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A COMPARATIVE ANALYSIS OF DRONE REGISTRATION AND OPERATIONAL REGULATIONS IN ECUADOR AND SELECTED LATIN AMERICAN COUNTRIES

Kevin Torres-Garrido *

Independent researcher (formerly associated with the Secretariat of Higher Education, Science, Technology, and Innovation), Quito, Ecuador.

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ABSTRACT

This study presents a comparative analysis of unmanned aerial vehicle (UAV) regulatory frameworks across five Latin American nations: Ecuador, Argentina, Brazil, Colombia, and Chile. Utilizing official civil aviation publications and guidance documents, regulatory requirements were evaluated across key operational parameters, including registration thresholds, pilot certification, commercial activity rules, administrative fees, and other. The findings reveal a shared regional operational baseline characterized by mandatory Visual Line of Sight (VLOS), altitude ceilings, airport buffer zones, and heightened scrutiny for commercial operations. However, substantial structural differences exist in how these objectives are enforced. For example, regulatory approaches range from multi-agency frameworks (Brazil) and environmental distinctions (Chile) to structured risk-based categories (Colombia, Ecuador) and streamlined low-risk models (Argentina). Nonetheless, while all five nations have adopted digital administration portals, none currently enforce broadcast Remote Identification (Remote ID). Results like these provide empirical baselines for policymakers to optimize commercial licensing fee structures, refine risk-based operational tiers, and support regional regulatory harmonization to facilitate safe UAV integration across Latin America.

Keywords: Unmanned Aerial Vehicles, UAV, Drones, Drone Regulation, Ecuador, Latin America

1 INTRODUCTION

Unmanned aerial vehicles (UAVs), commonly known as drones, have become vital tools across agriculture, environmental monitoring, infrastructure inspection, logistics, and recreation [1]. Technological advancements have reduced costs and increased accessibility, accelerating UAV adoption globally and throughout Latin America among public, commercial, and private users [2]. However, this rapid growth presents significant regulatory challenges. Aviation authorities must balance technological innovation with public safety, privacy, airspace management, and security [2]. Consequently, governments worldwide have implemented legal frameworks governing registration, pilot certification, altitude limits, and commercial operations, although the level of oversight varies substantially across jurisdictions [2].

In Ecuador, the *Dirección General de Aviación Civil* (DGAC-Ecuador) regulates drone operations to ensure safe integration into national airspace [3]. While these regulations establish baseline requirements for registration, operator responsibilities, and spatial restrictions, they have evolved largely in isolation. Existing research suggests Ecuador lags behind leading global UAV adopters, yet little scholarly work compares its framework with those of neighboring Latin American countries [4]. This lack of regional analysis obscures broader policy trends, complicates assessment of Ecuador's regulatory stringency, and limits opportunities to identify regional best practices.

Comparative policy analysis offers valuable insights for regulators, operators, and researchers seeking avenues for harmonization and modernization. This study addresses the following research question: How do drone registration and operational requirements in selected Latin American countries compare with those of Ecuador? By evaluating key similarities and differences across regional frameworks, this paper tests the hypothesis that substantial regulatory variation exists across Latin America, reflecting divergent national priorities, administrative approaches, and rates of technological adoption.

2 MATERIALS AND METHODS

2.1 Primary Study Area: Ecuador

Ecuador serves as the central focal point of this analysis, operating a centralized civil aviation model administered by DGAC-Ecuador and governed under the *Reglamento de Aviación Civil del Ecuador* (RDAC) [5]. While Ecuador has modernized its regulatory architecture to address expanding commercial applications in agriculture, environmental monitoring, and infrastructure, its prescriptive administrative burdens and commercial licensing procedures provide a direct point of comparison against contrasting open-market, risk-proportional, and environmental oversight models across Latin America.

