



THE VIEW FROM WASHINGTON

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Global Aviation: Divided by a ‘Common Language’

“Britain and America: two great countries divided by a common language.” — Winston Churchill

For aviation, I would add to this quote: We are but a hundred different authorities all divided by a common language — our regulations.

While every country has its own regulations, with the establishment of the European Aviation Safety Agency (EASA), there really are only a handful of regulatory “systems” in use throughout the world today.

Most AEA members are familiar with the U.S. Federal Aviation Regulations (FAR); European Aviation Safety Agency Implementing Regulations (IR); Transport Canada Civil Aviation Regulations (CAR); New Zealand Civil Aviation Regulations (CAR); and Civil Aviation Safety Regulations (CASR) of Australia.

The one thing each of these systems has in common is they all are printed in English.

The Convention on International Civil Aviation, signed on Dec. 7, 1944, in Chicago, established a standard language of international flight; however, it really doesn’t have much bearing on the maintenance and alterations of aircraft. Yet, because of the global nature of aviation and the constant movement of aircraft being sold internationally, understanding the languages is all the more important.

Recently, the ICAO addressed the use of the English language as a standard language and pointed out it was

not a statement of politics but rather an affirmation of safety. When aircraft transit every country around the globe, having a standard language is simply a factor of safety.

The common use of English in the maintenance and certification of aircraft is not a statement of politics, but a necessity of global commerce.

Although the regulations are in a common language, the meanings of the regulations are slightly different, and the requirements to the regulations are slightly, but critically, different.

This month, I hope to explain “major” and “minor” through three different regulations and to explain the data approval process in the U.S., because there are a number of avionics products for which root approvals begin in the U.S. FAA regulatory and certification system.

Major and Minor Alterations

In Canada and Europe, there are essentially only one major and one minor classification. Under FAA regulations, there are two major and two minor classifications. Therefore, it is important to understand the “major” and “minor” to which you are referring.

In changes to the “type design,” each of the regulatory authorities seems to be pretty close.

Under CAR 101.01 of Canada, a major modification means “an alteration

to the type design of an aeronautical product in respect to which a type certificate has been issued that has other than a negligible effect on the weight and centre-of-gravity limits, structural strength, performance, powerplant operation, flight characteristics or other qualities affecting its airworthiness or environmental characteristics.”

Under U.S. FAR Section 21.93 (with a few exceptions), a minor change is one with “no appreciable effect on the weight, balance, structural strength, reliability, operational characteristics or other characteristics affecting the airworthiness of the product. All other changes are major changes.”

According to European Commission Regulation (EC) No. 1702/2003, Section 21A.91, a minor change is one with “no appreciable effect on the mass, balance, structural strength, reliability, operational characteristics, noise, fuel venting, exhaust emission or other characteristics affecting the airworthiness of the product. Without prejudice to 21A.19, all other changes are major changes under this subpart.”

Clearly, modifications (or changes) to the type design are addressed similarly in each of these three regulations. The definition of a major change in type design is consistent between each regulatory system. And each system essentially requires the application for

a supplement to the type certificate as a result of introducing a major change in type design into the type-certificated product.

There is a slight difference in application, however. In both the European system and the Canadian system, if a flight manual supplement is necessary to amend the approved sections of the flight manual, the authorities will regard the modification as a major change to the type design. This is not necessarily the case in the FAA system. Under the FARs, the flight manual supplement and the change in type design are uniquely separated in the regulations — in most cases, the supplement is a result of the alteration; it is not the alteration itself.

Where the regulatory systems differ is in how they address minor changes to the type design. In each case, it is at the discretion of the authority; however, in the U.S. regulatory structure, the regulations themselves define the second major — a major alteration.

A major alteration is defined in Part 1 of the FARs; specific alterations that are major are defined in Appendix A to Part 43. The Part 1 definition of a major alteration is similar to the definition of a major change in type design, including weight, balance, structural strength, performance, powerplant operation, flight characteristics or other qualities affecting airworthiness.

Usually, they are defined simply as a degree of change. If an antenna installation would appreciably affect the structural strength of the fuselage but is brought back to the original strength through a doubler, the alteration would be considered major because, if the doubler was designed incorrectly, it “might” affect the structural strength of the fuselage.

The other area of this definition for which industry gets caught up in is the “other qualities affecting airworthiness,” because this is where changes to

the aircraft interior designs come into play.

The rest of the Part 1 definition of a major alteration is that the alteration is major if the alteration is not done according to accepted practices or cannot be done by elementary operations.

Appendix A to Part 43 further describes major alterations by stating, “Alterations of the following parts and alterations of the following types, when not listed in the aircraft specifications issued by the FAA, are airframe major alterations.” (Paragraphs A.2, A.3 and A.4 define major alterations of powerplants, propellers and appliances.)

The beauty of this statement is, by regulation, any alteration listed in the “aircraft specifications issued by the FAA is not a major alteration.”

What are the requirements for a major alteration? The installer must use “approved” data; the alteration must be recorded on FAA Form 337; and a logbook entry must be made documenting the alteration.

According to FAA Advisory Circular 43-210, there are 19 sources of “approved” data that can be used for major alterations. The most common are:

- STC data, if it specifically applies to the item being altered.
- DER-approved data with FAA Form 8110-3, “Statement of Compliance with the Federal Aviation Regulations,” but only within authorized limitations assigned to the DER.
- Designated alteration station FAA-approved data.
- Service bulletins and letters specifically approved by the Administrator under a technical standard order, PMA or other TC’d basis.
- Other data approved by the Administrator.

Note: It is only the “other data approved by the Administrator” that is defined as a “field approval;” the other 18 sources of “approved data” are just that — approved data.

The most common kind of field approval is when the FAA inspector examines and approves the data for only one aircraft. The applicant submits data acceptable to the Administrator (such as drawings, photographs, a previously approved FAA Form 337, maintenance manuals, and so forth) and relevant to the major alteration. Then, the FAA inspector reviews the data package and, if it is found appropriate and complete, the FAA inspector signs Block 3 of the applicable FAA Form 337, declaring the attached data is approved. This is the only time Block 3 of the FAA Form 337 is used.

The data approval process in each of the major regulatory structures is similar; the challenge has been to understand what each system requires and understanding the “slang” of each process.

Many alterations of U.S. aircraft are referred to as a “337,” and many people refer to FAA Form 337 as a “field approval.” Both of these cases are incorrect. FAA Form 337 is only the form used to record a “major alteration” (including STCs); it has no meaning as to the type of data used to return the aircraft to service.

An FAA Form 337 might be used to record a modification using an STC or it might be used to record the installation of a service bulletin. It is simply the form used to record all major alterations.

At the end of the day, each regulatory authority exerts the same oversight for the modification process. The only thing truly separating the regulatory process is the sovereignty of the country — the regulatory processes actually are very similar, only separated by a common language. □

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