# The View from Washington

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I'd like to start the View this month by thanking the FAA and Transport Canada inspectors and engineers who attended this year's AEAconvention. Your attendance helps make our program that much more valuable to our membership and at the same time, I hope the program provides you with solid training and information about advanced systems that isn't easily obtainable elsewhere. Thanks again for taking the time to join us in Las Vegas and especially to those that stopped by to chat for a few minutes.

I would ask the government officials who attended to provide me with your feedback on how we can make this program better for you. You can e-mail me at ricp@aea.net

Training is such a valuable tool for industry that the Association spends an enormous amount of time developing quality programs for the membership not only in formal settings such as the AEA's annual convention and the six regional meetings but also in the various articles in *Avionics News.* In addition to the AEA-sponsored events, we also participate in numerous local FAA/industry sponsored training programs, so for those members that cannot attend an official AEA event, I hope we can meet at one of the local programs in your community.

This month, I'd like to highlight two issues that have originated from various local events: The first, spoken by a local FAA inspector following a presentation on "Evaluating Alterations" and the second, regarding IA qualification for performing avionics installations.

Both issues are actually related. They have to do with the qualification of the person performing alterations and the role and responsibility of the FAAto oversee the process and ensure that the performance of maintenance is in compliance with federal regulations.

Following a presentation I recently presented on "Evaluating Alterations," the local FAA inspector got up (and very unprofessionally, I might add!) stated that the presentation was all fine and good, but here at ****** FSDO we do it our way! Well, sorry but in the United States, we do it the way the FAAAdministrator says we do it. Get over it!

However, the FAA is not unique here. The Civil Aviation Authorities throughout the world sets the standards, the local inspectors implement those standards, and the ability of the local inspector to adlib their interpretation is very limited.

But having said that, the inspector's point was that the presentation was fine in content, but in actual practice wasn't reliable and to provide reliability, the local FAAoffice still wanted to be involved in every decision about major and minor alterations. Somewhat contrary to FAApolicy and guidance, but I don't completely disagree. The decision tree that supports the findings of major or minor in alterations is a complicated tool that takes practice and discipline to use reliably. But to the inspector: "don't reject the tool simply because you don't understand it."

Since the local FAA inspector had not used the tool, he was not comfortable with its ability to reliably guide the user to a repeatable, defendable determination of major or minor with regards to an alteration. The fact is that the use of AEA's decision tree as presented at AEA regional meetings and at the convention is more reliable and more defendable than the inspector's visual image of an alteration and their arbitrary determination of major or minor.

But the skills for using the decision tool needs to be developed and it takes extra effort to use it correctly. The applicant must begin to use the tool on simple projects and develop their skills progressively so that when difficult projects are evaluated, their skills have been developed to support the task. And, by working with the FAA as you develop those skills, the local FAA inspector's knowledge of the program and understanding of the evaluation process will also grow.

Interestingly enough, the process of evaluating alterations is not new, it is only the analytical tool as presented at the convention and regional meetings that is the "new tool." And like any new tool, there are those who have performed that task for years using outdated methods and are comfortable with it that don't understand the "new tools" and reject them. Then there are those with an open mind who evaluate the "new tool" and learn how to use it and improve their own efficiency. To the local inspector: which do you choose to be?

The other issue I'd like to address is: Can an IA install avionics equipment? Answer: "No, a basic IAcannot install avionics."

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# Frequently Asked Questions

## TOPIC: Applicability of Advisory Circulars

**QUESTION:**
Can an FAA inspector reject the use of a published AC?

**ANSWER:**
No, not if the AC is applicable to the task being performed and the procedures in the AC are followed.

It is widely understood that an Advisory Circular is just that "advisory" and that it may show "a means but not the only means" of compliance with a regulation. In fact, most current ACs contains language in the Purpose section that indicates that "Like all AC material, this AC is not mandatory and does not constitute a regulation." Or other AC contain the language such as: "The material presented in this AC describes an acceptable means, but not the only means, to comply with the referenced regulations."

Advisory Circular 00-2.14 explains that the FAA issues advisory circulars to inform the aviation public of non-regulatory material. Unless incorporated into a regulation by reference, the contents of an advisory circular are not binding on the public. The public may, at their discretion, choose to develop and apply for an alternative means of compliance to a particular regulation rather than following the guidance in an AC.

The AC goes on to explain that an AC is issued to provide guidance and information to show a method for complying with a related Federal Aviation Regulation that is acceptable to the Administrator.

Therefore, while an AC may not be binding on the public, it does show an acceptable means of compliance to the FARs, and for that reason, must be accepted by the local FAA inspector.

