ALMA MATER STUDIORUM

APRIL / JUNE 2018 YEAR XVII N° 2

The Aviation & Space Journal

ISSN 2281-9134
The Aviation & Space Journal
[online]
Website: www.aviationspacejournal.com

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E-mail: newsletter@lslex.com
Registrazione presso il tribunale di Bologna n. 7221 dell'8 maggio 2002

Interpretation of the Term 'bodily injury' in International Air Transportation

Whether recovery for Mental Injury is tenable under the Warsaw System and Montreal Convention

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Abstract

In international air travel, the Warsaw Convention and the Montreal Convention are the main instruments applicable in case of liability of carrier to redress passenger injury. Under the liability framework of both the Conventions, passengers have been allowed a limited recovery of bodily injury. Judicial decisions have given controversial interpretations for claims dealing with mental injury which has led to a fragmented and inconsistent judicial precedent. The author argues that despite the retention of the same phrase of bodily injury in Montreal Convention, there is a new hope which has emerged to adjudicate claims beyond bodily injury.

A close analysis of the Montreal Convention's history and negotiations allows claims dealing with mental injuries. The change in policy framework from protecting the airline industry to protecting the passenger, and comparison with other International Conventions support the same analysis.

The research paper aims to examine the current existing legal regime dealing with liability of a carrier with regard to a passenger injury. The author argues that a different approach and analysis has to be adopted by courts while dealing with a claim under the Montreal Convention than the Warsaw Convention in light of new emerging medical science, which will be in consonance with the objective and purpose of the Montreal Convention.

Introduction

In a comforting age of recognition of mental health across the world, the concern arises with respect to the tenability of the mental injury claims under the current international civil aviation legal regime. In a fictitious situation of an aircraft meeting with an accident, even if there is no physical harm to majority of the passengers, the question arises as to what would happen if some passengers suffer from post-traumatic stress disorders, hereinafter referred to as 'PTSD'or other kinds of mental injuries after experiencing a frightening escape. Whether such claims can be compensated under the current legal framework?

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In international air travel, liability of air carriers to passengers is either governed by the framework of Warsaw Convention,[1] or the Montreal Convention.[2] The most important and critical provision regarding liability for passenger injury is Article 17[3] of the Warsaw Convention. The Montreal Convention incorporates similar requirements in case of a passenger injury with mere deletion of words.[4] Within the framework of Article 17, recovery for accidents suffered on international flights has been limited to bodily injury and compensation for pure mental injury has been excluded.[5] This limitation has been derived from the interpretation of the Warsaw Convention's French term 'lésion corporelle' which strictly requires physical injury to a passenger in its English translation.[6]There are also certain concerns regarding the acceptance of recovery for mental injury, including the 'opening of the floodgates' argument, difficulties regarding proof, disproof, diagnosis and causation of mental injuries.[7]

Initially the interpretation has almost universally required physical injury, however, there has been a minor and disputed widening of scope of liability along with time.[8] Some judicial decisions have recognized a right to recover damages under Article 17 for mental injury caused by, related directly to and emanating from an accompanying physical or bodily injury.[9] But in such cases, damage is not awarded for standalone or separate mental injury, but on the account of medically proven mental suffering caused directly by and emanating from the bodily injury.[10] In recent decisions, having reliance on the medical advancements, the courts have concluded that mental injuries can be considered as bodily injuries and therefore, can be compensated under the liability regime.[11]

Certain concerns as to what happens in case of a pure mental injury or in a case where the accident causes mental injury which, in turn, causes bodily injury need to be legally examined to come to a conclusion. The questions regarding whether recovery for pure mental injury or for the mental injury that precedes its physical manifestation can be permitted under the existing legal regime are yet to be answered. The current work aims to analyse the existing legal framework along with various judicial decisions for carrier liability to find out the extent of inclusion of damages for mental injury, if allowed.

During the course of the paper, it will be observed that courts in different jurisdictions have used distinctive terminology while dealing a claim for mental injury, including physiological damage or injury, emotional damage or injury or distress and psychiatric injury.[12] For the sake of brevity, the author uses the word 'mental injury' throughout while explaining her opinion.

What is mental injury?

Traditionally, the common law was hesitant to recognize mental distress as an independent basis for recovery.[13] The primary concerns for denying recovery for emotional distress included that emotional harm can be feigned, or imagined;[14] difficult to measure in monetary terms;[15] exposure of defendants to unlimited liability[16] and particularly, the potential for fictitious claims.[17]

Today, recovery for purely mental injury is recognised in the tort law of many states[18] and protections are used such as 'impact rule,'[19] 'zone of danger rule,'[20] and 'physical manifestations requirement'[21] to limit both application and amount of recovery and to alleviate spurious claims.[22]

The term 'mental injury' includes both psychiatric injuries and emotional harm.[23] Emotional harm, for instance, distress, upset or fear is distinguished from a psychiatric injury since it does not equate to a recognised psychiatric disorder.[24] A distinction can be seen in English law in relation to nervous shock. Nervous shock is a term which is used to describe psychiatric illness or injury, such as PTSD, or clinical depression, arising from witnessing a traumatising event.[25] A person suffering from nervous shock does not have to suffer any physical harm or any personal danger.[26] In addition, while in English law, there is a duty of care to not cause nervous shock, it generally excludes compensation for emotions such as grief and stress.[27]

In the United States, there has been uniformity in respect of the concept of mental injury and the recoverability of damages for the same. Conventionally, a plaintiff was allowed to recover damages for mental injury only when it was accompanied by physical injury[28], but in most states, plaintiffs may now recover for mental injury by reference to a recognised psychiatric disorder.[29]However, few states, namely Indiana and Kentucky require a physical impact i.e. some form of physical manifestation of injury in order to permit recovery for mental injury.[30]

In the context of air travel, tort recovery for pre-impact emotional distress is common and most courts have entertained them under state law.[31] Pre-impact emotional distress refers to the fear of impending death or bodily harm that a passenger on an airplane experiences upon discovering that flight, and therefore, his/her life is in danger.[32] In such cases, the primary issue is whether the plaintiffs actually suffered distress,[33] and not whether claims for purely psychological injuries are permissible.[34] Thus, tort recovery suggests validity of the monetary compensation for mental injury.

In case of legal outline, the provisions of the Warsaw Convention and Montreal Convention are of exclusive application and have mandatory effect.[35] As a result, all the claims relating to passenger injury are to be brought under the Warsaw Convention or Montreal Convention and otherwise, no claim can be brought under any national law.[36] Therefore, all the claims dealing with mental injury in an international air travel are to be examined within the framework of both these Conventions. In general, recovery for purely mental injuries has been denied by courts as it is difficult to identify which mental injuries are caused by the accident and as a result, can be compensated under international air law.[37] As a result, damages arising out of emotional distress are allowed under Article 17 of this convention only to the extent that they flow from the bodily injury suffered.[38]

These aforementioned references of the English and United States law are not to interpret the provisions of the Warsaw and Montreal Conventions since that contravenes the principles of treaty interpretation under the Vienna Convention on the Law of Treaties.[39] The aim is to provide a domestic legal framework about mental injury against the view that during drafting of the Warsaw Convention in 1919, recovery for mental distress was excluded in common law jurisdictions.[40]

The bodily injury has always been seen in terms of evident structural changes to the physical body.[41] However, the modern psychiatry has left behind the dualist approach of mind and body as 'Events and processes with which psychiatry is concerned are both physical and mental and ...the distinction resides not in the events and processes but in the linguistic/conceptual framework used in referring to them.'[42]

On the basis of evolution of scientific and medical understanding of purely mental injury, the distinction between purely mental and physical injuries has blurred.[43] The development in scientific research questions the dualism between mind and body and can affect heavily litigated issue of 'mental injury' within the ambit of Article 17.[44] Dr. Harris in *In re Air Crash at Little Rock Arkansas* explained in his testimony that certain medical tests can be used to examine physical changes to the brain, including magnetic resonance spectroscopy, positron emission tomography, scans.[45] In addition, the use of neuroimaging in medical research has recently shown physical effects of PTSD[46] which further supports the view that the distinction between bodily and mental injury is diminishing.

THE GOVERNING INTERNATIONAL LIABILITY REGIME

The Warsaw System

The Warsaw System collectively includes the Warsaw Convention along with amending protocols and supplementary instruments.[47] Article 17 of the Warsaw Convention lists the occurrences of death, wounding and bodily injury by referring to the physical world.[48] In its original text in French, the word 'lésion corporelle'' has been used. In French contract law, a lesion means-a pecuniary loss may occur for rescission of the contract when there is a disparity between the parties' contractual obligations.[49] In addition, *Dommage corpore*, is a type of damages in French law which can be recoverable and may include physical, mental, and moral damage, as well as any pecuniary loss resulting from personal injury.[50]

To make 'lésion corporelle' with its preceding words, 'lésion' must be taken in its literal sense with its physical connotations. On the one hand, interpretation on the basis of pure literal meaning of the words concludes that the conditions for 'lésion corporelle' are not satisfied by mental injury alone.[51] On the another hand, if both a concrete and an abstract interpretation can be given to the broad definition of 'lésion', the French legal usage 'lésion corporelle' can include mental suffering as it includes 'any injury suffered by the plaintiff as a person distinct from any injury done to his patrimony i.e., his belongings economic assets or interests.'[52] When it is applicable to the Warsaw Convention, 'the use of the word 'lésion' after the words 'death or wounding' comprises and contemplates cases of traumatism or disturbance of the mind which do not immediately become manifest, but have a causal relationship with the accident.'[53] In the opinion of Professor Mankiewicz, a leading expert on the Warsaw Convention and Aviation Law, if 'lésion corporelle' was intended to refer only to injury caused by physical impact, it is likely that the civil law experts who drafted the Warsaw Convention in 1929 would not have singled out and specifically referred to a particular case of physical impact such as 'blessure' i.e. wounding. The cause of action for mental injury was recognised by French law as far back as 1857.[54] In consequence, whether one embraces the importance of the usage in 1929 or present times, 'lésion corporelle' seems to incorporate a mental element.

Taking in account both the opinions, no conclusive answer can be given to the question as to how 'lésion corporelle' is to be read in accordance with its French legal meaning. A literal interpretation seems to exclude recovery for mental injury, where as a liberal interpretation seems to include recovery for mental injury. Even the minutes of the Warsaw Conference signifies that there was no discussion with regard to the term 'lésion corporelle' and the fact that it includes recovery for mental injury.

The subsequent agreements namely, the Hague Protocol, Guatemala City Protocol and Montreal Agreement which substituted the term 'personal injury' for the term 'wounding and bodily injury' and left the French term 'lésion corporelle' unchanged. As regards to these Agreements, one view is that analysis of the French term 'lésion corporelle' and subsequent conduct of the parties clarifies the intent of the drafters and thus, reveals that Article 17 provides recovery for purely mental injuries unaccompanied by physical trauma. In *Air France v. Saks*,[55] the Court held that 'reference to the conduct of the parties to the Convention and the subsequent interpretations of the signatories helps clarify the meaning of the term.'[56]

The Montreal Convention

In 1999, Montreal Convention was adopted with a view to modernize and replace the instruments of the Warsaw System.[57] Article 17 of the Montreal Convention introduced inconsequential changes in its wording and language was remarkably similar to Article 17 of the Warsaw Convention.[58]

However, regardless of the fact that the Warsaw or Montreal Convention applies, the requirements for recovery are virtually identical.[59] The liability is imposed under Article 17 if the plaintiff proves: (1) an accident (2) caused (3) death or bodily injury, (4) while the passenger was on board the aircraft or was in the course of embarking or disembarking.[60]

From the negotiations of the Montreal Convention, it is evident that at Montreal, majority of states had a desire to expand available recovery for mental injury.[61] However, during the final days of the Convention, the term 'bodily injury' was retained with the conviction that the then current-interpretation of the term 'bodily injury' as established by judicial precedent was still developing.[62] As suggested by Egyptian delegate that record could 'show the intent behind the term 'bodily injury' and would give a unified meaning to it.'[63] Thus, the proceeding of the Convention should inform judicial decision making.[64]

The French meaning of the term 'lésion corporelle' holds significance only for a claim under the Warsaw Convention, since the Montreal Convention is equally authentic both in English and French. The drafting of the Warsaw Convention is silent on the discussion regarding the meaning of the term 'lésion corporelle' since drafters may not have envisaged the case of mental injury occurring without physical injuries.[65] However, the argument is not convincing relying on the fact that French text was drafted by experts of Civil law where recovery for mental injury was allowed. Thus, relying on the basis of purpose of the Warsaw Convention dealing with limitation of liability of air carrier, recovery for mental injury may not be allowed within the framework of Article 17 of the Warsaw Convention.

On the other hand, the courts can play a significant role in developing the jurisprudence under the Montreal Convention where on the basis of negotiations, to say the least, it can be inferred by Courts that recovery for mental injury associated with bodily injury is permissible.

INCOHERENT AND DIVERGENT JUDICIAL PRECEDENTS IN VARIOUS JURISDICTIONS

Before *Floyd*, the courts in the United States were sharply split with regard to the interpretation of the term 'bodily injury' under Article 17 of the Warsaw Convention. There were some cases in which the courts have allowed recovery under Article 17 for purely emotional distress.[66] Other courts concluded that damages for emotional distress unaccompanied by physical trauma were not allowed.[67] The controversy was finally put an end to by the Supreme Court of the United States in the case of *Eastern Airlines Inc v. Floyd*.[68] During the flight from Miami, Florida to Bahamas in May, 1983, one of the aircraft's three engine lost oil pressure and eventually, the other two engines failed. The Passengers were informed that the plane would be ditched in the Atlantic Ocean. Fortunately, one of the engines restarted and the plane was landed safely at Miami International Airport.[69]

The Supreme Court reversed the Circuit Court judgement and held that Article 17 of the Warsaw Convention does not permit recovery for mental injury in absence of physical injury or physical manifestation of injury. The Court examined the text of the Convention as well as its history and negotiations.

In order to determine the French legal meaning of 'lésion corporelle', the Court examined the French legal materials including legislation, cases and treatises. The Court observed that there was no French legal provision in force in 1929 which contained the term 'lésion corporelle' and there was no French court decision explaining the meaning of the same phrase. In consequence, the Court that 'neither that "lesion corporelle" was a widely used term in French law nor that the term specifically encompassed psychic injuries.'[70]

Then, the Court examined the negotiating history of the Warsaw Convention and concluded that translation of 'lésion corporelle' as 'bodily injury' was in consonance with its history.[71] The Court considered that as 'many jurisdictions did not recognize recovery for metal injury at that time,' 'the drafters most likely would have felt compelled to make an unequivocal reference to purely mental injury if they had specifically intended to allow such recovery.'[72] The Court further examined the subsequent conduct of the parties to the Warsaw Convention in the Montreal Agreement and Guatemala City Protocol and stated that it was not an evidence of substantive change and clarify the term 'lésion corporelle'.

