on board UAS is neither practical nor appropriate. In this context, electronic or alterna-

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Regarding the implementation of the above provision, as Pevot *et al* notes, the inter- national response to the safety is still faced with challenges of unmanned traffic management (UTM).

navigation to fulfil certain conditions, one of which is carrying documents aboard.

should be provided.

ownership, the documents are meant to ensure safety of the aircraft, its crew and property, and persons on the ground. The list of passengers would allow for easier identification in circumstances where an accident occurs. Declaration of cargo would

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Other than, for purposes of identification, certification and

tive versions of the documents would need to be considered.

monplace that in the event an accident happens, most aircraft end up being burned completely, including paperbased documentation. It is, therefore, important to have a regulatory framework that ensures that advanced technology is fixed to UAS with backup to servers on the ground, which can be retrieved in case of accidents.

Secondly, it is com-

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Generally, UAS would require an advanced traffic management ecosystem under de- velopment for autonomously controlled operations of UAS to ensure safety in entry

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That notwithstanding, the international response under Article 8 of the Chicago Con- vention contemplates that the UAS must operate in the same airspace with the manned aircraft. This categorisation may be disruptive since the UAS comes in differ- ent shapes and may operate in much lower altitudes, which the aviation airspace was not originally designed to handle. This leads to concern over safety issues in en- try of UAS into the airspace.

The rule of the air is to reduce the safety risks that may arise. Part 3.6 in particular deals with control of air traffic. It specifically provides as follows:

"An air traffic control clearance shall be obtained prior to operating a controlled flight, or a portion of a flight as a controlled flight. Such clearance shall be request- ed through the submission of a flight plan to an air traffic control unit."

The import of the word 'shall' makes it mandatory for the requisition of the air traf- fic control clearance to be obtained when a person submits an air traffic control plan after submission of flight plans by civil aviation operators including operators of UAS. Despite the provision, the requirements of ICAO Annex 2 still compellingly direct to- ward two conclusions on implementation challenges. First, some of the requirements for flight plans and flight clearance to pilots in command may be impracticable for certain uses of UAS. Secondly, the idea of control as stipulated in the Chicago Con- vention and ICAO Annex 2 do not specifically provide for the command and control system. Accordingly, it depends on the State resources and the design of the UAS to fully implement these provisions that are pivotal for safety in the airspace.

In order to further cure the challenges that relate to the unmanned traffic manage-

ment in the ICAO Annex 2, ICAO developed Circular No. 328 AN 190. The Circular re-

quires pilot-in-command to ensure operation of the aircraft complies with rules of

the air and punishes those who violate them. The pilot-in-command for unmanned

aircraft systems is the person controlling it while airborne and has final authority

into the airspace.

ing the series of international standards 23629⁵² on UAS Traffic Management. Ideally, the system comprises a system that can monitor increased activity based on sharing of each operator's scheduled flight details in a digital form. Unfortunately, most UAS lack these systems.

In particular the International Standard Organisation is develop-

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case of unmanned aircraft systems. Further, it is the responsibility of a pilot operat-

over it.

This applies, whether the pilot is on-board or at a remote location in the

54 Other responsibilities are avoidance of collisions and development of flight plans,

ing a UAS to undertake a handing over process even where the aircraft is in flight.

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The ICAO has, over the years, developed a series of traffic rights, known as Freedoms of the Air, which continue to form the basis of rights exchanged in air services nego-

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regulatory challenges.

and do not specifically address the challenge of lack of the sense and avoid technolo- gy for some UAS.

provision of signals and, obtaining of air traffic control clearances.

tiations today.

UAS may present a contradiction since although UAS may interact like manned air- craft, there are certain inconsistencies exist in the latter such as non-co-operation and non-compliance, which may complicate management of air traffic with current

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This study contends, however, that this principle and its effect on

The above provisions speak to the general rules on safety

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The rule that specifically addresses the issue is the UAS principle of responsibility

and accountability. Under this principle, it is expected that UAS missions will still

need persons who are accountable, regardless of whether they are called command-

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person in command is on the ground.

