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Aviation

Digital Revolution in Air travel: the Interplay of E-Documents and Denied Boarding

Marco Franzoso

Protection and Remedies for the Security of Air Passenger Information: a Chinese Legal Perspective

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Digital Revolution in Air Travel: the Interplay of E-Documents and Denied Boarding

Marco Franzoso*

Abstract

This paper examines how electronic documents (e-docs) reshape denied boarding liability in aviation. It explores the evolution of transportation records - from ancient clay tablets to today's digital e-docs - leading to the examination of the legal frameworks governing air travel documentation, such as the Warsaw and Montreal Conventions, and their adaptation to modern technologies.

Denied boarding, a contentious issue, is analyzed across five jurisdictions (EU, USA, Canada, India, China), distinguishing consumer protection models (EU Regulation 261/2004, Canada, India) from contract-based approaches (USA, China).

Through the analysis of judgments from the CJEU and other national Courts, the paper demonstrates how "presentation for boarding" has been redefined: passengers fulfill obligations by submitting e-doc data through carrier systems, making system rejection equivalent to denied boarding.

The paper sheds light on the growing importance of standardizing practices and legal frameworks in addressing e-docs' unique challenges and the complex relationship between e-docs and denied boarding in aviation. It also establishes an operational control principle for e-doc liability: the party operating verification infrastructure bears malfunction risk, further emphasizing the need for clear legal frameworks and industry standards. Critically, IT system failures causing denied boarding do not constitute "extraordinary circumstances," as such failures represent foreseeable operational risks within carrier control.

Keywords:

Electronic Documents
Denied Boarding Air Law Digital Transformation
Ticketing

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1. Brief Introduction

From the earliest surviving carriage records – dating back to the Bronze Age¹ - to the first scheduled commercial air service in 1914,² ticketing and waybills have been an integral legal tool for moving people and goods. The medium had changed, but the function had not: documenting entitlement to carriage and anchoring the carrier–passenger legal relationship. This long continuity matters because today’s “paperless” shift does not eliminate documentation; it relocates it into databases and digital tokens, raising new questions about what counts as “delivery,” “possession,” and “presentation”. One of the most notable novelties has been the widespread adoption of electronic documents (e-docs), which now serve as a central component of modern air travel infrastructure. These digital alternatives to traditional paper documentation have impacted the way contracts of carriage are concluded, how passengers check-in, and even how legal frameworks govern the rights and obligations of air carriers and passengers, especially when boarding depends on the functioning of an electronic verification ecosystem. The present academic paper seeks to thoroughly explore the intersection of e-documents and the increasingly common issue of denied boarding within the aviation sector. While e-docs such as e-tickets and e-passports streamline passenger processes, they also raise important questions about legal liability, passenger rights, and operational challenges—especially when technological malfunctions lead to denied boarding situations. E-documents have grown in importance within the aviation industry, facilitated by international treaties, national regulations, and the shifting demands of modern air travel. However, while these electronic tools promise efficiency and convenience, their integration into the legal framework of air travel is still complex. Denied boarding—often arising from overbooking, inadequate travel documentation, or technical failures—presents an area where e-docs and traditional travel laws intersect and, in some cases, clash. By analyzing this phenomenon, the paper aims to address the challenges of integrating e-docs into a legal framework that was once based solely on paper-based records, which may require rethinking existing liability structures, as well as adapting international norms to modern technology’s future challenges.

1.1. Understanding e-documents

The rapid digital transformation within the aviation industry has introduced significant changes in how air travel is documented and managed. The term “e-document” (hereinafter “e-doc”) refers to any type of transactional document that is electronically exchanged between trading partners.³ Unlike PDF or image files, e-docs are machine-readable and are typically exchanged via software or online platforms, rather than email. Specifically, an electronic document is intended to be transferred from one system to another without any human intervention. It is a pure data representation that can be read by a computer, but it is not editable. Conversely, a digital document consists of data that is human-readable but not easily processed by computers.⁴ Common examples of e-docs include purchase orders, invoices, dispatches, credit/debit notes, correction invoices, goods receipt notes, and payment instructions.⁵ The specific e-docs utilized by an orga-

- 1 The “Hand of Nergal,” a clay tablet from around 1350 BCE, contains a notice of a contract of carriage between the King of Cyprus and the Pharaoh Akhenaten of Egypt and references the concept of force majeure. The very first evidence of a complete and proper waybill is probably the Hibeh Papyri (252 BCE), fragment 98. The document detailed both the amount and the caliber of goods, as well as the identities of the consignor and consignee, the representative handling the transport, the particulars of the vessel, and the points of departure and arrival. Cfr Ioannis Voudouris, Evi Plomaritou, Documents of the Shipping Transport: Historical Origins, Legal Validity & Commercial Practice, 10 J. of Shipping and Ocean Engineering 2, 48 (2020)
- 2 January 1st 1914, from St. Petersburg (Florida, USA) to Tampa (Florida, USA), a short journey of just 27 kilometres; cfr. Tim Sharp, The world’s first commercial airline, Space.com (1 March 2022), <https://www.space.com/16657-worlds-first-commercial-airline-the-greatest-moments-in-flight.html>. For further insights, see Thomas A. Heppenheimer, Turbulent Skies: The History of Commercial Aviation (Wiley, 1998). The first paid ticket was sold at an auction to Abram C. Pheil, former mayor of St. Petersburg, for a winning bid of \$ 400 (equal to approximately \$12,965 in 2026, according to the CPI Inflation Calculator, <https://www.officialdata.org/us/inflation/1914?amount=400>).
- 3 What is an e-documents?, Pagero (23rd September 2020), <https://www.pagero.com/blog/what-is-an-e-document>.
- 4 F. Tournay, The Difference Between “Digital” and “Electronic” Documents, Tie Kinetix, now SPS Commerce (7th August 2023), <https://tiekinetix.com/en/blog/difference-between-digital-electronic-documents>.
- 5 What is an e-documents?, supra.

nization are determined by its operations and applicable local regulations, which may vary by country for companies operating in multiple regions. Generally, the most commonly regulated e-doc is the e-invoice. Digital documents are similar to paper documents in many ways; although, as they can only be viewed on an electronic device, they are designed to resemble paper documents in appearance. Some of the most important e-documents in the aviation industry include e-passport, e-boarding pass, and e-ticket:

- An e-passport is a conventional passport that contains an embedded electronic microprocessor chip and an antenna. This chip contains biometric information (facial image, optionally fingerprints or iris scans) that can be used to authenticate the identity of the passport holder. The International Civil Aviation Organization (ICAO) sets the international standards and characteristics of the document and chip, ensuring global interoperability of e-passports.⁶ Airlines use e-passport data not to establish the contract of carriage, but to verify passenger identity and compliance with immigration requirements.
- An e-boarding pass is a machine-readable authorization to board a specific flight, issued *after* check-in is completed. The International Air Transport Association (IATA), Resolution 792, standardizes the bar-coded boarding pass (BCBP) format, which encodes essential flight data (passenger name, flight number, seat assignment, boarding gate, sequence number) in a 2D barcode.⁷ Unlike the e-ticket, the boarding pass is delivered to the passenger (via mobile app, email, or printed paper) and serves as their proof of eligibility to board. It functions as a “token” that operationalizes the pre-existing contract of carriage documented in the e-ticket.
- Finally, an e-ticket is essentially a reservation in an airline’s computer system that confirms the passenger’s contract of carriage – a reserved seat on a specific flight. The e-ticket serves as *prima facie* evidence of the contract’s existence and content. Crucially, the e-ticket resides in the carrier’s system, not in the passenger’s possession. The passenger receives only a receipt (an e-ticket receipt, typically via email, which can be printed out at a later stage)⁸ containing booking reference, itinerary, and fare conditions. It must be noted that the e-receipt is not itself the contract; it merely confirms the contract stored in the airline’s database.

1.2. Legal Documentation in Aviation: WC29, MC99, and Beyond

1.2.1. Legal Framework under the Warsaw and Montreal Conventions. Practical Application

In private aviation, two international treaties forge the applicable legal framework for documentation: the Warsaw Convention of 1929 (WC29)⁹ and the Montreal Convention of 1999 (MC99).¹⁰ The case-to-case applicability of one or the other follows the pivotal rules laid down in the Vienna Convention on the Law of the Treaties of 1969.¹¹

The MC99, specifically Article 3, serves the purpose of regulating the documentation requirements for both passengers and their baggage. Its emphasis lies on the adaptation of these requirements to modern technologies and the simplification of the process to ensure compatibility across the board. This particular provision has been instrumental in the

6 International Civil Aviation Organization (ICAO), Machine Readable Travel Documents, Doc 9303, <https://www.icao.int/publications/pages/publication.aspx?docnum=9303>.

7 International Air Transport Association (IATA), Resolution 792: IATA’s Bar Coded Boarding Pass, version 8 (2020).

8 What is an E-ticket, Really?, AirTreks (26 Aug. 2016), <https://airtreks.com/go/what-is-an-e-ticket/>. The Author also acknowledges Southwest Airlines as the first commercial air carrier to provide e-tickets, back in 1994.

9 ICAO, *Convention for the Unification of Certain Rules Relating to International Transportation by Air (as amended at the Hague, 1955, and by Protocol No. 4 of Montreal, 1975)*, 12 Oct. 1929, 49 Stat. 3000, T.S. No. 876, 137 L.N.T.S. 11 (1934).

10 ICAO, *Convention for the Unification of Certain Rules for International Carriage by Air*, 28 May 1999, Doc. No. 9740 (4 Nov. 2003).

11 United Nations, *Vienna Convention on the Law of Treaties*, UNTS 1155, 331 (23 May 1969).

industry's transition towards paperless ticketing (**e-tickets**), a goal that it has fervently pursued.¹²

Critically, Article 3(2) of MC99 provides that: *“the carrier may substitute other means for the document referred to in paragraphs 1 and 2, provided that the carrier preserves a record of the information contained therein.”*¹³ The Convention does not require an identity between paper and electronic documents; rather, it mandates functional equivalence: the “substituted means” must preserve the same information and serve the same evidentiary purpose as traditional paper tickets.

By electing to substitute electronic systems, carriers assume legal responsibility for maintaining these systems and ensuring they function properly. The “substitution” permitted under Article 3(2) is not merely a technological convenience but a legally significant choice that shifts documentation infrastructure from the passenger's physical possession (paper ticket) to the carrier's digital control (database record). Consequently, when e-doc systems malfunction and prevent boarding, liability's allocation would follow the MC99 framework, albeit with the critical distinction that the carrier, not the passenger, controls the substituted electronic infrastructure. Some air carriers around the world have already decided to join the digital revolution. For instance, Korean Air is the first airline to use an e-docs system for its customers, allowing them to complete multiple types of documents on their digital devices. The system automatically fills in information collected during the reservation process, such as declarations or reservations.¹⁴ On the opposite side of the Pacific Ocean, Copa Airline (Panama's state carrier) has already spent some years working on the transition from paper toward e-docs, in respect of their technical documentation.¹⁵

1.2.2. Legal Implications of Documentation: MC99 and WC29 Compared

One significant change that the MC99 brings forth is the replacement of the term “passenger ticket,” which was previously used in the Warsaw System, with the term “document of carriage.”¹⁶ This document must contain specific details such as the place of departure and destination, and at least one agreed stopping place if they lie within the same State Party (Article 3(1)). The issuance of a “collective document of carriage” is also permitted, commonly used in charter operations. Unlike the WC29, which had a liability regime that was dependent on the issuance and delivery of a notice within the ticket to the passenger, the MC99 does not require such measures, providing more flexibility in documentation requirements (Article 3(5)).

The drafters of WC29 opted for a *limited* liability system to “*speed up the settlement of claims*”.¹⁷ Within the maximums set in Article 22, the carrier's liability is presumed. Overcoming this regime is possible through the so-called “Wilful Misconduct test”.¹⁸ Hence, the inapplicability of the Warsaw System in cases of the absence of notice of Article 3(1,e) has been developed internationally through numerous case laws. In *Ludecke v. Canadian Pacific Airlines Ltd.*, it was established by the Supreme Court of Canada that the carrier's liability limitation applies even if the notice is not given. However, if the ticket is not delivered, the carrier's liability limitation will not apply. It's important to note that an irregular ticket delivery doesn't negate the limitations.¹⁹ United States (US) courts, instead, decided to focus more on

12 Benjamy I. Scott, Andrea Trimarchi, *Fundamentals of international aviation law and policy*, 164 (NY Routledge, 2020); Andrea Trimarchi, *An Analysis of the Grounds of Jurisdiction and Jurisdictional Issues in Light of the Warsaw/Montreal System*, 15 *Issues in Aviation L. and Policy*, 377-398 (2015).

13 *Supra* note 10, Article 3(2).

14 *Korean Airline launches full-scale electronic document system*, Korean Air (December 2021), <https://www.koreanair.com/tw/en/footer/about-us/newsroom/list/211228-korean-air-launches-full-scale-electronic-document-system/>.

15 Pablo R. Avendano, *Don't Start Your Airline's Electronic Documentation Journey Until You Read This*, Upshot by Inflightive (September 2019) <https://upshotstories.com/stories/don-t-start-your-airline-s-electronic-documentation-journey-until-you-read-this>.

16 B. I. Scott, A. Trimarchi, *supra*, 164.

17 Pablo M. de Leon, *Introduction to Air Law*, 10th Ed., 224 (Wolters Kluwer, 2022).

18 *Ibid.*

19 Canada Supreme Court, 2 SCR 63 (1979).

air carriers protection, giving a more flexible interpretation of the “notice requirement” of WC29 (*Mertens v. The Flying Tiger Line*, *Warren v. Flying Tiger Line*).²⁰ Furthermore, “*Lilliputian print in a thicket*”, small enough to be “*unnoticeable or unreadable*”, undermines the WC29’s limitation of liability of the carrier.²¹ Lastly, the US vision was crystallized in *Chan v. Korean Airlines*, when the US Supreme Court held that: “*the failure to provide an ‘adequate’ statement of notice [...] would eliminate the liability limitation.*”²²

1.2.3. Air Waybill and Air Consignment Note: Crucial Documentation in Air Cargo Transportation.

When it comes to documenting the transportation of cargo, the definition of air waybill (AWB) and “air consignment note” is due. Those consist of contracts of cargo between the shipper and the carrier.²³ Articles 4 and 5 of WC29 specify that the document of carriage should contain the details required for baggage checks and “air consignment note”, such as the place and date of issuance, the place of departure and destination, carrier information, item number and weight, the value of the carried items, and a statement regarding the application of the Warsaw Convention. The Hague Protocol streamlined these requirements by retaining certain conditions while introducing one related to the agreed stopping place when the departure and destination are within the territory of the same State. Failure to comply with specified requirements regarding the passenger ticket, baggage check, and the “air consignment note” results in the inapplicability of the limitation of liability of the carrier.²⁴ For example, a ruling by a US Court of Appeal found that the “air consignment note” must include the place of execution for a carrier to be able to limit its liability under Article 22 of the WC29, as mandated per Article 8 of the same text.²⁵ Finally, Article 5 of the MC99 replaces the wording of Article 5 of the WC29, and requires that an AWB shall be issued for the carriage of cargo.²⁶

2. Denied Boarding

The act of being denied boarding generally occurs when a passenger possessing a valid flight ticket is unable to occupy a seat on the aircraft due to an excess of checked-in and on-time passengers compared to the number of available seats.²⁷ There are various reasons why a passenger may be denied boarding, including security, safety, immigration, or health concerns. While WC29 and MC99 do not explicitly state denied boarding as a liability cause, courts around the world have clarified this point. Chapter 3 of the current paper will discuss these developments in relation to e-docs, while this chapter will focus specifically on the applicable legal framework through a comparative lens, distinguishing between jurisdictions that adopt a *consumer protection approach* and those that emphasize *contract of carriage principles*. This distinction becomes critical when analyzing liability for denied boarding caused by e-document system malfunctions.

2.1. Consumer Protection Model: EU, Canada, and India

Regulation (EC) No 261/2004 Article 4, the archetype of the consumer protection model in aviation law, lays out the guidelines for denied boarding in situations where the conditions specified in Article 3(2) are met.²⁸ A well-defined protocol must be adhered to, which involves requesting volunteers to relinquish their reservations in exchange for benefits

20 US Court of Appeals, 341 F.2d 851 (2d Cir. 1965). US District Court, 234 F. Supp. 223 (S.D. Cal. 1964).

21 US District Court: *Lisi v. Alitalia-Linee Aeree Italiane*, 253 F. Supp. 237, 243 (S.D.N.Y. 1966).

22 US Supreme Court, 490 U.S. 122 (1989).

23 *What is an air waybill (AWB)?*, FedEx, <https://www.fedex.com/en-nl/customer-support/faq/sending/shipping-documents/what-is-an-air-waybill.html>.

24 US District Court: *Cruz v. American Airlines, Inc.* 193 F.3d 526 (D.C. Cir. 1999).

25 P. M. de Leon, *Introduction to Air Law*, *supra*, 199. The Author referred to the US Court of Appeals: *Republic National Bank v. Delta Airlines*, 98 Civ. 8729 (JSM) (S.D.N.Y. Nov. 2, 2000).

26 B. I. Scott, A. Trimarchi, *Fundamentals of international aviation law and policy*, *supra*.

27 *Bumping & Oversales*, US Dep. Of Transportation, <https://www.transportation.gov/individuals/aviation-consumer-protection/bumping-oversales>.

28 Regulation (EC) No 261/2004, OJ L 46, 17.2.2004.

as described in Article 8's "right to care". If insufficient volunteers come forward, the airline may refuse boarding to passengers against their will but must provide compensation in accordance with Article 7. It should be noted that denied boarding scenarios may arise from varied causes, not just overbooking. In summary, the Regulation considers passengers as the weaker party in the contractual relationship, imposing strict obligations on carriers, without considering the possible commercial justification for the denied boarding. Concerning travel documents, EU legislation imposes the responsibility on passengers to ensure that they possess *valid* documentation, and carriers are not obligated to inform them.²⁹ In the event that a passenger is without the *necessary* documents, the carrier cannot be held responsible for any compensation for denied boarding. It is imperative to bear in mind that *inadequate* travel documentation on its own cannot serve as a justification for denied boarding, and the competent court must evaluate the reasonableness of the refusal based on the complexity of the case, as stated by the Court of Justice of the European Union (CJEU)'s ruling *D. Z. v. Blue Air – Airline Management Solutions SRL*.³⁰ Certain airlines may have carriage terms and conditions that permit them to refuse boarding to passengers without the requisite travel documentation, as exemplified by the CJEU case of *LE v. Transport Aéreos Portugueses SA*.³¹

In 2019, Canada implemented the Air Passenger Protection Regulations (SOR/2019-150) to safeguard passengers' rights, adopting a similar consumer-centric approach.³² This law offers significant protection to those who are denied boarding (as per Article 12(4)). Passengers who experience a refusal to board are entitled to receive information (Article 13), alternative travel arrangements (Article 18), a refund (Article 18), assistance (standards of treatment, Article 16 (1,2,3)), or compensation (Article 20(1)). It is recommended that a voluntary surrender procedure be established to prevent such events (Article 15 (1,2)). However, it's important to note that the law restricts the carrier's defense to instances where denied boarding is caused by factors outside of their control (Article 10). Compensation is not due if such situations arise for safety reasons. Lastly, the amended Article 5(5) states that a notice providing info about the protection in case of denied boarding must be present in all the digital platforms used to sell tickets, or within a "*document that contains a hyperlink*" (hence, an e-doc).³³

In 2022, the Indian Civil Aviation regulatory body, DGCA, specified certain conditions that airlines must follow in the event of denied boarding.³⁴ As per these regulations, no compensation must be provided if the airline can arrange an alternative flight within an hour. However, if an alternative flight is unavailable, the airline must compensate up to ₹10,000. Significantly, India's system incorporates a dual-track consumer protection mechanism: in *Air India Ltd v. Pallav Mongia & Ors*,³⁵ the Delhi High Court confirmed that passengers may seek additional compensation through civil and consumer courts beyond the DGCA's immediate relief provisions, as denied boarding constitutes "deficiency in service" under the Consumer Protection Act.³⁶ This judicial overlay strengthens passenger rights beyond the regulatory baseline, aligning India closely with the EU consumer protection paradigm.