After the Supreme Court decision in *Floyd*, majority of the lower courts found that mental harm unaccompanied by physical harm is not recoverable.[73] In a recent decision of *Jane Doe v. Etihad Airways*,[74] the United States District Court for the Eastern District of Michigan reaffirmed the position that recovery of damages for mental injury that was not caused by any bodily injury is not permissible under the Montreal Convention.

In the United Kingdom, the most important cases which have death with the issue of mental injury under the Warsaw Convention are *King v. Bristow Helicopters Ltd.*[75]and *Morris v. K.L.M. Royal Dutch Airlines*.[76] Both the appeals were heard together by the House of Lords since both cases dealt with same issue. In *King*'s case, an action was brought by the plaintiff who was a passenger on a helicopter transporting workers off a North Sea oil platform. Both of the helicopter's engines failed suddenly and due to the crash, the plaintiff suffered PTSD with symptoms including insomnia, nightmares, anxiety and a fear of flying. He also alleged that the accident also led to peptic ulcer.[77]

In the case of *Morris*, the appellnat was an underage girl who was travelling unaccompanied from Kuala Lumpur to Amsterdam who was sexually assaulted by a male passenger who was sitting right next to her. She claimed damages for mental anguish that she suffered because of the incident.

In the decision, the House of Lords held that damages can be awarded for physical manifestations of mental injury as long as a casual link can be established between the mental injury and the physical symptoms during the accident. However, no recovery would be allowed in case there are no physical symptoms.[78] As a result, the appeal in King's was allowed and he could recover for his ulcer. On the other hand, the appellant, Morris was denied recovery for purely psychological injury.

Even though decision in *King*'s endorses the same position of irrecoverability of damages or pure mental injury under the Warsaw Convention, it does go a step further to support that certain psychological conditions which were earlier regarded as not compensable can be allowed if it is proven on the basis of modern medical science that they manifest in physically measurable symptoms.

In Australia, there is limited jurisprudence examining the issue of mental injury. The issue of tension between physical injury and psychiatric injuries was raised again in the recent of *Casey v. Pel-Air Aviation Pty Ltd*; *Helm v. Pel-Air Aviation Pty Ltd*[79] where a claim was sought by Miss Casey against Pel Air, the flight operator contending that she suffered from a complex pain syndrome, a major depressive disorder, an anxiety disorder and PTSD. In order to come to a decision, Justice Schmidt analysed the decisions in the US and the UK. In the reasoning, the decision referred to the speech of Lord Hobhouse in *King*'s case detail at length. In the case of *King*, even though in that case the claim for PTSD failed, the House of Lords accepted that in certain situations, PTSD can be considered as a compensable bodily injury.[80]

Justice Schmidt concluded that 'the evidence established that the PTSD Ms Casey developed and continued to suffer was not merely the result of an injury to her mind, caused by the shock, fear and other emotional trauma caused by the crash but also involved an injury to her brain and other parts of her body involved in normal brain function, and thus constituted a psychiatric injury caused by a physical route.'[781] Thus, PTSD was considered to be a physical injury within the boundaries of Article 17 of the Montreal Convention and damages were allowed.

In France, the French Courts including the Court of Cessation have allowed recovery for mental injury in case of a work accident,[82] but in case of aviation accidents, the Court have not stated any view with regard to the meaning of 'lésion corporelle' and inclusion of recovery for mental injury pursuant to Article 17.[83] As a result, French jurisprudence does not clarify with regard to the issue of allowing damages for mental injury within the framework of Article 17, however, it can be concluded that the French law does allow damages for mental injury.

In Germany, the main instrument applicable with regard to aviation claims is the Air Traffic Act. In its English translation, Section 45 of the Act provides for a strict liability of the carrier for death and personal injury of a passenger caused by an accident on board the aircraft or in the course of embarking or disembarking.[84] However, section 44 of the Act clarifies that the provisions are only applicable as far as the Warsaw Convention, the Montreal Convention or the Council Regulation (EC) No 2027/97 as amended by the Regulation (EC) No 889/2002 do not apply or do not lay down rules.[85]

An inference can be made to the one of the articles of Ottos Riese dealing with the application of Section 45 of the Act,[86] which was translated by Professor R.H. Mankiewicz as:

'By mentioning the harm to the health, somewhat liberal translation of the French text which mentions 'lésion corporelle', next to Korperverletzung, namely 'blessure' which is a French term used in this, 'blessure' is intended to make it clear that any harm of the physical or psychic well-being is to be included, even if that harm has not resulted in a mechanical impact or in anatomic modification in the human body.

On the basis of divergent precedents and legal framework across the world, there is a wide disagreement as to whether the term 'lésion corporelle' or 'bodily injury' still encompasses mental injury. Since *Floyd,* there has been a range of claims regarding recovery of damages for mainly the following situations: pure mental injury, mental injury manifested in physical injury, mental injury flowing from physical injury and mental injury which is not related to physical injury. It has been agreed by most courts that recovery for pure mental injury is not permissible. Some Courts conclude that mental injury is not compensable where it has resulted only in physical manifestations for instance weight loss or sleeplessness.

On the other hand, some courts have also concluded that mental injury is compensable if it flows from a physical injury. Despite the varying results, the Courts have given not convincing reasoning by not considering the French text binding while dealing a claim under the Warsaw Convention. However, in cases where cases where Courts have considered the meaning of the French legal term 'lésion corporelle', it has again led to different results with *Floyd* excluding recovery for mental injury and *Palagonia* encompassing such injury. The decision of Supreme Court of Australia in case of *Casey* distorts the distinction between mental and physical injury. As a result, the inconsistency in these judicial decisions fails the purpose of the Warsaw and Montreal Convention to bring uniformity.

REASONS FOR ADOPTING A MODERN APPROACH

It is noteworthy that the International Conventions namely, the Athens Convention, 1974[87], the Inland Waterways Convention, 1976[88], Rail Conventions[89] uses the word' personal injury' for damage and injuries suffered. The use of the broad term 'personal injury' goes beyond mere physical injury and includes claims for mental injury as well.[90] In addition, Inland Waterways Convention has a specific reference to mental harm in its provision.

More importantly, Both the Draft Conventions, namely the Convention on Compensation for Damage to Third Parties, resulting from Acts of Unlawful Interference Involving Aircraft and Convention on Compensation for Damage Caused by Aircraft to Third Parties provide that 'damage due to death, bodily injury and mental injury shall be compensable. Damages due to mental injury shall be compensable only if caused by a recognized psychiatric illness resulting either from bodily injury or from direct exposure to the likelihood of imminent death or bodily injury.' Although both the Conventions are not yet in force.

Therefore, on the one hand, all the other modes of transport provide for a recovery for mental injury. With regard to aviation also, recovery for mental injury is envisaged in both the Draft Conventions mentioned above. On the other hand, compen-

sation for mental injury is negated in international commercial air law regime. Furthermore, it is inconsistent to have different compensation regimes for passengers and third party victims. Consequently, it is necessary to seek a balance between the scope of passenger's recovery and that of third party. Moreover, during the proceedings of the Montreal Convention, multiple nations, including Pakistan and Chile agreed with the inclusion of recovery for mental injury, but advocated replacing 'bodily injury' with 'personal injury' or 'damage to health' should be permitted.

Some of the states while advocating for inclusion of mental injury asserted that it was already available under Warsaw's original text. According to the German delegate the French phrase 'lésion corporelle' already encompassed mental injury and only the English version required an amendment to cover both elements.'[91] It was pointed out by the delegate from Saudi Arabia that the Arabic text for 'bodily injury' includes both mental and physical injury.[92] The similar view that mental injury was already included in the Warsaw text was retained by the representatives from the Ukraine,[93] Uzbekistan,[94] Spain,[95] the Russian Federation,[96] the Syrian Arab Republic,[97] and the Cameroon.[98] The French delegate also confirmed that the 'lésion corporelle' did cover both physical and mental injury and there was always coverage of the problem as a whole.[99] Therefore, a consensus emerged that new treaty should allow recovery for mental injury.[100]

Therefore, the Courts should establish a specific rule of compensation for passengers' mental injury and develop a jurisprudential policy framework allowing recovery for pure mental injury, specially under the Montreal Convention.

CONCLUDING REMARKS

The issue of recovery of mental injury under the Warsaw System and the Montreal Convention entails a lot of controversial jurisprudence across the world. When the Warsaw Convention was drafted, international commercial air transportation was still being developed. For its time, the Warsaw Convention was a major contribution to the unification of law and was quite forward and promising with an aim to protect an emerging airline industry. Since the Convention was only written in French and the drafting history did not help much in solving the mystery regarding inclusion of damages for mental injury, the interpretation of the French legal term 'lésion corporelle' mentioned in Article 17 became significant in order to know the intention of the drafters. However, interpretation by courts again gave contradictory results with regard to the meaning of 'lésion corporelle' on the premises that there was no French legal document using the same phrase. However, damages for mental injury could be recovered under French law and the debate continued. The continuous fragmented judicial precedent or as Professor Paul Dempsey says, 'Clash of Titans' did not square well with what Warsaw Convention had aimed to achieve, i.e. unification of certain rules for international carriage by air.

When the Montreal Convention came into being in 1999, time had changed and airline industry was no longer nascent. It had become a robust and profitable industry by then. The Convention put the Warsaw Convention and all of its amendments into one single document, thus unifying the system of private international air law once again.

Unlike the Warsaw Convention, it was written in six languages including French and English and as a result, both texts were equally authoritative. Therefore, it may not be argued under the Montreal Convention that interpretation of the words used was limited to its French text. The drafting of the Montreal Convention started with a hope to clarify the controversy ongoing for decades with regard to recoverability of damages for mental injury. A great majority of delegates advocated for broad recovery including mental injury, however, efforts failed to alter Warsaw's language limiting recovery to 'bodily injury'. Unfortunately, the same language was retained in Article 17 of the Montreal Convention.

Along with the growth of aviation industry, there have been medical advancements as well which has distorted the dichotomy between mind and body. Today, on the basis of available medical evidences, it can be easily shown that some kinds of mental injuries like PTSD not only affect the mind of a person, but there are physical changes to body as well. In such a situation, courts are given the responsibility to arrive at a conclusion which is sound in terms of both the liability framework envisaged by drafters and medical science. The proceedings of the Montreal Convention confirm the same analogy that the retention of the same phrase was meant to allow states to continue to develop their individual judicial precedents.

In addition, a comparison can be made to other International Conventions namely, the Athens Convention, 1974, the Inland Waterways Convention, 1976, Rail Conventions, Draft Convention on Compensation for Damage to Third Parties, resulting from Acts of Unlawful Interference involving Aircraft, 2008 and Draft Convention on Compensation for Damage Caused by Aircraft to Third Parties, 2008 wherein the damages for mental injury are allowed. The author argues that there is no reason to exclude the liability regime applicable to passengers from the same benefits under an industry which is quite healthy at this stage. The limitations of the courts are understandable for a claim under the Warsaw Convention and/or System since courts cannot go beyond the object and purpose of the Convention and intention of the drafters. In contrast, claims for mental injury can still be accepted by courts under the Montreal Convention, not only in cases where mental injury flows from a bodily injury, but also where a physical change is noticeable in body proven on the basis of medical diagnosis and an expert opinion.

In conclusion, the author submits that the courts have to develop a jurisprudential policy which is consistent, uniform and at the same time, adopt measures from exposing air carriers to an unlimited amount of claims for mere distress or fear.

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[1] Warsaw Convention for the Unification of Certain Rules relating to International Transportation by Air, [Warsaw Convention] opened for signature Oct. 12, 1929, 49 Stat. 3000, 137 L.N.T.S. 11 (entered into force on Oct. 29, 1934).

[2] Convention for the Unification of Certain rules for International Carriage by Air, [Montreal Convention] opened for signature May 28, 1999, S. Treaty Doc. No. 106-45, 2242 U.N.T.S. 309 (entered into force on Nov. 4, 2003).

[3] Article 17- The carrier shall be liable for damage sustained in the event of the death or wounding of a passenger or any other bodily injury suffered by a passenger, if the accident which caused the damage so sustained took place on board the aircraft or in the course of any of the operations of embarking or disembarking.

[4] Only the phrase 'or wounding of a passenger' was not carried forward into the Montreal Convention. See also Paul Stephen Dempsey and MichealMilde, *International Air Carrier Liability: The Montreal Convention of 1999* (Centre for Research in Air & Space Law, 2005) 55.

[5] Eastern Airlines Inc. v. Floyd [1991] 499 U.S. 530, 544.

[6] ibid. 543.
[7]Dr. Christopher Andres and Dr. Vernon Nase, 'Psychiatric Injury in Aviation Accidents under the Warsaw and Montreal Conventions: The Interface between Medicine and Law' (2011) 76 Journal of Air Law and Commerce 3.

[8]Jack v. World Airlines Inc. [1994] 854 F. Supp. 654 (N.D. Cal.); Turturro v. Continental Airlines [2001] 128 F. Supp. 2d 170, 178 (S.D.N.Y.); Lloyd v. American Airlines [2002] 291 F.3rd 503 (8th Circuit); Ehrlich v. American Airlines Inc. [2004] 360 F.3d 366 (2d Circuit); Weaver v. Delta Airlines [1999] 56 F. Supp. 2d 1190(N.D.); King v. Bristow Helicopters Ltd. (2002) 1 Lloyd's Rep. 745,746 (H.L.); Casey v. Pel-Air Aviation Pty Ltd; Helm v. Pel-Air Aviation Pty Ltd (2015) NSWSC 566.

[9]Jack v. World Airlines Inc. [1994] 854 F. Supp. 654 (N.D. Cal.); Turturro v. Continental Airlines [2001] 128 F. Supp. 2d 170, 178 (S.D.N.Y.); Lloyd v. American Airlines [2002] 291 F.3rd 503 (8th Circuit); Ehrlich v. American Airlines Inc. [2004] 360 F.3d 366 (2d Circuit).

[10]ibid. See also George N. Tompkins, Liability Rules Applicable to International Air Transportation as Developed by the Courts in the United States: From Warsaw 1929 to Montreal 1999 (Kluwer Law International, 2010) 73.

[11]Weaver v. Delta Airlines [1999] 56 F. Supp. 2d 1190(N.D.); King v. Bristow Helicopters Ltd. (2002) 1 Lloyd's Rep. 745,746 (H.L.); Casey v. Pel-Air Aviation Pty Ltd; Helm v. Pel-Air Aviation Pty Ltd (2015) NSWSC 566.

[12]Air France v. Saks [1985] 470 U.S. 392; Eastern Airlines, Inc. v. Floyd [1991] 499 U.S. 530; El Al Isr. Airlines Limited v. Tseng [1999] 525 U.S. 155, 170.

