



# THE VIEW FROM WASHINGTON

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## A Very Important Question: Why?

**R**ecently, I received a call from a longtime acquaintance who was having another “discussion” with his local FAA office. He had performed an alteration using the AEA’s “Evaluating an Alteration” checklist and came to the conclusion that the alteration was a minor alteration.

As many similar conversations often begin, he explained the alteration to me and added that his inspector wanted him to record the alteration on an FAA Form 337. And, oh by the way, get the data field approved, too.

And my question was: Why?

Without a doubt, “why” is one of the most important questions you can ask. The basis for the aviation safety inspector “recommending” a field approval may be that the inspector’s previous experience included a similar installation that was field approved. Or, maybe there is recent guidance that tells the inspector to address these types of alterations. Or, maybe the inspector just has a philosophy that any alteration is major, regardless of what the regulations say. Therefore, “why” is a very important question.

Asking why is not a question that challenges authority. But, rather it is a question to discover what “they know” that you hadn’t considered or what they hadn’t considered. As it turned out, in this case the “applicant” had not considered all of

the issues and after we walked through the process, asked the questions and evaluated the products (a non-approved PFD), the FSDO was more right than the applicant. In fact, the alteration was major.

If you have an inspector who believes that all alterations are major, don’t waste your time arguing your case. Simply take the issue up the chain of command and have a discussion with the supervisor and/or office manager. The regulations are clear. There are three levels of changes to type certificated products: a major change in type design, which requires an application for an STC; a major alteration, which requires approved data; and, a minor alteration. If your inspector doesn’t recognize all three changes supported by the regulations, then start up the supervisory chain until you reach a supervisor who recognizes the regulations.

For the benefit of our international members, an alteration and a modification are not synonymous. Technically, a major mod is a “major change in type design.” A major mod is treated the same worldwide. With few exceptions, they require a supplemental type certificate (14 CFR 21.93). Unique to the FAA system, minor mods are divided into major and minor alteration. Over the years, there have been a number of cases where a major alteration really should have been treated as a major change in type design (major

mod) and should have been performed via an STC, but these cases are rare. The one significant difference in major mods comes from the treatment of flight manual supplements. In the FAA system, the FMS is amended as a result of the change. It does not, in and of itself, create a need for an STC. On the other hand, many other authorities consider the FMS change a change to the aircraft and can, by itself, generate the need for an STC.

Because the regulations are clear that an STC is higher than a major alteration, and a major alteration is higher than a minor alteration, we perform a “top-down” analysis for an alteration starting at the highest level of approval (STC) and work down through the regulations. If at any point of the analysis you answer affirmative to a question, the change is defined at that level of the regulation.

The logic of the evaluation is simple, and the regulations are clear. “A minor alteration means an alteration other than a major alteration.” And, as has been told many times, the criterion for a major alteration is defined by regulation. As a result, the AEA was able to develop a checklist that is widely used in evaluating an alteration. The checklist is based on the regulations and follows the alteration logic of FAA Advisory Circular (AC) 43-210, Standardized Procedures for Requesting Field Approval of Data,

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Major Alterations and Repairs. (The AEA checklist is an exclusive member tool and can be found on the members-only section of the AEA website: [www.aea.net](http://www.aea.net).) Generally speaking, if the alteration does not meet at least one criterion of a major change in type design or a major alteration, the alteration is minor. However, like life, there are always exceptions.

For those who regularly use the AEA checklist, Decision Tree for Avionics Alterations, the final two items require research into policy. If you get to the last two items, the alteration does not meet the strict regulatory requirement of a higher level alteration. However, § 21.95 says that minor changes in a type design are approved under a method acceptable to the FAA. So, while an alteration may be technically minor, the Administrator can, and regularly does, require that an alteration be treated as if it were major.

A good place to start your search for policy is FAA Order 8900.1, Volume 4, Chapter 9, Selected Field Approvals. Figure 4-68 is titled, Major Alterations Job Aid. The job aid is divided into four sections: general aviation aircraft; rotorcraft; transport airplanes; and engines, propellers and APUs. If you “ask” your ASI for their opinion about a particular alteration, this job aid will guide your inspector. As a result, it also provides good guidance for the applicant. If the job aid requires an al-

teration to be accomplished via an STC, the Administrator has deemed that this type of alteration should be treated as if it were a major change in type design.

For example, according to FAA policy, the installation of avionics systems that are intended to perform critical functions, or involving complex interfaces to other systems, require an STC, as do head-up displays, enhanced flight vision systems, synthetic vision systems used for primary navigation and traffic alert and collision avoidance systems II.

There also are two classifications of alterations listed in the job aid to pay particular attention to: EVL and ENG. When an item is listed with either of these codes, the applicant should consider not applying for a field approval, but rather use an appropriately rated DER. Flight Standards ASI’s have not been delegated authority to approve data for every alteration. These codes indicate types of alterations that require the ASI to seek support from their Aircraft Certification Office. As anyone knows who has had to work one of these coordinated field approvals, the time expectations can be prohibitive. You will save money by seeking a qualified DER for these projects and bypassing data approvals at the local FSDO.

