FAA "Taxes" General Aviation

The cost of safety is not always obvious

BY GARY PICOU

Most aircraft owners may have a business model in mind when they look at an avionics shop. They assume the shop is a business that buys parts, marks them up, adds a labor charge, factors in administrative and utility costs, and bases a job estimate to make a profit. If that formula works for the plumber, why not for the avionics shop?

Not only does the labor rate (and therefore the cost of regulations) vary by 50 percent across this great land, but the exact cost is determined by the regulatory knowledge of both the avionics facility and the FAA inspector.

If only it was that easy. There are hidden costs that are associated with the Federal Aviation Administration's oversight of the aviation industry. This is a fact of life, and around the hangar pilots complain about it, "Oh, they just automatically charge more when it says 'aviation' on the label."

Wait just a minute, please. It IS true that everything from a 3/8-inch nut to a DVD player to an air filter DOES cost more when "aviation" is involved. But there is a reason.

In America, we are lucky for many reasons. One reason is that the FAA does not attach a user fee on their professional services. General aviation funding comes from the taxes we pay on avfuel. The FAA provides guidance, approves products and accessories, and provides weather and safety information without a direct charge to the user. But the FAA inspector or engineer is only part of that equation. For every action by the FAA, there is a reaction on the industry side, the commercial, retail side, the BUSINESS side. This activity must be accounted for in order for the business to remain a viable enterprise.

However, there are costs involved that the aircraft owner needs to be conscious of, and understand. These costs must be passed along to the consumer, or else the business will fail. They are a "cost of doing business" in aviation. This cost is not identified as a line item on an invoice, but perhaps it should be. This is a difficult cost to nail down, though.

Not only does the labor rate (and therefore the cost of regulations) vary by 50 percent across this great land, but the exact cost is determined by the regulatory knowledge of both the avionics facility and the FAA inspector. Sometimes the inspector would request a change in a manual or installation documentation, the shop would make the changes, and later discover that they were unnecessary as both parties further investigated the situation. Although the FAA doesn't charge for their services, errors or misunderstandings can be costly for the industry and the customer.

Starting an aviation business

So you want to start an avionics shop? That is great news; our industry needs a strong network of qualified professionals. We have to warn you, the cost of entry is steep.

After you have come up with a facility (hangar, ramp, office space, etc), $100,000 or more in test equipment, plus all of the maintenance manuals and data you can get your hands on, THEN you need to be approved by the FAA as a Certified Repair Station. You can't even apply for certification without all of the requirements in place.

This process can take anywhere from three months to more than a year, with six to nine months the typical time. This depends on the FAA workload, how good a job you do in preparation, your avionics skills, and so on. But consider the impact of investing in a capital-intensive business without the possibility

of income, let alone a profit, for a year. You wouldn't be able to use the Repair Station to work on an airplane until certification is received.

That is a daunting prospect for any businessperson; you could open and close several restaurants in that amount of time.

RSM/QCM

The key to running an FAA-certified repair station is the Repair Station Manual, Quality Control Manual and Training Manual. These documents are the only way that the FAA knows that a certified repair station is operating within the regulations, short of catching them running afoul through an audit, or discovering a safety violation in a crash investigation. These are important documents, and in the last couple of years have consumed countless hours of avionics shops' time.

In 2003, the FAA published the revised Part 145 Rule.

This was the result of the FAA's much appreciated effort to bring the regulations governing aircraft maintenance from the 1940's to the 21st century (well, late 20th, anyway).

This update was necessary, and the pain was equally shared by FAA and industry—with a good result, in the end. One of the things it revealed is how much documentation and verification is needed to certify that an airplane, part or appliance is safe for return to service. In addition, the regulations are clear, and always have been, for that matter, on the skills that a person should possess in order to work on an airplane.

The requirements for specialized, documented training are contained in yet–to–be released guidance that ultimately will ensure that every person who works in a repair station has the specific knowledge of the regulations to stay within the law.