*Note: AEAoffers these Frequently Asked Questions (FAQs) in order to foster greater under - standing of the rules that govern our industry. AEA strives to make them as accurate as possible at the time they are written, but rules change so you should verify any information you receive from an AEA FAQ before you rely on it. AEA DISCLAIMS ANY WARRANTY FOR THE ACCURACY OF THE INFORMATION PROVIDED. This information is NOT meant to serve as legal advice – if you have particular legal questions, you should contact an attorney.*

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The key word here is "basic." A fully trained, equipped and qualified mechanic can install a basic, stand-alone avionics system and approve the aircraft for return to service. However, the average IAis NOTproperly trained, is NOT properly equipped, and, in most cases, is NOT qualified to install, test and approve for return to service an aircraft after an avionics installation. And this holds true for experimental aircraft as well as certificated aircraft. While the aircraft may be experimental, the avionics are not!

But, so that I don't digress too far, let's focus on certificated aircraft for the time being.

The Federal Aviation Regulations (FAR) are pretty specific in that a mechanic is explicitly forbidden to perform any repair to, or alteration of, any instrument. So right off, the average mechanic cannot install any avionics system that interfaces with an existing autopilot or places a switch in line with a CDI. Keep in mind that section 65.81 of the FARs does not prohibits a mechanic from performing just major alterations to instrument, it prohibit mechanics from performing ANY alterations to instruments. And for those who need a quick refresher in the definition of an instrument, the FARs define an instrument as "a device using an internal mechanism to show visually or aurally the attitude, altitude, or operation of an aircraft or aircraft part. It includes electronic devices for automatically controlling an aircraft in flight."

What about a basic, stand-alone avionics system? The answer is: maybe!

Before a mechanic can approve an aircraft for return to service following the installation of a piece of avionics equipment, that mechanic must have satisfactorily performed the work at an earlier date. In addition, the mechanic

must have the current instructions of the manufacturer, and the maintenance manuals for the specific operation concerned.

Section 43.13 of the Federal Aviation Regulations requires that each person performing maintenance and/or an alteration on an aircraft shall use the methods, techniques and practices prescribed in the current manufacturer's maintenance manual or Instructions for Continued Airworthiness prepared by its manufacturer, or other methods, techniques and practices acceptable to the Administrator. Section 43.13 goes on to require that the individual shall use the tools, equipment, and test apparatus necessary to assure completion of the work in accordance with accepted industry practices. If special equipment or test apparatus is recommended by the manufacturer involved, they must use that equipment or apparatus or its equivalent acceptable to the Administrator.

So from the FARs perspective, the IA is qualified to install basic, standalone avionics systems provided that they have training similar to the training required of an avionics technician, documented prior avionics installation experience, and have the test equipment similar to an avionics repair station.

However, the qualifications don't stop there. (And this is where we can include all aircraft installations both in certificated and non-certificated aircraft.) The Federal Communications Commission (FCC) Regulations (14 CFR PART 87, Section 87.73) requires that "a general radiotelephone operator must directly supervise and be responsible for all transmitter adjustments or tests during installation, servicing or maintenance of a radio station."

So the FAArequires the IAto follow the installation and testing instructions provided by the avionics equipment manufacturer, however, the IA cannot perform the post installation test procedures of a transmitting piece of equipment unless they hold a FCC general radiotelephone operator license.

The bottom line here is that the FAAhas a role to play in ensuring the installation of avionics systems are done properly using the appropriate data, equipment, and by qualified personnel regardless if the person performing the installation is a repair station or an individual IA.

As you can see both issues are related. Both issues have to do with the qualification of the person performing alterations and the role and responsibility of the FAA to oversee the process and ensure that the performance of maintenance is in compliance with federal regulations. For one issue we have a new tool; and for the other, the tools have been around for years. Both issues can be solved if the FAAand industry work together to utilize the tools that have been provided. ❑

# Regulatory Update

## United States

### Electrical Equipment and Installations, Storage Battery Installation; Electronic Equipment; and Fire Protection of Electrical System Components on Transport Category Airplanes

On March 16, 2004, the Federal Aviation Administration (FAA) amended 14 CFR Part 25 which governs the airworthiness standards for transport category airplanes concerning: electrical equipment, nickel cadmium battery installation and storage, electrical cables, design and installation of electronic equipment, and fire protection of electrical system components. The FAA states that adoption of these amendments eliminates significant regulatory differences between the airworthiness standards of the United States and the Joint Aviation Requirements of Europe, without affecting current industry design practices.

The amendment affects the following section of Part 25:
Sec. 25.1353(a): Electrical equipment and installations.
Sec. 25.1353(c)(5): Storage batteries
Sec. 25.1353(c)(6): Storage batteries
Sec. 25.1353(d): Electrical cables and cable installations.
Sec. 25.1431(d): Electronic equipment
Sec. 25.869(a)(4): Fire protection systems.

