

What benefits brings the new amendment 5 to Regulation CS-23 for the certification of small aeroplanes?

The European Aviation Safety Agency (EASA) granted ELIXIR AIRCRAFT the Type certificate for its two-seater aeroplane on March 20th, 2020 complying with technical requirement of CS-23 amendment 5. While this amendment was published on March 29th, 2017, Elixir is the first European aeroplane certified under this regulation. Hugues Le Cardinal (VELICA) conducted the certification program along with the Design Office of the manufacturer. He gives us here a brief overview of this regulation and its use.

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The Elixir, first aeroplane certified under amendment 5 of the CS-23 regulation. © Elixir Aeroplane

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Amendment 5 of the certification regulation for small aeroplanes brings in a whole new philosophy. While regulations since then used to be prescriptive by imposing technical solutions, amendment 5 sets safety objectives. This regulation has the huge advantage to be almost identical to its equivalent in the USA, amendment 64 of the FAR 23. However, both CS-23 amendment 5 and FAR 23 amendment 64 need to be used along with another prescriptive regulation considered as means of compliance (old EASA regulation or American ASTM).

Amendment 5 takes into account safety at the aeroplane level and not anymore at the system or equipment levels and thereby enhances safety and pragmatism, which is its other great contribution.

The Elixir Aeroplane case

The first paragraph of the regulation defines the aeroplane's level of safety as follows:

CS 23.2000 Applicability and definitions

(a) This Certification Specification prescribes airworthiness standards for the issuance of type certificates, and changes to those certificates, for aeroplanes in the normal category.

(b) For the purposes of this Certification Specification, the following definition applies:

'Continued safe flight and landing' means an aeroplane is capable of continued controlled flight and landing, possibly using emergency procedures, without requiring exceptional pilot skill or strength. Upon landing, some aeroplane damage may occur as a result of a failure condition.

The most striking example is the one of the loss of control, which may lead to stall or spin. Formerly, even for an aeroplane certified in normal category and non-acrobatic, not authorised for spin, spin tests represented 3 weeks of flights in order to try different weights, balances and engine powers. In addition to that, tests were also performed for stall.

Thanks to amendment 5, the focus is on the case that generates the greatest number of fatal accidents, which is the loss control in the last turn. The aeroplane should not overturn in case of stall. By focusing on the flight qualities in that phase, safety is improved while alleviating the certification procedure. This method of demonstration of conformity was first put into practice with the Elixir.

Implementation to other programs

The 'amendment 5' philosophy offers means of compliance that weren't formerly accepted such as in-service experience. Some manufacturers have used this new possibility to receive the EASA approval for some modifications. This has eased the demonstration of conformity, by making it at the same time realistic and simplified; this is very positive.

Others have used amendment 5 with success for the approval of some Supplemental Type Certificates. This new approach, which focuses on the real safety of the aeroplane, allows a certain degree of pragmatism and at the same time promotes efficiency. It allows as well, and that is very important, the certification of innovating features by offering to the EASA a method of demonstration of the conformity tailored to particular cases.

Conclusion

As a conclusion, the certification of an aeroplane still requires a great effort. In this long-term endeavour, the choice of amendment 5 of regulations CS-23 happened to be positive for Elixir as well as for other aeroplanes. This regulation allows an approach closer to the reality and the operations of a small aeroplane, and I am convinced that the result is a better safety level for aeroplanes, modifications and STCs.

The philosophy of this regulation simplifies certification, enhances safety level and promotes innovation. The next significant regulatory change to come is the publication of Part 21 Light by the EASA, which will authorise a declarative regime for aeroplanes in the AESA scope, but we will talk later about that!

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