2.2 Selected Latin American Countries

To evaluate Ecuador's regulatory framework within a broader regional context, this study examines drone regulations in Argentina, Brazil, Colombia, and Chile. These nations share geographic proximity and rapid UAV growth, yet represent distinct market sizes, administrative approaches, and oversight philosophies. Their established frameworks provide sufficient variance across registration, operator licensing, operational limits, and authorization mechanisms to enable meaningful comparative analysis.

2.2.1 Argentina

Argentina illustrates recent administrative deregulation and market-opening reforms. Under the *Administración Nacional de Aviación Civil* (ANAC-Argentina), the country modernized its framework to eliminate key administrative and licensing barriers for low-risk and lightweight drone operations [6, 7, 8]. Argentina provides an important comparative baseline as a deregulated model designed to reduce administrative burdens while maintaining core operational safety standards.

2.2.2 Brazil

As Latin America's largest drone market, Brazil operates a mature multi-agency regulatory framework. Civil aviation regulations established by the *Agência Nacional de Aviação Civil* (ANAC-Brazil) through the *Regulamentos Brasileiros da Aviação Civil* (RBAC-100) are complemented by flight rules administered by the *Departamento de Controle do Espaço Aéreo* (DECEA) and telecommunications requirements enforced by the *Agência Nacional de Telecomunicações* (ANATEL) [9]. By classifying drones according to weight and operational risk, Brazil represents a structured, multi-authority governance model designed for large-scale commercial and industrial drone adoption.

2.2.3 Colombia

Colombia employs a risk-based framework administered by the *Unidad Administrativa Especial de Aeronáutica Civil* (Aerocivil Colombia). Drone operations are classified into Open, Specific, and Certified categories under *Reglamentos Aeronáuticos de Colombia* (RAC) 100, with regulatory requirements scaling according to operational complexity, payload, and associated risk [10]. Colombia maintains rigorous operational controls, including strict authorization requirements near controlled airspace, making it an important regional example of structured risk management.

2.2.4 Chile

Chile possesses one of the region's longest-established drone regulatory frameworks. Governed by the *Dirección General de Aeronáutica Civil* (DGAC-Chile) through *Disposición Aeronáutica Nacional* (DAN) 91 and DAN 151, the Chilean system distinguishes between recreational and commercial uses while also incorporating environmental distinctions such as

specialized provisions for rural operations [11]. Chile serves as a benchmark for balancing operational flexibility with pilot accountability and safety oversight.

2.3 Methodology

This study employed a comparative policy analysis approach to examine drone registration and operational requirements in Ecuador and selected Latin American countries. Regulatory information was obtained through a review of official regulations and guidance issued by the civil aviation authorities responsible for drone oversight in each country: DGAC-Ecuador, ANAC-Argentina, ANAC-Brazil, Aerocivil Colombia, and DGAC-Chile [5, 7, 8, 9, 10, 11].

To facilitate comparison, information from each country's regulatory framework was extracted and organized into a standardized comparison matrix. Regulatory characteristics were evaluated across several categories representing common elements of drone governance throughout Latin America. These categories included:

- Whether drone registration is required and the minimum drone weight requiring registration.
- Distinctions between recreational and commercial operations.
- Pilot certification or licensing requirements.
- Insurance requirements.
- Remote Identification (Remote ID) requirements.
- Availability of online registration systems.
- Maximum permitted altitude.
- Operational restrictions near airports or controlled airspace.
- Visual Line of Sight (VLOS) requirements.
- Age requirements for operators.
- Additional authorization requirements for specialized operations.

After developing the comparison matrix, a qualitative comparative analysis was conducted to identify major patterns and differences among countries. Particular attention was given to:

- The level of regulatory oversight applied to drone operations.
- Differences in registration thresholds based on aircraft weight.
- Variations in pilot training and certification requirements.
- Requirements specific to commercial drone activities.
- Adoption of modern regulatory tools, including Remote ID systems and online registration platforms.
- Broader regulatory characteristics, including operational classification frameworks, flight restrictions, and safety requirements.