[13]Fowler V. Harper and Fleming James, Jr. *The Law of Torts* (vol. 1, Little, Brown & Company 1966) 665; Magruder 'Mental and Emotional Disturbance in the Law of Torts' (1936) 49 Harvard Law Review 1033, 1035.

[14]Paul Stephen Dempsey, 'Accidents & Injuries in Air Law: The Clash of the Titans' 1, 15 <https://www.mcgill.ca/iasl/files/iasl/ASPL636-Accidents-Injuries.pdf> accessed 20 July, 2017.

[15]Isabella (n 8) 228.

[16] Mitchell v. Rochester Ry. Co., 151 N.Y. 107, 45 N.E. 354 (1896) (permitting recovery for emotional distress would lead to a flood of litigation, would allow fictitious and speculative claims, and would lead to recovery for injuries which were not the natural results of the negligent act); Chittrick v. Philadelphia Rapid Trans. Co., 224 Pa. 13, 73 A. 4 (1909) (mental injury, by nature, is easily feigned and thus fictitious claims would flood the courts).

[17]ibid.

[18]W. Page Keeton et al., Prosser and Keeton on Torts (5thedn, West Group 1984) 12.

[19]The impact rule requires a blow or impact as a condition for recovering damages in negligent infliction of emotional distress actions. The impact rule was established in the landmark case of Mitchell v. Rochester Ry. Co. [1896]151 N.Y. 107, 45 N.E. 354.

[20]The zone of danger rule was established in Orlo v. Connecticut Co. [1941] 128 Conn. 231, 21 A.2d 402. In Orlo, the plaintiff was a passenger in a vehicle following the defendant's trolley. The trolley struck trolley wires, causing the wires to snap and fall upon the vehicle in which the plaintiff was seated. The plaintiff remained seated in the vehicle while the wires flashed and hissed about. The plaintiff allegedly suffered nervous shock as well as aggravation to pre-existing physical ailments. The court allowed recovery because the plaintiff was within such close proximity to the accident that there was substantial risk of physical injury.

[21]Traditionally, courts have been reluctant to allow recovery for emotional distress itself, and recovery was always limited to the physical manifestations of emotional distress. Robb v. Pennsylvania R.R. Co. [1965] 210 A.2d 709, 714-15 (Del.)

[22]David L. Farnbauch, 'Pre-Impact Pain and Suffering Damages in Aviation Accidents' 20 (2) Valparaiso University Law Review 219,224.

[23] Des Butler, *Damages for Psychiatric Injuries* (Federation Press, 2004) 88.

[24]Behrens & Ors v Bertram Mills Circus Ltd. [1957] 2 QB 1.

[25]'Defining the Boundaries for Nervous Shock' (Aviation Bulletin, Clyde & Co., August 2013)<http://www.clydeco.com/uploads/Files/Publications/2013/CC003644_Aviation_Bulletin_12.08.13.pdf>, accessed 20 July, 2017.

[26]ibid.

[27]Hicks v Chief Constable of South Yorkshire [1992] All ER 65.

[28]Mitchell v Rochester Ry. 151 N.Y. , 45 N.E. 354 (1896).

[29]ibid.

[30]Steel Technologies, Inc v Congleton [2007] 234 SW3d 920 (Ky); Atlantic Coast Airlines v Cook [2006] (8557) NE2d 989 (Ind).

[31]Betsy J. Grey, 'The Future of Emotional Harm' (2014-2015) 83 Fordham Law Review 2605, 2623.

[32]David L. Farnbauch, 'Pre-Impact pain and Suffering Damages in Aviation Accidents' (1986) 20 (2) Vappa-raiso University Law Review 219, 225.

[33]Lousina Ann Collins, 'Pre and Post-Impact Pain and Suffering and Mental Anguish in Aviation Acciden-ts' (1993-1994) 59 Journal of Air Law & Commerce 403, 409.

[34]ibid.

[35]Andrew Field, 'International Air Carriage, the Montreal Convention and the Injuries for which There is No Compensation' (2006) 12 Canterbury Law Review 237, 241.

[36]Tory A. Wteigand, 'Accident, Exclusivity and Passenger Disturbances under the Warsaw Conven-tion' (2001)16 (4) American University International Law Review, 892, 931.

[37]ibid.

[38]Kruger v. United Airlines (N.D.Cal 2007) 32 Aviation Cases 15,703. See also Jonathan E. Demay, 'Recent Developments in Aviation Law' (2008) 73 Journal of Air Law & Commerce 131, 219.

[39]Article 27- Internal Law and Observance of Treaties: A party may not invoke the provisions of its inter-nal law as justification for its failure to perform a treaty. This rule is without prejudice to Article 46.

[40]See Eastern Airlines, Inc. v. Floyd [1991] 499 U.S. 530, 545. 'Although French law recognized recovery for certain types of mental distress long before the Convention was drafted, … in common-law jurisdic-tions mental distress generally was excluded from recovery in 1929.'

[41]Eastern Airlines, Inc. v. Floyd [1991] 499 U.S. 530, 545.

[42]Aviel Goodman, 'Organic Unity Theory: The Mind-Body Problem Revisited' (1991) 148 (5) The American Journal of Psychiatry 553, 562.

[43]John F. Easton et al., 'Post Traumatic "Lesion Corporelle": A Continum of Bodily Injury Under the Warsaw Convention' (2003) 68 Journal of Air Law & Commerce 665, 666.

[44]Hanna (n 26) 142.

[45]*In re* Air Crash at Little Rock Ark [2002] 291 F.3d 503, 512 (8th Circuit).

[46]Ruwantissa I.R. Abeyratne, 'Mental Distress in Aviation Claims-Emergent Trends', (1999-2000) 65 Jour-nal of Air Law & Commerce 225, 229.

[47]Postal History of ICAO, <,http://www.icao.int/secretariat/postalhistory/ the_warsaw_system_on_air_carriers_liability.htm> accessed 20 July, 2017.

[48]Georgette Miller, *Liability in International Air Transport* (1977, Kluwer-Deventer, The Netherlands) 112.

[49]B. Nicholas, French Law of Contracts (1982) 131-137.

[50]Dana Stanculescu, 'Reforms for Mental Health Under Article 17 of the Warsaw Convention : An Analysis of Lesion Corporelle' (1984-85) 8 Hastings International and Comparative Law Review 339, 361.

[51]ibid.

[52] Miller, Compensable Damages Under Article 17 of the Warsaw Convention, 1 AIR L. 210, 211-13 (1976). See also Joseph William Boone, 'International Air Carriers-Psychic Injury and the Warsaw Conven-tion' (1975-1976) 27 Mercer Law Review 589, 590.

[53] Mankiewicz, The Application of Article 17 of the Warsaw Convention to Mental Suffering Not Related to Physical Injury, 4 Annals Air & Space Law, 187, 201 (1979).

[54]ibid.

[55] 470 U.S. 392 (1985); See Laurie S. Truesdell, 'Air France v. Saks: The Applicability of the Warsaw Con-vention to a Passenger Injury Sustained During a Routine International Flight' (1986) 11 North Carolina Journal of International Law and Commercial regulation 157, 161.

[56] ibid. at 403.

[57]ICAO Doc.9775-DC/2, *International Conference on Air Law, Volume 1, Minutes* (199) [Montreal Minutes] 32-34.

[58] Pablo Mendes De Leon & Werner Eyskens, 'The Montreal Convention: Analysis of Some Aspects of the Attempted Modernization and Consolidation of the Warsaw System' (2000-2001) 66 Journal of Air Law & Commerce 1155, 1164.

[59]Paul Stephen Dempsey and Micheal Milde, *International Air Carrier Liability: The Montreal Convention of 1999* (Centre for Research in Air & Space Law, 2005) 55.

[60]Eastern Airlines, Inc. v. Floyd [1991] 499 U.S. 530, 543.See also Lindsey Ray Altmyer, 'The Montreal Convention-The Eleventh Circuit Embraces Airlines Practice of "Bumping" to deny Plaintiffs' recovery for personal injury under Article 17 (2015) 80 Journal of Air Law & Commerce 239, 242.

[61]ibid at 72.

[62]Montreal Minutes at 201. See also ICAO, Convention for the Unification of Certain Rules for International Carriage by Air, Explanatory Note for Article 17, May 28, 1999 reprinted in S. Treaty Doc. No. 106-45 (1999).

[63]Ibid at 112.

[64]ibid.

[65]Miller (n 48) 126.

[66]See Karfunkel v. Compagnie National Air France, 427 F. Supp 971 (S.D.N.Y. 1977) ; Krystal v. British Overseas Airways Corp., 403 F. Supp. 1322 (C.D. Cal. 1975); Husserl v. Swiss Air Transport Cp., 388 F. Supp 1238 (S.D.N.Y. 1975); Palagonia v. Trans World Airlines, 110 Misc. 2d 479 (N.Y. Supp. Ct. 1978).

[67]Burnett v. Trans World Airlines, 368 F. Supp. 1152 (D.N.M. 1973); Rosman v. Trans World Airlines, 34 N.Y. 2d 385 (1974).

[68]113 L. Ed. 2d 569 (U.S. Sup. Ct. 1991)

[69] ibid.

[70] ibid. 538. See also Max Chester, 'The Aftermath of the Airplane Accident: Recovery of Damages for Psychological Injuries Accompanied by Physical Injuries under the Warsaw Convention' (2000-2001) 84 Marquette Law Review 227, 229.

[71]ibid 542.

[72]ibid at 544-545.

[73]Alder v. Malev Hungarian Airlines [1992] WL 15144 (S.D.N.Y.); *In re Flight Explosion on Trans World Airlines* 778 F. Supp. 625 (E.D.N.Y. 1991); *Al Israel Airlines Ltd v. Tsui Yuan Tseng* 525 U.S. 155 (1999); *Longo v. Air* France[1996] WL 866124 2; *Terrafranca v. Virgin Atlantic Airways*151 F.3rd 108 (3rd Cir. 1998).

[74]E.D. Mich. Oct. 13, 2015

[75](2002) 1 Lloyd's Rep. 745,746 (H.L.)

[76](2002) 1 Lloyd's Rep. 745 (H.L.) See also Andrew Field, 'Air Travel, Accidents and Injuries: Why the New Montreal Convention is Already Outdated' (2005) 28 Dalhousie 69, 82.

[77]King (2002) 2 A.C. 630

[78]ibid.

[79](2015) NSWSC 566.

[80](2002) 1 Lloyd's Rep. 745,746 (H.L.)

[81](2015) NSWSC 566.

[82]Cas. Soc. 27 janv. 1961 : Bull. civ. 1961 n ° 134 ;Cour de cassation, Civil Division 2, N° de pourvoi: 02-30576

[83]TGI Paris, 11 mai 1984 : RFD aérien 1984, p. 450

[84]ibid.

[85]ibid.

[86]He was a member of the German delegation to the Warsaw Convention and later became a Judge of the German Supreme Court as well as the head of the German delegation here, mentioned as evidence in the case of *Palagonia v. Trans World Airlines*.

[87]Robert D. Peltz, 'The Athens Convention revisited' (2012) 43 (4) Journal of Maritime Law and Commerce 491, 500.

[88]Article 5, The Inlands Waterways Convention, 1976.

[89]<https://www.otif.org/pdf_external/e/RU-CIV-1999-e.PDF> accessed 20 July, 2017.

[90]Michael Milde, 'Liability for damage caused by Aircraft on the Surface - Past and Current Efforts to Unity the Law' (2008), 57 Z.L.W. 534, 538. See also Vernon Nase, 'International Aviation and the Liability for Mental Injury: Is the Best Really an Enemy of the Good.' 10 Finnish Yearbook of International Law 409,410.

[91]Montreal Minutes 68.

[92]Montreal Minutes 69.

[93]Montreal Minutes 71.

[94]Montreal Minutes 74.

[95]ibid.

[96]Montreal Minutes 112.

[97]Montreal Minutes 115.

[98]Montreal Minutes 116.

[99]Montreal Minutes 68.

[100]Montreal Minutes 117. It was noted by the Chairman that the 'the Group…had just agreed by consensus on a definition of damages that was somewhat broader than before as it encompassed mental injury which was not closely associated with bodily injury.' He also noted that 'a compromise had just been reached that pure mental injury was recoverable').

U-Space is Coming

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U—Space: a regulatory gap

An increasing demand for civil drone operations is apparent worldwide, as outlined in the 2016 **SESAR**[1] Drones Outlook Study[2]. Activities of Unmanned Aircraft Systems (UAS) can potentially be conducted in several scenarios corresponding to a wide range of different flight conditions. Currently, the civil market mainly comprises Very Low-Level (VLL; i.e. not higher than 500feet/150metres above ground level) operations carried out using small drones (i.e. below 25 kg).

Different missions may serve different user needs, such as emergency deliveries, law enforcement, site inspections, aerial filming, etc. These operations, whether commercial (i.e. a farmer contracts a company specialised in UA operations) or non-commercial (i.e. the farmer purchases, maintains and flies the drone by himself) are generating relevant economic growth and societal benefits, in terms of new jobs and new services.

In this framework, the concept of **U-Space** (Unmanned-Space) was introduced in 2017[3] to safely and effectively support these developments, through new U-Space services, based on enhanced and increased level of complexity and automation in services supporting civil drone operations in the European context.

U-Space is in fact founded on a set of **new services** designed to support the safe access of drones in a defined volume of airspace and as well as an efficient traffic management (i.e. UTM U-Space Traffic Management), in both controlled and uncontrolled airspace, but possibly with even greater emphasis on uncontrolled airspace, where there is no Air Traffic Control (ATC) to maintain safe distance between aircraft but were nevertheless air traffic can be 'managed'.

These new services will rely on a high level of digitalisation, thus creating an interoperable network of different services sharing different types of information among drone users, manned traffic and authorities and aiming at a whole integration between manned and unmanned flights. Information would be often exchanged between computers without human intervention, which several authors call 'Internet of things'[4].

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Several projects financed by **SESAR JU** are in development within the U-Space context. Among these, **DREAMS**[5] (**Drone European AIM Study**) aims at defining the European UTM Aeronautical Information Management operational concept. The project is focused on two main objectives:

- analysis of specific operational scenarios, producing related safety risk assessments to serve as requirement for the definition of U-Space services; and
- verification of the regulatory compliance of U-Space service and service providers, by considering current regulations on ANSP[6]s, expected UAS regulations and consequently highlighting possible gaps in the rules or issues for compliance.

The European regulatory process is normally quite slow, as almost obvious in a Union composed by around 500 million citizens and 27/28 Member State. Currently, EASA Opinion 01/2018, published on 6 February 2018 is under discussion at the level of the European Commission, with the aim of creating ad hoc Regulations for UAS in the 'open' and 'specific' categories of operations.
The Opinion contains two draft Regulations, complemented by one Annex and one set of AMC/GM[7]. However, while competence of remote pilot, airworthiness and operational aspects are covered, in such proposed regulatory material there is no reference to any U-Space concept or services.

