



Duncan Aviation's two full-service maintenance bases—in Lincoln, Neb., (shown here) and Battle Creek, Mich.—see plenty of large-aircraft work. Duncan's Provo, Utah shop offers limited interior and avionics services.

DUNCAN AVIATION

Diverse issues shaping the bizav maintenance industry

It's no surprise that the same-old recurring issues are shaping the business aviation maintenance segment: the technician shortage, brutal competition and the reliability of the aircraft that make this industry possible.

The technician shortage is not a new subject and has been discussed ad nauseam for decades. Every year it seems another industry pundit or major company warns about the shortage, yet whether or not there is a genuine shortage remains questionable.

It seems that no one has attempted to quantify the technician shortage, but a recent report from the U.S. Government Accountability Office examined the situation in detail. The resulting report is somewhat unsatisfying, but in general it does not support the premise of a severe shortage of technician talent in aviation. Whether this stems from aircraft becoming more reliable or lack of growth in flying activity is debatable. But activity definitely is not breaking any new records.

Following 4-percent growth last year, the global business aviation market saw a 2-percent slowdown in flying during the first quarter versus the same period last year, according to JSSI's latest business aviation index. The FAA's May Business Jet Report shows worldwide operations last year at slightly more than 4 million, still well down from the peak of more than 4.8 million in 2007.

Competition among maintenance facilities remains strong and is a key reason why hourly labor rates trend lower than typical hourly rates for automobile maintenance. Maintenance facility owners and managers believe that aircraft owners and operators shop around for the best deal and that they compare hourly rates. Of course there are other factors such as timely availability to complete a big job, convenient location and comparison quotes between shops for a particular job. While all facilities claim to be extremely busy, they are not by and large employing the logical economic tactic of raising prices, because of fear of competition.

Keeping aircraft available to fly is what maintenance is for, but increasingly aircraft



TAG Aviation

manufacturers understand that sometimes less is more. The philosophy of reliability-centered maintenance has become embodied in most manufacturers' maintenance programs, and while it seems that inspection intervals and required overhaul periods haven't changed much in business aviation, the trend is toward freeing technicians from doing too much unnecessary maintenance, leaving their time for more worthwhile troubleshooting and repair jobs. This might also be having an effect on the need for technicians; if fewer man-hours are needed for redundant inspections, then ultimately fewer technicians will be needed.

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Greenwich Western Aircraft

Industry is training the technician of the future, and that is occurring on shop floors as well as in training centers.



The 'NextTech' future aviation technician

The aviation industry is transitioning to a new type of aviation maintenance technician, the "NextTech," according to NBAA director of technical operations Eli Cotti, who is also staff liaison for the NBAA Maintenance Committee. The transition is driven in part by the difficulties maintenance providers are having finding qualified technicians and the gap between training that the mechanics

receive and the needs of the industry that will employ them.

According to Cotti, "Technology today is changing at a rapid pace and skill sets are still tuned to 1980s-1990s aircraft. Training providers have, for the most part, not adapted well to the state of the art. We are still contending with analog regulations while living in a digital world. The groundswell of technology application advancing rapidly...sets

in motion a condition where the maintenance provider is behind the curve in the knowledge."

While there likely isn't a true shortage of technicians, providers are having a tough time finding qualified candidates, and part of the reason is that the schools have not caught up with current technology. "There is no doubt that the approved curriculum for airframe and powerplant maintenance certification is outdated," he explained, "and the dated curriculum alone does not prepare the individual for today's workforce. However, recognizing the knowledge gap and bridging this deficiency early in the learning environment prepares and equips the newcomers to meet and address the technology challenges."

The NBAA Maintenance Committee is trying to help the industry bridge that gap. "Our approach has been to identify the technology gap," Cotti said, "and work with business aviation's dedicated training institutions, original equipment manufacturers and aviation industry certification

programs ASTM/NCATT to ensure the training and modern-age curricula are in place to prepare the individual for future technology. [The committee is also trying to] collaborate with worldwide airworthiness authorities to stimulate interest in aviation maintenance as a career field and modernize the definition of the profession along with curricula defining the need to know for specific areas of the industry. This effort has traction, with numerous aviation schools partnering to prepare the NextTech for NextGen."

Those who make the effort to learn the new technology, to become NextTechs, will reap the benefits. "The supply and demand for the NextTech is dictating compensation adjustments," he said. "Hiring organizations are selective and are willing to acquire the right individual at the right price. Many companies in business aviation realize that with a limited number of technicians actually fluent in maintaining a corporate office in the sky, it takes strong incentives to attract and retain talent."