Conclusion

The article has established that aviation safety is a cardinal ingredient for the opera- tion of UAS in all 193 ICAO members States. The relevant international law applica- ble for the effective safety regulation for UAS is the Chicago Convention, which es- tablished ICAO, with mandate to regulate air safety. Article 8 of the Chicago Conven- tion specifically provides the basis for regime of special authorization of aircrafts aimed at preventing safety concerns arising from likelihood of accidents and colli- sions of the pilotless aircrafts.

Under article 9(a) of the Chicago Convention, public safety considerations inform the basis upon which countries may restrict or prohibit the flying of aircrafts. Such dis- cretion has limitations, hence need to be exercised reasonably. This means for exam- ple, States should not deny authorization during emergency. However, for the pur- pose of public safety or security, State may restrict or prohibit flying of UAS into a national Airspace as contemplated under Art 9 of the Convention.

The Convention inaugurates wider outlines for safety measures. The mechanism en-visaged under Article 44(a) as read with 44(h) are dependent on the ICAO's develop- ment of relevant SARPs. More specific to aviation safety regulations of the operation of UAS, is Annex 19 to the Convention on Safety Management, Manual Doc 9859, Annex 2 on Rules of the Air and Circular 328-AN/190. This, international instrument ob-ligates member States to ensure that safety measures are put in place through estab-lishment of State Safety Programme (SSP).

Due to advancement of technology, that has seen UAS manufactured in different siz- es, States will likely continue to encounter safety challenges in operation of UAS in the area of compliance with some safety requirements such as certificate of registra- tion, certificate of airworthiness, appropriate licenses, insurance, and absence of unmanned Aircraft system traffic management in some developing countries. This requires continual improvement and counter measures coupled with dedication by States and none State actors support, as UAS are likely to increase in civil airspace as technology advances.

⁴ See Safety Management Manual Doc 9859. Glossary and definition of terms at p vii.

⁵ ICAO Annex 19, Paragraph 2.16.

er or pilot.

entities responsible for operations, in case of foul play. Particularly, the principle appreciates that the UAS involves novel technologies; hence, the need to create mechanisms to ensure responsibility and accountability in design, manufacture, maintenance and operations, equal to those of manned aircraft, even though the

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From a legal perspective, action must be taken against persons or legal

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¹https://www.icao.int/safety/UA/Documents/ICAO%20RPAS%20CONOPS.pdf.

² Annex 19 on Safety Management to the Chicago Convention (hereinafter referred to as ICAO Annex 19).

³ ICAO Circular on Unmanned Aircraft Systems No. 328-AN/190 (hereinafter refered to as ICAO Circular No. 328-AN/190). See section 2.16, 2.17, 2.18, 2.19, 2.20 and 2.21.



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⁶ICAO Circular 328-AN/190, Section 2.8 provides that: The principal objective of the aviation regulatory framework is to achieve and maintain the highest possible uniform level of safety. In the case of UAS, this means ensuring the safety of any other airspace user as well as the safety of persons and property on the ground.

⁷ The Chicago Convention, Article 3 (d) which provides that: The contracting States undertakes when issuing regulations for their State aircraft, that they will have due regard for the safety of navigation of civil aircraft.

⁸ The Chicago Convention, Article 44. ⁹ The Chicago Convention, Article 5.

¹⁰ E.g. European Commission Implementing Regulation (EU) 2019/947 of 24 May 2019 on the rules and procedures for the operation of unmanned aircraft.

¹¹ The Chicago Convention, Article 9(b). ¹² The Chicago Convention, Article 15. ¹³ The Chicago Convention, Article 44(a). ¹⁴ The Chicago Convention, Article 44(h).

¹⁵ The Chicago Convention, Article 9(a).

¹⁶ https://www.easa.europa.eu/domains/civil-drones-rpas/drones-regulatory-framework-background.