2.2. Contract of Carriage Model: USA & China

The US Department of Transport 14 CFR § 250 (2011) (hereinafter the "code") settled the rules for aviation-related denied boarding in the USA, emphasizing contractual compliance over consumer protection.³⁷ A typical voluntary-see pro-

29 Directive (EU) 2016/681, OJ L 119, 4.5.2016, p. 132–149, 27.04.2016.

30 CJEU C-584/18, 30.04.2020, ECLI:EU:C:2020:324.

31 CJEU C-74/19, 11.06.2020, ECLI:EU:C:2020:460.

32 Air Passenger Protection Regulations, SOR/2019-150, 22.05.2019.

33 *Ibid.*, Article 5(4).

34 *Denied boarding due to overbooked flight? How to get Rs 20,000 as refund*, Business Standard (2022), https://www.business-standard.com/finance/personal-finance/flight-overbooked-you-can-get-up-to-rs-20-000-as-refund-here-s-how-123061300279_1.html.

35 *Pallav Mongia v. Union of India & Ors.*, W.P.(C) No. 12006/2015, Delhi High Court (2 Feb. 2018) (Justice Vibhu Bakhru).

36 Consumers can approach civil and consumer courts too for compensation in case denied boarding, Consumer Voice (24 Dec. 2020), <https://consumer-voice.org/consumer-right-laws/consumers-can-approach-civil-and-consumer-courts-too-for-compensation-in-case-denied-boarding>.

37 US 49 Code 329, 14 CFR - part 250.

cedure shall be followed in exchange for various benefits, case by case offered by the carrier (sec. 250.2b). Involuntary passengers who have been denied boarding shall be compensated according to section 250.5. Exceptions are settled in section 250.6, which relates to unruly behaviors, operational or safety reasons, and failing to present at the check-in on time. Moreover, there is another exception to the obligation of compensation - that will be further discussed in Chapter 3: “The passenger does not comply *fully* with the carrier’s contract of carriage or tariff provisions regarding ticketing, re-confirmation, check-in, and acceptability for transportation.”³⁸ A notice regarding the applicable law of denied boarding shall be presented on each sold ticket, or in comparable other locations, per sec. 250.11 (b). Oddly, the article explicitly refers to “piece of *paper*”. These provisions grant the carriers significant discretion to define boarding eligibility, setting the threshold that the passenger must comply with, and leaving room for compensation only after all the carrier’s contractual requirements are fully met.

China’s Civil Aviation Administration (CAAC) regulates denied boarding through its *Regulation on the Management of Public Air Transportation Services for Passengers* (2021).³⁹ Articles 24(1) and 25 require carriers unable to secure volunteers to provide “relevant services” but lack standardized mandatory compensation provisions. Unlike the EU or Indian models, China’s system prioritizes administrative complaint mechanisms (CAAC Consumer Affairs Center) and judicial litigation over pre-determined “automatic” consumer protection, leaving compensation largely to carrier discretion and contractual negotiation.⁴⁰ This approach resembles the USA model’s emphasis on contract terms, though with weaker procedural safeguards for passengers

3. E-Docs and Denied Boarding: Acceptance, Interaction, and Legal Implications

The aim of this Chapter is to analyze how, and to what extent, e-docs and denied boarding interact in practice. As established in Section 1.2.1, Article 3(2) MC99 permits carriers to “substitute other means” for paper documentation, thereby providing the legal foundation for e-tickets, e-boarding passes, and e-passports. This Chapter examines the liability consequences when these carrier-controlled electronic systems malfunction and cause denied boarding.

3.1. Acceptance and Interaction.

Firstly, do the various stakeholders accept e-docs?

It has been shown in (1.2.1) that airlines are already implementing such systems in their various operations. Then, the other major stakeholders to analyze are international aviation organizations and agencies, in particular the IATA and the European Union Aviation Safety Agency (EASA). During the 2004 IATA Annual General Meeting, it was decided that the whole airline ticketing system would rely on e-tickets by the end of 2007 (then postponed to May 2008).⁴¹ For this purpose, in 2007 IATA released its “Ticket Handbook”, with the first Chapter entirely dedicated to e-tickets.⁴²

Starting in 2021, the EASA issued guidelines for the inclusion of e-docs on board aircraft.⁴³ These documents are required to be available on EU aircraft in accordance with Commission Regulation (EU) No 965/2012, which specifies the types of documents that must be carried, although without making any distinction between paper and electronic documents.⁴⁴

³⁸ *Ibid.*, sec. 250.6 (a). Italic added.

³⁹ CAAC, *Regulation on the Management of Public Air Transportation Services for Passengers*, Chapter 7, Artt. 24-25-42-49 (2021).

⁴⁰ Huan Qin, *Beyond Litigation: The Use of ADR in Resolving Disputes Involving Air Passengers in China*, 47(3) *Air & Space Law* 285 (2022).

⁴¹ *100% Electronic Ticketing Deadline Extension to 31 May 2008*, IATA (December 2007), https://web.archive.org/web/20080210094053/http://www.iata.org/pressroom/facts_figures/fact_sheets/et-deadline-extension.htm.

⁴² IATA, *Ticket Handbook*, 39th ed., Chapter I (IATA, 2018).

⁴³ EASA, *Carriage of electronic documents on board aircraft*, Issue 1, 16.12.2021.

⁴⁴ Commission Regulation (EU) No 965/2012, OJ L 296, 25.10.2012.

EASA concluded that the latter were admissible under EU law.

Secondly, do the international, regional, and national legal frameworks accept the use of aviation-related e-docs? As just reported in this paragraph, the EU rules relating to onboard documentation do not specify the kind of support they must be embodied. Hence, the adherence to the *Lotus principle* seems here completely lawful. Even easier is the situation mentioned in (2.1), where Canada explicitly admits the denied boarding notice to be outlined in e-docs.

Given those stances from all the major stakeholders and the legal framework, it is possible to affirm that there is a certain wide degree of acceptance of e-docs in today's aviation.

In an incredibly recent case, the CJEU decided to unveil the possible interaction between the two elements of the present dissertation. The case, *FW v. LATAM Airlines Group SA*, addressed the admissibility of compensation for denied boarding when a passenger is informed at least two weeks before the scheduled time of departure.⁴⁵ FW attempted to "check in online" [sic] but was denied boarding in advance.⁴⁶ The CJEU linked the denied boarding to the validity of the passenger's e-doc (e-ticket), highlighting their *indirect* interaction.

3.2. Consequences.

There is an important question that still requires an answer. It regards the consequences of the acceptability and of the interaction between e-docs and denied boarding. Following the *FW v. LATAM* case mentioned in the previous paragraph (3.1), it is possible to affirm that e-docs are now being treated as equivalent to traditional physical documents for carriage purposes. As a result, the *acquis communautaire* should be applicable in these cases, allowing legal analogies and past court decisions to be used for interpretation. However, it is important for courts to adapt their reasoning to account for the digital nature of these documents. For example, while the *Lisi v. Alitalia* case cannot be applied to e-docs due to their ability to zoom in or out ("*Lilliputian print in a thicket*," as mentioned in paragraph 1.2.2), the same legal and logical principles can still be used with some adjustments (*mutatis mutandis*). Legal analogies extend beyond regional legal systems, such as the EU; for instance, the case of *Kamanou-Goune v. Swiss International Airlines* involved the airline denying boarding to a passenger due to an issue with his passport picture.⁴⁷ Such cases can serve as legal precedents when interpreting future scenarios of denied boarding resulting from the malfunctioning of, for instance, the IATA's Timatic or other similar systems.⁴⁸ If such situations arise and are related to e-passports, a court may refer to legal precedents such as the one just mentioned to reach a verdict. The utilization of legal analogies based on precedents in private air law is reasonable because of the similarities between e-documents and traditional documents, the growing legal framework for e-documents, and the possibility of adapting the judgment's reasoning based on the unique characteristics of the e-document.⁴⁹ There exist comparable cases, such as those pertaining to immigration requirements that can be linked to e-visa and serve as useful analogies for future reference. Notable among them are *Lee v. AMR Corporation*,⁵⁰ *Ikekpeazu v. Air France*,⁵¹ and *Ratnaswamy v. Air Afrique*.⁵² In each of these cases, the court held that they fell solely under the jurisdiction of MC99 or WC29. Hence, it is reasonable to infer that similar cases concerning e-documents will likely be decided based on similar or identical reasoning within the international community.

45 CJEU C-238/22, 26.10.2023, ECLI:EU:C:2023:815.

46 Marco Stillo, *Air transport. The Court of Justice rules on the compensation of air passengers informed in advance that boarding would be denied*, Transportwatch (30 Oct. 2023), <http://www.transportwatch.eu/en/air-transport-the-court-of-justice-rules-on-the-compensation-of-air-passengers-informed-in-advance-that-boarding-would-be-denied/#page=1>.

47 State Supreme Court, 100 A.D.3d 968 (N.Y. App. Div. 2012).

48 *Document Verification travel trouble*, Airlines-website (2016), <https://airlines.iata.org/2016/10/13/document-verification-travel-trouble>.

49 An Hertogen, *The Persuasiveness of Domestic Law Analogies in International Law*, 29 European J. Int. L. 4, 1127–1148 (2018).

50 US Court, Civil Action no. 15-2666 (E.D.Pa. Oct. 7, 2015).

51 US District Court, Case No. 3:04cv00711 (RNC) (D. Conn. Dec. 6, 2004).

52 US District Court, Case No. 95-C-7670, 1996 (N.D. Ill. Sept. 4, 1996).

3.3. The LATAM Case and Liability for System Malfunctions.

As stated *supra* (3.1), the CJEU judgment in *FW v. LATAM Airlines Group SA* fundamentally altered the legal understanding of “presentation” in the digital age.⁵³ The case involved a passenger who attempted online check-in but was denied boarding in advance. The Court held this constituted “denied boarding” under Regulation 261/2004, establishing that interaction with the carrier’s electronic check-in system constitutes “presentation for boarding”,⁵⁴ even when occurring remotely.

Traditionally, “presentation” required physical arrival at the check-in desk with documents. Post-LATAM, the passenger fulfills the presentation obligation by submitting e-doc data through the carrier’s designated system. If a valid e-ticket exists in the carrier’s database but the system rejects it at check-in, the carrier has effectively denied boarding to a passenger who properly “presented.” The burden thus shifts: passengers must ensure valid e-tickets exist, and carriers must maintain functioning verification systems.

Accordingly, liability allocation depends critically on which digital element fails. In cases of **e-ticket** database failures, for example, if the carrier’s database experiences an outage or retrieval error preventing check-in, liability rests with the carrier, because it is the party that has control over the database and has an obligation to preserve records electronically.

In cases of **e-boarding pass** failures, for example, if a passenger successfully completes check-in but the system fails to generate a displayable QR code due to a server error or app malfunction, the carrier cannot deny boarding for its own system’s failure, because it is under the carrier’s control. Analogously, if a gate agent in the paper era lost a passenger’s boarding pass after check-in, the carrier would be obligated to issue a replacement and allow boarding.

In cases of **e-passport** verification failures, for example, when a carrier’s biometric reader malfunctions and rejects a valid e-passport (i.e. IATA’s Timatic),⁵⁵ liability analysis must distinguish intrinsic document defects from equipment failures. Drawing on *Kamanou-Goune v. Swiss International Airlines*,⁵⁶ where the carrier denied boarding due to a passport issue, courts must assess whether the e-passport chip was genuinely non-functional (passenger liability) or whether the carrier’s reader was inadequate (carrier liability). If the chip functions but the carrier’s biometric scanner fails to process it, this constitutes a carrier verification system failure, not passenger non-compliance.

This taxonomy demonstrates that denied boarding liability in the e-doc era follows the principle of operational control (see next paragraph): the party operating the verification infrastructure bears the risk of its malfunction, triggering carrier liability under both MC99 and Regulation 261/2004.

3.3.1. IT failure and the “Extraordinary Circumstances” Defense.

A critical question arises: when e-doc system malfunctions cause denied boarding, may carriers invoke the “extraordinary circumstances” defense under Article 5(3) of Reg. 261/2004 to escape compensation liability?⁵⁷ CJEU case law establishes that “extraordinary circumstances” must be unusual and unforeseeable events beyond the carrier’s control.⁵⁸ In parallel with many other decisions and rulings of the CJEU regarding denied boarding and strikes, when a situation is under the carrier’s control, the carrier would be liable to pay the established compensation.⁵⁹

⁵³ *Supra* note 45.

⁵⁴ According to Art. 2(j) and Art. 3(2,a) of Reg. EU 261/2004, *supra* note 28.

⁵⁵ *Supra* note 48.

⁵⁶ *Supra* note 47.

⁵⁷ *Supra* note 28, Article 5(3).

⁵⁸ Cfr. CJEU case C-22/11, *Finnair Oyj v. Timy Lassooy*, 04.10.2012, ECLI:EU:C:2012:604; CJEU case C-28/20, *AirHelp v. SAS*, 16.04.2021, ECLI:EU:C:2021:203; *The Krüsemann and Others* (C-195/17, C-197/17 to C-203/17, C-226/17, C-228/17, C-254/17, C-274/17, C-275/17, C-278/17 to C-286/17, and C-290/17 to C-292/17, EU:C:2018:258; ‘the judgment in Krüsemann’).

⁵⁹ Marco Franzoso, *A Short (Legal) Guide to Survive Travel Flight Chaos*, *Ius in Itinere* (24 Feb. 2023), <https://iusinitinere.it/a-short-legal-guide-to-survive-travel-flights-chaos/>.

Only when the events are outside the sphere of control of the carrier, the latter may invoke the “extraordinary circumstances” defence. So, regarding IT system malfunctions, it may be stated that the possibility of the carrier to invoke Article 5(3) Reg. 261/2004 fails for three main reasons. First, IT failures are foreseeable. Modern aviation depends fundamentally on information technology, and Airlines invest heavily in redundant systems precisely because they anticipate failures.⁶⁰ Server outages, software bugs, and hardware malfunctions represent predictable operational and business risks, not unforeseeable catastrophes. Second, IT failures are inherent in the carrier’s chosen operational model. With the wide recourse to e-docs (the “other means” for paper documentation), carriers voluntarily assumed IT risk inherently linked to their operation and use. Third, carriers control IT infrastructure, therefore dictating their responsibility: they cannot claim “extraordinary circumstances” for failures of infrastructure they own and operate. One exception merits consideration: a sophisticated cyberattack that completely disables an airline’s IT systems (similar to the one that happened in Europe in September 2025)⁶¹ might constitute extraordinary circumstances, whether the attack was unforeseeable and the carrier has implemented reasonable cybersecurity measures. However, routine IT glitches, server downtime, and software errors remain ordinary technical problems within the carrier’s risk sphere. Therefore, IT system malfunctions that prevent e-doc verification do not constitute “extraordinary circumstances” under Article 5(3), and carriers remain liable when e-doc system failures cause denied boarding.

3.4. De iure Condendo: Future Legal Challenges.

Lastly, a few ideas *de iure condendo*. In *Dazo v. Globe* it was established that the airport security company is not an agent of the carrier, because WC29: “does not require security screenings”.⁶² In the past few years, air carriers have introduced an additional check at the boarding gate to avoid possible errors regarding visas, tickets, and other requirements.⁶³ Further, in the already mentioned case of *Kamanou-Goune v. Swiss International Airlines*, the matter of the contender revolved around a mishap with the picture on the passenger’s passport. The plaintiff decided to base his claim on non-performance, instead of MC99. Given these coordinates, if a passenger who has already passed airport security is denied boarding due to the airline’s e-docs system malfunction, will he have a claim under MC99/WC29, or will he be pre-empted by the non-performance argument? In one of its rulings,⁶⁴ the CJEU affirmed that a lawful denied boarding must be assessed case by case, even in circumstances in which the passenger has inadequate travel documentation. It may be concluded that, especially in cases involving e-docs that do not require any human interaction to be validated, a “scanning” malfunction of an e-doc that leads to a refusal to board surely falls within the control of the carrier, which must be held liable. Moreover, in such cases, the correct individualization of one of the parties to the contract of carriage (the passenger), which is done by machine in an e-docs situation, is the responsibility of the carrier. If it fails to do so and proceeds to deny boarding, it must be held liable, and it cannot rely on the pre-emption clause of non-performance. Hence, WC29 and MC99 will be applicable.

Lastly, the intriguing case of the forgery of e-docs and accidents taking place on board aircraft. Does the forgery void the contract of carriage and preempt the application of WC29/MC99? In this scenario, the central issue revolves around whether the airline exercised due diligence in verifying the authenticity of the e-doc during the check-in and boarding process. If the airline’s document verification system, which is responsible for confirming the validity of e-docs such as e-tickets or e-passports, failed to detect the forgery, it could be argued that the airline was negligent in fulfilling its duty to ensure the authenticity of all passenger documentation. However, even if a fraudulent e-doc is discovered during the journey, the airline might still be held liable for the accident under the MC99 or WC29, as both conventions impose

60 In 2024, the estimated spending in IT by air carriers have reached \$ 37 billion worldwide; see Linda Fox, *Airline IT spend hits \$37 billion in 2024*, PhocusWire (26 Feb. 2025), <https://www.phocuswire.com/sita-airline-it-insights-2024>.

61 Maia Davies, Rachel M. Heyndyk, Joe Tidy, *Day of delays at Heathrow after cyber-attack brings disruption*, BBC (21 Sept. 2025), <https://www.bbc.com/news/articles/c3drpgv33pxo>.