In other words, there is a potential regulatory gap in the documents so far published by EASA.

U-Space Service Providers

Similar to traditional aviation (i.e. manned traffic) the U-Space concept relies on several "Service Providers" to support drone flights in heterogeneous scenarios and during all phases of operation. The ANSPs for "traditional aviation" shall comply with Commission Regulation 373/2017[8]. Likewise, it is logic to assume the also the organisation of the U-Space SPs[9], from the safety and quality perspective, might need to be regulated at European level, defining specific roles, privileges and responsibilities of each actor involved in the operations as well as, related oversight mechanisms.

Mentioned Commission Regulation 373/2017 contains the 'common requirements' for the provision of ANS[10] services, based on Article 6 of EU Reg.550/2004 and including liability and insurance coverage. In 373/2017 the ANSPs are defined as:

"any legal or natural person providing functions or services of ATM/ANS as defined in point (q) of Article 3[11] of Regulation (EC) No 216/2008 or other ATM network functions, either individually or bundled for general air traffic"

The definition is linked to the concepts of ATM[12], ANS and General Air Traffic and establishes specific roles, privileges and responsibilities for SPs supporting manned aviation. It is important to note that ANS can be 'bundled' (e.g. ENAV in Italy which, in addition to Air Traffic Services, provides also Aeronautical Information and Communication, Navigation and Surveillance), but also 'unbundled' (e.g. EGNOS[13] which only provides satellite-based signals for radio-navigation).

In principle, the emerging U-Space SPs are similar to the traditional ANSPs. However, some differences may exist due to:

- Information content and scope of the provided services;
- Means (both procedural and technological) for service provision to airspace users; and
- Risk-based oversight.

For instance, information on density of population, modification of the sky-line of a suburb, availability of mobile network 4G/5G, are not "pure aeronautical data", and in fact, they are part of the data standardised by ICAO in Annex 15 to the Chicago Convention. However, they are nevertheless relevant for safe drone operations (which means mainly protecting non-involved third parties).
Current definitions of ANSP (EU Regulation 549/2004) could perhaps be reviewed considering the new features introduced by U-Space services and, in some cases, some current definitions could be changed, and new definitions could be introduced to frame the new (future) services.
The clear definition of U-Space Service Providers and the scope of their specific functions will allow to define their responsibilities, their oversight and to assess their liability.

How to regulate U-Space Service Providers?

RISK-BASED REGULATION

Articles 46 and 47 of the Legislative Proposal[14] to reform EASA, already envisage three different regimes for operations of UAS:

- traditional certification by aviation authorities;
- declaration signed by the responsible manager of the applicant (e.g. manufacturer or operator); or
- where adequate levels of safety can be achieved without the application of either a) or b) 'Community harmonisation legislation' within the meaning of Regulation (EC) 765/2008 of the European Parliament and Council of 9 July 2008 for market surveillance would apply, which means that not aviation processes but processes applicable in general to industry would apply.

Should future implementing rules on service providers related to the U-Space or more in general to UAS operation, be based on this same spirit of 'risk-based' regulation, one could perhaps envisage that some providers would be certified, since standardised by ICAO (e.g. Command and Control data link providers or satellite-based augmentation systems for navigation), while others may subject to e.g. verification by an independent third party of their compliance with voluntary industry standards, for instance as developed by Subcommittee SC/16 of Technical Committee TC/20 of the International Standard Organisation (ISO).

PERFORMANCE REQUIREMENTS

The provision of information by U-Space service providers shall ensure the efficient management of drone operations, ensuring safety for third parties in the air and on the ground. Hence the necessity to establish specific requirements for U-Space services and related providers, similarly to ANSP in manned aviation.

The starting point could be Commission Regulation 373/2017, Annex VIII Subpart A regarding the common requirements for Communication, Navigation and Surveillance Service Providers:

"A communication, navigation or surveillance service shall ensure the availability, continuity, accuracy and integrity of their services".

Unlike ANS providers for manned aviation, U-Space providers are expected to exchange aeronautical information with drone users almost exclusively through digital processes. Therefore, it is reasonable to extend this general requirement to all the U -Space services.

Performance requirements could be assigned in terms of appropriate specifications. Typical specifications for manned aviation are proposed by ICAO[15] but they need to be revisited and adapted to meet the needs of drone operations.
These new specifications could be identified "ad hoc" for the U-Space and subsequently subject to a validation process.
Once a new specification is developed, two more processes could be undertaken:

a. application of an RCP/RSP[16] specification; and
b. verification of compliance with such RCP/RSP specification.

So firstly, the competent aviation authority should adopt and publish the appropriate specification in relation to each U-Space service, specifying, possibly in the Aeronautical Information Publication (AIP) to which specific UTM operations/services it applies and in which airspace zones or along which specific routes.

When an RCP/RSP specification wold have been prescribed, the authority should also establish how to verify that the involved U-Space Service Provider would demonstrate that the actual performance of the provided services services in an airspace is compliant with the applicable specification, which is a normal component of 'State safety oversight'.

In his context the Service Provider should ensure that its systems, services, procedures, personnel training and qualification are suitable for the intended service provision, as well as establish performance monitoring programmes, to maintain sufficient performance during the entire life cycle of the service.

QUALITY REQUIREMENTS

Beside performance, U-Space providers should be compliant also with quality requirements. Quality requirements for aeronautical information in manned aviation are established through Commission Regulation 73/2010 which defines "data quality" as:

"a degree or level of confidence that the provided data meets the user's data requirements in terms of accuracy, resolution, integrity, traceability, timeliness, completeness, and format".

Such requirements shall be developed in accordance with standardised processes describing the methodology for the derivation and validation[17].
Evidence shall be generated by Service Providers to prove compliance with quality requirements.

Existing requirements refer to traditional ANS providers for manned aviation, but it is reasonable to expect the application of the same principles also to U-Space service providers. Once again, quality requirements and standards could be modified considering the distinctive features of drone operations with respect to manned aviation.

SORA METHODOLOGY FOR SAFETY ASSESSMENT VALIDATION

According to EASA Opinion 01/2018, UAS operations will be classified in:

- Open Category (Low Risk);
- Specific Category (Medium Risk); or
- Certified Category (High Risk).

In the near future, the majority of non-recreational UAS operations could be in the "specific category" in which the UAS operator (i.e. the organisation employing the remote pilots) shall normally submit to the authority a safety risk assessment. This assessment would be approved by the authority before issuing the authorisation to undertake the intended operations.

It is not envisaged that EASA will prescribe which safety risk assessment methodology should be used. However, SORA (Specific Operations Risk Assessment) is a tool, published[18] by JARUS (Joint Authorities for Rulemaking on Unmanned Aircraft), to perform the risk assessment for UAS operations in the "specific category", independently from the size and mass of the drone.
The method, in addition to supporting the definition of the necessary safety mitigations (or 'barriers') provides guidance for the Means of Evidence (MoE) proving the achievement of required safety level by the operator.

According to SORA, depending on the level of risk associated to each operation, four options are envisaged:

a. no MoE required (very low risk level);
b. the accountable manager of the operator should sign a formal declaration of compliance with safety requirements attesting implementation of the required mitigations (low risk level);
c. the operator should provide evidence (e.g. the Operations Manual) to demonstrate the implementation of safety mitigations (medium risk); or
d. a competent and independent third party (e.g. a Qualified Entity) should assess robustness of the implemented safety mitigations (high risk).

In other words, depending on the risk level, SORA proposes in addition to a list of safety mitigations to be implemented, a process to demonstrate their actual implementation with a certain level of robustness (low, medium, high).

One of the possible mitigations proposed by SORA concerns the "External services supporting the UAS operation", which indeed relates to U-Space services.

DREAMS project has shown that operations in the U-Space generally present a high level of risk (urban scenarios, concurrent operations in which several drones share the same area, airspace presenting high air traffic density etc.) and consequently the analysis carried out through SORA underlines in most cases the need to validate the services and the service providers through the intervention of a competent and independent third party.

This approach is perfectly consistent with the principle of 'risk-based' regulation, summarised in previous paragraph 3.1.

QUALIFIED ENTITIES IN THE U-SPACE

As result of the previous paragraphs, the competent authority shall always be able to validate the compliance of U-Space services and providers with applicable requirements.

In relation to ANS providers supporting manned aviation, Commission Regulation 373/2017, Art. 6, establishes that:

"Service providers shall be granted a certificate and be entitled to exercise the privileges granted within the scope of that certificate".

Consequently, U-Space SPs, even if slightly different from Service Providers for manned aviation, could be in some cases subject to a certification process.

The certification process is definitively a responsibility of the competent aviation authorities, but, according to Article 58 of mentioned Legislative Proposal COM 613 of 2015, certification tasks could be delegated to "Qualified Entities" which are competent and independent third parties, as already defined in EU Regulation 216/2008:

"qualified entity" shall mean a body which may be allocated a specific certification task by, and under the control and the responsibility of, the Agency[19] or a national aviation authority.

On the 12th June 2018 the new EASA Basic Regulation -BR[20]- (Legislative Proposal COM 613 of 2015) was adopted by the EU Parliament and later approved by the EU Council.
Art. 69 of the new text approved by the Council definitely confirms and reinforces the role of "Qualified Entities", as highlighted in the following points:

- *the Agency and the national competent authorities may allocate their tasks related to certification and oversight under this Regulation to qualified entities…. (omissis), Para 1, comma 1;*
- *the Agency and the national competent authorities which make use of the qualified entities shall establish a system for QEs accreditation…(omissis), Para 1, comma 2;*
- *the competent national authority may grant QEs a privilege to issue, renew, amend, limit, suspend and revoke certificates, or to receive declarations, Para 3.*

In summary, applying the 'risk-based' principle, U-Space and U-Space service providers could demonstrate compliance with the applicable safety, quality, performance and organisation, through different mechanisms, depending on the safety criticality of the specific topic:

a. Declaration signed by the UAS operator;
b. Evidence provided by the UAS operator;
c. Evidence verified and endorsed by an independent Qualified Entity (QE) and based on applicable voluntary industry standards;
d. Certificate issued by a QE based on accreditation and delegation by competent authority; or
e. Certificate directly issued by the competent aviation authority.

Clearly option e) in the above list would require the greatest effort by the authority and it could therefore be limited to the organisations proving the most safety critical services supporting UAS operations, like e.g. those standardised in the new Part IV of Annex 6 to the Chicago Convention, which the ICAO RPAS Panel is developing.

U—Space: service providers and liability

The liability assessment needs, in principle, a regulation which should prescribe specific privileges and responsibilities of all the actors involved in UAS operations, including the U-Space service providers.

Traditionally, liability in manned aviation is distributed among:

- Pilot in Command (PIC),
- Aircraft Operator (i.e. the enterprise),
- Manufacturers,
- Service Providers (Air Traffic Management, Meteorological services, Communication, Navigation and Surveillance, Aeronautical Information Services),

• Others (e.g. flying schools, aerodrome operators; maintenance organisations, etc...).

As usual, damaged third parties almost always would convene in front of the Civil Court the aircraft operator, whether manned or unmanned, because the operator is easy to identify, because the operator has (normally) adequate financial capability (directly or more often through is insurance, but definitely with more financial resources than the individual pilot) and because the operator, with high probability, has anyway at least part of the responsibility. In case of strict or quasi-strict liability, this would be even more true.

So even in relation to operations of unmanned aircraft, the identification of operator (i.e. the company or organisation) is a key point to assess and apportion liability.

Regarding UAS operations, damages to third parties may occur due to several factors, such as:

- Remote pilot negligence in applying pre-flight check lists;
- Remote pilot error in performing manoeuvres (including Observer errors in providing information to Remote pilot);
- Operator negligence in organising the necessary maintenance/training activities;
- Component failure (e.g. engine failure or lost C2 link) which may due either to contingencies or errors in manufacturing process;
- Unexpected external events (e.g. a drone struck by a lightning or a bird);
- Errors of U-Space manager (if human) whose role and liability are still to be clarified also in relation to the classical Air Traffic Controller for manned aviation.

UAS could well share the airspace with manned aircraft, either in controlled airspace or uncontrolled airspace; in both situations, it would be important to define the responsibility boundaries among the ATC, the U-Space manager (human or BOT), the remote pilot, the UAS operator and the involved Service Providers (and other involved "actors") to ensure safe separation (distance) or to avoid/minimise traffic conflicts. Clearly established responsibilities are in fact a pre-requisite for possible subsequent apportionment of liability.

On the matter, EU Regulation 785/2004 Article 3, defines the aircraft operators as follows:

"the person or entity, not being an air carrier, who has continual effective disposal of the use or operation of the aircraft; the natural or legal person in whose name the aircraft is registered shall be presumed to be the operator, unless that person can prove that another person is the operator".

Article 4 of the same Regulation prescribes a mandatory insurance for aircraft operators:

"Aircraft operators shall be insured in accordance with this Regulation as regards their aviation specific liability in respect of passengers, baggage, cargo and third parties. The insured risks shall include acts of war, terrorism, hijacking, acts of sabotage, unlawful seizure of aircraft and civil commotion."

It must be kept in mind that passengers, baggage and cargo may not be relevant for aerial work operations with unmanned aircraft[21].

However, this regulation does not apply to:

- State aircraft[22];
- Model aircraft with a mass less than 20 kg;
- Captive balloons, kites, etc...

It is important to underline that the definition of model aircraft is not provided in Regulation 785/2004 and this aspect may represent a gap since operators in the open and specific category might escape the insurance obligation pretending that their drone is a model aircraft. It is therefore recommended to provide a clear definition of model aircraft keeping in mind the one already contained in the Standardised European Rules of the Air (SERA):

"model aircraft means an unmanned aircraft, other than toy aircraft, having an operating mass not exceeding limits prescribed by the competent aviation authority, that is capable of sustained flight in the atmosphere and that is used exclusively for display or recreational activities;"

The SERA text could however be considered even worse than Regulation 785/2004, since the latter contains a mass threshold, while the former, still contains this threshold, but leaves the numerical value to individual States of the EU, which inevitable would lead to even greater lack of harmonisation. A more appropriate definition of 'model aircraft' could be inspired by the EASA "prototype rules"[23]:

"model aircraft means an unmanned aircraft that is capable of sustained flight in the atmosphere and that is used exclusively for leisure flights, air displays, sport or competition activities."

UAS are aircraft and, consequently, UAS operator shall rely on an insurance to cover the hazard of activities and the related risks (for itself and third parties).

At the moment, there are insufficient data to evaluate the level of damage caused by UA to third parties (on the ground and in the air) and the related financial consequences. Information on occurrences should be improved in order to have more reliable data statistics.

On the other hand, UA may cause damage only to third parties (in the air or on the ground) but no injury for "people on board" (unless passengers presence,e.g. "taxi drones").