The analysis also assessed Ecuador's relative position within the regional regulatory landscape by comparing the country's requirements under RDAC with regulatory frameworks that employ more restrictive, more comprehensive, or more flexible oversight models. Comparisons focused on registration requirements, operational limitations, pilot qualification standards, administrative procedures, and regulatory mechanisms used to manage operational risk. This approach enabled identification of shared regional trends as well as regulatory innovations and policy differences that may inform future modernization efforts within Ecuador's drone governance framework.

3 RESULTS AND DISCUSSION

3.1 Key Findings

The comparison of drone regulations across Ecuador, Argentina, Brazil, Colombia, and Chile (Table 1) reveals both broad regional convergence and important differences in regulatory philosophy, oversight mechanisms, and operational requirements. Although all five countries seek to promote aviation safety and protect controlled airspace, they differ in how they regulate drone operators, classify operations, and manage risk.

Table 1: Comparison of Drone Registration and Operational Requirements in Selected Latin American Countries.

Regulatory Element	Ecuador	Argentina	Brazil	Colombia	Chile
Regulatory Authority	Dirección General de Aviación Civil	Administración Nacional de Aviación Civil	Agência Nacional de Aviação Civil (ANAC-Brazil)	Unidad Administrativa Especial de Aeronáutica	Dirección General de Aeronáutica Civil (DGAC-Chile)

	(DGAC-Ecuador)	(ANAC-Argentina)		Civil (Aerocivil Colombia)	
Primary Regulation	RDAC 101	Resolution 550/2025 (ANAC)	RBAC-100	RAC 100 (Part 19)	DAN 91 (Rural) & DAN 151 (Urban/Commercial)
Registration Requirements	Required for drones >250 g or commercial use. Exempt: recreational drones ≤250 g.	Required for drones >250 g or non-recreational use. Exempt: recreational drones ≤250 g.	Required for drones >250 g through SISANT. Exempt: recreational drones ≤250 g.	Required for drones >200 g or operations in the Specific or Certified categories. Exempt: Open Category drones ≤200 g.	Required for drones >750 g or operations conducted under DAN 151. Exempt: rural recreational drones ≤750 g under DAN 91.
Registration Fees & Portal	Free registration for Open Category operations through the DGAC-Ecuador portal. Commercial operator license: $517 USD.	User registration is submitted via *Casillero Aeronáutico Digital* (CAD) while the E-PAGOS portal is used for payment. ≤10 kg: 800 Argentine pesos (ARS); 10-150 kg: 1,600 ARS; >150 kg: 2,400 ARS.	Registration through SISANT is free. DECEA authorization is free. ANATEL radio-frequency homologation may incur fees (~$70 USD when manual approval is required).	Free registration through the Aerocivil Colombia digital portal.	15,811 Chilean pesos (CLP) (~$16-18 USD). Processed through email submission and bank transfer. New online registration platform is being introduced.
Pilot Certification	Not required for Open Category operations (≤4 kg recreational). Required for Specific Category operations; certificate issued by DGAC-Ecuador.	Not required for recreational operations ≤10 kg. Required for commercial operations or flights in controlled airspace.	Not required for Class 3 drones (≤25 kg) operated under VLOS. Required for Class 1 (>150 kg), Class 2 (25-150 kg), and Beyond Visual Line of Sight (BVLOS) operations.	Not required for Open Category operations. Required for Specific and Certified categories through accredited training centers.	Not required for DAN 91 operations. Required for DAN 151 operations; RPAS Operator Credential obtained through written examination.
Insurance Requirements	Third-party liability insurance required for commercial and high-risk operations. Optional for recreational flights.	Required for commercial, scientific, and certain higher-risk recreational operations. Optional for recreational tourism use.	*Responsabilidade do Explorador e Transportador Aéreo* (RETA) insurance required for drones >250 g. Drones ≤250 g exempt.	Third-party liability insurance required for commercial and Specific Category operations. Optional for Open Category operations.	Third-party liability insurance required for commercial and DAN 151 operations. Recommended for recreational flights.
Remote ID & Radio Rules	Broadcast Remote ID not required.	Broadcast Remote ID not required.	Remote ID not required. ANATEL radio-frequency homologation required.	Broadcast Remote ID not required.	Broadcast Remote ID not required.