62 P. M. de Leon, *ibid.*, 209.

63 *Document Verification travel trouble*, *ibid.*

64 *Supra* note 34.

responsibility on the carrier for the safety and well-being of the passenger once they are onboard the aircraft. The legal complexities arise from the fact that while the airline remains liable for the passenger's safety, it might also seek to invoke a non-performance defense in relation to the fraudulent document, arguing that the contract of carriage is void due to misrepresentation. This legal defense could limit the airline's liability concerning other obligations, such as compensation for denied boarding. In this context, it is crucial that airlines enhance their verification protocols by integrating advanced technologies like biometric verification, blockchain-based systems, or machine-readable systems designed to authenticate e-docs in real-time, minimizing the risk of allowing fraudulent documents to bypass the check-in process. International standards need to be established regarding the legal status of forged e-docs, particularly to address cases of accidents or other incidents where fraud is detected after the fact. Such standards, implemented by organizations like ICAO or IATA, would provide consistency across jurisdictions and enable airlines to better understand their legal obligations when handling forged travel documents. Additionally, they would ensure that legal frameworks evolve in line with technological advances in the aviation industry (especially with the implementation of AI-based systems), thereby safeguarding both airlines and passengers from potential legal uncertainties.

4. Conclusion

In conclusion, this academic paper investigates the interaction between e-documents (e-docs) and denied boarding in the aviation industry, together with the evolution of proof of contracts. It raises the question of how e-docs affect denied boarding, highlighting their growing acceptance among stakeholders.

Recent legal developments indicate that e-docs are becoming increasingly equivalent to traditional documents in the context of carriage. This shift has profound legal implications and requires a nuanced understanding of airline responsibilities. While many courts worldwide have determined the jurisdictional status of electronic documents, there is currently no widely accepted international standard on the matter. To avoid any potential confusion regarding the legal status of e-docs, it would be advantageous to establish clear guidelines within the appropriate context. This can be achieved through the implementation of international (ICAO), regional (EU), and national legislation that recognizes electronic documents as being, *mutatis mutandis*, on par with traditional documents. Thus, standardized practices in addressing such issues are needed. The legal foundation for this transformation lies in Article 3(2) of the Montreal Convention, which permits carriers to "substitute other means" for traditional documentation provided they preserve equivalent records. By electing this substitution, carriers assume responsibility for record preservation and for maintaining functioning verification systems. This led to a new "map" of liability consequences: when carrier-controlled e-doc infrastructure malfunctions, liability rests with the party exercising operational control over that infrastructure.

Within the EU context, some CJEU judgments redefined "presentation for boarding" in the digital era. Passengers now fulfill presentation obligations by submitting e-doc data through carrier-designated systems; consequently, when valid e-tickets exist but verification systems reject them, carriers have denied boarding to properly presenting passengers. On the other hand, IT system malfunctions causing denied boarding do not constitute "extraordinary circumstances" under Regulation 261/2004. IT failures are foreseeable operational risks inherent in carriers' voluntary adoption of electronic systems, maintained within carriers' exclusive control that cannot externalize the risks of systems they chose to implement and exclusively operate. Only truly exceptional events (i.e., high-level cyberattacks) that go beyond reasonable security measures might qualify as extraordinary.

As technological advancements continue to evolve, new challenges arise, such as the carrier's liability when forgery impedes the identification of passengers. In such a hypothesis, liability allocation must be assessed case-by-case, taking also into consideration whether the verification system the carriers implemented was on par with industry standards.



In summary, the aviation industry's digital transformation has not eliminated documentation requirements; it has relocated them into carrier-controlled databases, shifting liability accordingly. Legal frameworks must recognize this generational change: the party benefiting from e-doc efficiency bears responsibility for system reliability.

Protection and Remedies for the Security of Air Passenger Information: a Chinese Legal Perspective

Wenhui Shi* Min Zheng**

1. Introduction

In 2021, the Civil Aviation Administration of China (CAAC), the National Development and Reform Commission (NDRC), and the Ministry of Transport (MOT) jointly issued the "14th Five-Year Plan for Civil Aviation Development", which explicitly stated: "Establish and improve the classified and categorized management measures for the civil aviation network, implement data management according to data security sensitivity levels and scope of access, formulate data sharing mechanisms, as well as requirements for data usage and control; Strengthen the protection of important data to prevent the unauthorized disclosure, damage, or unlawful use of passengers' personal information." The "15th Five-Year Plan" for National Economic and Social Development formulated in 2025 specifies the objectives of building a modernized industrial system, consolidating and strengthening the foundation of the real economy, and accelerating the efforts to build China into a leading power in aerospace, transportation, and cyberspace. As a strategic industry for national development, the effective safeguarding of aviation information security constitutes a critical foundation for ensuring aviation safety and aligns with the requirements of the holistic approach to national security. However, in the digital era, aviation passenger information involves substantial volumes of personal data and travel particulars, which are characterized by their high value and inherently international nature. Consequently, incidents of information leakage and privacy breaches are proliferating, making the security of passenger information in the civil aviation industry a subject of paramount concern.

Existing scholarship predominantly addresses personal information protection and data security in general contexts, yet it has largely neglected the safeguarding of such interests within specialized domains. Similarly, discourse concerning aviation transport safety remains primarily centered on conventional physical and flight security, while significantly marginalizing the critical aspect of aviation passenger information security. In view of the foregoing, this paper examines the security of aviation passenger information. It begins by establishing the juridical definition of aviation passenger information. Subsequently, it systematically assesses the current landscape of aviation passenger information security and analyzes the attendant challenges from three dimensions: information processing, act identification, and liability attribution. Ultimately, the study proposes a framework to enhance the protection of such information, primarily through clarifying the scope of lawful information processing and refining the norms governing accountability for security breaches.

2. Definition and Connotation of Aviation Passenger Information

Aviation passenger information emanates from the domain of air transport, constituting a specialized instantiation of general personal information. Consequently, while such information is subsumed under the broad concept of general personal data, it possesses distinctive legal attributes and implications within the aviation context.

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2.1. Definition of Aviation Passenger Information

Aviation passenger information constitutes a specific manifestation of general personal information within a specialized context. It shares the conceptual basis of general personal information, and its definition may accordingly derive from the methodologies applied to the latter. The legal definition of personal information typically adheres to either the “identification” theory or the “relational” theory. The former employs the capacity to identify, directly or indirectly, a specific natural person as the decisive criterion, defining personal information as “any information recorded by electronic or other means that can, alone or in combination with other information, identify a specific natural person.” The latter adopts the existence of a connection to an identified or identifiable natural person as the standard, defining it as “any information recorded by electronic or other means that relates to an identified or identifiable natural person.” The distinction between the two approaches is methodological; their substantive outcomes converge.¹ China’s “Provisions on the Administration of Passenger Services in Public Air Transport” stipulate that upon completion of check-in procedures, carriers or their ground service agents must accurately display confirmed information—including the passenger’s name, flight number, date, boarding time, gate, and itinerary—on the boarding pass (whether paper or electronic). Consequently, aviation passenger information can be legally defined as any information recorded by electronic or other means that either directly or indirectly identifies a specific natural person or is associated with such a person. This includes, in particular, the passenger’s name, flight number, date, boarding time, boarding gate, and itinerary.

However, the legal notion of personal information lacks the stability characteristic of definitions applied to material objects; it evolves in accordance with the information subject, usage contexts, as well as technological and other objective factors.² With the advancement of consumer rights, the status of the “passenger” within aviation transport legislation has progressively shifted from that of a “contracting party” to a “consumer”. The 1999 “Convention for the Unification of Certain Rules for International Carriage by Air” (hereinafter the “Montreal Convention”) explicitly acknowledged the significance of protecting the interests of consumers in air transport,³ signaling a transformation in the legislative framework governing carrier liability from safeguarding carrier interests towards strengthening consumer protection.⁴ Consequently, passengers possess a dual status as both general information subjects and consumers. The definition of passenger information in air transport should therefore be constructed upon relational or identifiability approaches and delineated within specific consumption scenarios. Specifically, within air transport, passenger personal information in the capacity of consumers can be primarily categorized into three types based on service requirements: Firstly, information generated from booking services, referring to passenger details or Advanced Passenger Information (API), mainly including name, date of birth, passport number, gender, and nationality. Secondly, information furnished for flight services, referring to Passenger Name Record (PNR) information, which encompasses the aforementioned passenger information and typically extends to name, itinerary information, payment information, special service requests, contact details, identification particulars, and other related information.⁵ Thirdly, extensible information provided based on the passenger’s individual preferences, primarily comprising product recommendations and personalized service information related to diet, accommodation, etc. This category of information is inherently more private in nature.

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- 1 Xiao Cheng. *The Interpretation of Personal Information Protection Law of the People’s Republic of China*, China Legal Publishing House, 2021, p.64.
 - 2 Aimin Qi, Zhe Zhang. *Identification and reidentification: The definition of personal information and the legislative choice*, Journal of Chongqing University (Social Science Edition), Vol.24, 2018(2).
 - 3 CONVENTION FOR THE UNIFICATION OF CERTAIN RULES FOR INTERNATIONAL CARRIAGE BY AIR, “RECOGNIZING the importance of ensuring protection of the interests of consumers in international carriage by air and the need for equitable compensation based on the principle of restitution;”
 - 4 Han Wang. *New Developments on International Private Aviation Law of the 21st Century—The Comments and Analysis on The Liability Legislation of Air Transportation of 1999 Montreal Convention*, Journal of Beijing Institute of Technology (Social Sciences Edition), Vol.13, 2011(4).
 - 5 “API Guidelines & PNR Reporting Standards”, World Customs Organization, <https://www.wcoomd.org/en/topics/facilitation/instrument-and-tools/tools/api-pnr.aspx>, (visited on 27 November 2025).

2.2. The Distinctive Nature of Aviation Passenger Information

2.2.1. National Security

The authenticity of aviation passenger information derives from the mandatory passenger information recording regime, which obligates passengers to provide personal information in compliance with said regime and holds them accountable for its authenticity and accuracy. The national security dimension inherent in such information is predicated upon this authenticity and materializes in two principal aspects: First, the security of destination states in international air transport. Prompted by the hijacking wave of the 1960s and the September 11 terrorist attacks, destination countries conduct pre-screening reviews of passenger identity and background to identify and exclude potential terrorists, thereby denying them entry.⁶ Second, the security of the state in which aviation passenger information is stored. As air transport constitutes critical national transportation infrastructure, any successful cyber-attack, destruction, or leakage of aviation data would compromise the operation and integrity of such essential infrastructure, thereby posing a severe threat to national security, public welfare, and the broader public interest.⁷

2.2.2. Cross-border liquidity

Air transport possesses an inherently transnational character,⁸ and the issues pertaining to passenger and cargo carriage arising from international air operations similarly exhibit cross-border mobility. The cross-border flow of international aviation passenger information occurs in distinct stages. At the ticket reservation stage, passengers primarily make bookings through cross-border e-commerce channels of domestic reservation platforms or via the domestic sales channels of foreign carriers. The passenger information involved at this stage consists chiefly of data provided to the carrier for ticket issuance, primarily including name, date of birth, passport number, gender, and nationality. During the inbound passenger screening stage, destination states predominantly utilize PNR systems to assess whether passengers exhibit tendencies related to terrorist activities and to consequently determine their admissibility. PNR information is mainly furnished by international air carriers to the government authorities of the destination country. However, in response to frequent hijacking incidents, this practice has progressively evolved into a mandatory obligation, with the U.S. government, for instance, requiring direct access to airline PNR databases.⁹ Following the September 11 terrorist attacks, the scope of such information has gradually expanded to encompass additional data categories, including credit card details, religious affiliations, and political beliefs.

2.2.3. Marketability

The Internet and digital technologies enable the transformation of large-scale information into a quantifiable digital format amenable to tabulation and analysis.¹⁰ This capacity facilitates behavioral prediction and enhances the precision of decision-making and analytical processes. The ability to collect, store, process, and analyze information constitutes a critical determinant of corporate competitiveness. When utilizing online services, consumers generate extensive digital footprints through their browsing activities. Within the aviation sector, each passenger may be associated with a pro-

6 "The proposed EU passenger name records (PNR) directive Revived in the new security context", Think Tank European Parliament, [https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI\(2015\)554215](https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI(2015)554215), (visited on 27 November 2025).

7 Xianfeng Chen. *Collaborative Governance for the Protection of Critical Information Infrastructure*, Chinese Journal of Law, Vol.40, 2018(6).

8 CONVENTION FOR THE UNIFICATION OF CERTAIN RULES FOR INTERNATIONAL CARRIAGE BY AIR, Article 1.1: "the expression *international carriage* means any carriage in which, according to the agreement between the parties, the place of departure and the place of destination, whether or not there be a break in the carriage or a transshipment, are situated either within the territories of two States Parties, or within the territory of a single State Party if there is an agreed stopping place within the territory of another State, even if that State is not a State Party."

9 Cristina Blasi Casagran. *The Future EU PNR System: Will Passenger Data Be Protected?*, European Journal of Crime, Criminal Law and Criminal Justice, Vol.23, 2015(3).

10 Qi Zhang. *Between Technical Rationality and the Rule of Law: A Humanistic Legal Perspective in Intersecting Temporal and Spatial Contexts*, Studies in Law and Business, Vol.40, 2023(6).

proprietary database on the carrier's platform, archiving individual characteristics and preferences.¹¹ Big data analytics can leverage this accumulated personal information to identify developmental patterns and enable informational reuse. Concurrently, passenger information represents a strategic asset for airlines and their commercial partners. Such data finds application in multiple domains, including market analysis, customer profiling, and targeted marketing campaigns. This utilization provides substantive support for the business decisions of airlines and associated enterprises, thereby realizing its inherent economic value.

3. Review of the Current State of Aviation Passenger Information Protection

3.1. The Practical Landscape of Aviation Passenger Information Security

A query conducted on the PKULAW database using the keywords "aviation" and "passenger information" generated a total of 215 results, comprising 103 civil cases and 112 criminal cases. Following a screening process, 10 and 12 datasets respectively were identified as pertinent to the subject matter discussed in this article. Legal claims arising from infringements of passenger information in air transport primarily concern the determination of information processing activities and the attribution of liability. Accordingly, the judicial analysis herein focuses principally on these aspects.

3.1.1. Issues of Excessive Processing and Unlawful Disclosure of Information

The protection of personal information of air passengers confronts two notable challenges: the excessive processing of information and the risk of its unlawful disclosure. On the one hand, passenger information is extensively utilized for entry screening pursuant to national security requirements. The destination country, in consideration of its national security, conducts entry screening of passengers, typically employing the PNR system to assess potential affiliations with terrorist activities and to determine admissibility. This information is primarily furnished by international air carriers to the governmental authorities of the destination country. However, in response to recurrent hijacking incidents, this practice has progressively evolved into a mandatory obligation, and the scope of collected information has gradually expanded to encompass passengers' credit card details, religious beliefs, political affiliations, and other related data.

On the other hand, the issue of unlawful disclosure of passenger information persists. Leakages of aviation passenger information primarily encompass intentional disclosure as well as illegal intrusion and theft. For instance, in *the case of Lu Mouqing et al. for Violating Citizens' Personal Information*,¹² the defendant Lu Mouqing exploited his position as a customer service agent at China Eastern Airlines to illegally sell acquired passenger flight information to others, enabling a criminal gang to commit financial fraud based on this data. In *the case of Yang Mougui and Yu Mouxue for Fraud, Selling, and Illegally Providing Citizens' Personal Information*,¹³ external personnel of an airline sold citizens' personal flight information to others, enabling a criminal gang to deceive victims into transferring funds by sending fraudulent SMS messages and voice calls instructing them to set up transfers, followed by withdrawals via bank cards and other fraudulent means. In *the case of Tian Mou for Illegally Obtaining Data from a Computer Information System and Illegally Controlling a Computer Information System*,¹⁴ the defendant illegally intruded into an airline's computer system, obtained data from its information system, and sold it to others.

11 Weiming Hong, Zhanjun Jun. *Data Information, Commercialization and Protection of Personal Information Property Rights*, Reform, Vol.301, 2019(3).

12 *People v. Xu & Lu* (徐某、鲁某侵犯公民个人信息罪案) (2018) Ji 0681 Xing Chu No. 61, Jilin Province Linjiang City People's Court (Criminal Judgment).

13 *People v. Yang & Yu* (羊某、于某诈骗、出售、非法提供公民个人信息案) (2019) Lu 17 Xing Zhong No. 38, Shandong Province Heze City Intermediate People's Court (Criminal Judgment).

14 *People v. Tian* (田某非法获取计算机信息系统数据、非法控制计算机信息系统罪) (2019) Chuan 01 Xing Zhong No. 956, Sichuan Province Chengdu City Intermediate People's Court (Criminal Judgment).

3.1.2. Ambiguity in Types of Liability and the Scope of Liability Allocation

The protection of airline passengers' personal information encounters challenges not only in the processing stage but also in the realm of legal remedies, where multiple issues arise, including the concurrence of contractual and tort liability, the complexity of identifying liable parties, and the ambiguity in determining the scope of compensation. On the one hand, there exists a divergence in the nature of liability. In air transport, passengers conclude an Air Transport Contract with the airline, under which the carrier assumes the primary obligation of safe transportation and a collateral duty to safeguard passengers' information against unauthorized disclosure. Consequently, a leakage of passenger information may give rise to both contractual liability and tort liability for the infringement of personal rights. When these two forms of liability concur, the aggrieved party typically must elect a single basis for redress. This divergence in liability type directly impacts the scope of recoverable damages. In an action for breach of contract, compensation for spiritual damage is generally not available. For instance, in the case of *Fang v. Beijing Golden Century Business Technology Co., Ltd. & China Eastern Air Holding Co., Ltd.* (a contract dispute),¹⁵ the court held that the plaintiff, having pursued a claim for breach of contract, was not entitled to spiritual damages. Conversely, in a tort action, the relief awarded may vary significantly across jurisdictions due to differing statutory frameworks governing compensation for tortious injury.

On the other hand, the scope of liability remains unclear, with a central point of contention being whether a plaintiff is entitled to compensation for spiritual damages. In aviation transport practice, even where a court upholds a plaintiff's claim for compensatory damages against an airline or other liable parties following a data breach, awards for spiritual damages remain difficult to obtain. The principal reason is the failure to satisfy the requisite severity threshold for such compensation, meaning the proven harm does not rise to the level of "severe spiritual damage", thereby resulting in a phenomenon of "injury without redress".¹⁶ For instance, in *Lin v. Sichuan Airlines Co., Ltd.* (a tort liability dispute),¹⁷ the plaintiff sought damages for spiritual damage arising from an information leak. The court, however, denied this claim because the plaintiff failed to substantiate that the damage suffered was severe in degree.

3.2. Analysis of Challenges in Aviation Passenger Information Security

3.2.1. Failure of Informed Consent and the Proportionality Principle

The EU General Data Protection Regulation (GDPR) and Personal Information Protection Law of the People's Republic of China (PIPL) stipulate the principles of informed consent and proportionality in the processing of personal information. This requires that, when collecting personal information, the controller shall inform the information subject of the identity of the controller and the recipients, the purposes and methods of processing, the retention period, and other relevant information, as well as the rights available to the data subject, such as the rights of access, erasure, and rectification.¹⁸ Moreover, the controller must obtain the consent of the natural person prior to processing. In practice, however, the institutional functions of the rules on informed consent and the principle of proportionality are difficult to fully realize.