NBAA provides a variety of resources to help the NextTech develop the skills business aviation needs. These include the Certified Aviation Manager and Professional Development programs. NBAA's Project Bootstrap, which has been developed by the Maintenance Committee's Training/Advanced Education Subcommittee, is proposing a new certification category, the aviation maintenance technical engineer (AMTE), which embodies the concept of the NextTech.

According to NBAA, "The AMTE credential will combine the A&P, IA [inspection authorization] and avionics skill sets with a required 10-year contiguous experience history composed of any combination of years of service in any rated capacity following the award of all certificates, licenses and ratings." □



Greenwich AeroGroup's Western Aircraft facility in Boise, Idaho, employs 95 technicians.

Technician Shortage—For Real?

Whenever the subject of aircraft maintenance comes up, a discussion about the shortage of technicians is inevitable. Perhaps this has always been the case, but in 1976 when I was sitting in the recruiter's office at East Coast Aero Tech in Bedford, Mass., his sales pitch was all about the impending shortage driven by the retirement of World War II-era mechanics. By the time I graduated with a fresh FAA mechanic certificate with airframe and powerplant (A&P) ratings, jobs would be plentiful, he promised, and I would have a hard time choosing where to work.

It turned out he was right, but not necessarily because there was any shortage. Cessna recruited our graduating class, with promises of cheap flying in the company flying club and the opportunity to help put together the incredible new Citation III.

We were also recruited by Bethlehem Steel and Xerox, and this illustrated a fundamental problem with the training that A&P mechanics receive: it is so broad-based and covers so many technical skills that graduates from A&P schools are desirable employees for any number of technology companies, not just aviation-related. More non-aviation companies than aviation enterprises, in fact, made serious recruiting efforts at our school, although most of my classmates did end up in aviation jobs.

After shifting to the aviation journalism beat, I noticed that the subject of the technician shortage seemed to surface every few years in publications. The resilience of this theory, which became even more apparent in maintenance-focused magazines, culminated in an industry effort to combat the shortage



StandardAero's facilities employ about 450 technicians whose average tenure is 15 years, with some still at work after 40 years. At StandardAero's Los Angeles base, machinist Frank Escobedo repairs ground-support equipment.

by an organization called Make It Fly. Donations from industry associations and companies kept it afloat for about a year, but Make It Fly fizzled for lack of widespread financial support. Perhaps the technician shortage wasn't as severe as we supposed.

The Government Accountability Office (GAO) was tasked by members of Congress with examining the issue of an aviation technician shortage. The concern, according to the GAO report, is "that an insufficient supply of certain types of aviation professionals—airspace engineers, aircraft mechanics and avionics technicians—could develop because of imminent retirements and a perception that fewer people are choosing to enter certain aviation professions."

In interviews conducted for this report, nearly every maintenance company that responded indicated that one of its greatest issues is finding qualified technicians.

The GAO study focused on all segments of civil aviation and examined three types of aviation profession: aerospace engineers, aircraft mechanics and avionics technicians. Data analyzed for the study came from the Bureau of Labor Statistics (BLS), Department of Education, Department of Defense (DOD) and the FAA. The GAO's definition of a labor shortage is: "[A] sustained period during which

the demand for workers in a geographic area exceeds the supply of workers available, qualified and willing to work at a particular wage and under particular working conditions."

The GAO said that compared with aerospace engineers, its "analysis found less support for a shortage of aircraft mechanics. For example, while both have low unemployment rates, neither employment nor earnings have increased for aircraft mechanics, suggesting that employers' demand for this occupation has not outstripped supply."

The unemployment rate for aircraft mechanics from 2000 to 2012 as calculated by the GAO is a relatively low 3 percent. The change in full-time employment and change in median weekly earnings numbers were flat, supporting the GAO's conclusion that mechanic jobs and wages are not growing. Finding the right person for a job opening may still be difficult: "The low unemployment rate suggests that with few available people to hire, employers may have difficulty finding people with specific skill sets, certifications or work experiences."

In 2012, the most recent year for which data was available when the GAO conducted its research, 119,160 aircraft mechanics were employed in the U.S., earning an average hourly

NBAA SALARY SURVEY SHOWS GROWTH FOR AMT WAGES

While the GAO report on the aviation maintenance technician shortage suggests that there is no real shortage because salaries haven't risen much, the NBAA's salary survey reveals a different picture. This might be due to the NBAA's singular focus on the business aviation industry, while the GAO report examined data for the entire civil aviation marketplace.

