Requirements and Recommendations: A Chat with Certifiers

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Today, we will drive us to certifying aerospace certification authorities, particularly those focused on aeronautics, civil and military certification; but the emphasis on this occasion will be in the civil area. The message is also important applicants who intend to certify their products. Follow us and reflect.

The theme proposed can, occasionally, brings endless discussions, in terms of interpretation. Care must be taken in such interpretations, to avoid unnecessary work on the part of the certification applicant, since this can bring them costs and consequently higher prices for their products. This, of course, does not interest mainly to those of the end of the rope, that is, those who purchase the product..

When we speak to aircraft certification, almost always we refer to the FAA certification agency (Federal Aviation Administration) and, consequently, to our ANAC, due to the similarity of its regulations with those of the FAA. We believe, for its history, that the FAA is an excellent model for the certification area, and our theme is strongly linked to that agency.

Generally, the FAA enters its aeronautical requirements in the popular FAR (Federal Aviation Regulation). Of particular importance for this MSC, we quote the FAR FAR 23-1309 and 25-1309, dealing with systsafety assessment. .

is conhecidos pela sigla AC.

In its early days, the FAA, realizing the difficulty of applicants in interpreting its requirements, inserted into your FARs, decided to issue the help documents called Advisory Circulars, more commonly known by the abbreviation AC.

However, the agency has always made it clear, on the first page of those documents, their content was not a requirement, ie would not be mandatory, as it is only a help, a suggestion to applicants in their demonstration activities of the project compliance of their aircraft or systems with the requirements contained in the FAR.

Unfortunately, the FAA's goal has not been completely achieved, at least in relation to the listed FARs. In other words, the AC didn't help much the applicants, in their activity of compliance demonstration with the safety requirements established in the mentioned regulations.

The aeronautical community felt the need to have clearer procedures, trying to reduce, as much as possible, the need for discussions with the Certification Authority.

With this noble intention, there were committees coordinated by SAE International, with the presence of FAA engineers and representatives of the aviation community that developed aeronautical systems.

Finally, among others, they have been issued two sets of important recommendations condensed in SAE ARP 4754 documents and SAE ARP 4761 (v. Ref. 5 and 6).

These documents have become an extension of AC relating to paragraph 1309 of Part 25, but ended up becoming an extension of similar AC relating to

Parts 23, 27 and 29. The Authority has ensured that recommendation, through AC 20-174 (Ref. 3.

But look: they are recommendations and not requirements, that is, and not mandatory.

It was from there that settled the "problems" that we will treat then.

The SAE ARP 4754 and 4761 became feverishly studied by the civil aviation community, and have become models for this segment.

However, the issue was just one: these documents would be requirements or recommendations? Well, the ARP acronym denotes that they are just recommendations: Aerospace Recomended Practices. These documents have, even on the first page, the same recommendations in the AC, to which they relate, ie they are simply recommendations. Therefore, we consider them as an extension of their AC.

Said in other words, the applicant for certification is not required to follow them. He can perform the certification by own methods, provided these methods allow them to prove, to the satisfaction of the certifying authority, the compliance of their designs with the requirements of the respective FAR.

Why the CA emphasizes both the AC or its extensions reflected, for example, in ARP 4754 and 4761, are only recommendations?

Answer, with high possibility of being certain, saying that if the Certification Authority imposed, for example, a systems engineering methodology (case of ARP 4754) to a manufacturer of aeronautical systems, she would simply be, with great chance, cluttering up the intrinsic capabilities of the company. Let the engineers seek the best technologies, thinking, among other things, the safety of the systems engaged.

Now, we're specifically writing to segments of aeronautical certification, appealing so they don't turn to the applicants recommendations on requirements. This appeal is not important, it's very important.

If he applicants have their own methodologies to demonstrate compliance with the requirements of their designs, listen to them, giving them this freedom. Let the mind of our engineers to flow solutions maybe never before thought, and may turn into new recommendations and, who knows, even in requirements.

We conclude, telling to the certifiers and especially to certification applicants: requirements are mandatory, and recommendations are just an aid. Applicants may follow them if they believe that they should do so, *but not turn them into requirements.*

muito com nossa indústria aeronáutica.

By doing so, you will be collaborating a lot with our aviation industry.

See you.

References:

(1) **FAA**: CFR 14 Part 25 § 1309, Equipment, Systems, and Installations, Amendment 25-123, USA, 11/8/2007.

(2) **FAA**: AC 25.1309-1A, System Design and Analysis, USA, 06/21/1988.

(3) **FAA**: AC 20-174, Development of Civil Aircraft and Systems, USA, 9/30/2011.

(4) **FAA**: AC 23.1309-1E, System Safety Analysis and Assessment for Part 23 Airplanes, EUA, 17/11/2011.

(5) **SAE**: ARP 4761, Guidelines and Methods for Conducting the Safety Assessment Process on Civil Airborne Systems and Equipment, EUA, 01/12/1996.

(6) **SAE**: ARP 4754, Guidelines for Development of Civil Aircraft and Systems, Rev. A; EUA, 12/2010.