No specific rules for UAS insurance related to the 'categories' of operations are currently in force but, in the future, the situation could evolve as follows[24]:

a. Operations in "Open" category with a contract with private liability insurers (e.g. home insurers);
b. Operations in "Specific" category with an insurance contracted with general liability insurers (e.g. car insurers whose competencies could be extended to unmanned aircraft);
c. Operations in "Certified" category with a traditional aviation insurance.

In fact, Regulation 785/2004 does not prescribe to have an insurance with aviation insurance companies. Consequently, operations in the specific category could be related to car insurers, thus implying lower prices, since the risk would be distributed across a wider insured population.

In addition, a "compensation fund" (as used in motor insurance) could be considered to cover risks associated to drones which are not insured or operated without the consent of the owner.

Information on occurrences should be improved and made more widely available, including both insurers and operators so that insurance policies would be based on more reliable data and statistics.

Furthermore, U-Space service providers are not at all mentioned in Regulation 785/2004, while these providers play an important role for the safe and efficient conduct of UAS operations.

Traditional ANSP are subject to Commission Regulation 373/2017 which prescribes for them a mandatory insurance:

"*Air navigation services and air traffic flow management providers shall have in place arrangements to cover liabilities related to the execution of their tasks in accordance with the applicable law*."

And:

"The method employed to provide the cover shall be appropriate to the potential loss and damage in question, taking into account the legal status of the providers concerned and the level of commercial insurance cover available".

The protection of society has to be considered mandatory and,in the future, specific rules should establish the obligation for insurance of the U-Space service providers, based on the same concept that insurance coverage should be commensurate to the task they perform; in other words, the impact on safety of the provided information.

Another topic to be addressed is the high level of automation and digitalisation that will be applied in the U-Space. "BOT"[25] controllers (i.e. not human) and "autonomous"[26] drone operations are foreseen in the future scenario. It is relevant to underline that when autonomous UAS will come, ethics, legal and societal topics shall be reviewed with heavy fallout on liability and responsibility aspects.

The introduction of robots certainly allows to perform some activities in a more efficient way. However, the use of robots makes the issue of liability assessment in case of accident even more difficult.

The European Parliament considered this aspect in a Resolution on "Civil Law Rules on Robotics", published by in 2017. Current regulations in fact establish that robots cannot be liable "per se" for acts that caused damages; the responsibility always lies on the manufacturer/operator. For the U-Space this might not be appropriate due to increasing automation and due to the relevance of the data inserted in the system by the service providers.

Therefore, the assessment of civil liability for damage caused by robots is an issue that should be further analysed to ensure legal certainty. New legal "ad hoc" categories could be introduced for robots and, of course, for autonomous drones.

In addition, the European Commission should evaluate if the concept of strict liability and risk management could apply also to operations with robots. This aspect is even more important when dealing with artificial intelligence, mainly when robots are capable of taking their own decisions without human intervention.

Part of the possible solution for liability should in any case be the introduction of a mandatory insurance for U-Space service providers, probably taking into account a wider range of responsibilities and not excluding the use of robots or artificial intelligence.

According to EU Regulation 373/2017, traditional ATS providers shall implement and maintain a safety management. In the U-Space this context, training activities might be distributed as follows:

- Traditional training for humans; and
- Training for BOT entities (in particular self-training of BOTs).

It is expected that some robots may experience an autonomous self-training process in which their decision-making capability would change according to previous experience.

This may lead to service providers employing the same model of a robot but with different evolving competencies as a function of their experiences.

A possible solution could be represented by the definition of a taxonomy for the automation levels. At the moment different scales (e.g. the one proposed by Sheridan & Verplanck 1978, or Endsley and Kaber 1999) have been proposed but none is yet universally recognised. A more recent taxonomy of automation which tries to overcome the limitations of the earlier ones was proposed in 2012 in the paper "Designing Human-Automation Interaction: a new level of Automation Taxonomy", a proposed by Luca Save (Deep Blue srl, Rome, Italy) and Beatrice Feuerberg (Egis Avis, Tolouse, France).

In this paper a more detailed taxonomy is presented to define several levels of automation which could be suitable for the classification of drone operations presenting a high level of automation (as in the U-Space).
This classification could pave the way for a "more transparent" liability assessment: this way specific responsibilities will be clearly associated to the right actors involved in the operations.

All of these issues should be taken into account in a possible future Commission Regulation on U-Space providers, to establish objective criteria for liability issues and training of non-human entities.

In addition, the technology improvement will probably substitute the human in some functions. The drones will fly more and more automatically and, progressively, autonomously; consequently, the role of remote pilots could be mainly limited to the flight preparation phase (i.e. preparation of the UAS and planning of the operation) with almost no involvement in the tactical phase (i.e. flight monitoring).

The change of the roles of several actors will determine a new range of responsibilities involved in the operations.

Conclusions

U-Space services will safely support enhanced UAS operations, including at very low level and over urban areas. However, they will also pose new technical, regulatory, procedural and, last but not the least, legal and liability challenges in the aviation world.

New services are in any case unavoidable and new Service Providers will emerge.
U-Space services will probably rely on cellular networks (e.g. 4G/5G) for Communications; other service providers (e.g. of information) will also emerge. Executing safety critical functions. Consequently, these new Service Providers should be considered and their role, responsibilities, privileges and liability should be defined, like they are defined for traditional ANSP, although the 'risk-based' approach may allow to implement oversight with reduced involvement of the aviation authorities.

Liability might also be a very important aspect to consider:

- EU Member States should decide which could be the responsibilities of computers (BOT) and associated service providers managing them;
- Revised provisions on insurance could be envisaged to more comprehensively cover risks of UAS operations, but in a proportionate and cost-effective way related to the category of operations and possible damage level;
- A "compensation fund" could be considered to cover damages caused by non-insured drones;
- Reasonably, also U-Space service providers should be mandated to have an insurance (like traditional ANSP according to Reg.373/2017) which shall be proportionate to the task they perform (e.g. the impact on safety of the provided information);
- As the level of automation increases, the range of tasks (and responsibilities) of human remote pilots/U- Space managers could become more restricted, shifting liability issues on manufacturers, operators or data providers;
- The need for a universally recognised automation taxonomy might contribute to more clearly apportion liability in case of incident/accident involving drone operations in the U-Space.

Requirements on performance and data quality shall be prescribed for U-Space providers since the reliability of the information that they share with the other actors (pilots, authorities etc..) is vital for safety issues.

Requirements for traditional ANSP for manned aviation are in force through Commission Regulation 373/2017 but new provisions should be defined "ad hoc" for services supporting drone operations within the U-Space.
Therefore, Commission Regulation 373/2017 could be adequately modified (for instance introducing a new Annex with specific requirements for at least some U-Space service providers). However, Authorities could be overloaded by certification processes of new Service Providers and subsequent continuous oversight to maintain "certifications", while these processes could prove disproportionate for some new providers. Therefore, we should not exclude a new risk-based regulation, relying not necessarily on certification by aviation authorities, but on other forms of oversight based on voluntary industry standards and Qualified Entities, which might support the authorities for safety oversight.

According to the new EASA Basic Regulation (Art.69), Qualified Entities may have a main role in the process of certification and continuous oversight of U-Space Service Providers, supporting national authorities and all U-Space stakeholders.

Another element of discussion is to determine which entities would be eligible to provide U-Space services. In principle such services could be provided either by:

- Traditional ANSP only; or
- Traditional ANSP and other new providers; or
- New service providers only.

Furthermore, all the providers involved in the U-Space should be able to interoperate in the same network, based on industry standards. In a future perspective, this concept of interoperability should be extended with the aim to integrate U-Space providers and classical providers for manned aviation.
This is a key point for the complete integration of UAS and manned traffic in the U-Space and beyond.

Even small unmanned aircraft might represent a risk for third parties either on the ground or in the air and such risks shall be adequately covered. The level of risk cannot be reduced to zero and, sooner or later, drone "accidents" will happen. The challenge is to find the balance between the appropriate safety level and the UAS market growth.

Development and production of new and more performing technology is a key-point of aviation improvement. But technology needs to be applied by specific Service Providers in a "suitable", safe and socially acceptable regulatory framework, otherwise technology alone might not succeed.

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[1]SESAR JU - SESAR Joint Undertaking is the European public-private partnership that is managing the development phase of the Single European Sky ATM Research (SESAR) Programme

[2]SESAR JU - https://www.sesarju.eu/sites/default/files/documents/reports/European_Drones_Outlook_Study_2016.pdf

[3]SESAR JU – U-Space Blueprint - https://sesarju.eu/u-space-blueprint

[4]Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - Internet of Things — An action plan for Europe, COM (2009) 278 final. Brussels, 18.6.2009 http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52009DC0278&rid=1

[5]DREAMS – EUROUSC Italy is Linked Third party in this European Project https://www.u-spacedreams.eu/

[6]ANSP – Air Navigation Service Provider

[7]AMC/GM – Acceptable Means of Compliance/Guidance Material

[8]Commission Implementing Regulation (EU) 2017/373 of 1 March 2017 laying down common requirements for providers of air traffic management/air navigation services and other air 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 http://eur-lex.europa.eu/legal-content/AUTO/?uri=CELEX:32017R0373&qid=1527699511936&rid=1

[9]SP-Service Provider

[10]ANS – Air Navigation Services

[11]Which in turn makes reference to Article 2 of EU Regulation 549/2004

[12]ATM - Air Traffic Management

[13]European Geostationary Navigation and Overlay Service

[14]Proposal for a Regulation of the European Parliament and of the Council on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and repealing Regulation (EC) No 216/2008 of the European Parliament and of the Council, COM(2015) 613 final, Brussels, 7.12.2015 https://eur-lex.europa.eu/legal-content/AUTO/?uri=CELEX:52015PC0613&qid=1527781897188&rid=1

[15]ICAO - International Civil Aviation Organization

[16]RCP/RSP (Required Communication/Surveillance Performance)

[17]EUROCAE ED documents contain standards and compliance methods

[18]http://jarus-rpas.org/content/jar-doc-06-sora-package

[19]EASA – European Aviation Safety Agency

[20]*Regulation (Eu) 2018/… Of The European Parliament And Of The Council of … on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2111/2005, (EC) No 1008/2008, (EU) No 996/2010, (EU) No 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No 552/2004 and (EC) No 216/2008 of the European Parliament and of the Council and Council Regulation (EEC) No 3922/91* (Regulation expected to be published soon in the Official Journal of the EU).

[21]Passengers might be relevant for future applications (e.g. taxi drone). In addition, cargo could be taken into account in mission dealing with delivery of goods.

[22]State aircraft – Article 3 of Chicago Convention "Aircraft used in military, customs and police services shall be deemed to be state aircraft"

[23]https://www.easa.europa.eu/sites/default/files/dfu/UAS%20Prototype%20Regulation%20final.pdf

[24]Regulation 785/2004 does not prescribe to have an insurance with aviation insurance companies; consequently, operations in the open/specific category could be related to general insurers, thus requiring a lower minimum coverage since the risk is distributed over a wider range of third parties.

[25]BOT – the term comes from the Czech word "robot".

[26]Autonomous - no human intervention in flight management according to ICAO Doc. 10019.

Air Passenger Data Protection Comes into a New Era: In Light of the Enforcement of GDPR

*by Sizhu Liu**

Introduction

The access and transfer of air passenger data has been the controversial topic in the process of air traffic and aviation law, especially against the background of frequently happened terrorist attack these days. Airlines are requested to collect and provide passengers' information to other countries when there are transnational air routes. Airlines need the information in order to identify the passenger and make sure of the safety of the flights, whereas the States need passenger data with the purpose of national security protection and terrorisms prevention.

When foreign governments ask airlines to provide PNR on the ground of security, tracking criminals or terrorists, there would be a few legal obstacles especially in a regime with strict protection of personal information, especially in the area of European Union. The EU's data protection legislation is considered the most ambitious, comprehensive and complex regime worldwide.[1] The Data Protection Directive (Directive 95/46/EC) used to constitute the central legislative measure of the EU data protection regime. However with the General Data Protection Regulation (GDPR) came into effect this year, the States as well as non-EU airlines need more comprehensive deliberation. Still, the transfer of PNR data from the EU to third countries must be governed by a bilateral agreement which has to be provided with a high level of personal data protection.

While, questions remain how to tackle the dilemma? As the PNR experience proved, negotiations were difficult, with data protection differences being at the heart of the conflict.[2] A solution would, therefore, be an international agreement setting down certain data protection guarantees that would govern data exchanges between the two parties in order to raise restrictions on data flows. Such creation and movement was finally accepted both by EU and non-EU sides, creating a series of PNR Agreements accordingly.

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Passenger Name Record and Directive 2016/681

A short introduction on PNR

Passenger Name Record (PNR) is a record in the database of a computer reservation system (CRS) or Global distribution system (GDS), it is closely linked with API information[3] as it is currently an information tool that could give additional information to Customs Officials. When passengers book airline tickets, the travel agent or travel website user will create a PNR. It does, however, substantially differ to API as it is a business document belonging to air carriers that may be accessed by customs officials. PNR is therefore not a governmental creation, but rather a business tool belonging to private entities, the air carriers, in which the possible usage raise sensitive issues.[4] It mainly includes all information that a passenger needs to submit to complete a successful reservation, and varies with the requirements of different airlines.

The best definition that can be found is within the United States Passenger Name Record Final Rule:

"Passenger Name Record information that air carriers would need to make available upon request under section 44909 ©(3) and section 122.49b refers to reservation information contained in an air carrier's electronic reservation system and/or departure control system that sets forth the identity and travel plans of each passenger or group of passengers included under the same reservation record number with respect to any passenger flight in foreign air transportation to or from the United States."[5]

PNR provides a comprehensive and extremely detailed record of every entry and show what was entered, when, where, by whom, for whom, where you went, who went, when, with whom, for how long, and at whose expense. According to the WCO, the Passenger Name Record can be identified similarly to the US Final Rule: the entire air carrier booking including flight segments, seating arrangements, meal preference, medical condition of passenger and all other data that is stored this reservation file.[6] Through these special service codes, PNR reveals details of travellers' physical and medical conditions. For instance, through special meal requests, they contain indications of travellers' religious practices, i.e. a category of data typically referred to "sensitive information"[7].