According to the NBAA numbers, salaries and total compensation for most levels of technical employment in

business aviation have outpaced the rate of inflation. Only the jobs of maintenance foreman and manager of maintenance saw growth below the rate of inflation.

The bottom line is that these numbers suggest that the business aviation industry is responding appropriately to any shortages it is experiencing, by increasing wages and total compensation to attract the right people. And clearly if there is a shortage, avionics technicians are in the highest demand, judging from the rapid growth in compensation for that role.

—M.T.

NBAA Salary Survey for Business Aviation

Position	Average Base Salary Growth 2004-2013 (%)	Average Total Compensation Growth 2004-2013 (%)
Director of Maintenance	26.57	26.63
Manager of Maintenance	17.13	15.11
Maintenance Foreman	17.87	16.56
A&P Maintenance Technician	25.11	25.21
Maintenance Technician Helper	32.09	28.17
Avionics Technician	47.78	45.73

Source: NBAA. The cumulative rate of inflation in the U.S. from 2004 to 2013 was 23.3 percent, according to www.usinflationcalculator.com.



Gulfstream specialist Western Jet Aviation employs 39 technicians at its Van Nuys, Calif. and Reno facilities and plans to look for new opportunities to expand elsewhere.

Tech shortage for real?

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wage rate of \$26.78. Another 16,810 avionics technicians were tallied, earning an average of \$26.85 per hour. It should be noted that the median weekly earnings (not average) cited in the previous paragraph don't necessarily account for differences between entry-level wages and salaries paid at the height of an employee's career. So the analysis can't determine whether starting wages are rising to attract new workers.

Mechanic Ranks Growing

The number of mechanics has climbed about 5 percent from 2000 through 2012. During the same period, the number of graduates from aircraft

mechanic schools grew 48 percent, while avionics program graduates declined by 53 percent. The avionics number shouldn't be alarming, the GAO noted, because many avionics technicians receive training in other industries before joining aviation. The mechanic number is somewhat encouraging, but mechanic schools have plenty of capacity to train more people if demand grows. The military remains a source of aviation-trained personnel, and the number expected to separate from the military is expected to increase from the average 16,000 per year during 2001 through 2012. Military mechanics usually need additional training, however, to obtain A&P certification.

The FAA reports that issuance of A&P tickets dipped

in 2010 to about 6,000 annually, then climbed in 2012 to about 7,000. FAA records list more than 335,000 A&P mechanics age 70 or younger, but there is no way of knowing how many are still living and available to work. That the GAO shows only about a third of that number actively working as mechanics raises many questions—likely unanswerable—about the quality of the FAA's database.

A worrisome statistic is the BLS assessment of employment projections for aviation mechanics and avionics technicians. While the overall employment picture in the U.S. suggests an average jobs growth rate of one percent per year through 2022, only about 3,000 new mechanic and 500 avionics technician jobs are expected to be added during that period. That equates to about 0.24-percent growth in mechanic jobs and 0.29-percent growth for avionics technicians per year, not a rate sure to result in dramatic wage increases to attract new talent. A big factor in this slow jobs growth rate is "...the introduction of newer aircraft that require less maintenance..." (See "Reliability-Centered

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OEMs DISCUSS SERVICE CENTER REVENUE

Original equipment manufacturers (OEMs) have vastly expanded their factory-owned service center networks over the past decade or two, and these now contribute a significant portion of their annual revenues. AIN surveyed OEMs about their factory-owned service center networks and how they affect the OEMs' overall business, and these are summaries from those that responded.

How important is service center revenue?

Bombardier: It's a substantial piece. It is a nice piece to have in our portfolio and helpful to the company. Customer service and a service center network have two functions: to make the life of the customer as easy as can be so when the time comes to buy another aircraft they stay home with us, and to enhance the product as it goes on so as to refine it and make sure we're getting all the goodness out of those improvements. We can look at service merely as a source of revenue or as a source of customer satisfaction. The more we satisfy the customer, the more the revenue. Like every other OEM, [Bombardier experiences] issues that get resolved as the product matures, but also in the way of maintenance delivery, [and this] is pretty important. Given the size of aircraft we have out there, those are meant to fly and not be in the shop. If we can generate quicker turn times, that gets them out the door in a reasonable time, saving the owners money and getting the aircraft in the air.