Altitude & Line of Sight	Maximum altitude: 122 m (400 ft) Above Ground Level (AGL). VLOS required; BVLOS requires authorization.	Maximum altitude: 120 m (400 ft) AGL. VLOS required.	Maximum altitude: 120 m (400 ft) AGL. VLOS required; BVLOS requires DECEA approval.	Maximum altitude: 120 m (400 ft) AGL. VLOS required; maximum operating distance 750 m.	Maximum altitude: 130 m (426 ft) AGL. VLOS required; maximum operating distance 500 m.
Airport No-Fly Buffers	9 km buffer around airports and airfields.	5 km runway protection zone; 500 m from heliports.	3-5 NM (5.5-9.2 km) buffer; altitude limited to 30 m within some controlled areas.	5 km buffer around airports; additional restrictions near major hubs.	2 km airport buffer; 1 km around aerodromes.
Age Limits	18 years; operators aged 16-17 may fly under adult supervision.	16 years for recreational operations; 18 years for commercial operations.	18 years for all remotely piloted aircraft operations.	16 years for recreational operations; 18 years for commercial operations.	18 years to obtain a DAN 151 RPAS Operator Credential.
Specialized Equipment Rules	Prior authorization required for night flights, operations over crowds, and agricultural spraying.	Authorization from ANAC-Argentina required for night operations, flights over crowds, and heavy payload operations.	Authorization from DECEA through the *Solicitação de Acesso de Aeronaves Remotamente Pilotadas* (SARPAS) platform required for night and BVLOS operations.	Authorization from Aerocivil Colombia required for night flights, operations over crowds, and agricultural spraying.	Parachute system required for drones >750 g operating over populated areas under DAN 151.

3.2 Comparative Analysis

3.2.1 Level of Regulatory Oversight

The regulatory frameworks identified in this study differ in their organizational structures and operational classifications (Table 1). Ecuador regulates drone operations under RDAC 101 using Open and Specific operational categories. Argentina regulates drone operations under Resolution 550/2025, distinguishing between recreational and non-recreational activities, and with added language relating to risk (i.e., Open, Specific, and Certified). Brazil regulates drone operations through a system involving ANAC-Brazil, DECEA, and ANATEL, with requirements varying according to aircraft classification and operational conditions. Colombia regulates operations under RAC 100 through Open, Specific, and Certified categories. Chile regulates operations through two primary frameworks, DAN 91 and DAN 151, which apply to different operating environments and mission types.

3.2.2 Registration Thresholds Based on Aircraft Weight

Registration requirements are based primarily on aircraft weight and operational purpose. Ecuador, Argentina, Brazil, and Colombia require registration for drones weighing more than 200 g, while recreational drones weighing 250 g or less are generally exempt from registration requirements. Chile requires registration for drones weighing more than 750 g or for operations conducted under DAN 151. In all five countries, commercial or non-recreational operations may trigger registration or additional operational requirements regardless of aircraft weight.

3.2.3 Pilot Training and Certification Requirements

Pilot certification requirements vary according to aircraft classification and operational category. Ecuador requires a Remote Pilot Certificate for Specific Category operations. Argentina requires pilot certification for commercial operations and flights conducted in controlled airspace. Brazil requires pilot qualifications for certain aircraft classes and operational conditions, including BVLOS operations. Colombia requires approved training for operators conducting Specific and Certified Category operations. Chile requires an RPAS Operator Credential for operations conducted under DAN 151. Recreational operations involving lightweight drones generally do not require pilot certification in the jurisdictions examined.