Most of these manuals and efforts are aimed at keeping the FAA-approved facility in compliance with the regulations. The regulations themselves have a primary goal to ensure safety. There is no guidance toward being a successful business, and little about actually fixing airplanes, other than requiring the tools and manuals necessary.

For an avionics shop, that quality system, described in the FAA-accepted manual, details the shop's activities that will ensure that all work is done in accordance with regulations, and will result in a safe airplane. Each step of the work is explained, from who will do the work to where the parts come from, and where the technician will find the information about making the repair or installation.

The manual will even explain whom the shop will get to repair units that they don't have the manuals, training or time for. In a sense, each person, place, or thing that comes into contact with an airplane must be qualified.

A big part of the flowed-down costs is in the approval of subcontractors and suppliers. For instance, if Daylight Avionics wants to install a gyro overhauled by Moonlight Instruments, it is Daylight's responsibility to qualify that instrument shop's capabilities. This probably means that the manager of Daylight will send a questionnaire to Moonlight, which will take the time from overhauling gyros to fill out the survey, which says "yes, we are qualified." If Moonlight Instruments has other customers, such as the other 600 avionics shops in the United States, the number of qualifying surveys can become overwhelming.

Still, it is the repair station's responsibility to verify the qualifications of their subcontractors, even if these subcontractors and suppliers are already certified repair stations on their own. So, performing services they are not qualified for is a violation of federal law.

The time it takes to develop and maintain current RSM, QCM and training manuals is a double whammy- the manager is usually tasked with the job, which removes him as a productive team member.

Field Approvals & DERs

After the FAA-approved facility is in business, they may want to install some of the latest avionics into an airplane. That activity could require FAA approval of the installation, because, although the facility is certified, the airplane is certified, and the avionics are certified, there is no FAA-approved data that ties all of these items together.

This calls for a "Field Approval" wherein the FAA will bless a specific installation. To get a field approval, the installer should document the work on a Form 337 "Major Repair or Alteration," and submit it to the local FSDO. The act of completing the paperwork for a job, including the FAA inspector's changes and revision, can easily exceed 15 man-hours. This is two full days of paperwork, instead of productively pulling wires and bolting in antennas.

Still, if this seems like a wanton

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waste of avionics craftsmanship, remember that the only way the FAA can determine if the installation and the airplane are safe, without supervising every installation, is through a review of the documentation.

The FAA side of this paper process can take six months to complete. In a society of "get it NOW" and an industry of faster, higher, farther, the idea of waiting half a year for a bureaucratic nod is outrageous. But it is the world we work in.

With thousands of avionics installations going on, and only a handful of FAA avionics inspectors, most of the work of these certifications, has been left to designated consultants, Designated Engineering Representatives (DER).

These costs, in the $75 to $200 hour range, should be a line item on an invoice, because they are billed directly, unlike the FAA overhead.

Maintenance

The FAA controls who can perform what types of maintenance on any airplane through a capabilities list and/or a certified repair Station's "Operations Specification." By doing this, the FAA helps assure a higher level of safety, because it is another way to keep people from messing with things they don't know about.

To the aircraft owner, it is another hidden cost, because he may not know when he rolls up on the ramp that the avionics shop is not legally qualified to work on the make and model of autopilot in his make and model of aircraft.

The avionics shop has two choices, send him away to another facility or become qualified. To be qualified, the shop will have to: 1) buy the maintenance manuals, 2) buy the test equipment, and 3) attend training. The manuals are a few hundred dollars, test equipment runs about $10,000, and training is cheap ($850), but is one week long, either in some beautiful Midwestern or southern state, or some other location, but undoubtedly somewhere that requires travel.

Oh, there is one "kicker." The manufacturer doesn't support the autopilot anymore, so they don't offer training or test equipment. The avionics shop will have to find another way to add this important service to the capabilities list.