Gulfstream: Revenue from all divisions of Gulfstream contributes to the overall growth of the company and our ability to continue investing in people, products and services to support the Gulfstream fleet worldwide. Service center loading is a good indicator of flying hours for the fleet and also a good report card for the quality of the maintenance work we are providing.

How much has service center revenue grown?

Bombardier: We've added a lot of service center capability, in Dallas, Macon (Ga.), Amsterdam, Singapore. We've got a good foothold in Asia, and we're working on a footprint in Tianjin, China. We're growing where our density of aircraft are, and we try to have a footprint and have labor hour output by being in the right place. Right now we're leveraging our authorized service network in South America.

What percentage of total revenue is from service centers?

Bombardier: The entire service group does about \$1.5 billion annually; that's about 7 to 10 percent of aerospace revenue.



TAG Farnborough Engineering is one of three TAG Aviation maintenance facilities (including Paris and Geneva) that employ 150 technicians.

Tech shortage for real?

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Maintenance” on page 6). The BLS added, “Most of the demand for new workers in these three occupations will be to replace those retiring or leaving the profession.”

What all these numbers point to, the GAO report concluded, is as follows: “Nonetheless, with employment growth projected to be slower than average or not to grow and recent trends indicating a stable or growing supply of personnel, there is little reason to believe that a significant shortage is likely to arise in the United States over the next several years.”

Following are some other interesting findings in the GAO report:

- Almost all employers we spoke with reported taking some actions that economists associate with responding to a labor shortage, but few were raising wages to attract workers.
- Consistent with this assessment, more than half of the large employers we

interviewed said that they were not currently experiencing difficulties attracting and retaining workers.

- According to some employers and stakeholders we spoke to, mechanics have relevant skills for working at a variety of occupations, including at amusement parks or on oil rigs, which were stated to be either higher paying or have characteristics employees found more favorable.

- Few companies we interviewed reported raising wages, improving benefits or offering bonuses to attract employees.

- “The inability to pass... costs on” was the reason that officials from at least one company we interviewed provided for why the company could not afford to raise wages.

- Eighteen companies also indicated that they improved working conditions—such as by improving the tools available to employees, updating safety mechanisms and installing fans or lighting to make working in hangars more comfortable in efforts to improve morale and retention.

- Most employers and stakeholders we interviewed said that maintaining a qualified aviation professional workforce will be more difficult in the future because of changes in K-12 education, a perceived emphasis on earning a four-year degree and the perceived decreased desirability for working in aviation, particularly aviation maintenance. Several employers cited the absence of vocational and “shop” classes in high school as a reason interest and critical knowledge in maintenance are waning.

Several employers and stakeholders we interviewed also said that with parents and counselors insisting that a college degree is needed for every job, students may not be aware that there are well paying professions that do not require a four-year degree. Several employers and stakeholders also noted that aviation used to be a more “exciting” industry, which attracted people even though wages were often lower than those paid by other, similar industries. □

What are plans for boosting service center revenue?

Bombardier: We’ve got strategic plans stacked up like cordwood. We’re always looking at where the installed base [of our aircraft] is going to grow, where they have maintenance done, what is the density in the region of our installed base? This tells us whether to put our own footprint [there] or leverage our authorized service network. There are a lot of airplanes going to low-density areas, but they need help. We’re starting to [build] our mobile service business and customer response teams. What we’re trying to do is ensure we can get to those AOGs and mid to small events without customers having to fly or put another cycle or two on the aircraft or spend a lot of money on fuel and keep the pilots home so they don’t have to be in a hotel all the time. We can give them a little break, instead of them having to fly to us all the time.

Gulfstream: Gulfstream continually compares fleet growth with service center capacity. Right now, we have eight U.S. and three international company-operated maintenance facilities. We have experienced tremendous service center growth in the past few years. In 2012 we opened service centers in Sorocaba, Brazil, and Beijing, China. In May last year we added a 125,000-sq-ft hangar at our service center in Westfield, Mass., and in January this year we announced plans to build a 110,000-sq-ft hangar at our service center in Brunswick, Ga. Also, we announced in January that we will build a new product support distribution center in Savannah. The 405,000-sq-ft facility is expected to be completed early next year. This state-of-the-art center will further enhance the speed and service capabilities of our distribution network.