In the practice of aviation industry, at first, PNR was used as a technical method for airline companies to transmit passenger information in their interim sale networks. Later, it was used to exchange reservation information interline. IATA and Airlines for America (A4A) made standards for interline PNR transmission named *"A4A/IATA Reservations Interline Message Procedures – Passenger (AIRIMP)"*.[8]

A PNR is created every time a traveller makes a reservation. PNR cannot be deleted either by the employees of the airlines or technicists: once created, they are archived and retained in GDS, and can still be viewed, even if a person never bought a ticket or cancelled the reservation. Each entry in each PNR, even for a solo traveller, contains identifiable information on at least two, often more people: the traveller, the travel arranger or requester, the travel agent or airline staff person, and the person paying for the ticket.[9]

The Creation of Directive 2016/681

The idea of a uniform system regulating the PNR data throughout the Europe is not a newly sprouted item. As a matter of fact, various Member States already use PNR data for law enforcement purposes, either on the basis of specific legislation or on the basis of general legal powers, however with no common approach across the EU adopted. Accordingly, an instrument regulating PNR data processing within the EU was first proposed by the Commission in 2007. While, the most concerned was API information, until that time. As API data processing was not considered sufficient for intra-EU security purposes, especially when more extensive PNR agreements were being concluded with third countries. Thus, the proposal for a Framework Decision by no means constituted a surprise. In this way, negotiations for the EU Data Protection were well under way.

Later in February 2011, the EU PNR proposal was presented by the Commission once again, which comes under the "co-decision procedure", whereby the European Parliament and the EU Council of Ministers legislate on an equal footing.[10] Unfortunately, the 2011 draft directive was rejected by the Civil Liberties Committee in April 2013 by 30 votes to 25.[11] The debates at that time were mainly about the proportionality principle, and moreover, the proposal made reference to EU framework legislation, which is still under negotiation between the EP and the Council. They also suspected whether it was efficient to collect passengers' data as a solution to fight terrorism, since no powerful evidence could demonstrate.

Nevertheless, after unexpected Paris Attack taken place in January 2015, the proposed PNR Directive were brought back under the spotlight. While in the aftermath of November 2015 terrorist attack in Paris, the Civil Liberties Committee finally backed the deal of PNR. "We cannot wait any longer to put this system in place. (...) The choice is not between an EU PNR system and no EU PNR system; it is between an EU PNR system and 28 national PNR systems that will have vastly differing, or absent, standards for protecting passenger data", said Timothy Kirkhope, Parliament's Civil Liberties Committee lead negotiator on the EU PNR proposal.[12] Questions are no longer about whether PNR is needed, but the emergency of establishing a uniform PNR system instead. Thereby, the EU PNR Directive was finally approved by Parliament on 14 April 2016, in face of acts of terror at the top agenda.

The Directive regulates the use of PNR data in the EU for the prevention, detection, investigation and prosecution of terrorist offences and serious crime.[13] In the previous time, different national legislations regulating PNR applied in each European countries results a fragmented scheme for the processing of passenger name records in the EU, thus has tons of negative consequences. At the time of the Directive first proposed in 2001, the UK was the only country having a PNR data collection system. Currently, many European countries are setting up a PNR system and national legislation, namely Belgium, Denmark, France, Sweden and Spain.[14] In this context, although criticisms still exist, such PNR Directive is necessary in order to avoid the fragmented regime of 28 different PNR systems, which will probably be detrimental for law enforcement agencies as well as for individuals.[15]

Under the new Directive, airlines will have to provide PNR data for flights entering or departing from the EU. It will also allow, but not oblige, Member States to collect PNR data concerning selected intra-EU flights.[16] Besides, each Member State will also be required to set up a so-called Passenger Information Unit (PIU), which will receive PNR data from air carriers.[17] In addition, there are also obligations stipulated on air carriers, for instance, the 'push method'. That is to say by sending data to the PIU of the Member State on the territory of which the flight will land or depart.[18] As for code-sharing flights, obligation to transfer is the operating air carrier. While for the flights with one more step-overs within the Member States, regardless of an extra-EU or intra-EU flight, air carriers shall transfer the PNR data of all passengers to the PIUs only in relation to the Member States concerned.[19] Most importantly, there is time limit for the transfer, with 24 to 28 hours before the scheduled flight departure time on the one hand, and immediately after the passengers boarded the aircraft as well as the flight closure on the other hand.[20]

The data retention period of PNR data amounts to five years after the transfer to the PIU.[21] After the expiration, there is a short period of six months for PNR data depersonalization by means of masking out the related data elements.[22]

Naturally, there are also rules of penalties addressed, in Article 14 of the Directive. Whereby national provisions related to penalty rules shall be effective, proportionate and dissuasive.[23] Moreover, national supervisory authority is supposed to be provided referred to Framework Decision 2008/977/JHA, with the responsibility of advising and monitoring pursuant to the Directive.[24]

Challenges of international airlines: How does GDPR come into play?

The General Data Protection Regulation (GDPR) (Regulation EU 2016/679) is a Regulation by which the European Commission intends to strengthen and unify data protection for individual within the European Union. The regulation was adopted on 27 April 2016, and it entered into force on 25 May 2018 after two-year transition period. It is supposed to replace the Directive 95/46/EC and, unlike a Directive it does not require any enabling legislation to be passed by governments.

- **Principle of Transparency and Accountability**

Article 5 of the GDPR establishes the basic principles that govern the process of personal data activities. Namely, lawfulness, fairness and transparency; purpose limitation; data minimization; accuracy; storage limitation; integrity and confidentiality; and accountability.

While personal data shall be processed lawfully, fairly and in a transparent manner in relation to the data subject[25], as stated in article 5.1 of GDPR. It should be transparent for the individuals to know how their data is collected, accessed or even transferred to other entities, in which the transparency principle particularly requires.

As a consequence, accountable controllers, that is the air carriers, need to comply with the transparency principle. Since the carriers will have to further transfer the data to the PIUs, and hence will have to process the data "for a purpose other than that for which the personal data were collected", they should provide the passengers "prior to that further processing" with information on the transfer to the PIUs.[26]

Besides, the GDPR introduces the general principle of accountability in Article 5.2, which imposes the responsibility for the compliance of processing with the GDPR and the burden of proof for said compliance onto the controller.

Whereas the carriers, when processing PNR data for their normal course of business, need to comply with the accountability principle provided for by the GDPR.[27] They need to make sure that the PNR data collected do not exceed what is necessary for booking and reservation.

- **Data transfers to third countries**

For multinational entities and airlines, cross-border data transfers are indispensable in the course of the flying activities. This involves not only the data transfers within the EU, but also a transfer to third countries, which are not EU Member States. Such data flow has to be ensured as an adequate level of privacy in order to comply with the data protection law.

According to Art. 44 of GDPR, any transfer of personal data to a third country or to an international organization shall take place only if subject to the general principle laid down in the aforementioned provision.[28] The legal requirements including data transfers on the basis of an adequacy decision, subject to appropriate safeguards and binding corporate rules, are vital for non-EU airlines in the sake of operate trans-European flights.

As it is stated in the regulation, a transfer of personal data to a third country or an international organization requires an adequate level of protection. While, the difficulty comes to determine what is ‘adequate level’, and whether a third country affords an ‘adequate level of protection’. Such requirement, however, shall be assessed and decided by the Commission. According to art. 45.2, the substantive basic elements that shall be taken into account are:

- the rule of law, respect for human rights and fundamental freedoms, relevant legislation;

- the existence and effective functioning of one or more independent supervisory authorities in the third country;

- the international commitments the third country has entered into, or other obligations arising from legally binding conventions or instruments as well as multilateral or regional systems.[29]

Furthermore, since the GDPR is supposed to replace the Directive 95/46/EC, there is an additional provision, which leaves the place of decision made on the basis of the Directive. Such decision will remain in force until amended replaced or repealed by a Commission Decision.[30]

- **Data Protection Officer (DPO)**

When it refers to the most impressive changes, that is the independent Supervisory Authority (SA) will be established to hear and investigate complaints, sanction administrative offences in each Member State.[31] SAs in each Member State should cooperate with other SAs, providing mutual assistance and organizing joint operations. Also, a European Data Protection Board (EDPB) is hereby established and will coordinate the SAs, which will replace the Article 29 Working Party.[32]

More particularly, under the GDPR, the independent Data Protection Officer (DPO) will be a legal obligation to notify the Supervisory Authority without undue delay.[33] The DPO is similar but not the same as a Compliance Officer, it shall be designated by the controller and the processor as they are also expected to be proficient at managing IT processes, data security (including dealing with cyber-attacks) and other critical business continuity issues around the holding and processing of personal and sensitive data. The skill set required stretches beyond understanding legal compliance with data protection laws and regulations. Monitoring of DPOs will be the responsibility of the Regulator rather than the Board of Directors of the organization that employs the DPO.[34]

Thus, airlines whose 'core activities' consist of processing data on a 'large scale'[35], though not all the airlines, are advised to appoint a DPO. The individual must have sufficient expertise, beyond reproach knowledge and understanding of the GDPR and interpersonal skills at all levels. IATA also advocates that their members nominate a DPO as required by the Regulation in relation to Article 37 (1) (b), and contact a specialised lawyer for any specific questions, as associations are not equipped to give detailed legal advice. The International Association of Privacy Professionals (IAPP) estimated that at least 28,000 DPOs are required in Europe alone, not to speak of the companies outside Europe. As a matter of fact, most airlines went on to designate DPOs and most recently Eastern Airlines has been the first one in China to set up a DPO.[36]

Challenges of National Governments: PNR Agreements

It's time to turn to the PNR Agreements, which are bilateral agreements reached between EU and other States. Currently, there have been three PNR Agreements that have been concluded, namely, European Union with United States, Canada and Australia. Besides, other countries have also sought to undertake negotiations, for instance, Mexico has started the PNR data transmission negotiation with EU in 2015.[37]

However, things do not always go well as they supposed to be. Specifically, EU and Canada has encountered a bottleneck since the Opinion 1/15 of the Court of Justice of European Union (CJEU), in which the Court has determined its negative on the envisaged EU-Canada PNR Agreement.

It was estimated by the CJEU that the draft agreement was not enough to protect personal data and infringed the privacy regulation based in EU. Thus, it is necessary for us to understand how this conclusion was made especially when the new Regulation comes out, as well as the influence on the following PNR agreements negotiation.

The Court insisted that there should be very strict rules as to the concrete implementation of surveillance. For this reason, it found some provisions of the draft agreement incompatible with Articles 7 and 8, in conjunction with Article 52 of the Charter of Fundamental Rights of the European Union (CFREU).

On the other hand, there are also several provisions interfere with the General Data Protection Regulation, thus requires further thinking. Firstly, the process, transfer and retention of sensitive data seems differently treated in EU-Canada agreement and EU-Australia agreement, where it has been allowed by the Court in the former however prohibited in the latter. Nevertheless, neither PNR Directive nor GDPR allows the process of sensitive data.[38] Moreover, in the case of EU-Canada agreement, the Court does not consider the prevention of terrorism is a sufficiently good reason to transfer sensitive data.[39] In this regard, it is apparently States need more consideration when negotiate PNR agreement with EU.

Secondly, the principle of purpose limitation listed in GDPR[40], as mentioned before, should be worth more attention. When CJEU focused on definitions, it held that the term of "terrorist offence" is clear and precise, as well as the term of "serious transnational crime", since they are both listed by the agreement. Nonetheless, the agreement also says that PNR data can be processed, in exceptional circumstances, also for "other purposes" in exceptional cases.[41] According to the CJEU, such cases are not defined in a clear and precise manner, and still article 4 (5) that PNR data can be processed on a case-by case basis is too vague and general to meet the requirements as to clarify and precision required.[42] In other words, the draft agreement violates the principle of purpose limitation.

Moreover, the data retention problem has drawn numerous concerns in all these PNR agreements. The EU-US agreement admits the possibility that PNR data could be retained in exceptional circumstances for up to ten years,[43] however it was denied by the Court in the Opinion 1/15 regarding the envisaged EU-Canada agreement, therefore must limit the retention of PNR data after the air passengers' departure. Actually the PNR Directive regulates the PNR data provided by the air carriers to the PIU are retained for five years, in this regard, the EU-US agreement seems incompatible with the provisions either.

Conclusion and the way forward

Throughout the history of air transport, the passenger information is an essential element for airlines to control. The information can be accessed during the flight tickets reservation or registration of passengers on the airline websites. Airlines thus establish a database regarding the data process.
The air law has set a goal aiming to beautify the environment of aviation facilitation, and the outcome can be achieved by the following methods of passenger data access.

The mainly used Passenger Name Record (PNR) data is collecting by the foreign countries custom agencies, as it is being considered a preliminary tool in case of terrorism or any other accidents, which may be a threat to public security. Furthermore, some of the governments require PNR as a *quid pro quo* of the airline market access to their countries. The airline has no way but to abide by the rules in order to broaden their service and international influence.

Whereas in the EU, the General Data Protection Regulation (GDPR) has just come into effect, as well as the PNR Directive this year. Accordingly it makes the whole privacy legislation integrated and united, and marks the PNR system in Europe a much brighter future.

The GDPR inherited the Data Protection Directive (Directive 95/46/EC), with the two-folds aims on hold, it still aims at protecting privacy with respect to the processing of personal data; and ensuring the free movement of personal data in the EU. However the provisions are rather strict and renovated, it sets the basic principles for data protection and requires the international airlines to obey the rules when there is data transferring to third countries.

However, it is always vital to engage a PNR agreement for EU and non-EU countries regarding PNR data transfer. Thus an ideal solution would be an international agreement setting down certain data protection guarantees that govern data exchanges between the two parties in order to raise restrictions on data flows. Apart from that, in order to improve the PNR system, both parties need to raise the recommended practice with the ICAO PNR guidelines contained in Annex 9 to the Chicago Convention to a 'standard' status. Following the international guidelines, ICAO, and jointly working partners of IATA, WCO, should keep an eye on the implementation. While ICAO, holding the most important role among them, cooperate more with different international agencies and national government, to create an acceptance solution in the battle of counter-terrorism and privacy protection.

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[1] Lee A Bygrave, Data Privacy Law: An International Perspective (1st edition, Oxford University Press 2014), at 53.

[2]For instance, the Extradition and Mutual Legal Assistance Agreement (2003); the Agreements governing personal data exchange between the United States and Europol (2002) and Eurojust (2006); and the SWIFT Agreement.

[3]Advance Passenger Information System (APIS) is part of the Computer Assisted Passenger Prescreening Systems (CAPPS), which is created by the U.S. government requiring comprehensive personal data about air passengers. Please see Oxford Reference, A Dictionary of Travel and Tourism, at http://www.oxfordreference.com/view/10.1093/acref/9780191733987.001.0001/acref-9780191733987-e-1452

[4]Nicolas Paul Banerjea-Brodeur, *Advance Passenger Information/ Passenger Name Record: Privacy Rights and Security Awareness*, McGill University, Montreal, at 29.

[5]Passenger Name Record Information Required for Passengers on Flights in Foreign Air Transportation to or from the United States of 2001, 66 Fed. Reg. 67482 (2002).