Firstly, the realization of the right to information is perfunctory. In the ticket reservation process, information controllers notify passengers of information processing activities through lengthy and complex privacy or personal information agreements. Due to the inherent disparity between passengers and information controllers in terms of information con-

15 *Fang v. Beijing Golden Century Business Travel Network Technology Co., Ltd. & China Eastern Airlines Group Co., Ltd.* (方某与北京金色世纪商旅网络科技有限公司、中国东方航空集团有限公司合同纠纷案) (2018) Yue 0306 Min Chu No. 23342, Guangdong Province Shenzhen City Bao'an District People's Court (Civil Judgment).

16 Ye Tian. *Risks as the Harm: Redefining "Damage" of Tort in Big Data Era*, Political Science and Law, 2021(10).

17 *Lin v. Sichuan Airlines Co., Ltd.* (林某与四川航空股份有限公司侵权责任纠纷案) (2015) Cheng Min Zhong Zi No. 1634, Sichuan Province Chengdu City Intermediate People's Court (Civil Judgment).

18 General Data Protection Regulation, Art 13: Information to be provided where personal data are collected from the data subject.

trol and the application of network technology, a fundamental asymmetry exists in their respective capacities to access and protect information. Superficially, this practice appears to discharge the duty to inform; substantively, it overlooks the inherent power imbalance between the parties.

Secondly, “consent of the data subject” as a lawful basis for processing is prone to abuse, leading to a “take-it-or-leave-it” or coerced consent scenario. It remains questionable whether the acts of air carriers providing information to governmental authorities of the destination country, or of those authorities directly accessing carrier systems to review aviation passenger information, satisfy the genuine realization of the right to information or constitute validly obtained consent.

Thirdly, the principle of proportionality is misapplied in information processing. In international air transport, the scope of information collection—extended to encompass passengers’ credit card information, religious beliefs, political affiliations, and other sensitive details—aims to prevent terrorist activities. Whether this extension complies with the principle of proportionality warrants further scrutiny. The balancing of sensitive personal information against national security imperatives must be rigorously guided by the principle of proportionality throughout this process.

3.2.2. *Unclear Norms Governing Information Security Liability*

The legal application concerning the processing of aviation passenger information is characterized by dual uncertainty. It remains unsettled under which regulatory framework lawsuits for aviation passenger information breaches should be initiated, and considerable controversy persists over whether recoverable damages should encompass compensation for purely spiritual damage, resulting in inconsistent remedial standards.

On the one hand, whether an infringement involving aviation passenger information falls under the jurisdiction of the Montreal Convention or the Civil Aviation Law of the People’s Republic of China determines the applicable regime of liability. If the Montreal Convention applies, its established “two-tier liability system” governs; otherwise, the aggrieved party may seek redress under the contract law or tort law of a relevant jurisdiction. Given the variance among national laws, however, the scope of compensation for damages remains highly uncertain.

On the other hand, for purely domestic air transport, China has enacted specific provisions governing compensation liability. Nevertheless, the legal basis for awarding damages for spiritual damage remains ambiguous. In judicial practice, courts predominantly invoke Article 1183 of the Civil Code of China, often overlooking the application of Article 69 of the PIPL. As these two provisions impose significantly different thresholds of proof for establishing spiritual damage, the determination of compensable damages becomes inconsistent, leading to ambiguity in the application of the law.

4. Remedial Approaches to Aviation Passenger Information Security Issues

4.1. Defining the Scope and Limits of Information Processing

To address the issues surrounding aviation passenger information security, it is first necessary to delineate the permissible scope of information processing. A specific approach may be structured in three sequential steps: firstly, establish a refined checklist regime for the collection of aviation passenger information to define the precise boundaries of processable information; secondly, safeguard the effective exercise of the informed consent to prevent the impermissible expansion of processing activities; and thirdly, adhere rigorously to the principle of proportionality to ensure the overall lawfulness of the processing.

4.1.1. Establish a Negative List Framework for Information Collection

The scope of aviation passenger information processing is defined by the checklist regime governing its collection. Aviation passenger information is primarily gathered through eTerm, which remains tens of thousands of passenger flight records and enables the provision of personalized services based on travel preferences.¹⁹ However, the precise boundaries of collectible information remain undefined.²⁰ Two principal approaches exist for delineating the scope of information collection: a positive list and a negative list. Given the cross-border and transnational character of aviation passenger information, a positive list lacks the necessary flexibility and is difficult to reconcile with the varied current standards of information protection across different jurisdictions. Consequently, adopting a negative list to define the scope of information collection is a more fitting approach.

Meanwhile, the Personal Information Protection Law of the People's Republic of China serves as a general regulation for the protection of personal information, it lacks strong specificity in the specialized field. Moreover, the relevant laws in the aviation sector only impose obligations concerning passenger information, and the protection regulations are not sufficient. Therefore, it is necessary to introduce specialized standards or rules in the aviation field to fill the lack in passenger information protection regulations.

4.1.2. Optimize the implementation mechanism for passenger informed consent

Prevent the expansion of processing scope through the realization of passengers' right to informed consent. Firstly, provide passengers with sufficient opportunities and channels for being informed; the realization of passengers' right to know applies in all situations. Information processors such as airlines should establish appropriate and timely information inquiry channels and feedback mechanisms. On the one hand, it ensures consistency between the information provided and the processing content; on the other hand, it allows passengers to check the status of their information or correct its content at any time.

Secondly, examine the authenticity of the expression of consent. There is a significant "Information gap" between aviation passengers and information processors such as carriers, and passengers may lose actual choice during the information processing process. When there is a significant imbalance between the passengers and the processor, consent of passengers cannot serve as a valid legal basis. The authenticity of a passenger's expression of intent can be assessed based on whether the passenger would suffer disadvantages for refusing.

Thirdly, cautiously apply exceptions to informed consent. The law stipulates that processing necessary for the conclusion or performance of a contract does not require consent, but signing a contract and consenting to the handling of personal information are different expressions of intent. The act of signing a contract alone does not constitute consent to information processing.²¹ It is necessary to make a new expression of intent regarding the information processing activities. Therefore, when passengers sign an aviation transport contract with an air carrier, it does not mean that they consent to all information processing activities of the carrier; passengers still retain the right to decide whether to allow the processing of personalized information generated through data statistical analysis.

4.1.3. Fully leverage the institutional effectiveness of the principle of proportionality

Exert the function of the proportionality principle to ensure the legality of information processing activities. Obtaining

19 Michael Milde. *International Air Law and ICAO, Essential Air and Space Law*, Eleven International Publishing, 2006.

20 Wilson, Kerianne. *Gone With the Wind?: The Inherent Conflict between API/PNR and Privacy Rights in an Increasingly Security-Conscious World*, *Air & Space Law*, Vol.41, 2016(3).

21 Xu Yang. *Comments on the Legality Basis of Personal Information Processing*, *China Journal of Applied Jurisprudence*, Vol.42,2023(6).

the consent of the passenger during information processing does not guarantee the legality of the processing; it also needs to comply with proportionality and necessity. To determine within what scope information can be processed or to what extent it can be processed without crossing the line into illegal handling, it is necessary to apply the principle of proportionality.

Whether the processing of aviation passenger information is proportionate is mainly judged based on its core content: Firstly, the purpose of information processing must be legitimate, and it should be included in the notice at the time of information collection.

Secondly, the processing activities must be directly related to the purpose of processing, and the subsequent processing activities should be limited to achieving that purpose.²² Once the basic use of passenger information has been realized, it will enter a dormant state until its value is reactivated for secondary use. Therefore, once passengers complete the ticket purchase service and generate flight information, the basic use of passenger information has been realized. Any subsequent information analysis and personalized services should be conducted only after obtaining the passengers' consent again.

Thirdly, the processor should adopt a method that minimizes the impact on rights and interests. This can be judged by whether there are other effective alternative methods. For example, during aviation transport, if passenger information is pre-screened to prevent terrorist attacks and ensure aviation flight safety, and the same purpose could be achieved through the passenger's criminal record, then collecting information such as the passenger's religious beliefs or personal preferences would not be considered the optimal method.

4.2. Clear Regulations on the Security Responsibilities of Aviation Passenger Information

4.2.1. Clarify the types of responsibilities

The security of aviation passenger information falls under the category of general personal information security issues within a specific field. Identifying the type of responsibility for passenger information security requires attention to the following aspects:

On the one hand, it is necessary to determine whether issues such as the leakage of aviation passenger information fall under aviation transport contract liability. According to the nature of the Montreal Convention and the special law category of Civil Aviation Law of the People's Republic of China, aviation transport contract liability has mandatory applicability and priority. The Montreal Convention limits the types of damage to "death or bodily injury of a passenger", while China's Civil Aviation Law limits it to "personal injury or death". Therefore, it is necessary to determine whether the case meets the applicability conditions of both, i.e., whether the damage suffered by aviation passenger information constitutes "bodily injury" or "personal injury or death". In addition, the applicability of aviation transport liability requires that the tortious acts of passenger information occur "on board the aircraft or in the course of any of the operations of embarking or disembarking". However, in practice, most tortious acts of passenger information infringement occur before boarding or after the flight, not necessarily on board the aircraft or in the course of any of the operations of embarking or disembarking. Therefore, it is difficult to seek remedies under the Montreal Convention or China's Civil Aviation Law.

On the other hand, it is also necessary to determine whether to seek remedies based on breach of contract or tort liability. According to the theory of concurrent civil liability, when an information tortious act simultaneously violates contractual and tort liability norms, the passenger has the right to choose which regulations to rely on when claiming compensation for damages. However, in the context of international transport, differences in national laws result in

22 Fuping Gao. *International Rules on Personal Data Protection and Use: Origin and Trend*, Law Press, 2016.

passengers receiving different remedies for the same tortious act. Therefore, it is necessary to make specific provisions for such issues, which could expand the applicability of the Montreal Convention. In the era of information proliferation, the Montreal Convention cannot fully meet the practical realities of air transport, so expanding its interpretation or making amendments is reasonable. Additionally, bilateral or multilateral treaties on information protection can also be concluded, but in the long term, this approach still has limitations and lacks standardization, which is not conducive to the unified protection of aviation passenger information.

4.2.2. Include mental damage in the scope of compensation

The right to personal information, as a personal right, is stipulated in the Civil Code of the People's Republic of China, Book IV: Personality Rights and inherently reflects the freedom, equality, and dignity of a natural person. When passengers' personal preferences, medical health, or other information are leaked or disclosed, it may expose them to discrimination and injustice, thereby infringing on their equal status and dignity. Information breaches not only pose economic risks such as extortion and fraud, but can also cause travelers to experience indescribable fear, anxiety, and other adverse mental or psychological reactions due to information tracing and personal discrimination.²³ Therefore, it is necessary to include mental damages within the scope of compensation.

On the one hand, it supports compensation for standalone mental damages. Although the Montreal Convention stipulates that only mental damages resulting from personal injury or bodily harm can be compensated to balance the carrier's liability, supporting compensation for standalone mental damages would not crush airlines. Moreover, in cases where information interests are particularly significant, even if passengers cannot seek damage compensation under the Montreal Convention, they can still file tort lawsuits under domestic law. Compensation standards vary across countries in such lawsuits and may even exceed the liability limits set by the Montreal Convention.

On the other hand, the threshold for claiming mental damages should be lowered. In Chinese practice, compensation for passengers' mental damage is limited to cases of "serious" harm. However, Article 69 of the Personal Information Protection Law of the People's Republic of China stipulates that those who infringe on personal information rights and interests and cause damage shall bear tort liability. This has two implications: firstly, the term "damage" should include "mental damage"; secondly, the article does not specify that compensation for mental damage should meet the "serious" threshold. From the perspective of legislative intent, Article 69 of the Personal Information Protection Law of the People's Republic of China does not use the term "property damage" as in Article 1182 of the Civil Code but directly uses "damage", indicating that "damage" in Article 69 is not equivalent to "property damage" and should also include mental damage. Therefore, including mental damages within the scope of compensation aligns with legislative intent. Consequently, the threshold for mental damages can be lowered; otherwise, situations where there is loss but no compensation would occur.

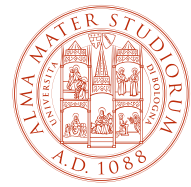
5. Conclusion

In the new generation of industrial revolution, with the rapid development of the Internet and artificial intelligence application technologies, the information and digital technology play a significant role in national development and modernization processes. As a vital industry for national development, aviation transportation requires effective protection of aviation information security, which has become an important foundation for maintaining aviation safety. The public security attribute of passenger information has made its safety issues widely concerned.

23 Zhengshan Xie. *Research on the Issues of Data Breach Damage*, Tsinghua Law Journal, Vol.14, 2020(4).



Research has found that in practice, there are issues such as illegal handling of aviation passenger information and unclear scope of responsibility. The reasons lie in the fact of informed consent and the principle of proportionality cannot function effectively when applied, as well as the lack of clear regulations on information security responsibilities. Therefore, it is necessary to establish a list system for the collection of passenger information, optimize the implementation mechanism of passenger informed consent, and fully leverage the function of the principle of proportionality to clarify the boundaries of information processing. Additionally, by defining the types of responsibilities for aviation passenger information and including mental damages in the scope of compensation, the responsibility can be clarified to achieve effective protection and adequate remedy for the security of aviation passenger information.



Space

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CM25, i.e. the ESA Ministerial Council recurring every three years in order to determine the funding priorities for the subsequent three-year period, took place on 26 and 27 November in Bremen (Germany).

In his opening speech¹, ESA Director General Joseph Aschbacher presented his programmatic proposal as a real action plan based on the following five objectives around which the ESA 2040 Strategy was designed, pursuing Europe's sovereignty, growth, and resilience through space, at a time that he compared to a *"perfect storm"* requiring *"corageous decisions"*, even in terms of security and defense:

1. *"protecting our planet and climate"*;
2. *"explore and discover"*, because space science *"is not a luxury"* since, by expanding national capabilities, it helps reduce dependencies;
3. *"increase European autonomy and resilience"* by accessing space with European launchers;
4. *"reinforce support to Europe's industrial base"*, so as to be able to have *"hardware in orbit, ground segments on the surface, and services on the market"* in order to drive growth, profitability, and competitiveness;
5. *"inspire young people"*.

After appealing to the delegates' *"profound responsibility"*, DG Aschbacher then moved to the heart of his proposal, *"that is tailored to your national priorities and financial realities"*: € 22 billion for the next three years, i.e., 30% more than CM22 and equivalent to € 15 per year per European citizen. A proposal – he added – that is as challenging as *"solid to the core: tested, shaken, measured, and weighed, like a satellite before launch"* so as to *"show to the world - what a united Europe can truly achieve"*.

And... as if by magic... Europe got united: the Ministers of the 23 ESA Member States – including Italy, whose delegation was led by Minister of Enterprises and Made in Italy, and authority delegated for Space and Aerospace Policies Adolfo Urso, who also **chaired** the Council –fully approved the €22 billion proposal for the European Space Agency's scientific, technological, applications and exploration programs for the 2026-2028 period.

At the top of the list of the main contributors are, again, Germany, with €5,067 million (+45.8%); France, with €3,599 million (+14.8%); and Italy, with €3,464 million (+13%): all united for a common goal, as emphasized by President of the Italian Space Agency Teodoro Valente², i.e. to strengthen an increasingly competitive and strategic sector at the global level, for solid and profitable developments, both institutional and commercial, including also the involvement of new players, sharing the common objective of contributing to greater European autonomy and resilience in space.

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The opinions expressed in this article are purely the views of the author and thus may not be regarded as an official position of the institution the author belongs to.

1 https://www.key4biz.it/wp-content/uploads/2025/11/CM25_DGproposal-1.pdf

2 <https://www.asi.it/2025/11/cm25-esa-si-e-conclusa-la-ministeriale-europea-dedicata-allo-spazio/>

The EU Space Act and the Italian Space Law: Differences and Similarities

Anna Masutti* & Gilda Caso**

1. Introduction

Space activities and the novel space economy are rapidly growing, driven by geopolitical tensions between states, international competition between an ever-growing number of private actors, and the constant drive for technological innovation.

Against this landscape, states and supranational organisations have started to perceive the regulation of the sector as a necessity, both to enable the development of space activities for economic and competitive reasons and to protect the strategic interests that are now inextricably linked with outer space¹.

Amongst these legislative acts and proposed legislations are Italian Law No. 89/2025², published in June 2025 (herein-after also referred to as the *“Italian Space Law”*), and the Proposal for a regulation on the safety, resilience, and sustainability of space activities of the European Union (known as and hereinafter referred to as *“Space Act”*), which aims at harmonising national legislations and dates to the same period³.

This paper will briefly describe the regulatory design and objectives of the Italian Space Law and the proposed Space Act and then focus on how they regulate specific aspects of space law, namely authorization and registration procedures, delving into differences, similarities, and coordination issues.

2. Italian Law no. 89/2025 and the Space Act: legal basis, regulatory design and objectives

Through Law No.89/2025 the Italian legislator seeks to regulate space activities comprehensively, operating on the assumption that this sector lies outside the European Union’s regulatory competence, as clearly stated in the Dossier that accompanied the draft of the law⁴.

It therefore introduces authorisation, supervision and sanctioning mechanisms for space operators, as well as provisions of financial and economic nature.

To guarantee the safety of outer space activities, Law No. 89/2025 introduces the obligation to obtain an authorisation for the exercise of space activities and to register launched space objects. Accordingly, specific norms are introduced for the supervision and control of all space activities and violations are tied to administrative and criminal penalties.

Civil liability is regulated through specific provisions, that include insurance obligations. Furthermore, Law No.89/2025 specifies that the Italian state, in cases to which international conventions are applicable and provide for its liability for damages caused in relation to space activities⁵, has a right of recourse against private operators.

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1 See for reference European Commission and High Representative of The Union for Foreign Affairs and Security Policy, Joint communication to the European Parliament and the Council -European Union Space Strategy for Security and Defence, JOIN (2023) 9 final, Brussels, 10.3.2023; Mario Draghi, *The Future of European Competitiveness: Part A: A Competitiveness Strategy for Europe*, Publications Office of the European Union 2025, 9 September 2024; Enrico Letta, *Much More than a Market - Speed, Security, Solidarity. Empowering the Single Market to Deliver a Sustainable Future and Prosperity for All EU Citizens*, April 2024.

2 Law number 89 of the 13th of June 2025, Disposizioni in materia di economia dello spazio.

3 Proposal for a Regulation of the European parliament and of the Council on the safety, resilience and sustainability of space activities in the Union, COM/2025/335 final, Brussels 25 June 2025; reference will also be made to the amendments proposed by the Council of the European Union in Interinstitutional File: 2025/0335 (COD), 16437/25 No. Cion doc.: 10935/25 + ADD 1, 5 December 2025, Brussels.

4 Servizio Studi Senato della Repubblica e Servizio Studi, Dipartimento attività produttive Camera dei deputati 28 febbraio 2025, Dossier XIX Legislatura, Disposizioni in materia di economia dello spazio, AC 2026- aa, page 8.