Textron Aviation: Through Beechcraft’s and Cessna’s combined service network, we provide service at 21 company-owned service facilities worldwide and through mobile support. All factory-owned service centers as well as our mobile service network are being upgraded to work on all Citations, Hawkers and King Airs. We also have a constellation of more than 200 channel partner service facilities around the world. We continually evaluate our offerings to ensure we provide value-added services to our customers in appropriate locations based on our customer needs. ■

AIN polled OEMs and independent maintenance providers about whether they are experiencing a shortage of technicians and how they are dealing with these issues. See what they had to say at ainonline.com.



Bombardier's Singapore facility is part of the company's strategy to provide product support where customers are located, which is increasingly at far-flung locations.



Textron Aviation's 21 company-owned service centers, like this facility in Wichita, are now offering maintenance on Beechcraft King Air, Cessna and Hawker aircraft.

Business aviation and reliability-centered maintenance

The application of the principles of reliability-centered maintenance (RCM) has been an enormous boon to aviation, more so for airlines but increasingly for Part 25 business jets as well. Most mechanics have probably grumbled about having to unscrew yet another wing panel during an inspection to look at something that never shows a problem. And meanwhile, at least one of the screw heads is either already stripped from the previous removal or is about to become stripped because the shank is sticking in the threads. This kind of all-too-typical problem adds hours to maintenance events, and at \$100 an hour the labor costs ratchet up rather quickly. What if it isn't necessary to inspect that particular hole in the wing every year or 600 hours?

RCM aims to eliminate redundant maintenance. It gained favor following a study done by two United Airlines analysts, Stanley Nowlan, director of maintenance analysis, and Howard Heap, manager of maintenance program

planning. Their book, published in 1978 and available online, makes for fascinating reading.

Basically, RCM upends what we think we know about maintenance—that, according to the book, “there is a fundamental cause-and-effect relationship between scheduled maintenance and operating reliability. This assumption was based on the intuitive belief that because mechanical parts wear out, the reliability of any equipment is directly related to operating age. It therefore followed that the more frequently equipment was overhauled, the better protected it was against the likelihood of failure.”

While this seems logical—and remains the way many aircraft are still maintained—it is untrue. “Over the years, however, it was found that many types of failure could not be prevented, no matter how intensive the maintenance activities,” Nowlan and Heap wrote. “It was also found that in many cases there was no effective form of scheduled

maintenance.”

The 516-page book documents development of MSG-1, an industry and FAA “Maintenance Steering Group” that applied earlier reliability concepts to the then-pioneering Boeing 747. This led to MSG-2, which brought significant savings. Comparing the initial maintenance program of the DC-8, with 339 scheduled overhaul items, to the DC-10, with only seven items, underscored the dramatic improvement. Even more dramatic was the Boeing 747. The 747's initial maintenance program called for 66,000 man-hours of major structural inspection to reach the 20,000-hour interval (flying time). Contrast that with the 4 million man-hours of inspection required on a DC-8 to reach the same interval.

Bizav Applications

Business jet OEMs are using the MSG-3 process to refine maintenance programs using RCM concepts, but RCM hasn't taken hold as quickly in private aviation as with the

airlines. One reason for this is that “the airlines operate their own repair stations,” said Mike Busch, a long-time student of RCM and founder of Savvy Aircraft Maintenance Management, which helps owner-operators manage their maintenance and also applies RCM concepts to Part 23 aircraft maintenance. “They're extremely motivated to do anything to reduce maintenance costs as long as it's not at the expense of safety,” he explained. “Business jet operators with few exceptions do not have control over their maintenance. The maintenance is done by contractors, and the program is specified by the manufacturer.”

Bombardier takes RCM seriously, according to Stan Younger, vice president of service centers. “The most important number for us is how easy is it for our customer to own our product? Even though we are a service organization as well, increasing the reliability is more important than that. We always have projects going, but [RCM] is a big piece of what we do. We're changing the active fleet over as we speak.”

Bombardier has applied MSG-3 to Learjets beginning with the 40/45, the Challenger 300 and 605 and is adding the Global Express and XRS (later models are already participating). “Once we have [the aircraft] in the field for a specific time, we ought to have enough data for the regulatory organizations to mitigate some of [the requirements] that were not known in the past.” The application of RCM techniques has had beneficial results, according to Younger. “It's actual decreases in cost per hour.”

Cessna employs RCM and “ongoing research regarding service improvements, design improvements, reliability improvements, supplier agreements and so

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Reliability-centered Mx

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on,” the company explained.