### Airworthiness Compliance Checklists for Small Airplanes during Major Alterations

The FAA's Small Airplane Directorate has issued a draft Advisory Circular (AC) on Airworthiness Compliance Checklists for Small Airplanes during Major Alterations for comment. This advisory circular (AC) is intended to provide guidance material for the creation and use of airworthiness compliance checklists for small airplanes. These compliance checklists will be used by Airframe and Powerplant (A&P) mechanics with Inspection Authorization (IAs) and Airworthiness Safety Inspectors (ASIs) while planning, facilitating, and

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executing a major alteration data package submission to the FAAfor approval. They may be used as a planning tool to determine the return to service documentation requirements while performing common major alterations.

Comments are due on May 7, 2004.

### Proposed Policy for Flammability of Electrical Wire Used in Part 23 Aircraft per 14 CFR, Part 23, Sections 23.853 and 23.1359.

The FAA's Small Airplane Directorate has issued a proposed policy on the Flammability of Electrical Wire Used in Part 23 Aircraft.

The FAA was recently asked to clarify policy on the flammability of MIL-W 22759/16 and /18 wire and coaxial cable per MIL C-17.

AC 43.13-1B, Section 7, paragraph 11-85a, states that the wires in Tables 11-11 and 11-12 "have been determined to meet the flammability requirements of Title 14 of the Code of Federal Regulation (14 CFR) part 25, § 25.869(a)(4), and the applicable portion of part 1 of Appendix F of part 25." Section 25.869, Fire protection: systems, paragraph (a)(4), states, "Insulation on electrical wire and electrical cable installed in any area of the fuselage must be self-extinguishing when tested in accordance with the applicable portions of part 1, appendix F of this part." The applicable portion of appendix F of part 25 is part 1, paragraph (a)(3), which states, "Insulation on electrical wire or cable installed in any area of the fuselage must be self-extinguishing when subjected to the 60 degree test specified in part 1 of this appendix. The average burn length may not exceed three inches, and the average flame time after removal of the flame source may not exceed 30 seconds. Drippings from the test specimen may not continue to flame for more than an average of 3 seconds after falling."

Section 23.1359 is the most severe test requirement for part 23 aircraft. It has the same test procedure, burn length, and flame times as part 1 of Appendix F of part 25. Therefore, in meeting § 25.869(a)(4), wire in AC 43.13-1B meets the most severe requirement in part 23 and exceeds the earlier flammability requirements.

Electrical wire flammability requirements vary based on aircraft category and amendment level.

The proposed policy clarifies that for normal, utility, and acrobatic categories certified before Amendment 23-49, all parts, including wiring, are required to be flame-resistant per § 23.853 (as defined in 14 CFR, part 1). For commuter category aircraft certified before Amendment 23-49, all materials, including wiring, must be self-extinguishing per § 23.853 and part 23, Appendix F. And for all part 23 categories included under Amendment 23-49 or later, § 23.1359 and part 23, Appendix F, requires self-extinguishing insulation on electrical wires and cables.

Comments were due on April 26, 2004. Even though the comment period has passed, the FAAusually accepts constructive comments after the close of the comment periods.

### Policy on Circuit Breakers and Fuses

The FAA's Small Airplane Directorate has been busy of late. They also published a final policy on Circuit Breakers and Fuses which clarifies Section 23.1357(d).

The policy statement provides clarification on installed circuit breakers, which includes either primary or secondary (in-line) circuit protection. It also clarifies policy contained in advisory circular AC-23-17A. The policy applies to normal, utility, acrobatic and commuter category airplanes as well as non-rigid airships certificated in the normal category with nine seats or fewer, excluding the pilot's seat.

Since its original effective date in 1965, 14 CFR part 23, § 23.1357(d), has stated that "If the ability to reset a circuit breaker or replace a fuse is essential to safety in flight, that circuit breaker or fuse must be so located and identified that it can be readily reset or replaced in flight."

The applicability of the statement from 14 CFR part 23, § 23.1357(d), depends on whether a function is determined to be "essential to safety in flight." There are two criteria, dependent on the certification basis of the system, that are used to define "essential to safety in flight," as used in 14 CFR part 23, § 23.1357(d). They are: (1) For airplane systems with a certification basis at Amendment 23-40 or earlier: When the function is required by the applicable airworthiness or operational requirements, as listed in 14 CFR part 23, 14 CFR part 91, or 14 CFR part 135, it is considered "essential to safety in flight;" or (2) For airplane systems with a certification basis at Amendment 23-41 or later: When the failure condition of the loss of the function is determined to be "major," "hazardous," or "catastrophic" [according to § 23.1309 and AC 1309-1C safety assessment, which also considers operational and airworthiness requirements], it has a significant impact on safety in flight and is considered "essential to safety in flight."

If the above criteria show § 23.1357(d) applies, and if the circuit protection devices are internal circuit breakers or fuses that cannot be reset by the pilot, an equivalent level of safety or an exemption is required.

For systems certified using the above criteria under Amendment 23-41 or later, it is acceptable for required equipment whose failure is considered "minor" under § 23.1309 to not meet § 23.1357(d). However, § 23.1357(a) still requires the applicant to show that the resulting design does not present a safety hazard. ❑