5 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies,

Alongside these measures, the Italian Space Law establishes mechanisms to support the space economy, providing for the allocation of significant funds to space-related commercial activities and introducing schemes to facilitate the participation of small and medium-sized enterprises in public procurement procedures and contracts.

The intent to support space operators and favour the growth of the space economy is also evident in the way the legal text was designed and formulated.

Law No. 89/2025 is streamlined, the administrative burdens are structured around established principles and models that are familiar to economic operators, creating a legal framework that is both effective and concise.

These same objectives, including increasing the competitiveness of the space economy, promoting the participation of small and medium-sized enterprises, and ensuring the safety of outer space activities through technological innovation and governance mechanisms, also underlie the Space Act.

In fact, as the Italian Space Law, the European proposal represents an attempt to comprehensively regulate space activities, attempt whose legal basis has been identified as Article 114 of the Treaty on the Functioning of the European Union (TFEU)⁶, which allows the European Union to adopt measures to harmonise the legislative, regulatory, and administrative provisions of Member States with the purpose of ensuring the establishment and functioning of the single market.

The choice of relying on Article 114 TFEU is peculiar and has proven controversial⁷.

In fact, the TFEU contains a specific legislative provision on the space sector, Article 189, that assigns the European Union the task of developing a common space policy aimed at promoting scientific and technological progress, strengthening industrial competitiveness, and supporting the implementation of its policies⁸. However, Article 189 TFEU excludes any harmonisation of laws and regulations of the Member States, which explains why the Italian legislator has expressly indicated that the Union lacks regulatory competence for space activities and why the proposal of Space Act could not rely on this provision⁹.

To justify the use of Article 114 TFEU as a legal basis, the Commission notes that Member States' legal systems differ on essential aspects, such as authorisation schemes and provisions to ensure safety, resilience and sustainability, giving rise to a situation of fragmentation of the internal market that is bound to increase with the gradual adoption of further national legislations, thereby making an intervention at European level justified and necessary¹⁰.

It can be argued that this mechanism is a way to circumvent the clear limits imposed by Article 189 TFEU, which is the specific and therefore appropriate legal basis for interventions in the space sector, and to extend the competence of the European Union beyond what was agreed upon by the Member States.

Such a line of reasoning is further supported by two circumstances:

- I) the provisions of the Space Act cannot all be linked to the internal market, as some of them clearly pertain to space policy issues and would fall under the scope of application of Article 189 TFEU, with the consequent application of its limits;

27 January 1967; Convention on the international liability for damage caused by space objects, 29 March 1972.

6 Consolidated version of the Treaty on the Functioning of the European Union [2012] OJ C326/47, Article 114.

7 See Karolina Muti, Andrea Grillo, Sergio Marchisio, Michele Nones, *The Proposal for an EU Space Act: An Italian Perspective*, Istituto Affari Internazionali, n. 25, October 2025 and Sergio Marchisio, *Le novità del 25 giugno 2025: la Legge n. 89 sull'economia dello spazio e la proposta di Space Act dell'Unione europea*, *Federalismi*, n.20, 30 July 2025.

8 Consolidated version of the Treaty on the Functioning of the European Union [2012] OJ C326/47, Article 189.

9 See the Explanatory Memorandum of the Proposal of Space Act, which indicates that: "While the Treaty specifically provides for a legal basis in respect to measures relating to space policy (Article 189 TFEU), that legal basis cannot be used for this initiative. Article 189 TFEU covers only measures that promote joint initiatives, support the research and technological development or coordinate efforts for the exploration and exploitation of space. It explicitly excludes any harmonisation of Member States' laws and regulations".

10 According to the Explanatory Memorandum of the Proposal of Space Act, the use of Article 114 is justified by the fact that Member States' divergent approaches may make it more difficult for space operators to conduct space activities, particularly cross-border operations, and is supported by established case law.

- II) the fragmentation of approaches and principles at the national level that represents the basis for an intervention pursuant to Article 114 TFEU has only been alleged by the Commission but has not been convincingly demonstrated and exemplified¹¹.

Notwithstanding these concerns regarding the choice of legal basis, the Space Act, as already indicated, regulates meticulously all aspects of space activities, adopting a legal design that is a much more complex and burdensome compared to the Italian Space Law.

More specifically, it envisages a two-tier governance system.

Member States are required to establish a public authority responsible for issuing authorisations and supervising the activities of space operators, that are subject to sanctions in cases of violations. At the European level, the EU Agency for the Space Programme (“EUSPA”) is called upon to establish and manage the Union Repository of Space Activities (“URSA”) for the registration of space operators authorized by Member States and the subsequent issuance of electronic certificates, to support the Commission in the exercise of its supervisory powers and to assist in the drafting of the delegated and implementing acts that the Space Act provides for.

As opposed to the Italian law, the Space Act does not contain provisions on civil liability or related insurance obligations, leaving its regulation to the Member States. However, to prevent accidents in outer space and the formation of debris, the Space Act imposes extensive obligations on European space operators regarding risk assessment and risk mitigation measures. Conversely, these procedures are only briefly mentioned in Law 89/2025, which outlines the need to ensure an adequate level of safety, resilience, and sustainability through procedures and requirements, but does not include them, indicating that they should be the subject of future implementing legislation.

Having clarified the legal basis, objective and general design of the Italian Space Law and of the European Space Act, the following paragraphs will focus on selected aspects of these legal frameworks in a comparative perspective.

3. Authorisation mechanisms: a comparison of Italian Law no. 89/2025 and the Space Act

Law no. 89/2025 requires space operators of any nationality conducting activities in the Italian territory, as well as national operators conducting activities outside of the Italian territory, to obtain an authorisation for conducting a single space activity, multiple space activities of the same type or multiple interconnected space activities of different types. The authority tasked with the investigation process for the issuance of the authorizations is the Italian Space Agency (ASI) which determines whether the space operator is suited to guarantee safety, sustainability and resilience and possesses all the technical, financial and insurance-related requirements. Its evaluation is then transmitted to other competent authorities for their assessments.

Similarly, the Space Act also requires space operators to obtain an authorisation (identified as “EUSA authorisation” in the amendments proposed in December 2025 by the Council) to carry out space activities within the Member State, issued by the competent authority of the State in which they are established. It then provides for mutual recognition of authorisations issued by Member States, as well as for the possibility of entering into agreements to cooperate in the authorisation process and in the exercise of supervisory activities.

The Italian legislation aligns with the Space Act insofar as it designates and regulates the functions of the national authority, which the proposed European legislation mandates Member States to designate.

However, there are significant differences concerning the authorization procedures and their timelines. Law No. 89/2025 provides for a less complex authorisation process than that described in the Space Act. Furthermore, the Space Act contains differentiations between launch operators and spacecraft operators that are not mirrored in the Italian legislation.

11 Ioana Bratu and Francis G. von der Dunk, *The EU Space Act Proposal and its Impact on the Dutch Space Ecosystem*, SSRN, 11 August 2025.

The timelines also present significant differences, as under the Italian system a negative assessment has to be communicated within 60 days, whereas in case of a positive assessment the authorisation has to be issued within 120 days from the submission. The Space Act provides for an initial period of 30 working days from receipt of the authorisation application to verify full compliance with the prescribed documentation, but national authorities have 6 months (180 days) from the receipt of the technical file to issue their opinion of conformity, and 12 months (365 days) from receipt of the application to issue or refuse the authorisation.

The proposed timeframes are therefore double the duration of those indicated by the Italian legislator.

It is apparent that the effort to guarantee safety, resilience and sustainability has resulted in the Space Act in administrative and procedural burdens that appear, at times, excessive and risk undermining the effort of the Italian legislator in creating an efficient and straightforward governance system.

4. Registration Systems: URSA and National Registry

Once an authorisation is issued according to the Space Act, the competent national authority is required to transmit to EUSPA the information obtained from operators during the investigative phases, including space activities and mission duration, space objects used, the space operator conducting such activities, and the competent national authority. Based on this information, the space operator will be registered in the Union Repository of Space Activities (URSA).

EUSPA is required to issue, following registration in URSA, an electronic certificate that identifies the space activity and the object that generated the space data or enabled the provision of space services. The objective is to make available through URSA a list of all space operators in the European Union.

However, before the amendments to the draft introduced in December 2025, the Space Act provided for an additional register called URSO (Union Register of Space Objects).

As Law no. 89/2025 also provides for the obligation to register space objects in the National Registry established pursuant to Law 153/2005¹², the presence of the URSO would result in coordination complexity between national law and European regulation and in a duplication of burdens and formal obligations for space operators, which appears excessive and unjustified.

5. Conclusions

In conclusion, the comparison between Italian Law No. 89/2025 and the European Space Act proposal highlights the common objectives of ensuring safety, sustainability, and competitiveness of space activities.

However, the regulatory designs through which they are pursued are radically different. The Italian Space Law is characterized by a streamlined and concise text, aimed at reducing the administrative burdens on space operators, as opposed to the Space Act, whose complex technical and procedural requirements, governance system and extensive obligations could create disproportionate administrative and bureaucratic burdens.

The analysis of the differences and similarities between the Italian legal instrument and the European proposal highlights how to ensure an effective coordination between them, avoiding duplications and excessive burdens for operators, will be a complex endeavour, that will likely mirror the difficulties in delimiting and distinguishing between European and national competences in space policy and regulations.

¹² Law No.153 of 12 July 2005, n. 153, Adesione della Repubblica italiana alla Convenzione sull'immatricolazione degli oggetti lanciati nello spazio extra-atmosferico, fatta a New York il 14 gennaio 1975 e sua esecuzione.

Sovereign Joint-Ventures and the Corporate Veil in Defence Procurement: Analysis of the GIGO Convention (The GCAP Case)

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Abstract

The article provides a critical analysis on the Convention establishing the GCAP International Government Organisation (GIGO), recently entered into force. Particularly, the author argues that the entity transcends the traditional nature of an intergovernmental organization to functionally configure itself as a supranational public Special Purpose Vehicle (SPV). Through the exegesis of the asset segregation clauses (ring-fencing) under Article 54, the centralized commercial agency mandate and the imposition of arbitration as the exclusive dispute resolution method, the paper demonstrates how the treaty aims to erect a “corporate veil” to protect state budgets; such hybrid architecture is designed to effectively interface with the industrial joint-venture, mitigate direct financial risks and overcome domestic administrative rigidities in favour of lex mercatoria flexibility and industrial soft-law standardization. The analysis concludes that GIGO inaugurates a new paradigm of “corporate minilateralism”, a prerequisite for the economic sustainability of next-generation defence systems.

1. From state sovereignty to business logic: the GIGO architecture as a legal engineering tool for asset management of next-generation programs.

The date of December 10, 2024, does not exclusively mark a milestone in the diplomatic chronicle of Euro-Asian relations, but constitutes a real turning-point in the dogmatics of aerospace law and international public contracts, as, with the deposit of the instrument of ratification by the Italian Republic (the final act of a rapid legislative process, culminating in Law No. 184 of 18 November 2024), the Convention establishing the GCAP International Government Organisation (GIGO) formally entered into force¹. In fact, on a legal closer inspection, the event transcends the geopolitical dimension to invest that of legal engineering: the Global Combat Air Programme (GCAP), aimed at developing a next-generation air combat system by 2035, not only proposes a technological challenge for the creation of a cloud-native System-Of-Systems (SoS), but also requires a radical reconfiguration of the legal instruments of cooperation²; a mere reading of the conventional text, signed in Tokyo on December 14, 2023, reveals the inadequacy of traditional consortium models – such as NETMA for the Eurofighter program or OCCAR for joint intra-European programs – to sustain the complexity of a partnership that, for the first time, unites two NATO powers and a strategic Pacific partner within a framework of deep industrial integration³.

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- 1 Law No. 184 of November 18, 2024, containing «Ratification and Implementation of the Convention on the Establishment of the International Governmental Organization GCAP», represents the transposition of the treaty into Italian law. It is interesting to note the speed of the Italian parliamentary process, unusual for treaties of such complexity, which testifies to the strategic nature and industrial urgency of the programme. Entry into force follows the rule of Article 62(4) of the Convention, which required the deposit of the last instrument of ratification. *Amplius*, for an examination of the political convergence process, see: Marrone A. (curated by), *The New Partnership among Italy, Japan and the UK on the Global Combat Air Programme*, IAI Documents, 2025.
- 2 Unlike previous generation aircraft (e.g., Eurofighter Typhoon or F-35), the GCAP is designed as an aerial platform integrated into a network of remote effectors (loyal wingman drones), advanced sensors and combat clouds; such technical complexity translates into exponential contractual complexity: object of purchase is not a single good (off-the-shelf), but the development of an evolutionary digital ecosystem, making contractual fragmentation impractical and imposing a single design and procurement authority. See BRONK, J., *The Case for Greater Mission Specialization by NATO's European Air Forces*, in *RUSI Occasional Papers*, 2025.
- 3 The choice not to entrust GCAP to Organisation for Joint Armament Cooperation (OCCAR), of which Italy and UK are founding members, is legally significant. OCCAR, despite having legal personality, operates within a purely European regulatory framework and is bound by “juste retour” logic calculated on a multi-annual and multi-programme basis. The inclusion of Japan, a non-European nation with a specific constitutional framework on military exports (albeit recently revised), necessitated the creation of an *ad hoc* entity (GIGO). Furthermore, the GIGO structure appears leaner and more verticalized (“corporatised”) than the OCCAR bureaucracy, in line with the British need for post-Brexit agility.

The GIGO was born, since the Preamble, with an explicit and, in some ways, aggressive commercial mandate: it was established as an entity with «international legal personality and full legal personality», with the specific «legal capacity to enter into contracts with industrial entities». The founding rationale is not mere policy coordination, but rather the pursuit of better cost/efficiency and support for the prosperity of the Parties: it is an entity that, while dressing in the formal garb of the international organization (enjoying immunity, inviolability of headquarters and tax exemptions), conceals an exquisitely corporate functional nature. The GIGO is designed to operate as a public management holding company, a single client (Single Contracting Authority) responsible for centralizing demand and harmonizing requirements that come from three heterogeneous legal systems: the Italian Civil Law, the British Common Law, and the Japanese hybrid system.

The need for such a legal superstructure responds to a principle of institutional specularity: the public GIGO must correspond, on the private side, to an equally unitary interlocutor. It is no coincidence that the Convention explicitly refers to the need to contract with Industry, foreshadowing the establishment of the industrial joint-venture – commercially known as Edgewing – whose framework agreement, between Leonardo SpA, BAE Systems plc and Mitsubishi Heavy Industries Ltd, serves as the synallagmatic counterpart of the government organization⁴.

The element of greater theoretical innovation, however, lies in overcoming traditional state sovereignty in matters of patrimonial liability: the Convention establishes what it might be called an international corporate veil, considering that Art. 54, with a lapidary wording, stipulates that responsibilities arising from the activities of the GIGO «shall fall entirely on the GIGO itself and shall not be borne by any Party»; such segregation of risk (ring-fencing), which is extremely rare in international public law where there is usually subsidiary or concurrent liability of Member States, transforms Governments from direct clients to shareholders of a Special Purpose Vehicle (SPV), thus such architecture protects national budgets from direct claims by third-party creditors (industrial suppliers), but raises unprecedented questions about ultimate accountability in the event of programmatic default or structural cost overruns, shifting the focus of legal protection from administrative law to international *lex mercatoria*⁵.

2. Joint-ventures in the Defence market, between strategic imperatives and competition law: industrial concentration profiles and sectoral derogations in the context of GCAP.

Before proceeding to examine the GIGO convention, it should be pointed out that, in the specific context of the Defence sector, joint-ventures represent an essential strategic model for addressing complex and highly technological projects, such as the development of advanced weapons systems; through such collaborations, industries from multiple nations can share expertise, financial resources, and technological capabilities with the goal of executing projects that require significant investments and extended development timelines. The GCAP falls within the described approach, standing out as one of the most ambitious collaborations in the Defence sector, aimed at consolidating the position of the three nations as technological leaders in the Aerospace domain⁶.

Collaboration within the GCAP framework offers numerous strategic advantages, enabling the sharing of research and development (R&D) costs, which can be extremely high for projects of such magnitude; additionally, the participation

4 The commercial law doctrine emphasizes how the creation of a transnational industrial JV necessarily requires a centralized public counterparty to reduce transaction costs. Without GIGO, JV Edgewing would have had to negotiate three separate development contracts with three Ministries of Defence, subject to three different public procurement laws and three different budget cycles. The GIGO acts as a Single Contracting Authority, allowing the JV to operate according to unitary industrial logics. See: Patalano A.-Watkins P., “LEAP” Forward: Building a GCAP Generation, in Freeman Air & Space Institute, 2024, paper 21; Vecchi V.-Casalini F.-Cusumano N.-Leone V.M., PPP Legal Framework, in Vecchi V.-Casalini F.-Cusumano N.-Leone V.M., *Public Private Partnerships*, 2021, pp. 33-61.

5 Article 54 represents a unique or almost unique in the defence treaty landscape. Usually, in international organisations (think of the Tin Council case or subsidiary responsibilities in ESA), there remains an ultimate guarantee link of the Member States. The full exemption clause configures GIGO as a limited liability company under international law; such mechanism serves to isolate the financial risk of the project, preventing a potential billion-dollar dispute with Industry from directly attacking the state treasury, instead forcing the parties to resolve the dispute within the Organization’s capital perimeter (which is state-funded but legally distinct).

6 *Amplius*, NICOL T., *Joint Venture Regulation under European Competition Laws: An Update*, *European Law Journal*, 2007, pp. 408-423.

of a technologically advanced nation like Japan facilitates access to new expertise and markets in Asia, a region that is increasingly strategic for the Defence industry.

Joint-ventures such as GCAP not only allow for the division of costs and risks, but also enhance the global competitiveness of the participating companies. Specifically, the collaboration among the mentioned key industrial players provides a unique combination of industrial and technological expertise; it enables the development of cutting-edge technologies, including artificial intelligence (AI) systems, advanced avionics, and next-generation sensors, all critical elements for maintaining a competitive edge in the decades to come.

GCAP, like any joint-venture involving industrial players in the Defence sector, raises certain competition-related issues due to the general need to balance innovation and national security requirements with the maintenance of a competitive and open market, albeit within the framework of specific regulations⁷.

A potential risk of GCAP lies in the creation of excessive power concentrated in the hands of a few companies, which could undermine competition in the global market for advanced Defence systems. The project involves companies that are already dominant in their respective countries, and their collaboration on such an advanced fighter platform could limit opportunities for other players to emerge; it could lead to a reduction in competition not only in the market for air platforms, but also in related technologies, such as propulsion systems, sensors, and electronic warfare technologies: in other words, there is a risk of excessive concentration of technological and industrial capabilities in the hands of a few global players, potentially restricting market access for new entrants or slowing the development of alternative technologies.

⁷ As is well known, joint-ventures represent a form of strategic collaboration between multiple companies that decide to combine resources and expertise to achieve a common goal while maintaining their legal autonomy. Indeed, such type of agreement is characterized by flexibility, as it can serve various purposes, including accessing new business opportunities, sharing risks in complex and costly projects, developing new technologies, and increasing competitiveness in existing or emerging markets.