3.2.4 Requirements for Commercial Drone Activities

Commercial drone activities are subject to additional regulatory requirements in all five countries. These requirements may include operator credentials, operational authorizations, registration, and third-party liability insurance. Ecuador requires commercial operator authorization and licensing under RDAC 101. Chile requires compliance with DAN 151, including operator credentialing and operational approval requirements. Brazil requires RETA insurance for specified operations. Argentina and Colombia require documentation, authorizations, and insurance coverage for commercial activities as specified in their respective regulatory frameworks.

3.2.5 Digital Registration and Administrative Systems

All five countries provide administrative mechanisms for drone registration and compliance management. Ecuador uses the DGAC-Ecuador registration portal, Brazil uses SISANT, Colombia uses the Aerocivil Colombia registration platform, and Argentina uses the CAD portal for submission and the E-PAGOS system for payment. Registration through Ecuador, Brazil, and Colombia is available at no cost for eligible operations. Argentina applies registration fees based on aircraft weight. Chile has historically processed registration through email document submission (via email) and fee payment procedures administered by DGAC-Chile but is recently transitioning to an online portal.

3.2.6 Operational Classification Systems

The regulatory frameworks reviewed use different methods to classify drone operations. Ecuador distinguishes between Open and Specific categories. Colombia utilizes Open, Specific, and Certified categories (i.e., a risk-based framework). Argentina distinguishes between recreational and non-recreational operations, as well as through a risk-based framework. Brazil classifies aircraft according to weight classes and operational conditions. Chile distinguishes operations under DAN 91 and DAN 151 according to operational context and mission type.

3.2.7 Operational Restrictions and Safety Requirements

Several operational requirements are present across all five regulatory frameworks. Standard operations are generally limited to visual line of sight (VLOS) conditions and maximum altitudes of approximately 120-130 m (400-426 ft) AGL. Night operations, BVLOS activities, and flights in controlled airspace typically require additional authorization. All countries maintain restriction zones around airports and other protected airspace. Minimum operator age requirements vary by jurisdiction and operational category, with certificated or higher-risk operations commonly requiring operators to be at least 18 years of age. None of the five countries currently require broadcast Remote ID for standard drone operations.

3.3 Limitations

This study is limited to regulations publicly available from official aviation authorities at the time of data collection. Because drone regulations are subject to periodic revision, some requirements may change over time. Furthermore, the analysis focuses on national regulatory frameworks and does not account for differences in local enforcement, implementation practices, or temporary operational restrictions within individual countries. Nevertheless, the comparative approach provides a systematic assessment of drone governance across selected Latin American nations and establishes a useful foundation for identifying regional trends, regulatory innovations, and opportunities for the continued modernization.

3.4 Implications and Recommendations

The findings indicate that drone regulation in Latin America is characterized by a combination of regulatory convergence and institutional diversity. Although the countries examined employ different administrative structures and oversight mechanisms, all seek to balance aviation safety, airspace protection, and technological innovation. This suggests that while regional regulators share similar policy objectives, they continue to differ in how risk is assessed, managed, and translated into regulatory requirements. As UAV applications continue to expand, these differences may influence the ease with which operators, businesses, and institutions conduct activities across national boundaries [2, 12].

One of the most significant patterns identified in this study is the emergence of a common operational baseline. Across the countries examined, regulators have adopted similar requirements for visual line of sight operations, altitude limitations, airport protection zones, and heightened oversight of higher-risk activities. This degree of consistency suggests the influence of widely accepted aviation safety principles and may provide a foundation for future regional harmonization efforts [2, 4, 12]. At the same time, differences in registration requirements, certification standards, and administrative procedures indicate that harmonization remains incomplete.

The variation observed in registration thresholds highlights broader differences in regulatory philosophy. While the other countries in this study utilize a threshold of 200-250 g, Chile applies a higher threshold for certain recreational operations. This contrasting approach from Chile illustrates the absence of a regional consensus regarding the level of risk posed by lightweight consumer drones [2]. Such variation may create challenges for operators working across jurisdictions and suggests an area where greater regulatory alignment could improve clarity and compliance without necessarily reducing safety.