[6]Umbrella Document: http://www.icao.int/Security/FAL/Documents/Umbrella_Document.2013Dec03.pdf

[7]Sensitive personal data are types of personal data to which greater restrictions apply, paragraph 1 of Article 8 of the Data Protection Directive provides that:
"Member States shall prohibit the processing of personal data revealing racial or ethnic origin, political opinions, religious or philosophical beliefs, trade-union membership, and the processing of data concerning health or sex life."

[8]See http://www.iata.org/publications/Pages/airimp.aspx,the latest version till now is the 40th edition.
PDF text of the table of contents and key changes can be found via
http://www.iata.org/publications/Documents/toc-airimp-37-ed-2013.pdf and
http://www.iata.org/publications/Documents/preface-airimp-37-ed-2013.pdf.

[9]Mironenko Olga, *Air Passenger Data Protection: Data Transfer from the European Union to the United States*, Norwegian Open Research Archives (NORA), 2009, at 11.

[10]See European Parliament News, EU Passenger Name Record (PNR) proposal: what happened in Parliament on EU PNR from 2011 to early 2015? Available at http://www.europarl.europa.eu/news/en/news-room/20150123BKG12902/EU-Passenger-Name-Record-(PNR)-proposal-an-overview

[11]Ibid.

[12]See European Parliament News, EU Passenger Name Record (PNR): Civil Liberties Committee backs EP/Council deal, available at http://www.europarl.europa.eu/news/en/news-room/20151207IPR06435/EU-Passenger-Name-Record-(PNR)-Civil-Liberties-Committee-backs-EPCouncil-deal

[13]Art. 1 of the PNR Directive.

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[16]Art.1 of the PNR Directive.

[17]Art.4 of the PNR Directive.

[18]Art. 8 (1) of the PNR Directive.

[19]*Ibid.*

[20]*Art. 8 (3) of the PNR Directive.*

[21]*Art. 12 (1) of the PNR Directive.*

[22]*Art. 12 (2) of the PNR Directive.*

[23]*Art. 14 of the PNR Directive.*

[24]*Art. 15 of the PNR Directive.*

[25]*Art. 5 (1) of the GDPR.*

[26]*Art. 13 (3) of the GDPR.*

[27]*Art. 5 (2) of the GDPR.*

[28]*Art. 44 of the GDPR.*

[29]*Art. 45 (2) of GDPR.*

[30]*Art. 45 (9) of GDPR.*

[31]*Art. 51 of GDPR.*

[32]*Art. 68 of the Regulation.*

[33]*Art. 37 of the PNR Directive.*

[34]*Art. 38 and 39 of the PNR Directive.*

[35]*Art. 37 (1) (b) of the GDPR.*

[36]*Press released on Civil Aviation Administration of China (CAAC) news, please see at http://www.caacnews.com.cn/1/6/201806/t20180601_1248765.html*

[37]*Please see the joint statement and press-release of European Union at http://europa.eu/rapid/press-release_STATEMENT-15-5374_en.htm*

[38]"... it prohibits the collection and use of sensitive data", the preamble of Directive 2016/681, paragraph 37, and "This Regulation also provides a margin of manoeuvre for Member States to specify its rules, including for the processing of special categories of personal data ('sensitive data')", Harmonised level of data protection despite national scope, Recital 10 of the General Data Protection Regulation.

[39]Paragraph 164-167 of the Opinion 1/15.

[40]Art. 5.1. (b), "personal data should be collected for specified, explicit and legitimate purposes and not further processed in a manner that is incompatible with those purposes; further processing for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes shall, in accordance with Article 89 (1), not be considered to be incompatible with the initial purposes ('purpose limitation')".

[41]Article 3 Use of PNR data, paragraph 4, "In exceptional cases, the Canadian Competent Authority may process PNR data where necessary to protect the vital interests of any individual."

[42]Paragraph 179-181 of the Opinion 1/15.

[43]See EU-US agreement, Art. 8 (6).

The 2nd National Congress of Space Renaissance Italia: "Orbital Laboratories, first Level of Civil Expansion in the Outer Space"

by Adriano V. Autino

The Second National Congress of Space Renaissance Italia was held at the INAF (Istituto Nazionale di Astrofisica), in the CNR Research Area, in Bologna on 18 and 19 May 2018. The Congress has been a clear success confirmed by the numerous messages of appreciation for the subject "Orbital laboratories, first level of civil expansion into outer space and for the high-level presentations of the prominent speakers.

The outcome of the Congress shows that it is time to begin traveling in space as civil passengers, no more only as trained astronauts. This implies a full change in the mission requirements: it means to allow normal people to take a spacecraft as a normal airliner, and travel to orbit, to work, to make business, or tourism in the outer space. Space vehicles will have controlled acceleration bearable by a normal passenger, safer and more comfortable re-enter in atmosphere, protection from the cosmic radiation. Some earthling technologies, such as welding, additive manufacturing, wastes reuse, will be tested in order to extended their use in space The orbital and cislunar habitats will be endowed with artificial gravity, in order to allow long time resident civilian settlers. These were some of the themes discussed by the Orbital laboratories session, chaired by Stefano Ferretti (ESPI). The congress also hosted a session on space law, chaired by Prof. Alfredo Roma that, taking the opportunity of the 50th anniversary of the Outer Space Treaty, recurred in October 2017, has put the urgency of a new space law system, compliant with the private commercial activities that will take place in space during the next decades.

All speeches were carefully focused on the proposed theme: the industrialization of space and the highly innovative character of the new space industrial sector and the related open market, that is developing worldwide. The Congress has been a great opportunity to discuss and try to understand the great social process that will take place in the near future thanks to the development of the space economy.

The theme of the orbital laboratories was conceived during the II World Congress of the Space Renaissance International, October 2016. Should anybody like to trace the inspiring concepts, they can take a look at: (https://spacerenaissance.space/congress/sri-2nd-world-congress-from-space-exploration-to-space-settlement/).

This proposal was able to reach and bring to the conference an exceptional number of panellists of the highest profile thanks to the presence in the committee of three people of great international reputation: Stefano Ferretti (European Space Policy Institute), Alfredo Roma (formerly responsible for Italy for the Galileo project), Luigina Feretti (INAF of Bologna), besides, of course, Adriano Autino, the president of Space Renaissance International.

Just to give an idea, a few numbers. The congress had 42 speakers, 9 companies, 2 aerospace districts or clusters (Emilia Romagna and Sardinia), 3 agencies (ESA, ASI, ENAC), 5 universities and research institutes, 2 associations, 4 artists. 5 round tables were held. Some keynote speakers: Anna Masutti, professor of Air Law at Bologna University, Claudio Portelli (ASI expert of space debris), Marco Ferrazzani (chief of ESA legal department, Andrea Vena (ESA, head of the Corporate Development Office), Alessandro Cardi (ENAC, Roya Ayazi, NEREUS, Secretary General).

The Congress hosted Enrico Dini, a visionary entrepreneur, the man who conceived the 3D printing for lunar construction, and some young italian new space corporates e.g.: D-ORBIT, Ferrari Farm, Technologies For Innovation Giacomo Cao, on behalf of the Aerospace District of Sardinia, gave a first-class testimony on the results achieved by the DASS: 50 million contracts in a few years. Gaetano Bergami -- President of the Aerospace Cluster of Emilia Romagna, and new President-elect of SR Italia -- described a reality of high-profile, healthy and prosperous mechanical companies.

The papers of the Congress are available at: https://goo.gl/1qaQmB

Better and Simpler Rules for Civil Aviation in EU

*Filippo Tomasello**

Acronyms	
ANS	Air Navigation Services
ATM	Air Traffic Management
BR	Basic Regulation (establishing EASA)
EASA	European Aviation Safety Agency
EC	European Commission
EP	European Parliament
EU	European Union
ICAO	International Civil Aviation Organisation
ISO	International Standard Organisation
JAA	Joint Aviation Authorities
JAR	Joint Aviation Requirements
JU	Joint Undertaking
LP	Legislative Proposal
QE	Qualified Entity
SESAR	Single European Sky ATM Research
SME	Small and Medium-sized Enterprise
UA	Unmanned Aircraft (i.e. only the 'machine' which flies in the air)
UAS	Unmanned Aircraft Systems (i.e. comprising also other components, among which the station of the remote pilot)

Breaking news

On 12 June 2018 the European Parliament (EP) adopted in first reading the reform of the European Aviation Safety Agency (EASA), based on a Legislative Proposal[1] by the European Commission (EC).

After the mentioned Legislative Proposal (LP) of 2015, the positive vote in 1st reading by the EP[2] is the second official milestone in the legislative procedure, aiming at extending the competencies of EASA, but also at simplifying the rules for safety processes to be applied by civil aviators and at using more efficiently the scarce resources available in civil aviation authorities at national level.

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The views expressed are purely those of the author (and thus may not in any circumstances be regarded as an official position of either EuroUSC or University Giustino Fortunato).

Next formal step will be the 'position' to be adopted by the Council of EU Transport Ministers. However, through an informal 'trialogue', the EP, the EC and the Council have already reached an informal 'political agreement' to amend the EC proposal and then to approve it, in last December 2017. Therefore, there is consistent hope that the Council 'position' would be identical to the text adopted by the Parliament, which could mean that the act would be adopted before end of 2018.

Once promulgated, in force and applicable, the act would constitute the new 'Basic Regulation' (BR) establishing EASA and repealing the EU Regulation 216/2008 currently applicable. Based on this new Basic Regulation, the EC will be empowered to adopt a number of delegated acts and a number of implementing rules, based on 'Opinions' developed by EASA, while that Agency would be able to promulgate related new technical (non-legally binding) provisions. The rules adopted by the EU Institutions and the provisions published by EASA, will be complemented by several consensus-based voluntary standards, developed e.g. by the International Standard Organisation (ISO) or Eurocae.

The adopted text contains significant innovations not only for civil drones, but also on aerodromes and respective operators. But in this notes the author mainly explains aspects related to drones.

Why a third extension of EASA?

There is a long history behind EASA. In fact, when in the '60s of last century Aérospatiale and the British Aerospace Corporation (BAC) initiated the development of the supersonic transport aircraft Concorde, of course they planned to obtain the 'Type Certificate' from the civil aviation authorities of France and UK. At the time, due to different applicable legislation, it was in fact necessary to obtain two different certificates, which already was an administrative burden. But the project was so demanding and innovative, that the two industrial partners convinced the Authorities to accept a single 'certification basis' (i.e. the list of technical requirements) and a single testing programme to reduce the costs, although details of the rules of the time were not identical between France and UK.

When Airbus was established in 1970, also Germany supported the idea of common technical requirements and certification programmes to reduce costs, while enhancing safety. This was the embryo of the Joint Aviation Authorities (JAA) which for a couple of decades published Joint Aviation Requirements (JAR) to harmonise the provisions applicable to civil aviation across several European States. However, application of these rules by the States was only voluntary and requiring legal adoption at national level. The process therefore inevitably led to different application dates and often to national variants in the rules, which increased the burden for industry. Not to mention the economic cost for taxpayers due to multiple legal adoption processes: in fact, one in each State.

Therefore in 1991 the Council adopted Regulation (EEC) No 3922/91 to transpose the JAR into EU legislation, at the same date and without the need of legal transposition at national level. This was an improvement towards uniform safety across the EU and also towards removal of barriers to the free movement of goods and services in the internal market, which, after almost 75 years of peace, is the second major benefit of the Union. However, the rulemaking process (i.e. adoption of technical requirements by EP and Council) was still cumbersome, while there was no pooling of authorities' resources at EU level.

To overcome this shortcoming, the EU legislator in 2002, through Regulation 1592, established EASA and enshrined the principle of automatic mutual recognition of certificates (e.g. the approval of a maintenance organisation issued in Italy was immediately valid in front of all other EU civil aviation authorities). A further simplification was the fact that EASA was empowered to publish non-legally binding technical provisions, not even requiring procedures at EC level, making the rulemaking process much shorter. Airbus and other manufacturers of large aeroplanes or large helicopters almost immediately benefited from these common EU rules.

Nevertheless, in 2002 the competencies of EASA were limited to airworthiness and environmental compatibility of aircraft. Progressively, in 2008 (first extension) and 2009 (second extension), the competencies have been extended to pilot licensing, air operations, authorisation to operators from non-EU third-countries, aerodromes, Air Traffic Management (ATM) and Air Navigation Services (ANS).

But, after 2010, three new challenges emerged for civil aviation:

1. Several studies (example in [3]) had demonstrated that safety of ground handling at aerodromes was sub-optimal, in addition representing a challenge for economic and operational efficiency of air transport. And in fact, the LP highlighted that accidents related to ground handling constituted the fourth biggest accident category in the period 2006-2015, while the voluntary initiatives at Member State level had not yet produced satisfactory results to address this risk. This trend of greater attention to safety of ground handling is in progress around the world, as e.g. demonstrated by promulgation in Qatar in 2017 of new rules on aerodrome safety in that country[4] developed by EuroUSC Italia ltd, which indeed covered the service providers of ground handling.

2. The unsatisfactory harmonisation between Regulation (EC) No 300/2008 on aviation security and the EASA BR had already been identified, but new threats were emerging in this area, mainly linked to cyber-security, considering that not only aircraft, but also ATM/ANS are more and more dependent on computers and digital data, which indeed may be subject to cyber-attacks.

3. The exponential growth of activity of civil drones, much beyond recreational use, which was confirmed after the LP also by SESAR JU[5].

In the opinion of he EC it was then necessary to propose a third extension of the EASA mandate, to indeed cover ground handling, aviation security with emphasis on cyber-security and civil drones of any mass. In fact, based on EU Regulation 216/2008 EASA is today competent only for civil drones of more than 150 kg, while 95% at least of that market is represented by much lighter drones.

Furthermore, while high and uniform aviation safety across the continent is the principal objective of EASA, it is not the only one. The LP hence aimed also at enhancing competitiveness of European aviation industry, which generates high value-jobs and drives technological innovation. This may be pursued not only covering new technical domains, but also simplifying the rules and administrative processes through a more proportionate and flexible approach to eliminate rules which can stifle entrepreneurship with too prescriptive requirements. In other words, a second objective of the LP was to introduce a scalable framework which recognises the differences existing between the various sectors of civil aviation and the risks involved therein to reduce the administrative burden for industry and in particular of Small and Medium-sized

Enterprises (SMEs), which may be involved not only in small Unmanned Aircraft Systems (UAS), but also in general aviation, maintenance or production of components.