It is worth recalling that there are two main types of joint-ventures: the so-called contractual joint-venture and the corporate joint-venture. In a contractual joint-venture, the parties regulate their collaboration through a simple contract without creating a new legal entity; such model is particularly useful for short-term or less complex projects where companies collaborate while maintaining separate management of their assets. Conversely, in a corporate joint-venture, a new legal entity is established, typically in the form of a company, in which the partners act as members or shareholders; such model is therefore more structured and suitable for long-term collaborations or activities requiring extensive resource sharing and a more formal management of joint operations.

It should also be emphasized that joint-ventures are not subject to a uniform legal framework; instead, the applicable rules vary depending on the specific content of the agreements.

Amplius, Caterino D., *La joint-venture*, in Patroni Griffi U. (curated by), *Manuale di diritto commerciale internazionale*, 2012, pp. 465 ff.

It must be observed that the different classification of joint-ventures, whether as contractual or corporate, has significant implications for the application of antitrust regulations: in the European context, contractual joint-ventures are assessed as agreements between companies to verify that they do not conflict with the prohibition of anti-competitive agreements; conversely, corporate joint-ventures, being essentially full-function entities, are evaluated as concentrations (Caterino D., *Op. cit.*).

Contractual joint-ventures are forms of collaboration in which the parties involved do not establish a new legal entity, but cooperate based on a contractual agreement; however, even in the absence of a new legal entity, such arrangements can raise antitrust concerns. In the European framework, any agreement between companies that restricts competition, even temporarily, is subject to review under the Treaty on the Functioning of the European Union (TFEU); consequently, contractual joint-ventures may impose restrictions on competition if, for example, they include exclusivity clauses, market divisions, or production limitations: antitrust authorities closely examine whether the agreement between companies significantly reduces competition or creates barriers to entry for other firms, particularly in technology-intensive markets or those with a limited number of dominant players (Waha M.-Lee J., *Contractual joint-ventures and competition law issues*, in *Financier Worldwide Magazine*, Aug 2023). In many cases, however, contractual joint-ventures may benefit from exemptions if they demonstrate that their cooperation delivers significant efficiencies, innovation, or consumer benefits.

Corporate joint-ventures, unlike contractual ones, involve the creation of a new legal entity co-owned and co-managed by the participating companies; because companies share direct ownership in the new entity, corporate joint-ventures pose greater antitrust risks than contractual ones. Competition authorities evaluate corporate joint-ventures as partial mergers or acquisitions, as they create financial and operational ties between the participating firms; for example, the European Commission closely examines the ownership structure and the degree of control exercised by the parties over the new entity to determine whether the joint-venture creates market concentrations that could hinder competition. A common risk in corporate joint-ventures is that participating companies may use the new entity to coordinate their commercial activities, thereby reducing competition among themselves in the markets where they operate independently.

The mentioned regulatory attention is reflected in the EU Merger Regulation No. 139/2004, which stipulates that all merger or acquisition operations, including the creation of joint-ventures, must be notified to the European Commission if they exceed certain turnover thresholds; if a joint-venture risks creating or strengthening a dominant market position, the agreement could be blocked or modified to preserve competition. In essence, joint-ventures – whether contractual or corporate – offer significant advantages in terms of cooperation and technological development; however, they also present substantial risks from a competition perspective: antitrust authorities closely monitor such operations to ensure that dominant positions are not created and that market access is not restricted for other companies.

However, in the regulatory context of modern economies, joint-ventures are subject to strict antitrust regulations aimed at preventing the concentration of economic power and the reduction of market competition⁸.

One of the most complex aspects of antitrust regulation for international joint-ventures concerns the coordination among authorities in different jurisdictions; for instance, global cooperation projects must navigate a patchwork of national regulations that can vary significantly in terms of application and flexibility.

The antitrust authorities of the EU, the United Kingdom, and Japan often collaborate to assess the global implications of large joint-ventures; however, the lack of harmonization in rules can complicate the implementation of such projects: while exemptions exist for strategic sectors like Defence and Aerospace, they provide a degree of flexibility, but companies must be prepared to demonstrate that the cooperation generates benefits that outweigh the competitive risks⁹.

3. The dualistic governance of the GIGO: the functional separation between political ownership (Steering Committee) and managerial management (Agency) as a decision-making efficiency mechanism.

The structural analysis of the GIGO reveals an institutional architecture that, although formally embodied in the law of international organizations, essentially replicates the corporate governance mechanisms typical of joint-stock companies, aimed at solving the classic agency problem (Principal-Agent problem) between sovereign ownership (states) and executive management (the administrative body). The Convention establishes a clear functional dualism between the Steering Committee (SC) and the GCAP Agency, outlining a system of checks and balances that appears designed to mitigate the risks of political paralysis and government micromanagement that have historically plagued European cooperation programs, such as the Tornado or the Eurofighter¹⁰.

3.1. The Steering Committee as a high strategic direction body: the dialectic between sovereign equality and corporate democracy in the composition of state shareholders.

At the top of the decision-making pyramid, Chapter II of the Convention (Artt. 6-8) defines the SC as «the highest governance forum», vested with «overall responsibility for the guidance, direction, control and supervision of the GIGO»: under a commercial law lens, the SC combines within itself the typical functions of the Shareholders' Meeting and those of high strategic supervision of a Board of Directors in plenary composition.

The composition of the body, consisting of representatives of each Party headed by a Head of Delegation, reflects the intergovernmental nature of the entity; however, it is the decision-making mechanism that reveals the peculiar “mini-lateral” nature of the GIGO: although the unanimity rule for the establishment of subordinate committees (Art. 8) and for strategic decisions evokes the Westphalian principle of sovereign equality, the Convention confines the SC to a role of political direction, preventing – at least, *de jure* – direct interference in day-to-day operational management, which is delegated to the Agency. The rotation of the SC presidency (Art. 6.2) introduces an element of corporate democracy

8 Grcic G., *Bridges across regions: the effects of EuroAtlantic and IndoPacific cooperation on European security architectures*, in *International Politics*, 2025, vol. 62, pp. 988-1001; Mendelsohn J.K.-Iniguez M.V., *Financial Power in Competition Policy as a Key Component of Modern Bigness*, in *Utrecht Law Review*, 2025, vol. 21, pp. 5-21.

9 To be highlighted that, while the GCAP structure raises, as mentioned, antitrust concerns, particularly due to the high concentration of technological assets in the hands of three leading firms, participating governments justify the arrangement by emphasising security, innovation, and interoperability benefits; the project's security classification and dual-use nature are also used as arguments for antitrust exemptions under strategic defence exceptions: Muti K.-Ravazzolo G., *The GCAP industrial architecture*, in Marrone A. (curated by), *Op. cit.*, pp. 59-66.

10 The “agency problem” is one of the primary causes of inefficiencies in defence procurement. In traditional models (e.g., NETMA), (Principal) States tend to micro-manage the Agency (Agent) through technical committees that require unanimity even on operational details, paralyzing the decision-making process; instead, the GIGO structure seeks to break such pattern by delegating broad executive powers to the CEO (Art. 14), reserving only high management for the SC: on this point, see the critical analysis of Eurofighter governance in MARRONE A. (CURATED BY), *OP. CIT.*, where it is highlighted how the GIGO aims for an unprecedented «decision-making» slenderness. See also Barbieri D.-Ongaro E., *EU agencies: what is common and what is distinctive compared with national-level public agencies*, in *International Review of Administrative Sciences*, 2008, vol. 74, pp. 395-420.

between the three involved Member States, essential for maintaining political balance in a partnership between equals, avoiding the asymmetries perceived in other consortia where decision-making weight is parametrised to funding quotas¹¹.

3.2. The Executive Agency and the Chief Executive: the Adoption of a privatistic management model for the centralization of procurement functions.

The real innovation with respect to the practice of international law lies in Chapter III and IV (Artt. 9-17), which establish the GCAP Agency not as a mere administrative secretariat, but as a true operational arm entrusted with the «management, coordination and execution of all the phases of GCAP».

The lexicon used by the international legislator is revealing here and marks a semantic break with the past: the Agency is directed not by a kind of secretary general or director, but by a Chief-Executive (CE), that is a title borrowed directly from Anglo-Saxon corporate practice. The CE, elected by the SC but with operational autonomy, is supported by Division Directors, replicating the structure of an Executive Board. Art. 14(3) establishes a direct reporting line («the CE shall be directly responsible to the SC for the operation of the Agency»), creating that typical fiduciary relationship between CEOs and shareholders necessary for managerial efficiency.

But it is in the powers attributed to the Agency that the commercial nature of the entity manifests itself: under Art. 12, the Agency has the exclusive mandate about the «definition, prioritisation, decomposition and derivation of technical requirements into contract packages under the requirements set forth by the SC», crucially, entering into contracts relating to GCAP; such centralisation of negotiating power transforms the Agency into a transnational Centralised Purchasing Body (CPB). Among other things, acting as a single interface/voice, the Agency drastically reduces transaction costs for the industrial counterpart (the Edgewing JV), which does not have to negotiate three separate national contracts, but a single legal instrument regulated by the Agency on behalf of the GIGO¹².

3.3. The “juste retour” dilemma: citizenship constraints in senior appointments and the mandate of functional independence as the “Chinese Wall” against national interference.

The most delicate point of friction in any public joint-venture is the balance between meritocratic management selection and the need to ensure political returns to Member States (the so-called “juste retour”): the Convention addresses such crucial point in Art. 15, by institutionalizing a citizenship-based mechanism for the allocation of senior positions (EC and Directors), in order to «preserve a balance between the Parties».

Although Art. 17 proclaims the principle that positions must be filled by personnel with the «by personnel who have the competence needed to enable it to fulfil its mission as efficiently as possible», the regulatory reality of Art. 15 imposes a political constraint on the selection of personnel (political endorsement); however, to mitigate the risk of national loyalty overriding the interest of the programme, Art. 15(2) introduces a strengthened independence obligation: parties «shall not seek to influence» Agency staff, who must respect the «international character of responsibilities»; such provision seeks to erect a kind of “Chinese Wall” between the seconded official (often a government officer or official, as per Art.

11 The concept of minilateralism – to be understood as cooperation restricted to a small number of actors with converging interests – is central to GCAP. Unlike NATO or the EU, where consensus is diluted among many members, the GIGO operates on a narrow trilateral basis. The rotation of the presidency (Art. 6) and the balance of appointments (Art. 15) serve to prevent the hegemony of one partner over others (e.g., the United Kingdom as the seat of the HQ), ensuring that Italy and Japan maintain equal political dignity (“peer partnership”) regardless of fluctuations in annual financial contributions. *Amplius*, see: Dell’Era A.-Piasentini M., *From Strategic to Tech-oriented Minilateralism: GCAP as a Platform to Accelerate Military Technology Development*, in *The International Spectator*, 2024, vol. 59, pp. 95-115; Gott H., *The Law of Interactions Between International Organizations. A Framework for Multi-Institutional Labour Governance*, 2020.

12 Article 13.1 of the Convention is explicit, establishing that contracts are negotiated by the Agency «on behalf of the GIGO», thus creating a legal diaphragm: industry does not bargain with the Ministries of Defence, but with the Agency; it eliminates duplication of requirements and contractual fragmentation. Legally, the Agency acts as an agent with representation, centralizing the demand; such approach is crucial for the Edgewing industrial JV, which needs a single interlocutor (Single Voice) to effectively integrate the technologies of the three countries. *Amplius*, see NEUWIRTH R.J., *GAIA 2048 – A “Glocal Agency in Anthropocene”: Cognitive and Institutional Change as “Legal Science Fiction”*, in Lewis M.K. et al., *A Post-WTO International Legal Order*, 2020, pp. 71-91.

16) and the home government, a legal attempt to create a supranational corporate culture (*esprit de corps*) that overcomes the logic of merely protecting short-term national interests¹³.

4. The centralization of demand and the segregation of financial risk: the institutionalization of the international “corporate speed” to protect state budgets.

The beating heart of the legal architecture of GCAP and, perhaps, its most daring aspect from the perspective of internationalistic dogmatics, lies not so much in the technical provisions, but in the sophisticated contractual risk allocation mechanism outlined in Chapters III and X of the Convention: if the programme aspires to overcome the structural rigidities of previous European consortia, it does so by transforming the GIGO into a true “corporate shield”; in this way, the combined analysis of the rules reveals an attempt to apply the principle of limited liability typical of joint-stock companies to public international law, creating a net asset segregation between the supranational entity and the member states “shareholders”.

4.1. The GIGO as a “Single Contracting Authority”: the monopoly of negotiating representation and the political safeguard clauses on acts of extraordinary administration.

Art. 13(1) of the Convention gives the Agency a monopoly on negotiating representation, considering that contracts with Industry are «negotiated, concluded and managed by the Agency on behalf of the GIGO»; such provision is not merely procedural, but establishes a Centralized Purchasing Body (CPB) that acts as the sole imputation centre for legal relationships.

From the perspective of contract theory, GIGO solves the problem of demand fragmentation, as, instead of three national clients negotiating in parallel with their respective industries – generating asymmetric transaction costs and time mismatches – the Agency operates as a Single Face to Industry. However, the discretion of the Agency’s management is not absolute: Art. 13(3) introduces a safeguard clause: the Steering Committee may reserve prior approval of contracts in circumstances to be defined «in a further arrangement»; legally, such power evokes assembly authorizations for acts of extraordinary administration or public golden shares, ensuring that, while having delegated signature capacity, States retain ultimate control over the program’s financial exposure for commitments of particular magnitude¹⁴.

4.2. The radicalization of asset “ring-fencing” ex Article 54: the segregation of financial risk and the Special Purpose Vehicle (SPV) nature of the organization.

The most disruptive – at least, from the doctrinal point of view – innovation is contained in Art. 54, that states that «the international liability arising from the activities of the GIGO... shall fall entirely on the GIGO itself and shall not be borne by any Party»: it is the explicit codification of a ring-fencing (segregation of risk) in public international law. Contrary to customary practice, where the subsidiary responsibility of Member States for the debts of international organizations is often presumed or otherwise the subject of doctrinal debate (think of the famous case of the International Tin Council), the GIGO Convention erects an almost imperforable “corporate veil”; the economic rationale is clear: to protect national

13 Article 15(2) echoes the statute of international officials of the UN or the EU Commission, but applied to a sensitive military and industrial context; consequently, the legal issue will be the practical application of such independence, given that most staff will come from government ranks (Art. 16) and return there at the end of their term. However, the explicit provision of a ban on influence («shall not seek to influence») provides a legal basis for the CEO to resist undue pressure from capitals, protecting the technical autonomy of the Agency.

14 The Steering Committee has the power to take approval of specific contracts (Art. 13.3) acts as a control mechanism similar to that provided for in joint-ventures shareholders’ agreements, where members reserve the right to veto supra-threshold transactions (above a certain value threshold). In the context of GCAP, this avoids the Agency being able to commit States to billion-dollar contract variants without explicit prior political and financial coverage. However, the efficiency of the programme will depend on how high the threshold is set in the “further understandings”: too low a threshold would turn the Agency into a mere paper-passer, negating the benefits of centralisation. *Amplius*, Sharma A.-Ray R., *Government Procurement Derogation Under Article III(8)(a) of the GATT: An Analysis of the Jurisprudence and Recommendations for Designing WTO-Consistent Industrial Policies*, in Bäumler, J. et al., *European Yearbook of International Economic Law*, 2023, vol 14, pp. 3-25.

budgets (and taxpayers) from direct actions by industrial creditors or damaged third parties. The GIGO thus becomes a SPV with limited liability: Industry, by signing contracts with the GIGO, implicitly accepts that the only assets that can be attacked are those of the Organization, and not those of the treasures of Rome, London or Tokyo¹⁵.

4.3. The internal indemnity mechanism (inter-company indemnification) as a tool for managerial accountability and a disincentive to moral hazard.

If Art. 54 closes the door to external liability, Art. 55 opens that of internal liability (Inter-company Indemnification), providing that the GIGO must compensate the Parties for losses caused by wilful misconduct or negligence of its personnel or for international liabilities that may fall on States; with respect to this topic, legal analysis reveals potential financial circularity: since the GIGO is financed exclusively by contributions from the Parties (Art. 18), a GIGO compensation obligation to a Member State would ultimately result in a request for additional funds from the States themselves to cover such liability; however, from a governance perspective, such provision is not tautological, but serves as a managerial accountability mechanism, allowing the cost of management inefficiency or error to be attributed to the Agency's operating budget, thus creating a virtuous incentive for the Chief Executive and Directors to operate with the diligence of the "good businessman" (prudent businessman), knowing that mistakes will erode the resources available to the program itself, reducing development spending capacity and putting their own performance goals at risk¹⁶.

4.4. Arbitration interface as a necessary corollary of limitation of liability: the bankability of contracts through selective waiver of immunity.

Completing the framework, Art. 58(2) requires that every contract with Industry contain, «whenever possible... an arbitration clause»; such prediction is the necessary corollary of the shield nature of the GIGO: if liability is limited to the entity, and the entity enjoys immunity from state jurisdiction (Art. 28.1), the only way to make contracts enforceable (and therefore bankable for industry) is to waive immunity specifically for arbitration (Art. 28.4.a). Therefore, the Convention builds a closed system: the GIGO shields States, but exposes itself commercially to arbitration, by "privatizing" dispute resolution to ensure the credibility of the system¹⁷.

5. The privatization of justice in supranational public contracts: the obligation of commercial arbitration and the conditional waiver of immunity as a guarantee of bankability for the industrial base.

The hybrid nature of the GIGO is most prominently displayed in law in Chapter XI of the Convention, where the international legislature has designed a dispute settlement regime characterized by a clear "functional bifurcation": if, on the one hand, frictions between Member States or between them and the Organization remain confined within the perimeter of classical diplomacy – resolvable exclusively through "consultation" under Art. 57 – litigation with the industrial base is drastically removed from publicist logic to be embedded in the tracks of transnational commercial law.

15 Article 54 appears to have been written precisely to avoid the ambiguities that emerged in the case of the bankruptcy of the International Tin Council (ITC) in the '80s, where creditors sought to directly attack member states (including the United Kingdom) over the organization's debts. The GIGO clause («shall fall entirely on the GIGO itself») is a statutory limitation of liability that aims to secure state assets; for involved industries, it means that financial due diligence will need to focus on GIGO solvency and financing mechanisms, rather than implicit sovereign guarantee. See reflections on IO accountability in: Ryngaert C., The Responsibility of International Organizations and their Member States, in *International Organizations Law Review*, 2015, pp. 502-517.

16 Although financially circular (States pay to compensate themselves), Article 55 has a crucial accounting and disciplinary function: if the Agency causes damage through negligence, the compensation is borne by its budget, forcing the CEO to justify the losses in the annual budget (Art. 20), making the cost of inefficiency transparent; furthermore, by reducing the funds available for operational activities (hunting development), it creates immediate pressure from states to replace management or correct procedures. See

17 Article 28.4(a) creates a structural incentive for arbitration: the GIGO loses jurisdictional immunity if the contract does not provide for arbitration, but, since Industry would never accept a non-justiciable contract, and the GIGO prefers arbitration (confidential and technical) to the ordinary justice of a state (public and unpredictable), then arbitration becomes the default standard, thus aligning GCAP with the *lex mercatoria* of large international infrastructure projects, definitively abandoning the model of the authoritative administrative act.