For example, all terrain awareness and warning systems (TAWS-A and TAWS-

B) not listed in FAA InFO 08047 require that the alteration be EVL (evaluated) before a field approval may be granted. This clearly would require the involvement and coordination of a second FAA office (ACO). To minimize the delays and impact to your customer, this is a prime candidate for a DER data approval.

You also need to review ACs for pertinent guidance. For instance, AC 20-138A requires that although there are several Technical Standard Orders that apply to the design and certification of GNSS systems, the AC requires that each TSO’d article obtain a first-time airworthiness approval through TC or STC.

Please note: GNSS (Global Navigation Satellite System) is a generic term for satellite-based navigation, including GPS, SBAS, GBAS, GLONASS and any other satellite navigation system.

The AC continues to address subsequent installations. According to the AC, “For installation of TSO’d articles after the first-time STC, the extent of FAA involvement and review for a given installation depends on the characteristics of the installation.” The AC continues with guidance that the installation should be evaluated to classify the installation and determine the type of approval vehicle. The AC guidelines follow consistent FAA phi-

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losophy of a top-down analysis from major change to type design, to major alteration and, finally, minor alteration. This is one of those areas where many ASI's have failed to keep up with the latest guidance, or in some cases, reject headquarters' guidance altogether.

Under the original AC 20-138, installation of GPS equipment required the use of approved data under an STC or major alteration, because GPS was a new and unique technology. However, since GPS technology is now common and considerable experience has been obtained in the installation of GPS, the FAA has made it clear that approved data for every installation is no longer appropriate. Instead, installations that do not qualify as major alterations above should be accomplished as minor alterations.

This guidance also is applicable to WAAS upgrades of previously installed equipment.

An often overlooked item in the AC addresses GNSS equipment that is installed for VFR use only or in aircraft that are not approved for IFR use. GNSS equipment may be installed on a no-hazard basis as a supplement to VFR navigation. GNSS installations limited to VFR use only should be evaluated under the same criteria as described above.

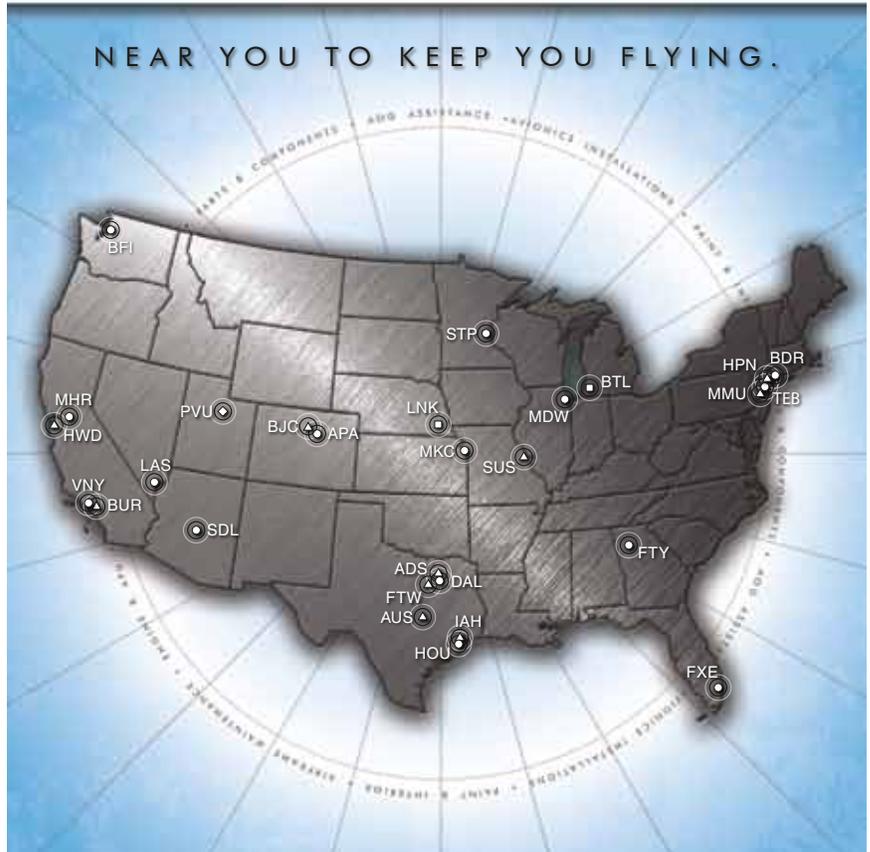
So, back to the original alteration. The physical alteration to add VFR only, non-interference avionics was minimal. However, the policy regarding the installation of this type of equipment shows that the administrator wants all such installations to be treated as if they were major. And, once this happens, the data to support the conformity of the non-approved PFD, in addition to the alteration data, was also required to be approved.

As a result, this "cheap" alternative proved to be more expensive than using an available certified product under the provided AML-STC. □



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— Eddie Avedikian, Assistant Director of Maintenance, Avjet Corp.

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