Gulfstream began applying MSG-3 with the GV in 1995, according to Barry Russell, v-p of East Coast and international product support operations, and has done so with all subsequent models. “Each year, Gulfstream holds its Sustaining Maintenance Review Board Report meeting to review fleet findings and squawk rates against all MSG-3 tasks,” he explained. “The goal is to validate each task’s effectiveness and the intervals selected. When service history shows a lower-than-expected finding rate, the intervals may be adjusted outward. The end result is a reduction in scheduled maintenance costs for operators.”

Gulfstream also uses data from its PlaneConnect air-to-ground maintenance datalink system to monitor issues with the fleet and speed resolution of problems to improve reliability. On the G650, the PlaneConnect health and trend monitoring system can record up to 10,000 parameters, according to Russell. “The system transmits the information to the operator’s maintenance department with an optional copy to Gulfstream Technical Operations. All of the data can be analyzed to identify

systems’ condition status, which leads to faster maintenance turnaround times and the ability to predict fleet maintenance trends.

“Gulfstream incorporated lessons learned in the aircraft designs for its most recent aircraft, the G650 and G280. Built-in-test technologies allowed for extended check intervals and reduced tasks. For older aircraft in service, we use historical data to determine whether maintenance intervals can be extended or shortened over time.”

Effective Implementation

While it’s clear that OEMs are using the MSG-3 process to deploy RCM concepts, there might be room for improvement, if operators and technicians can be persuaded to feed more data back to the OEMs and if the OEMs pay attention to that data, according to Len Beauchemin, founder of maintenance consultancy Aero Techna Solutions. Beauchemin is a long-time student of RCM and provides training to industry and FAA personnel on implementation of MSG-3 principles and maintenance program development.

“We have this process that uses reliability data to initiate the [maintenance] program,” he explained. “We’re also supposed

to use that data to substantiate and make adjustments [to maintenance programs]. But it’s good only to the point that [OEMs] get information from in-service use.”

Beauchemin sees a weak link in business aviation implementation of MSG-3: the lack of a robust feedback mechanism to OEMs. As he noted, if a mechanic is performing the items on a task card during an inspection and finds nothing wrong, how does the OEM know that this inspection might not be necessary at that interval? “If we’re doing a particular task at a scheduled interval and do it 500 to 1,000 times and never have a finding, then that’s a reflection of reliability,” he said. “It means that we should be able to make an adjustment.”

In other words, opening that particular panel on the wing, including the effort needed to remove and repair stripped-out screws, might be a waste of time.

Indeed, one Gulfstream mechanic made that specific complaint in a comment on a blog post about RCM by Savvy’s Mike Busch. According to the mechanic, “I maintain a Gulfstream G550, with a Chapter 5 maintenance program based on a MSG-3 program. They take reliability data and adjust the maintenance intervals accordingly. At least, that’s the theory.

“In our case, it does not work. Our aircraft is now 10 years old, less than 3,000 hours total time, and has been disgustingly over-maintained. The most obvious example: every one of the \$100 titanium screws has been rounded out by hack mechanics. Only to find nothing wrong behind each panel and under each floorboard. The maintenance-induced damage is considerable in some areas.

“We could put the blame on individual mechanics trying to get the job done quickly. Or place the blame where it actually belongs: with corporate management and the FAA requiring excessive maintenance.

“We now have a solid 100 years of maintenance data. Folks, sufficient data exists and we need to use that data to improve reliability and safety.”

Operator Feedback

Ideally, the best way to gather the information that would help OEMs apply RCM to an even greater degree would be to make sure all task cards include a check box, indicating that there was no finding for the particular inspection item. “It’s another box to check,” Beauchemin said. “And when you do that, it’s so powerful, it will provide the data necessary to make an adjustment to a decision that was made when [there was no] vetted data.”

Beauchemin sits on a committee that is rewriting the FAA advisory circular that explains how to implement reliability programs, AC 120-17A, which was last revised in 1976. “Technology has made it much easier to collect information,” he said. “But it’s not a one-way street. We can’t wait for the OEMs to fix it... We won’t be able to close the circle without the education of operators. Hard time intervals are not really a good plan. To proactively manage this, you need to participate in supplying data because it’s to your benefit.”



Gulfstream's Savannah service center is one of eight U.S. and three international factory-owned service centers. The company began using MSG-3 to improve reliability with the GV in 1995.