¹⁷ The Chicago Convention, Article 31.

¹⁸ Amendment 108 to ICAO Annex 8 applicable on 26 November 2026.

¹⁹ Somalia hitherto, has no UAS regulation.

²⁰ https://jaato.com/courses-examinations-virtual/?cat=18&ct=all&d=all.

²¹ The Chicago Convention, Article 32 (a).

²² The Chicago Convention, Article 32 (a).

²³ Pepin E "Development of the National Legislation on Aviation since the Chicago Convention" 1957 JALC 1.

²⁴ ICAO Annex 19, Paragraph 4.13.

²⁵ Artcile 69 and Annex VI in EU Regulation 2018/1139.

²⁶ ICAO UAS Circular No. 328 AN 190. Section 2.16, 2.17, 2.18, 2.19, 2.20 and 2.21.

²⁷ ICAO Annex 19, Paragraph 2.19.

²⁸ ICAO Annex 19, Paragraph 2.19.

²⁹ https://www.iata.org/en/training/courses/state-safety-program/tcvg90/en/ (Date of use: 22 July 2020).

³⁰ https://www.iata.org/en/training/courses/state-safety-program/tcvg90/en/ (Date of use: 22 July 2020).

³¹https://www.iata.org/en/training/courses/state-safety-program/tcvg90/en/ (Date of use: 22 July 2020).

³² ICAO Annex 19, Paragraph 2.15.

³³ Provided in relevant ICAO Annex 6 on Operation of Aircraft to the Chicago Convention (hereinafter referred to as ICAO Annex 6); Annex 11 on Air Traffic Services to the Chicago Convention (hereinafter referred to as ICAO Annex 11" and Annex 14 on Aerodromes Design and Operations to the Chicago Con- vention (hereinafter referred to as the ICAO Annex 14).

³⁴ The Chicago Convention, Article 8 on pilotless aircraft. It provides that each contracting State to en- sure use of UAS by any contracting State shall be controlled to obviate danger to civil aircraft.

³⁵ ICAO Annex 19, Paragraph 2.15.

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³⁶ Annex on the Rules of the Air to the Chicago Convention (hereinafter referred to as ICAO Annex 2).
³⁷ ICAO Annex 2, Paragraph 2.3.1.
³⁹ ICAO Annex 2, Paragraph 3.3-3.6.

⁴⁰ ICAO Annex 2, Paragraph 3.3-3.6.

⁴¹ https://www.eurocontrol.int/archive_download/all/node/11149.

⁴² See Cooper JC "Backgrounds of International Air Law" 1965 YASL 3.

⁴³ Libyan Arab Jamahiriya v United Kingdom 1992 88 (ICJ) Rep 3 [578].

⁴⁴ Bouve C "Regulation of International Air Navigation under the Paris Convention" 1935 JAL 299.

⁴⁵The United Nations Charter of 26 June 1945 1 UNTS XVI (entered into force 24 October 1945) (hereinafter referred to as the UN Charter).

⁴⁶The Chicago Convention 1944, Article 12.
⁴⁷The Chicago Convention 1944, Article 29.
⁴⁸The Chicago Convention 1944, Article 29.
⁴⁹ICAO Annex 2, Paragraph, 2.1.1 also makes similar requirements. ⁵⁰ICAO Annex 119, Paragraph 4.1.1

⁵¹ Prevot *et al* "UTM" 3292.

⁵² https://www.iso.org/committee/5336224.html.

⁵³ ICAO Annex 2, Paragraph 2.3.1.

⁵⁴ ICAO Annex 2, Paragraph 2.3.1.

⁵⁵ICAO Annex 2, Paragraph 3.3-3.6.

⁵⁶ Manual on the Regulation of International Air Transport (Doc 9626, Part 4). ⁵⁷ DeGarmo M *Issues Concerning Integration* 8.

⁵⁸ De Garmo *Issues Concerning Integration* 8.

⁵⁹ De Garmo *Issues Concerning Integration* 8.