The results also suggest an ongoing transition toward more risk-based regulatory frameworks. Rather than applying uniform requirements to all drone activities, several countries increasingly tailor regulatory obligations according to operational characteristics and risk exposure. This trend reflects broader international developments in drone governance, where regulatory requirements are scaled according to factors such as aircraft weight, operational environment, proximity to people, and mission complexity [2, 4]. Risk-based approaches may allow regulators to reduce barriers for low-risk recreational and educational users while concentrating oversight on activities with greater safety implications.

Another important implication concerns administrative accessibility. The degree of institutional complexity varies considerably across the region, ranging from streamlined digital systems to regulatory frameworks that require interaction with multiple agencies or manual administrative procedures. These differences may affect operator compliance, particularly among small businesses, educational institutions, and first-time users. As drone technology becomes increasingly integrated into commercial, agricultural, environmental, and public-service applications, reducing unnecessary administrative burdens may become an important component of effective regulation.

The limited adoption of technologies such as Remote ID represents another notable finding. Although digital registration systems are becoming common throughout the world [2, 3, 4, 13], real-time identification capabilities have not yet been widely incorporated into national regulatory frameworks. As more advanced operations such as BVLOS flights, urban air mobility applications, and autonomous missions become feasible, regulators may face increasing pressure to adopt technologies that enhance accountability, airspace awareness, and enforcement capacity. The experiences of jurisdictions that have already implemented Remote ID requirements may provide useful reference points for future regulatory development.

From a policy perspective, the findings suggest several opportunities for continued regulatory modernization in Ecuador. The country's existing framework already incorporates elements of a risk-based approach, providing a foundation for future refinement as drone use expands. Continued investment in digital administrative systems, periodic evaluation of registration and certification requirements, and monitoring of emerging international best practices may help ensure that regulatory oversight remains proportional to operational risk [2, 4, 12, 14]. More broadly, comparative analyses such as this can support evidence-based policymaking by identifying effective practices from neighboring countries and highlighting opportunities for greater regional consistency in drone governance.

4 CONCLUSION

This study compared drone regulatory frameworks in Ecuador, Argentina, Brazil, Colombia, and Chile to identify similarities, differences, and emerging trends in UAV governance across Latin America. The results revealed a shared commitment to aviation safety through common operational requirements such as visual line of sight restrictions, altitude limitations, and protections around controlled airspace. At the same time, differences were observed in registration thresholds, pilot certification requirements, administrative procedures, and the regulation of commercial operations. The findings suggest that while regional regulatory frameworks are increasingly incorporating risk-based principles and digital administrative tools, a fully harmonized approach to drone governance has not yet emerged. As UAV technologies continue to expand across commercial, environmental, agricultural, and public-sector applications, ongoing regulatory modernization and greater regional coordination may help improve operational consistency, support innovation, and facilitate the safe integration of drones into Latin American airspace.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

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REFERENCES

[1] Satama Rivilla LM, Lara Guijarro EG. Drones: oportunidades y desafíos en usos civiles. Investig Tecnol IST Cent Técnico. 2025;7(1):100–113. Available from: [https://investigacionistct.ec/ojs/index.php/investigacion_tecnologica/article/view/187]

[2] Stöcker C, Bennett R, Nex F, Gerke M, Zevenbergen J. Review of the current state of UAV regulations. Remote Sens. 2017;9(5):459. Available from: [https://doi.org/10.3390/rs9050459]

[3] Gutiérrez-Proenza J, Quishpe-Lugmaña KS, Tipantuña-Tenelema SF. Drones en el Ecuador: aproximación a una regulación jurídica ineludible. Rev Jurídica Crítica Derecho. 2022;3(4):68–79. Available from: [https://doi.org/10.29166/cyd.v3i4.3536]