5.1. The arbitration clause as a systemic imperative: the search for the “neutral forum” and the mitigation of home bias risk in transnational litigation.

Art. 58 forms the core of “private” GIGO architecture; its Paragraph 2 does not simply suggest, but imposes a precise direction, considering that, as already said, every contract entered into by the GIGO with Industry «whenever possible... an arbitration clause» and it is not a mere style clause, but a structural necessity dictated by the nature of the GCAP: GIGO’s industrial counterpart is not a domestic supplier operating under a domestic monopsony regime, but a transnational joint-venture (Edgewing) made up of publicly traded giants and such entities, having to sustain immense technological development risks over a multi-decade time horizon, could not operate with the necessary legal certainty if they were exposed to local administrative jurisdictions or the pitfalls of sovereign immunities, accordingly, the adoption of international arbitration as the default standard responds to the *lex mercatoria*’s need to ensure a “neutral forum”, preventing a dispute between GIGO (based in the United Kingdom) and, for example, its Japanese partner, from being decided by the London courts, preventing any perception of home bias¹⁸.

5.2. Conditional jurisdictional immunity ex Article 28: “regulatory pressure” towards private justice as a guarantee of enforcement for the industrial counterpart.

The most doctrinally refined aspect emerges from the combined reading of Art. 58 with Art. 28: while Paragraph 1 of Art. 28 establishes the classic immunity of the GIGO from «every form of legal process», next paragraph 4(a) introduces a deadly derogation: immunity automatically lapses «in relation to disputes arising out of contracts not providing resort to arbitration or alternative binding mechanisms of dispute settlement»: a kind of “normative pressure” (incentive-based regulation) that is extremely rare in public international law. In this way, the Convention creates a dilemma for the organization: either it agrees to arbitrate on an equal footing with Industry, or it loses its protective shield and exposes itself to ordinary jurisdiction; such mechanism acts as a guarantee of “justiciability” for private partners.

In the past, defence consortia have sometimes used jurisdictional immunity as a delaying tool; the GIGO, by contrast, is forced by its own statute to behave like a fair trader: refusing arbitration, it would be “naked” in front of civil courts, presumably those in the UK (home of the headquarter) or those where the contract was performed¹⁹.

5.3. The “multi-tier” approach to dispute resolution: domestic political conciliation as a preliminary filter for arbitral outsourcing of conflict.

The litigation architecture under consideration is further enriched by Art. 58(1), which provides for a mandatory preliminary step before a «subordinate conciliation committee established by the SC»; such multi-tier dispute resolution (first conciliation, then arbitration) clause reflects the best practices of FIDIC contracts for major infrastructure works. However, the presence of an internal conciliation body within the Steering Committee raises doubts about its actual third-party nature: it is likely that, in practice, the real legal game will be played in arbitration, making conciliation a procedural step aimed more at political de-escalation than at the legal resolution of the conflict.

18 The choice of international arbitration (presumably with offices in Paris, Geneva or London, applying ICC or LCIA rules) is the only instrument capable of reassuring JV Edgewing’s private shareholders. If disputes were devolved to national courts, there would be a risk of forum shopping or political influence; arbitration also ensures the possibility of appointing arbitrators with specific technical expertise in aerospace law and defence procurement, expertise rarely found in the ordinary judiciary. *Amplius*, see AA.VV., *State entities in international arbitration*, in *IAI Series on International*, 2008, vol. 4.

19 Article 28.4(a) is an absolute modernity clause; in fact, traditionally, international organizations enjoy absolute immunity (see the 1946 Convention on the Privileges and Immunities of the United Nations), while the GIGO adopts a functional approach: immunity exists to protect political independence (Art. 28.1), but not to avoid contractual obligations. By constraining the maintenance of immunity to acceptance of arbitration, the de facto treaty “privatizes” commercial litigation, making the GIGO a “commercially trustworthy” (bankable) subject in the eyes of financiers and suppliers.

Ultimately, the GIGO abandons the paradigm of the act of state empire to embrace the equal one of the commercial contract, definitively signalling that the GIGO, despite being a subject of public law, intends to operate in the market according to market rules²⁰.

6. The political economy of the programme, between common export control mechanisms and operational sovereignty over intellectual property rights.

The financial sustainability of a sixth-generation programme, whose operational life cycle is – lastly – estimated beyond 2070, cannot ignore an aggressive and structured export strategy: defence economic doctrine is now unanimous in believing that household orders in Rome, London, and Tokyo alone are not sufficient to generate the economies of scale needed to amortize non-recurring development (NRE) costs, estimated at tens of billions of euros; consequently, the GIGO Convention elevates export from a mere commercial eventuality to a legal imperative, codifying a «common mechanism», through Art. 51, that represents a unicum in the law of arms treaties and that aims to prevent the political paralyse observed in previous European consortia²¹.

6.1. Export control's "common mechanism" and policy clearing house function: the impact of the Japanese regulatory review on the program's global projectability.

Art. 51(1) requires Parties to create and maintain a mechanism «for facilitating exports of GCAP systems, subsystems, and technology to non-Parties»: legally, such provision is, in its own way, revolutionary, presupposing a prior alignment of historically divergent national export control policies. Instead, Art. 12(1)(h) explicitly mandates the Agency to «GCAP export management and support», centralizing the administrative function of foreign sales.

However, the real regulatory test lies in Art. 50(2): aware of the risk that one of the Parties may block a sale for domestic policy reasons (the so-called “political veto”), the Convention stipulates that, in the event of export concerns, the Parties will initiate “high-level consultations” to find solutions. While the right of sovereign veto is not formally ruled out, the procedure institutionalizes diplomatic pressure for consensus, transforming the GIGO into a political clearing house; such architecture was only made possible by the historic revision of the “Defense Equipment Transfer Guidelines” approved by the Japanese Cabinet in March 2024, which removed the de facto constitutional ban on the export of co-developed lethal weapons, thus, without this reform, implicitly transposed by the treaty in Art. 51, GIGO would have found itself in the legal impossibility of operating as a global player²².

20 The «conciliation subordinate committee» (Art. 58.1) represents a final attempt to resolve the dispute “in the family”, that is, at a political level, before outsourcing it to the referees: it is typical of large government programs, where contractual differences often hide differences in operational requirements (e.g., changes in technical specifications); however, if conciliation fails, Art. 58.2 ensures that the final say rests with an independent arbitral tribunal, protecting Industry from the political arbitrariness of the Steering Committee. Useful references in Önay I., *Interpretation of the Scope of International Commercial Arbitration Agreements: A Comparison of Swiss and Turkish Case Law*, in *European Business Organization Law Review*, 2024, vol. 25, 843-870.

21 Recent studies estimate that maintaining the unit cost of a next-generation fighter at sustainable levels requires a total production of several hundred units, well beyond the sum of the national requirements of the UK, Italy and Japan. Article 51 is therefore not ancillary, but foundational. The creation of a “common mechanism” (Art. 51.1) aims to avoid a repeat of the Eurofighter scenario, where Germany’s veto on sales to Saudi Arabia has blocked vital contracts for BAE Systems (UK) for years. The GIGO centralizes export policy management to offer certainty to third-party customers.

22 Japan’s participation in the GIGO required a radical reinterpretation of Article 9 of the pacifist Constitution. The mentioned guidelines allow direct exports of GCAP to third countries with security agreements with Tokyo (excluding nations in active conflict). Article 51 of the Convention is the international “hook” that legitimizes this new posture: Japan does not export “weapons”, but participates in an international mechanism of an organization of which it is a founding member. See WASIL A.R. et al., *Governing dual-use technologies: Case studies of international security agreements and lessons for AI governance*, 2024.

6.2. Technological sovereignty and open architecture: from the “black-box” model to the perpetual cross-licensing regime for national “freedom to modify”.

On the intellectual property (IP) front, the Convention rejects the “black-box” model (typical of the F-35 programme), where access to source codes is restricted even for first-level partners; in contrast, the legal paradigm of GCAP is grounded in equality of rights and freedom of modification.

Art. 5 of the Convention establishes an obligation for Parties to support, «to the maximum extent possible», the import, export, or transfer of «f all items and information generated within the GCAP between the Parties in all phases»; furthermore, the Preamble recognizes the importance of «sharing of data and physical assets» for the success of the programme.

From an industrial law perspective, the described rules lay the foundation for an open architecture regime: the issue for joint-venture Edgeworking will be to manage ownership of IP backgrounds (the pre-existing technologies brought by each company, such as Leonardo’s AESA radars or MHI composites) over IP foregrounds (the jointly developed innovations). While the treaty delegates details to “further arrangement”, the regulatory structure of Art. 5 suggests a perpetual and free cross-licensing model for Member States: it guarantees each nation the so-called “Operational Sovereignty”, that is the legal and technical capacity to modify, update and certify the platform (Art. 12(1)(f)) independently, without having to request authorization (“electronic keys”) from Washington or other partners, an essential requirement for maintaining national strategic independence in the 21st century²³.

7. The metamorphosis of intergovernmental cooperation into a supranational public holding company with limited liability.

The conducted exegesis of the Convention establishing the GIGO paints a picture of a legal body that challenges traditional taxonomies of international law: if, formally, it appears as a classical intergovernmental organization, endowed with the hallmarks of immunity (Art. 28) and legal personality under public law (Art. 3), the normative substance of the treaty reveals an operation of sophisticated corporate engineering; the GIGO is not simply the spiritual heir of NETMA or OCCAR, representing an evolutionary leap – a quantum leap – towards the “corporatization” of defence cooperation²⁴.

The thesis that this article aimed to demonstrate is that the 2023 Convention serves, for all intents and purposes, as the articles of incorporation of a supranational public holding company: member States, by abdicating direct contract management in favour of an Agency with executive powers (Art. 9) and a managerial Chief Executive (Art. 14), have implicitly agreed to transform themselves from omnipotent sovereign clients into strategic “controlling shareholders”; such metamorphosis is legally crystallized in Art. 54, which erects that corporate veil capable of segregating the financial risk of the program from state budgets, while such an asset protection mechanism, which prevents creditors from tracing back national treasuries, has been identified by the most astute doctrine as the necessary precondition for the fiscal sustainability of 21st-century weapons systems, whose development costs challenge the spending capacity of individual treasury²⁵.

23 Article 12.1 (f) gives the Agency certification and airworthiness management, but «in support of national requirements and regulations»; in conjunction with Article 5 (data transfer), it confirms that Italy, the UK and Japan do not intend to purchase a “closed” product (such as the F-35, where software modifications are centralized in the USA), but want to own the Design Authority, thus allowing domestic industries to access source code to integrate new weapons or sensors into the future, ensuring that technological and employment added value remains onshore. See SIMÓN L. ET AL., *Nodal Defence and the Future of European Air Power*, in *Journal of Strategic Studies*, 2021 vol. 44, pp. 360-388.

24 DROESSE G., *Changing Concepts of Intergovernmental Organization and International Organization*, in Droesse G. (curated by), *Membership in International Organizations*, 2020, pp. 275-313.

25 The separation of assets enshrined in Article 54 («The international liability arising from the activities of the GIGO... shall fall entirely on the GIGO itself and shall not be borne by any Party») has a profound impact on public accounting: it allows States to treat contributions to GIGO as “closed” expenditures, limiting contingent liabilities; instead, without this shield, the risk of unlimited cost overruns would fall directly on public debt, making the program politically indefensible in times of austerity. In few words, the GIGO acts as a financial fuse.

The most significant breaking element with respect to European procurement practice lies, however, in the renunciation of the dogma of exclusive State jurisdiction. The imposition of commercial arbitration as a method of dispute settlement (Art. 58) and the simultaneous waiver of immunity there (Art. 28.4.a) report that GIGO intends to operate in the global market in compliance with the *lex mercatoria*, equating its procedural position with that of the Edgewing industrial joint-venture; in this sense, the GIGO Treaty can be read as an attempt to create a legal safe harbor for private industry, immunizing it from the political uncertainties and administrative delays that have, in the past, eroded the competitiveness of the Eurofighter²⁶.

Looking to the future, the GIGO model poses pressing legal questions: if the experiment is successful, it will be possible to attend a progressive obsolescence of traditional forms of multilateral intergovernmental alliance (often paralyzed by the unanimous consensus of too many actors) in favour of Special Purpose Vehicles (SPVs) dedicated to individual technological domains, operating according to logics of “corporate minilateralism”. The convergence between Japanese export reform and Anglo-Italian contractual flexibility suggests that international defence law is moving towards “transactional” pragmatism, where sovereignty is no longer exercised in the minute control of the bureaucratic process, but in the definition of strategic objectives and the sharing of dividends (technological and economic)²⁷.

Ultimately, GIGO is not just the contracting authority of a fighter: it is the legal laboratory where we are testing whether three G7 powers can overcome their own regulatory particularisms not through political harmonization – a slow and cumbersome process – but through the creation of a third-party, efficient, justiciable and, above all, business-oriented legal avatar; the success of the GCAP will depend on the aerodynamic stability of the aircraft as much as on the stability of such legal fiction: the ability of GIGO to remain an “honest merchant” (honest broker) between the needs of the shareholder States and the profit logic of the industrial base.

8. Beyond the Treaty: the crystallization of a “soft law” for international strategic joint-ventures, between regulatory standardization and industrial best practices.

The evolution of international strategic joint-ventures in high-tech sectors, such as the GCAP, highlights the growing need for a multi-level and flexible regulatory framework capable of guiding intergovernmental and industrial cooperation in geopolitically sensitive domains. In such context, the development of soft-law instruments, understood as non-binding but operationally influential rules, emerges as a valuable middle path between the rigidity of international treaties and the limitations of purely contractual approaches²⁸.

The GCAP model – featuring an intergovernmental governance structure (GIGO), an equal-share industrial joint-venture, and coordinated approaches to IP, technology security, and export control – offers a concrete example of structured co-operation; it could serve as a blueprint for developing best practices applicable to other multilateral programmes; such practices could be compiled into an operational guide promoted by international organizations such as the Organization

26 It has been highlighted how the legal structure of the GIGO was designed “in the negative” with respect to past governance errors (e.g., Tornado/Typhoon), aiming for an industrial single voice. The legal certainty offered by arbitration and contractual centralization is the real incentive for companies to invest equity capital (Risk Sharing) in the JV, knowing that they are protected by an equal and non-authoritative legal framework. *Amplius*, see: Gouri A.A., *Resolving Incompatibilities of Bilateral Investment Treaties of the EU Member States with the EC Treaty: Individual and Collective Options*, in *European Law Journal*, 2010, vol. 16, pp. 806-830.

27 The GIGO architecture demonstrates that deep cooperation is possible even between distant legal systems (Civil Law, Common Law, Japanese Law) if a neutral third-party vehicle is adopted; such model of “technology minilateralism” is destined to replicate in the Indo-Pacific (e.g., AUKUS Pillar II), where the flexibility of the legal instrument is a precondition for technological integration.

28 Soft-law increasingly plays a central role in governing transnational economic activity, particularly in fields marked by rapid innovation and regulatory fragmentation: *ex multis*, Abbott K.W.-Snidal D., *Hard and Soft Law in International Governance*, 2003. To be noted that soft-law becomes especially relevant in times of geopolitical instability, when rigid legal instruments may hinder or delay strategic cooperation; in such cases, it may function as a progressive legal coordination tool, capable of evolving into customary practice or standard contractual frameworks, as demonstrated by the gradual consolidation of instruments such as the UNIDROIT *Principles* or the OECD *Guidelines on Corporate Governance of State-Owned Enterprises*.

for Economic Co-operation and Development (OECD), the EDA, the International Forum on Business Ethical Conduct (IFBEC), the NATO Industrial Advisory Group (NIAG), or UNIDROIT, with a focus on key regulatory dimensions including governance standards, model clauses for IP, cybersecurity principles, ESG due diligence, and harmonized risk and dispute management mechanisms.

Such soft-law framework could be structured around five foundational pillars: multi-level management of IPRs, based on the principle of functional equity, with shared rules on access, licensing, protection, and valorisation of jointly developed technologies; minimum cybersecurity standards, aligned with existing international frameworks, such as the National Institute of Standards and Technology (NIST) or the European Union Agency for Cybersecurity (ENISA), and adapted to the specific needs of dual-use and Defence-oriented technologies; ESG due diligence and supply chain traceability, in accordance with OECD guidelines and EU legislation, even for Defence-sector actors; common dispute resolution mechanisms, based on international arbitration and mediation models, provided from UNCITRAL or ICC, including optional escalation clauses for multilateral contexts; and institutional coordination among oversight authorities, including competition regulators, export control agencies, and national security bodies, to prevent normative conflicts and promote legal predictability. The codification of such principles, while not formally binding, would contribute to the consolidation of international cooperative practice and provide a shared normative reference point for the negotiation of complex intergovernmental and industrial agreements.

Ultimately, the development of an international soft-law regime for strategic joint-ventures could contribute to shaping a new model of functional multilateralism, grounded in transparency, adaptability, and shared responsibility²⁹.

The GCAP, thanks to its hybrid structure, modular design, and innovative regulatory architecture, emerges as a legal laboratory for governance innovation, with the potential to inspire the progressive codification of global standards in complex industrial cooperation³⁰.

9. The regulatory legacy of GCAP in the aerospace continuum: hybrid governance models and application prospects for the commercialization of space activities.

The GCAP programme, while formally positioned within the domain of next-generation military aviation, exhibits several legal, institutional and regulatory features that resonate well beyond the strict boundaries of air law, extending into the emerging terrain of space governance and aerospace integration; indeed, the hybrid nature of GCAP, as both a defence-industrial and intergovernmental initiative, invites reflection on its potential relevance as a normative and organisational prototype for future cooperation in complex dual-use domains, including the progressive intersection between air and space.

Historically, the legal and institutional architecture of air law has developed along a clear demarcation line between civilian and military applications, and – more significantly – between atmospheric and extra-atmospheric operations;

29 Choi J., *International Joint Venture Governance Mechanisms: The Role of Institutional Environment on Contract Design*, in *Corporate Governance. An international review*, 2025, vol. 33, pp. 370-388.

30 In truth, the hypothesis of a soft law crystallization in the defence sector finds empirical evidence in the pre-normative activity conducted by bodies such as the NATO Industrial Advisory Group (NIAG). NIAG Studies (e.g., *High Level Studies* on interoperability and *supply chain security*) effectively function as “pre-competitive” industrial standards that orient technical requirements well before their contractual formalization (see: *NATO Industrial Advisory Group Mandate*, AC/259-D(2019)0001, which emphasizes the role of industry in defining “best practices” for multilateral cooperation). In parallel, regarding public *corporate governance*, GIGO implicitly adopts the principles of the OECD Guidelines on Corporate Governance of State-Owned Enterprises (2015/2024 ed.), particularly concerning the separation between the state ownership function and autonomous managerial management. Finally, regarding business ethics, the mandatory reference is to the *Global Principles of Business Ethics* of the International Forum on Business Ethical Conduct (IFBEC), which now represent the ethical *lex mercatoria* for aerospace prime contractors (including Leonardo and BAE Systems), creating a transnational compliance substrate upon which the GIGO treaty can be grafted without having to reinvent standards from scratch.

