Towards the Implementation of the AI Act in Aviation: Challenges and Strategies

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Abstract – Artificial Intelligence (AI) poses both opportunities and regulatory challenges for the aviation sector. As AI-enabled systems are progressively integrated into safety-critical environments, aviation regulators are called to ensure that existing safety, accountability, and certification principles remain robust and applicable in increasingly complex operational contexts. In response, the European Union Aviation Safety Agency (EASA) has developed a domain-specific strategy grounded in risk-based governance and human-centric automation, as outlined in its *Artificial Intelligence Roadmap 2.0* and related regulatory guidance. In parallel, the EU Artificial Intelligence Act (Reg. (EU) 2024/1689) introduces a horizontal, risk-tiered framework designed to ensure fundamental rights protection and legal certainty across sectors, including aviation. While the AI Act recognizes the need for sectoral adaptation, it also introduces new legal obligations for high-risk AI systems, potentially intersecting with existing aviation regulations (Reg. (EU) 2018/1139 and Reg. (EC) No 300/2008). Drawing from the studies carried out within the HUCAN Project (GA ID: 101114762)[6], this paper adopts a comparative approach to the normative foundations of the two frameworks and explores three key dimensions where differing regulatory logics may constructively interact. First, it explores the concept of automation, AI and autonomy, analysing differences in how these concepts are defined and regulated across horizontal contexts. Second, it explores misalignments between the AI Act fundamental rights-based risk model and the safety-centric, operationally grounded risk assessment methods of the aviation sector. Finally, it follows all the above to present challenges in aligning the detailed supervision and certification logic of EASA with the broader governance requirements introduced by the AI Act for human oversight. By analysing these regulatory intersections, the paper contributes to identifying viable pathways toward complementarity, where trustworthiness evolves from a general principle into an operational criterion for ensuring safe and responsible AI integration in aviation.

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[6] HUCAN Project. Holistic Unified Certification Approach for Novel systems based on advanced automation. SESAR 3 JU (GA ID 101114762).