[4] Torres-Garrido K, Rodriguez-Gonzalez M. A comparative analysis of UAS governance in Ecuador and the United States. World Journal of Advanced Research and Reviews. 2026;30(1):2385–2394. Available from: [https://doi.org/10.30574/wjarr.2026.30.1.1105]

[5] Dirección General de Aviación Civil (DGAC). Normativa UAS/drones: Reglamento de Aviación Civil del Ecuador (RDAC) [Internet]. [cited 2026 Aug 20]. Available from: [https://www.aviacioncivil.gob.ec/normativa-uas-drones/]

[6] Administración Nacional de Aviación Civil de Argentina (ANAC-Argentina). Nuevo marco normativo para la operación de drones [Internet]. [cited 2026 Aug 20]. Available from: [https://www.argentina.gob.ar/anac/nuevo-marco-normativo-para-la-operacion-de-drones]

[7] Administración Nacional de Aviación Civil de Argentina (ANAC-Argentina). Resolución 550/2025: Regulaciones Argentinas de Aviación Civil - Apruébase la Parte 100 [Internet]. 2025 [cited 2026 Aug 20]. Available from: [https://www.argentina.gob.ar/normativa/nacional/resoluci%C3%B3n-550-2025-416149]

[8] Administración Nacional de Aviación Civil de Argentina (ANAC-Argentina). Reglamento VANT / SVANT [Internet]. [cited 2026 Aug 20]. Available from: [https://www.argentina.gob.ar/anac/vant-svant/reglamento-vant-svant]

[9] Agência Nacional de Aviação Civil (ANAC-Brazil). Regulamento Brasileiro da Aviação Civil - RBAC nº 100 [Internet]. 2026 [cited 2026 Aug 20]. Available from: [https://www.anac.gov.br/assuntos/legislacao/legislacao-1/boletim-de-pessoal/2026/bps-v-21-no-24-15-a-19-06-2026/rbac-100-emd-00/visualizar_ato_normativo]

[10] Unidad Administrativa Especial de Aeronáutica Civil (Aerocivil Colombia). Reglamento Aeronáutico de Colombia: RAC 100 - Operación de Sistemas de Aeronaves No Tripuladas (UAS) [Internet]. Bogotá D.C.: Aerocivil; 2023 [cited 2026 Aug 20]. Available from: [https://www.aerocivil.gov.co/autoridad_aeronautica/loader.php?lServicio=Tools2&lTipo=descargas&lFuncion=descargar&idFile=16966]

[11] Dirección General de Aviación Civil (DGAC-Chile). Normas DAN: DAN 151 - Operaciones de Aeronaves Pilotadas a Distancia (RPAS) [Internet]. Santiago: DGAC Chile; [cited 2026 Aug 20]. Available from: [https://www.dgac.gob.cl/normativa/reglamentacion-aeronautica/normas-dan-nueva/#1690982711785-cb3ca1e7-8ac8]

[12] Albán Ruiz PF, Montoya Lara LH, de Jesús Pereira AM. Standardization of policies of the use of distance aircraft systems and aircraft systems (RPAS/UAS) in Ecuador. In: World Conference on Information Systems and

Technologies. Cham: Springer International Publishing; 2017. p. 596–602. Available from: [https://doi.org/10.1007/978-3-319-56541-5_61]

[13] Hussein M, Nouacer R, Corradi F, Ouhammou Y, Villar E, Tieri C, et al. Key technologies for safe and autonomous drones. Microprocess Microsyst. 2021;87:104348. Available from: [https://www.sciencedirect.com/science/article/pii/S0141933121005056]

[14] Schmidt R, Schadow J, Eißfeldt H, Pecena Y. Insights on remote pilot competences and training needs of civil drone pilots. Transp Res Procedia. 2022;66:1–7. Available from: [https://doi.org/10.1016/j.trpro.2022.12.001]