Amplius, see Helbing D.-Ienca M., *Why converging technologies need converging international regulation*, in *Ethics and Information Technology*, 2024, vol. 26.

however, the increasing convergence of technologies – such as hypersonic propulsion, autonomous systems, real-time satellite-based communications, and AI-enhanced avionics – is progressively eroding these distinctions. In this regard, GCAP, with its integrated SoS structure and its emphasis on advanced electronic warfare, remote command systems, and sensor fusion, may already be viewed as a precursor to a new generation of aerospace platforms that operate at the frontier between regulated airspace and near-space environments.

The described evolution poses a number of legal and regulatory questions that are likely to become central in the coming decades, including the harmonisation of certification standards for aircraft and aerospace vehicles operating across functional domains, the establishment of liability regimes applicable to cross-domain operations involving civil and military actors, the interoperability of export control regimes in the context of increasingly trans-regional cooperation, and, above all, the adaptation of institutional frameworks capable of managing joint-ventures whose operational scope may span both the air and the space dimensions³¹.

In this respect, the analysed GCAP governance model – centred on the creation of the GIGO functionally limited international organisation, endowed with legal personality, joint decision-making bodies, and an industrial equal-share structure – offers several elements of interest. Notably, the adoption of a multilevel legal framework combining treaty-based obligations, national legislative instruments, and contractual arrangements among industrial players anticipates many of the complexities that future space-related ventures will have to address; furthermore, the explicit inclusion of flexible mechanisms – such as variable membership geometry and soft-law regulatory coordination – aligns well with current debates on adaptive governance in outer space, particularly as regards large constellations, on-orbit servicing, and shared infrastructure.

A further area of potential cross-fertilisation concerns cybersecurity and IPR regulation, considering that GCAP demonstrates the feasibility of constructing common standards for the protection and valorisation of sensitive technologies in a multinational setting, even in the presence of divergent national regimes; such experience may provide valuable insights for emerging space law challenges, especially those related to the joint development of space applications, as Earth observation, autonomous navigation, and quantum communications, where IP, data governance, and technological sovereignty must be reconciled with cooperative imperatives and security considerations.

Moreover, the incorporation of ESG principles into the GCAP framework – though still at an early stage – suggests the growing relevance of accountability, sustainability, and responsible conduct even in traditionally security-sensitive domains; in the space sector, similar concerns are increasingly voiced with regard to orbital debris management, environmental impact of launches, and the long-term sustainability of outer space activities: in this light, the GCAP experience may inform future sector-specific ESG guidelines for space industries, tailored to the strategic nature of their operations.

Finally, it is worth noting that the GCAP's openness to non-EU and non-NATO partners, coupled with its balanced multilateral structure, stands in contrast to more regionally enclosed programmes: such aspect is of particular relevance when contemplating future legal instruments for space cooperation, where the need for inclusiveness and global standard-setting remains largely unmet; GCAP, in this regard, illustrates a model of functional multilateralism grounded in equity, legal interoperability, and shared strategic interests, representing a model that could prove particularly useful in the fragmented legal landscape of space law³².

In conclusion, while GCAP is not a space programme *stricto sensu*, its institutional design, regulatory strategies, and operational philosophy reflect the types of legal and governance solutions that will be increasingly necessary in the aerospace and outer space domains; as such, the programme may be seen not only as a milestone in international defence cooperation, but also as a legal laboratory from which future frameworks of air and space law might draw inspiration.

31 Ryngaert C.-Wessel R.-Prévost D. *et al.*, *Global Constitutionalism: Editorial Introduction*, *Netherlands International Law Review*, 2019, vol. 66, pp. 191-195.

32 Tapio J.-Soucek A., *The European Space Agency's Contribution to National Space Law*, in Karjalainen K.-Törnberg I.-Pursiainen A., *International Actors and the Formation of Laws*, 2022, pp. 113-134.

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Miscellaneous Material of Interest

Dreaming of an Increasingly Accessible Moon with LuGRE, the Italian Lunar GNSS Receiver
Mauro Cardone & Luisa Santoro



Dreaming of an Increasingly Accessible Moon with LuGRE, the Italian Lunar GNSS Receiver

Mauro Cardone* & Luisa Santoro**

Abstract

Designed by the Italian company Qascom in collaboration with NASA and ASI, and with the scientific support of Politecnico di Torino, LuGRE (Lunar GnsS Receiver Experiment) was the mission launched towards the Moon in January 2025, in order to test an Italian receiver and demonstrate the feasibility of using GPS and Galileo signals for navigation, positioning, and synchronization on our natural satellite.

Thanks to LuGRE, the Moon-based mission succeeded in acquiring and tracking signals from the two above-mentioned GNSS constellations, then used for navigation on the lunar surface, thus breaking a series of global records and advancing our ancestral dream of an increasingly accessible Moon.

1. Introduction

Designed by the Italian company Qascom, in collaboration with NASA and the Italian Space Agency-ASI, and with the scientific support of Politecnico di Torino, LuGRE (Lunar GnsS Receiver Experiment) was the mission launched with a Falcon 9 towards the Moon on January 15, 2025, in order to test an Italian receiver – placed on board the Blue Ghost lander of the Texas-based company Firefly, as part of the NASA Commercial Lunar Payload Program.

The objective of the LuGRE mission was the first demonstration of GNSS signal reception and navigation in the lunar environment, so as to potentially paving the way to its operational use in future lunar missions.

2. The Moon-based mission

LuGRE's payload consisted of a high-sensitivity cold redundant GNSS receiver [22 dB-Hz (acq), 18 dB-Hz (trk)], a high-gain L-band patch antenna, a low-noise amplifier and an RF filter. The receiver was designed to track GPS L1 C/A and L5 signals, as well as Galileo E1 and E5a signals. Fully realised by QASCOM, this device was able to collect pseudo-range, carrier phase and Doppler measurements, to calculate onboard navigation solutions, and to record raw I/Q baseband samples for ground processing.

NASA's Space Communications and Navigation (SCaN) Program office funded and oversaw the full experiment, which was then selected as one **out** of ten research and technology demonstrations for lunar surface delivery by Firefly Aero-space, under NASA's Commercial Lunar Payload Services (CLPS) initiative.

Eight hours after launch, soon after having acquired the first signal, LuGRE achieved its set objective, establishing its first global record: for the first time ever, a GNSS signal had been acquired at a distance of 40 Earth radii, surpassing 200,000 km from Earth, i.e. the limit already achieved by NASA.

After a 45-day journey, 25 of which were spent in lunar orbit¹, on March 2 the Blue Ghost lander touched down on Mare Crisium, a solidified lava plain on the Moon characterized by a flat surface: a site that offered ideal conditions for

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The opinions expressed in this article are purely the views of the author, and thus may not in any circumstances be regarded as an official position of the institution the author belongs to.

¹ <https://fireflyspace.com/missions/blue-ghost-mission-1/>

scientific observations. The maneuver took place with a controlled free fall, regulated by thrusters for longer than 63 minutes. In the last 5 minutes, the engines gradually reduced speed, from 1,700 to 40 meters per second, until a stable descent was achieved, via eight secondary thrusters. Firefly thus became the first commercial company to fully complete a successful landing on the Moon.

But before LuGRE could be activated, the lander had also to complete a series of checks to ensure that its onboard systems and scientific instruments could function correctly, above all the calibration of the *gimbal*, the mechanism that orients the antennas towards Earth. Only after ensuring proper alignment was it possible to activate LuGRE² to begin searching for GNSS signals: on March 3, at 7:10, LuGRE was turned on, and at 7:48 it picked up its first signal, tracking 4 satellites: 2 from the GPS system and 2 from the Galileo one. This allowed the first position on the lunar surface to be successfully calculated by using 4 satellites on two frequencies evenly distributed between the American GPS system and the European Galileo one - two from the former and two from the latter³. It was the first experiment ever to demonstrate the combined use of GPS and Galileo signals in lunar space: never before had such signals been successfully received and processed at such a great distance from Earth.

Fig. 1 The iconic image of Lugre on the moon, 2 March 2025 (courtesy of Firefly)



As first Italian instrument to reach the Moon, then, LuGRE completed its mission on March 16, when the Blueghost 1 Lander ended operations since its solar-powered batteries had lost their charge and communications had been interrupted. But the receiver “performed exceptionally throughout the mission, breaking world records for deep space navigation at 401,000 km and achieving the first-ever PVT (Position, Velocity, Time) fix on the lunar surface.”⁴

The first public satellite navigation data from the Moon **was** then collected and released by NASA and ASI thanks to LuGRE.

² <https://www.polito.it/en/polito/communication-and-press-office/poliflash/lugre-arrives-on-the-moon>

³ *ib.*

⁴ <https://www.qascom.com/news/goodbye-lugre-mission-accomplished/>

The mission benefited from the Lunar Navigation Analysis and Reporting Tool (LuNART-q)⁵, which is a scientific software designed to evaluate the feasibility of the LuGRE mission's scientific experiments and support rapid reporting after mission operations. It was a "Mission Quick-Look Tool" led by Politecnico di Torino. Such tool facilitated the detailed analysis of mission data downlinked from the Firefly BlueGhost lander allowing for prompt troubleshooting.

Complementing those capabilities, the Remote Science Processing Center (RSPC), hosted at the Fabio Neri Lab (at Politecnico di Torino), further expanded the scope of scientific operations with detailed analysis.

The tool was used to extract the first results from acquired data, which were later released to the public during a dedicated workshop held at the ASI premises in Rome on October 14 and 15 2025 (Fig.2).



Fig. 2 The LuGRE workshop
(courtesy of ASI)

By publicly sharing that data, NASA and ASI provided universities, research centers, and industrial and international partners with a concrete tool for developing commercial, low-cost lunar navigation services, supporting space exploration, advancing the Artemis Program and *"paving the way for a sustainable human presence on the Moon"*⁶.

5 https://iris.polito.it/retrieve/handle/11583/3004243/5201ea46-cc6d-4527-8585-215480bb9eb9/ION_GNSS__2025_LuNARTq_technical_paper_authAcc.pdf

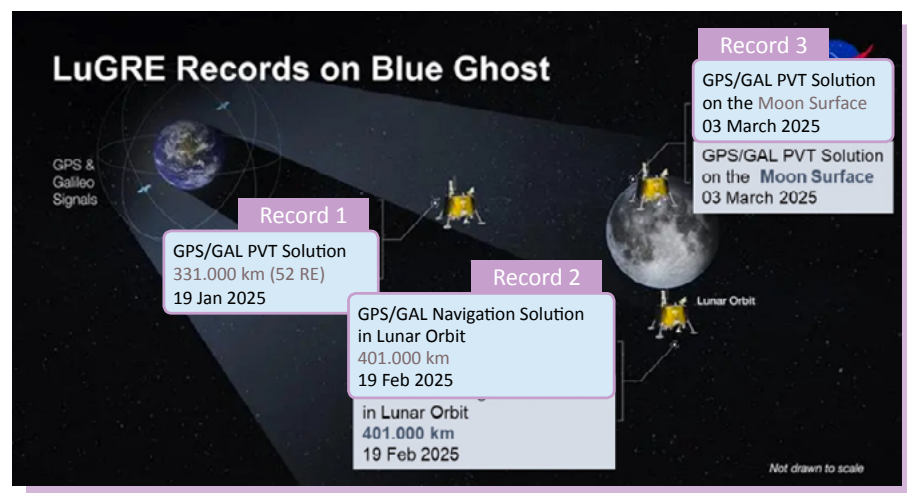
6 <https://www.calitoday.net/2025/08/nasa-advances-artemis-program-paving.html>

The data collected by LuGRE can be used by anyone interested in any related scientific and technological aspects, with the goal of capitalizing on the experimental ASI/NASA LuGRE mission.

3. Results

The Lunar GNSS Receiver Experiment (LuGRE) was the first known demonstration of GNSS signal acquisition, tracking, and navigation near and on the Moon. LuGRE successfully completed its mission and met all requirements and objectives and showed that GPS and Galileo L1/E1 and L5/E5a signals can be used on the Moon, using both main lobes and side lobes. It was the first active Italian GNSS Instrument on the Moon and it broke all previous world **NASA records** for deep space positioning (featured in Fig.3).

Fig. 3 The three records of LuGRE (courtesy of Nasa)



PVT was successfully calculated on the moon, with more than 20 signals, of which 7 from the Galileo constellation: all the measurements are high-quality and consistent with the measurements from typical terrestrial receivers.

4. Conclusions

The above-mentioned results represent the initial phases for a future where astronauts, rovers, and spacecraft will rely on the same satellite navigation systems that we employ every day on Earth. Within the framework of the Artemis pro-gram, to which Italy consistently contributes thanks to ASI and its long-standing **relations with NASA**, this technology represents an effective solution in preparation for ESA's Moonlight constellation, designed for lunar communication and navigation services, and in which our Country is the prime contractor.

NASA Deputy associated administrator of Space Communications and Navigation program Kevin Coggins declared: *"On Earth, we can use GNSS signals to navigate everything from smartphones to airplanes. Now, LuGRE shows us that we can successfully capture and track GNSS signals on the Moon. This is a very exciting discovery for lunar navigation and we hope to exploit this ability for future missions"*⁷.

LuGRE, in conclusion, is the result of the ability of the entire Italian space sector - said President of the Italian Space Agency Teodoro Valente -, an advanced and mature sector, with a high profile at the international level, and whose expertise and competence bear fruit every day, in all fields of this challenging world. LuGRE is the top success of our involvement in such an important exploration program and will enable us to study the large amount of data collected in two months for the entire scientific community, for future advancements and technological research⁸.

⁷ <https://www.nasa.gov/directorates/somd/space-communications-navigation-program/nasa-successfully-acquires-gps-signals-on-moon/>

⁸ <https://www.asi.it/2025/03/lugre-conneSSIONe-stabilita/>



According to ASI Director of Engineering and Technologies Roberto Formaro, LuGRE was a record-breaking mission, demonstrating the combined use of GPS and Galileo signals at distances never tested before, around the Moon and on the Moon. It confirmed the possibility of having interoperable systems enabling key functions for robotic and human missions on other celestial bodies. The data we received from LuGRE represents the starting point for characterizing the cis-lunar and lunar environments, to improve the design of future lunar constellations - including ESA's Italy-led Moonlight constellation - and future receivers that will accompany mankind in space exploration⁹.

After the landing of Blue Ghost, our ancestral dream of an increasingly accessible Moon is becoming a reality, thanks also to Italy, with its technological and scientific expertise and contributions as a key player in the present new space era, paving the way for future missions that will take humanity ever further: LuGRE's journey is just the beginning of a future lunar exploration initiative that is proving to be more ambitious than ever.

⁹ *ib.*



Past and Upcoming Events

18th European Space Conference 2026

27-28 January 2026, SQUARE Brussels

The 16th Annual Conference of the Worldwide Airport Lawyers Association (WALA)

Buenos Aires, 20-22 May 2026

EALA Liability & Litigation Seminar

Paris, 22 May 2026

Master in Business Management – New Space Economy

(II Edition, A.Y. 2026–2027)

18th European Space Conference

Delivering on Europe's Space Ambition: Sovereignty, Security, and Industrial Transformation

SQUARE, Brussels
27-28 January 2026



The 18th European Space Conference in Brussels provided a clear indication of the progressive consolidation of space policy within the European Union's broader strategic and security architecture. The debates moved beyond the traditional emphasis on industrial competitiveness and technological innovation, situating space firmly within the framework of strategic autonomy, resilience, and geopolitical positioning. Space was consistently characterized as critical infrastructure, essential to the functioning of key societal systems and increasingly intertwined with the Union's security and defence objectives.

A central theme of the Conference concerned the resilience and protection of European space assets. Particular attention was devoted to safeguarding satellite-based services, ensuring operational continuity, and developing secure communication architectures capable of addressing both civilian and dual-use requirements. In a context marked by heightened geopolitical tensions and systemic vulnerabilities, the continuity and integrity of space systems were framed as prerequisites for the stability of transport networks, energy grids, financial systems, and emergency response mechanisms. The discussions reflected an awareness that the governance of space infrastructures can no longer be approached through a purely sectoral lens, but requires integration within a comprehensive security strategy.

From a legal and regulatory perspective, the Conference underscored the growing complexity of the normative environment governing space activities. The increasing convergence between civil and defence-related uses of space raises significant questions regarding responsibility, liability, transparency, and the delineation of competences at both Union and Member State levels. Moreover, the emphasis on strategic autonomy invites reflection on the balance between international cooperation and the protection of European strategic interests. In this respect, the Brussels Conference may be read as both a political milestone and a normative inflection point, signalling an evolution in the conceptualization of space governance within the European legal order and its positioning within the broader global space regime.

For more information visit [HERE](#).

The 16th Annual Conference of the Worldwide Airport Lawyers Association (WALA)

Buenos Aires
20-22 May 2026



The 16th Annual Conference of the Worldwide Airport Lawyers Association (WALA) will take place in Buenos Aires, Argentina, from 20 to 22 May 2026, bringing together leading legal experts, airport operators, industry professionals and regulatory stakeholders from around the world. Over three days, participants will have the opportunity to engage in pre-conference seminars, thematic conference sessions and dedicated networking activities, fostering knowledge exchange and collaborative dialogue across jurisdictions and disciplines.

For more information visit [HERE](#).

EALA 15th Liability & Litigation Seminar

Paris,
21st & 22nd May 2026



The 15th Liability & Litigation Seminar, organized by the European Air Law Association, will take place in Paris at the Aéro-Club de France on 22 May 2026. The event will bring together legal practitioners, academics, industry representatives and policymakers to discuss recent developments in aviation liability and dispute resolution.

The seminar will focus on the evolution of the liability regime under the Montreal Convention (1999), current litigation trends linked to EU Regulation 261 on passenger rights, and the growing complexity of claims management in the aviation sector. Further discussions will address emerging issues related to air traffic management responsibilities, ground handling agreements, administrative enforcement and the increasing use of alternative dispute resolution mechanisms.

Overall, the seminar will provide an opportunity to reflect on how legal frameworks governing aviation liability are adapting to the operational and regulatory changes affecting international air transport.

For more information visit [HERE](#).

Master in Business Management New Space Economy

Bologna Business School
(II Edition, A.Y. 2026–2027)



Bologna Business School launches the second edition of the Master in Business Management – New Space Economy, a one-year full-time program taught in English and entirely dedicated to the managerial dimension of the space sector. The initiative is designed for graduates who aim to operate at the intersection of business, innovation and space technologies. The program combines core management disciplines — including finance, marketing, supply chain and corporate governance — with a specific focus on the aerospace ecosystem, satellite services, regulatory frameworks and the evolving industrial dynamics of the New Space Economy.

Applications are open in four rounds, starting from April 27, 2026.

Further information and application details are available at: [Master Full Time | BBS](#).



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