This brings the subject of a capabilities list self audit. Let's say that Daylight Avionics wants to work on the "AP340," because there are 15 planes on the field with this system. If they can show the FAA they have the training, tools and manuals to be qualified, they can add this to the capabilities list. By using a self-audit and a capabilities list, the shop won't even have to wait for the FAA to inspect their facility to add the capacity, as long as the shop follows an accepted protocol.

This is called a self audit, and the shop will buy the test equipment and manuals from another shop that doesn't need them, and either hire a technician that went to school in the past, or find a way to gather enough skill and knowledge that they can show is equal to the factory school.

Training

Naturally, as a consumer, you want to know that the guy with the test equipment and pointy things poking at your airplane is as highly trained as possible. The FAA, on the other hand, is only concerned that he knows enough to comply with the regulations, and give you back an airplane that is in a safe condition. In either case, you, as a customer, must pay for that education.

Training in avionics has three distinct categories. The fundamental aviation maintenance education occurs in a technical school approved under FAA Approval Part 147 or the military. This training, good as it is, is geared to getting the student a working knowledge of the industry. You learn the difference between pitot and static. What a transponder does and a compass always lies. Which places on an airplane you can put your hands, and where you shouldn't.

When a technician enters the industry with a shiny qualification for the FAA Repairman certificate, he is NOT ready to be turned loose on YOUR airplane. He will need specific education that is based upon the employer's capabilities list, and soon, the FAA-approved training manual.

From a cost/benefit standpoint, training is another double whammy. Let's send Joe Tech to Texas for autopilot school, so we can fix all of the AP340s on the field, yea! The school is free. However, there is airfare, lodging, meals, and incidentals like rental car or bus fare. And the technician should be drawing a salary, too, because his mortgage and family grocery bills will not be waived that week. Then, there are 40 hours LESS of available billable hours.

The responsible manager must determine before gambling on a

factory school that there will be adequate return on that investment. If Joe Tech diagnoses one AP340 problem, which will require a unit trip to the factory anyway, with a billable invoice of $150, the avionics shop is way behind the economic power curve and will wonder if he made the best business decision. On the other hand, if the manager doesn't take the initiative to go through the full process, he is forced to turn business away or make an illegal repair.

Products

Every item that gets hung on the certified airplane (or is to be used inside controlled airspace) must carry a pedigree—FAA approval. Maybe the seat belt, compass or transponder is FAA approved under a Technical Standard Order. Maybe the fuel cap has been improved under an STC, and now carries a PMA stamp. The bolts and castellated nuts have a standard parts approval, under AN (Army/Navy) that dates back before the FAA or CAA—but they are still FAA-approved.

Each one of these bits and pieces has a cost that is associated with the FAA approval process. Even if the part was designed in 1938, it is manufactured by a company that maintains an approved quality system, which provides for traceability and accountability from raw material to your mechanic's wrench. That system adds a safety value that must also incur a cost.

Summary

We have shown that at each step of the way from starting an avionics business to servicing aircraft avionics and installing new gear, the FAA levies a cost. This cost is not obvious, but is undeniably there, and must be paid eventually by the aircraft owner.

We know it takes about six months of hard work to open an avionics shop for business. We know that the manuals that describe the operation of the business for the FAA are a living document and must be maintained and updated.

Every piece or part on the airplane has to be manufactured under a quality system that traces the serviceable part back to the raw material. This includes replacement parts for airplanes and avionics made generations ago.

We know any activity or repair associated with an aircraft part must be traceable to an approved contractor or supplier, and that the FAA requires the avionics repair station to approve all of their suppliers.

We have shown that installations of avionics must be FAA approved, even when performed by certified shops, and that process is time-consuming and can take months, while the airplane waits.

We cannot emphasize enough that these costs are not the result of some conspiracy or as a way to profit, but purely and simply the costs associated with aviation safety. The FAA is responsible for keeping us safe, and discharges that activity with too few people with fewer resources such as industry training and materials. The only tools they have to work with are a review of data and documentation supplied by the avionics shops they are charged with overseeing. ■