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RESEARCH REPORT

Unsettled Topics in the General Aviation Autonomy Landscape

Anna Mracek Dietrich

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Anna Mracek Dietrich
AMD Consulting

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About the Editor

Anna is an industry-recognized leader in policy, certification, and government relations for advanced air mobility (AAM), electric vertical takeoff and landing aircraft, and autonomous aviation. Her experiences include Mars rover testing, being the founding Chief Operating Officer of Terrafugia, testifying on AAM for Congress, and speaking at TEDGlobal. She has appeared on or been published in a wide range of outlets including CNN, *Ms.* Magazine, and *Good Morning America*. Currently, she runs AMD Consulting, serves as Regulatory Lead for Xwing, and is the Co-founder and Director of Industry and Strategy at the Community Air Mobility Initiative. Anna also has leadership roles in ASTM International (formerly the American Society of Testing and Materials) and General Aviation Manufacturers Association committees. She received her bachelor's and master's in aerospace engineering from the Massachusetts Institute of Technology and is a private pilot.

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Unsettled Topics in the General Aviation Autonomy Landscape

Abstract

The extent of automation and autonomy used in general aviation (GA) has been steadily increasing for decades, with the pace of development accelerating recently. This has huge potential benefits for safety given that it is estimated that 75% of the accidents in personal and on-demand GA are due to pilot error. However, an approach to certifying autonomous systems that relies on conventional modes limits their potential to improve safety. Placing a human pilot in a situation where they are suddenly tasked with flying an airplane in a failed situation, often without sufficient situational awareness, is overly demanding.

This consideration, coupled with advancing technology that may not align with a deterministic certification paradigm, creates an opportunity for new approaches to certifying autonomous and highly automated aircraft systems. The new paths must account for the multifaceted aviation approach to risk management which has interlocking requirements for airworthiness and operations (including training and airspace integration). They occur across a variety of different operational paradigms with varying roles for the human and the systems in question. If implemented properly, autonomy can take GA safety to the next level while simultaneously increasing the number and variety of aircraft and transportation options they provide.

NOTE: SAE EDGE™ Research Reports are intended to identify and illuminate key issues in emerging, but still unsettled, technologies of interest to the mobility industry. The goal of SAE EDGE™ Research Reports is to stimulate discussion and work in the hope of promoting and speeding resolution of identified issues. These reports are not intended to resolve the challenges they identify or close any topic to further scrutiny.

ANNA MRACEK DIETRICH
AMD Consulting

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