

LEADING EDGE

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AN EXPERIMENT IN AIRCRAFT CERTIFICATION began in 2004 when the FAA created the Light Sport Aircraft/Sport Pilot (LSA/SP) rule. Opening the door to a self-declarative certification process based on industry consensus standards, this rule lowered the barrier to entry for manufacturers as well as pilots of small two-seat aircraft.

To support the LSA/SP rule, an international industry committee under the ASTM International F37 committee crafted a set of standards. While the FAA maintains a role in the process and the final authority to accept or reject them for use with LSA, these standards are written, approved and maintained by a group that includes manufacturers, pilots, aviation organizations and other qualified industry parties worldwide.

Thirteen years later, the ability to leverage consensus-based industry standards was expanded to include larger general-aviation (GA) aircraft that fall under Part 23 certification regulations. These are aircraft with 19 or fewer people on board and weights up to 19,000 lb. This created a sea change in how aircraft certification is approached.

At its core, this modification stemmed from a recognition that overly prescriptive rules are, in effect, self-replicating, with no pathway for new and innovative aircraft or technology that could advance the utility and safety of GA. In this environment, new aircraft would always look and function largely like old aircraft.

The Aviation Rulemaking Committee's (ARC) solution evolved from questions such as: What were the fundamental assumptions about the role and likely failures of the systems covered by a specific requirement? How else could that same level of safety be achieved? And most critically, What was the safety intent behind that requirement?

Working through the entire Part 23 Amendment (Amd.) 62 language, the ARC teased out the safety intent behind each prescriptive requirement. The result, captured in Part 23 Amd. 64—formally accepted in August 2017—is about one-third the size of the original rule and strives to answer the fundamental question: What makes a GA aircraft safe? The revised rule is now the certification basis for new Part 23 aircraft.

There is still value in the information that was extracted from the rule. To preserve institutional knowledge as an industry, another ASTM committee (F44) adapted the Part 23 Amd. 62 language into an initial

set of standards. These standards evolved into the first FAA-accepted means of compliance to Part 23 Amd. 64. In the interest of international harmonization, the European Aviation Safety Agency also has revised its CS-23 Rule and is accepting the ASTM F44 standards as a means of compliance.


Decoupling the prescriptive requirements from the rules has several benefits. An ASTM revision can go through a consensus and ballot process and be published within 6-24 months, as opposed to the previous 5-10-years for an FAA rulemaking effort. ASTM voting requirements ensure a diverse spectrum of participants, granting top experts in the field, regardless of whether they work for a regulatory body, a venue in which to write new standards.

The initial base of the ASTM F44 standards is already expanding to include new technologies such as electric propulsion, including both aircraft integration and the motors themselves, batteries for propulsive-energy storage, indirect flight controls, system-level safety verification, and

other key areas for the next generation of GA aircraft.

This combination of a safety-intent certification basis and a standards-based library of means of compliance that can be kept current as technology evolves is essential to bringing new technology to aviation. The urban air mobility revolution sparked by the advent of electric vertical-takeoff-and-landing (eVTOL) aircraft is enabled in large part by the new Part 23 and ASTM standards.

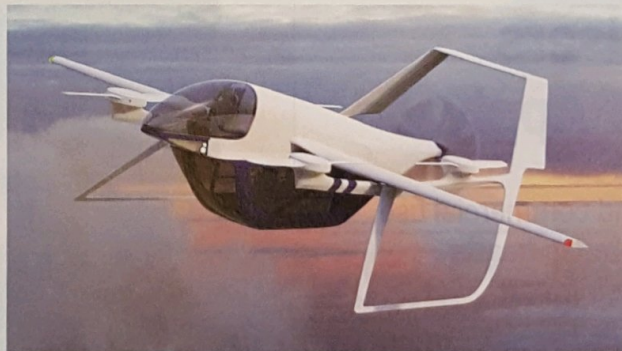
Recently, the FAA confirmed it would be using Part 23 Amd. 64 language as a certification basis for winged eVTOL aircraft, bringing in limited special-conditions and rotorcraft (Part 27) language as necessary to cover the roughly 10% of the rule that does not quite fit these new vehicles. This allows us to expand our focus on other key pieces of the regulatory puzzle, operations and airspace access, where we will need to leverage similarly forward-looking approaches.

As Terrafugia and others push the boundaries of GA with aircraft that offer new levels of convenience and safety, we are excited to see what lies ahead, confident we can continue to "future-proof" relevant regulatory framework—without looking for loopholes—in a way that provides durable safety of innovation for decades. 

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Future-Proofing

Streamlining the regulations path led to a sea change in aircraft certification and innovation



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