Performance-based and Risk-based regulation

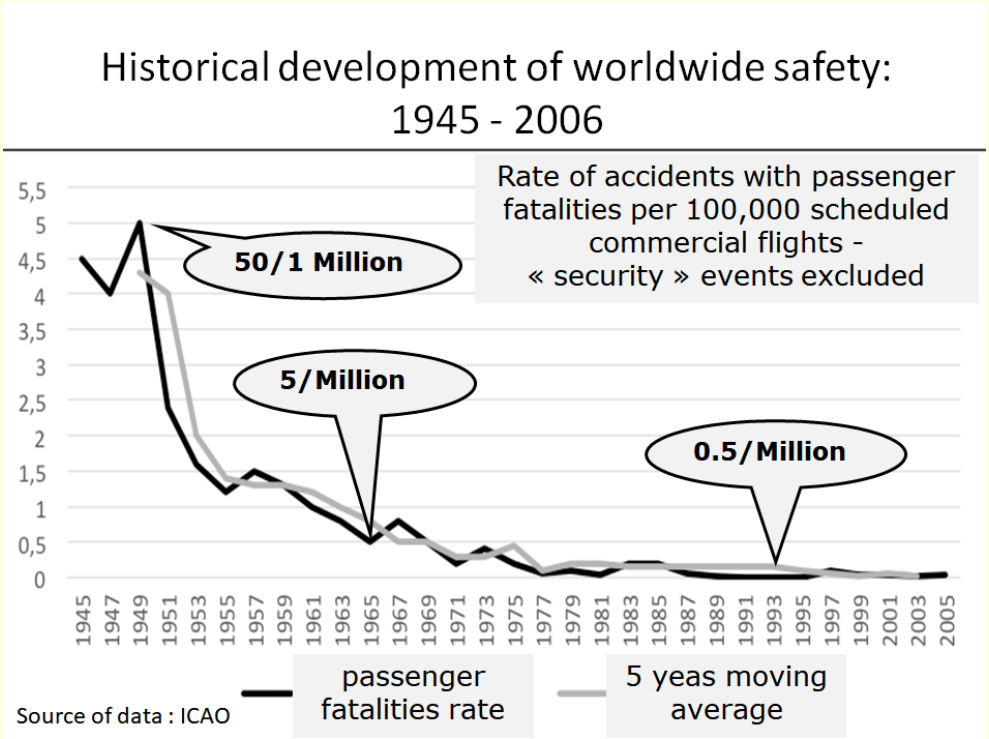
Therefore, the basic intent of the LP was to introduce the principles for more performance-based and more risk-based regulation.

The former concept means in essence:

- Legally binding rules limited to identification of the legal actors, regulatory processes, related approvals, responsibilities and privileges as well as safety and performance objectives to be reached; in other words, to aspects which are largely technology-independent and therefore do not require frequent amendment, while on the other side not preventing industry, through the established legal processes, to propose new technical solutions;

- Wide reliance, beyond possible technical specifications issued directly by EASA, on consensus-based voluntary industry standards, developed by bodies like e.g. ISO or Eurocae.

To better understand the concept of Risk-based regulation, readers may perhaps first pay attention to the dramatic improvement of civil aviation safety in the world from 1945 to the present day, as depicted in Figure 1.



Beside the numerical figures (i.e. rate of fatal accidents decreased 100 times in about 60 years) one might note that the graph means that air transport is now safer that transport by train and much safer than cars or motorcycles. Furthermore, currently some societies are more worried by other concerns (e.g. unemployment, terrorism, immigration, crime, etc.) than by aviation safety. This implies that for the political decision-makers all around the world, there are more urgent priorities in respective countries to assign resources. Consequently and unavoidably, while the volume of aviation activities increases and while technological complexity increases as well, the resources which Governments allocate to civil aviation authorities decrease. Complex aviation administrative procedures are not only a burden for industry, they also imply workload on authorities and, of course, if the workload increases while resources shrink, authorities become a bottle-neck for the orderly development of aviation.

Risk-based regulation hence responds to this challenge: how to concentrate the scarce resources of the authorities on what is more relevant for society (e.g. international aerodromes) however without decreasing safety of also e.g. general aviation, and indeed ground handling and UAS.

In fact, to ensure a risk-based and proportionate approach, for instance the LP did not propose a certification process for service providers for ground handling, but instead oversight of them based on recognised industry standards and best practices.

More in general the EP in its first reading, following the LP by the EC, concurred that to reduce the workload on EU national aviation authorities without reducing safety several innovative means may be used. So, having reiterated (Art. 1in (2)) that one of the objectives is to "promote cost-efficiency, by inter alia avoiding duplication, and promoting effectiveness in regulatory, certification and oversight processes as well as an efficient use of related resources at Union and national level" the EP endorsed the following tools to reach that goal:

- Wider 'privileges' to approved organisations (e.g. design and production organisation in Art. 15) to adopt changes and to attest conformity of products, without involvement of the authority;
- No need for formal pilot licence issued by the authority and medical certificate in relation to some light aircraft (Art. 21) as it will be detailed in subsequent implementing rules;
- A much wider application of a simpler 'declaration' (instead of certification or approval by authority) regime in respect of design, production and maintenance activities which are performed in relation to small aircraft (Recital 11) as well as in respect of engines, parts, aerodromes, operators of aircraft and aerodromes, ATM/ANS systems, constituents and service providers, pilots, air traffic controllers and persons, products and organisations involved in their training and medical examination (Recital 23), taking into account the nature and indeed the risk of the particular activity concerned;
- Comprehensive regulation (not necessarily certification) of organisations involved in the design, production or maintenance of ATM/ANS systems and constituents (Art. 42) which avoids duplication of the process of verification of conformity in relation to 'single sky' processes, since in fact the infamous Regulation (EU) 552/2004 is going to be repealed (Art. 139);

- Pool of European aviation inspectors (Art. 63) and possible voluntary reallocation of oversight responsibility of a Member State to EASA or to a different Member State (Art. 64);
- But also, reallocation of responsibility (e.g. to EASA) upon request of organisations operating in more than one Member State (Art. 65) which would allow e.g. Airbus to be totally under oversight by EASA and not by the French or German authorities; in Regulation 216/2008 this possibility already existed, but upon request by the State, while now industry may directly request the reallocation;
- Finally, Qualified Entities (QEs), which have a marginal role in Regulation 216/2008, should now have privileges (art. 69) once the related delegated and implementing rules would become applicable; on this basis a QE established in one of the Member States, may offer its services to applicants in any other Member State.

Unmanned Aircraft Systems (UAS)

Some people call drones Unmanned Aerial 'Vehicles', possibly implying that they are not 'aircraft' and therefore should not be regulated in the framework of aviation. This position is totally wrong as demonstrated by the fact that "unmanned aircraft" where already covered by the original EASA BR in 2002. In 2012 ICAO amended Annex 7 to the Chicago Convention clearly establishing that "an aircraft which is intended to be operated with no pilot on board shall be further classified as unmanned" and so meaning that any aircraft can be 'manned' (i.e. pilot on board) or 'unmanned' (i.e. no pilot on board, which does not exclude the possible presence of passengers).
Following this line and as proposed by the EC, in its 1st reading the EP confirmed that UAS are indeed aircraft and therefore should be fully embedded into the new EASA BR. Consequently, some definitions, specific for UAS, are included in Art. 3.

But probably the most important amendment, accepted by EP, is where UAS are not mentioned at all! In fact, in 2002, the EU legislator listed UAS of a mass higher than 150 kg, in Annex II to the EASA BR of the time, meaning that these aircraft were outside the mandate of that Agency. Now the aircraft excluded from the competencies of EASA are listed in Annex I of the text voted by EP … and UAS are not mentioned therein with few marginal exceptions (e.g. tethered aircraft with a mass of no more than 1 kg, which could be helium filled balloons used by children). All other UAS, whether aeroplanes, helicopters, ornithopters or lighter-than-air will be in the scope of EASA, once the new BR would become applicable.
Of course, it would be disproportionate to apply the same requirements and the same processes to a drone of 200 grams like to a drone of 200 kg. Therefore, in the case of UAS the concepts of performance-based and risk-based regulation become most relevant.
The entire Section VII of the text adopted in 1st reading by the EP is dedicated to Unmanned Aircraft (UA) and it comprises four Articles. The first (Art. 55) is quite important, since establishing essential requirements for design, production, maintenance and operation of UA, as well as personnel, including remote pilots, and organisations involved in those activities.

The applicable essential requirements are listed in Annex IX for UAS not subject to certification. Conversely, for UAS in the 'certified' category, meaning that they pose a risk for society comparable to that of manned aircraft, the same essential requirements applicable to manned aviation would be applicable: i.e. as contained in Annexes II (airworthiness), IV (crews) and V (air operations). Here it is important to recall that in the typical case the 'operator' is a commercial company (the employer), while the person actually flying the UA is a remote pilot (the employee). One may also note that Annex IV mentions also Aero-Medical Examiners and Aero-Medical Centres, as well as Flight Instructors, Flight Examiners and pilot Training Organisations. All these entities will be regulated through common EU rules once the new BR will be fully implemented, whether involved in manned or unmanned aviation.
It could also be observed that said Annex IV covers also cabin crews, which become a 'regulated' profession in recognition of the relevance of their competence to safeguard life of passengers. Conversely, UA 'observers' or other job profiles (e.g. payload master or flight engineer or flight dispatcher) linked to UAS are not mentioned in any place of the text adopted by the EP, which means that these professions would not be regulated: these persons will not have a formal licence issued by the authority, even for the largest civil drones. The fact that these professionals would not be regulated, does not however exclude that they would undergo training and be requested to demonstrate respective competence. These aspects would in fact fell under the responsibility of the operator (the employer).

Subsequent Article 56, referring to the 'risk' of the activity concerned, establishes that certificates and licences "may" be required when so established in the delegated or implementing acts: this would be the 'certified' category, subject to the same administrative procedures of commercial aviation using large aircraft, since the safety risk for society is high.
In this Article the EP mentions both 'delegated' and 'implementing' acts. The distinction, based on the Lisbon Treaty, did not exist in the previous versions of EASA BR. Now it is introduced, meaning that for an implementing act the EC would need the positive vote by a Committee where the States are represented, while in case of delegated act, vote by the States is no longer necessary (i.e. wider delegation of authority to the EC). In the LP the EC had proposed 'delegated' acts almost on any topic. No wonder during the 'trialogue' the States opposed, not wishing to delegate too much to the EC. In the text adopted by the EP the cases in which delegated acts may be promulgated are identified, not only for UAS, as well as the cases demanding implementing acts.

Paragraph 5 in same Article 56, provides the legal basis for the 'declaration' regime, less burdensome than certification, applicable essentially when 'standard scenarios' in the 'specific' category of UAS operations would have been published by EASA. In this category the risk for the society is perceived as medium by the political decision-makers. The related acts are expected to define also the possibility for voluntary certification in the specific category and, on the other side, when the operator shall instead apply for an authorisation, in the absence of airworthiness certification for the UA.

Really innovative is paragraph 6, still in Article 56, where, for the first time in history an attempt is made to take benefit from processes applicable to industry manufacturing consumer products, in the context of aviation safety. In fact, where UAS operations represent a low risk for society (e.g. a drone of around 1 kg flying at a height of few meters in a urban area or of 20 kg in the country side) these operations would fell into the "open" category and be subject only to the essential require-

ments in Chapter 1 of Annex IX. Detailed rules established on that basis would not be implemented through aviation administrative procedures, with a significant simplification for both manufacturers and operators, since these rules would constitute 'Community harmonisation legislation' within the meaning of Regulation (EC) No 765/2008 of the European Parliament and of the Council and Decision No 768/2008/EC of the European Parliament and of the Council. In other words, no certificates, licences or any other approval would be required from the aviation authority. In summary, drones in the open category, although being aircraft, would be subject to the same administrative procedures applied e.g. to toys or to domestic washing machines: i.e. a declaration of conformity signed by the manufacturer, possibly assisted by an independent notified body, and the CE mark. The latter would be required to sell the product on the internal market, even when the manufacturer s not European (e.g. DJI established in Shenzhen in China).

In such open category of UAS operations, the aviation authorities will establish limitations (e.g. mass or height) and the police is expected to enforce them. To do so a registration system and electronic identification of the UA and of its operator would be necessary, as in fact introduced by EP in paragraph 7.
Finally, considering the societal concerns on these matters[6] the EP emphasised in last paragraph of Article 56, the possibility for Member States to lay down national rules related to public security or protection of privacy and personal data in relation to civil UAS. Readers may recall that instead insurance for liability towards third parties is already covered by EU Regulation 785/2004, which is applicable also to UA.

Article 57 delegates the EC to adopt implementing acts (i.e. after positive vote by the Committee of States) related to UAS, mainly in the domains of remote pilots and operations. Conversely the subsequent Article 58 empowers the EC to adopt delegated acts (i.e. no formal involvement of States), with regard mainly to specific conditions for the design, production and maintenance of UA, or to amend the related essential requirements.

The vote in 1st reading follows a series of publications and initiatives by EASA addressing drone use over the past years. In December 2015, the Agency released a technical opinion including a series of early proposals for a regulatory framework for drones, as well as setting out three categories of unmanned aircraft operation – Open, Specific and Certified – based on an analysis of their risk levels. Earlier this year, EASA published a further Opinion recommending common EU rules for UAS operations in the open and specific categories, including the use of electronic identification systems, unique serial numbers for drones, and geo-awareness technology . These common rules are expected to be adopted by the EC early in 2019, immediately after the entering into force of the new BR described in these notes.

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[1]European Commission (EC), Proposal for a Regulation of the European Parliament and of the Council on common rules in the field of civil aviation and establishing a EU Aviation Safety Agency, and repealing Regulation (EC) No 216/2008 of the European Parliament and of the Council, COM(2015) 613 final of 7 December 2015 https://eur-lex.europa.eu/legal-content/AUTO/?uri=CELEX:52015PC0613&qid=1529141213996&rid=1

[2]European Parliament legislative resolution of 12 June 2018 on the proposal for a regulation of the European Parliament and of the Council on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and repealing Regulation (EC) No 216/2008 of the European Parliament and of the Council (COM(2015)0613 – C8-0389/2015 – 2015/0277(COD)) (Ordinary legislative procedure: first reading) http://www.europarl.europa.eu/sides/getDoc.do?type=TA&reference=P8-TA-2018-0245&format=XML&language=EN#top

[3]A.D. Balk, Safety of ground handling, report NLR-CR-2007-961, January 2008 https://www.easa.europa.eu/sites/default/files/dfu/NLR-CR-2007-961.pdf

[4]Qatar Civil Aviation Regulations (QCAR) No. 006 of 2017 Aerodromes -Requirements and Administrative Procedures https://www.caa.gov.qa/en-us/CivilAviationRegulations/RegulationMaterials/Aerodromes%20-%20Requirements%20and%20Administrative%20Procedures.pdf

[5]SESAR Joint Undertaking, European Drones Outlook Study, November 2016 https://www.sesarju.eu/sites/default/files/documents/reports/European_Drones_Outlook_Study_2016.pdf

[6]Filippo Tomasello e Marco Ducci, Research for TRAN Committee - Safe integration of drones into air-space, 2016 http://www.europarl.europa.eu/RegData/etudes/STUD/2016/585894/IPOL_STU(2016)585894_EN.pdf

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