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AMT
Aircraft Maintenance Technology

Written by aircraft maintenance professionals for the professional maintenance team

Official publication for AMTSociety

April 2012

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Bombardier maintenance technician inspecting a Challenger 604 engine at the Dallas Service Center.

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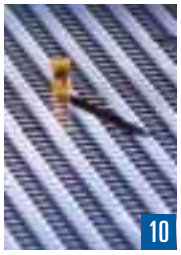

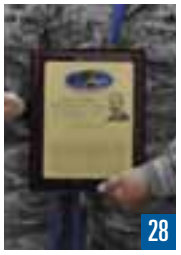

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AMT EXCLUSIVES:

You can watch the 50-minute video of the FBO/MRO Roundtable presented at Cygnus Aviation Expo on www.AviationPROS.com by visiting the Media Center and selecting the Cygnus Aviation Expo. And there is more on AMTSociety Maintenance Skills Competition.

Check out AviationPROS.com

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Readers In Action Photo Contest

Show the world what you do on the June cover of AMT

Ron Donner, Editor

Ron Donner has held both technical and management roles in general aviation and during his 27 years with Northwest Airlines. He holds FAA certificates as an A&P/IA and a commercial pilot.

Each year we sort through photos submitted by you our readers until we find that right one that says; *AMT* Readers In Action. It's that time of the year again. Last year's winning photo showed a team of US Airways technicians at work changing a tire on the main landing gear of an A330 as the aircraft was being prepared to be dispatched on an international flight. The image captured to the fullest extent *AMT* Readers In Action; several technicians; team work; tools and equipment; just a great photo.

So get out those cameras and send us your best images showing your technicians, your crew, in the shop, hangar, ramp, flight line or assembly line, for a chance to proudly show your stuff on the cover of the June issue of *AMT*. Any and all segments of aircraft maintenance will be considered. Along with being on the cover of *AMT*, we will also provide $250 for you and the team to celebrate with. Photos need to be quality high-resolution images. Send them directly to me at ron.donner@AviationPros.com; include your name, a detailed explanation of the photo, and your contact information including a telephone number. Place the words Readers In Action in the email subject line. The deadline for submitting photos is May 1. Good luck!

From left to right, Vinnie Venditto, Jet Aviation; Chad Doehring, Duncan Aviation; Rich Baeder, Elliott Aviation; and myself.

Last month the Cygnus Aviation Expo and the *AMTSociety* Maintenance Skills Competition proved to be another huge success. During the Expo, I held a discussion with leaders of three very successful business aircraft maintenance organizations. Rich Baeder, vice president and general manager for Elliott Aviation of the Quad Cities; Chad Doehring, maintenance manager with Duncan Aviation of Lincoln, NE; and Vinnie Venditto, avionics and maintenance manager with Jet Aviation St. Louis.

These industry leaders spoke on some of the challenges facing their companies today, including managing multiple MRO locations. They spoke on topics that echo through the industry these days: leadership, consistent application of policy, and hiring and retaining a skilled aircraft maintenance workforce. Each gave their perspective based on current real-life experiences. As a side note, each one of them stated their companies are growing and are currently hiring staff with the right blend of skills. You can watch the 50-minute video of this FBO/MRO Roundtable on www.AviationPros.com by visiting the Media Center and selecting the Cygnus Aviation Expo.

Enjoy the issue, Ron

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SPEED UNIFORMITY EFFICIENCY

International Standard for Business Aircraft Operations (IS-BAO)

What does it mean for maintenance?

By DeborahAnn Cavalcante

DeborahAnn Cavalcante earned her Master of Aeronautical Science, with a specialization in Safety Management from Embry Riddle Aeronautical University in Daytona, FL, and her Bachelor of Science from VA Tech in Business and Risk Management.

In today's world and global economy, many industries face inherent risks involved in their operations which affect their customers or the environment. The chemical industry, pharmaceuticals, and nuclear power have all embraced safety management systems (SMS) for years. The aviation industry has also now adopted a comprehensive, systematic, formal approach to safety designed to mitigate and manage risk while eliminating the management bias from the equation.

The International Standard for Business Aircraft Operations (IS-BAO) was formally introduced and made available to the business aviation community at the European Business Aviation Conference and Exhibit (EBACE) in Geneva, May 2002. IS-BAO was developed by the industry for the benefit of the industry. It is a code of best practices designed to help flight departments worldwide achieve and ensure a high level of safety and professionalism. In many business sectors, international standards are recognized for their role in facilitating global commerce. IS-BAO is similar in this respect as its fundamental purpose is to foster standardized, safe, and highly professional aircraft operations.

The International Business Aviation Council (IBAC) introduced the IS-BAO program for many reasons. IBAC recognized the need for the business aviation community to take a lead role in fostering harmonization of operating procedures and requirements. IBAC works closely with the International Civil Aviation Organization (ICAO) toward international standardization.

Bombardier maintenance technicians inspect a Learjet 45 flap at the Tucson Service Center, the company's biggest maintenance facility that caters to both business and commercial aircraft. Photo provided by Bombardier Customer Services.

The president of the ICAO Council has endorsed the efforts of the business aviation community in developing an industry 'code of best practices'. IS-BAO incorporates the International Standards and Recommended Practices for the Operation of Aircraft applicable to business aviation prescribed in ICAO Annex 6, Part II for International General Aviation.

The IS-BAO standards for maintenance providers focus on the maintenance operator's Maintenance Control System which should be described in the company operations manual.

The SMS connection

Even after all the SMS "buzz" of the last couple of years, many operators and maintenance facilities are still asking themselves what SMS is all about. Very simply, ICAO has adopted Annex 6 via its member states. Annex 6 simply says each member state will require the implementation of an SMS by aviation service providers. Minimally, the implemented program must: identify safety hazards, ensure remedial action is taken to maintain an acceptable level of safety, provide for continuous improvement to the program and level of safety, and finally provide for the continuous monitoring and assessment of the achieved safety level. Direct accountability for safety both throughout the organization and at the senior most level of management must be clearly defined.

What this means for maintenance facilities is that when a SMS is implemented, safety requirements become part of the decision-making process of management just like any other part of running a business. No longer can safety be disregarded as a matter of cost cutting or managerial bias. A structure will be put into place that contains a set of practices and policy that looks keenly at the operation to determine just what the hazards are and what to do about them. For a maintenance facility particularly, there are added benefits to the operation: improved communication, enhanced performance, and clear expectations, resulting in everyone "singing from the same sheet of music."

Basic elements of SMS

There are four basic elements to an SMS, the first of which is a **safety policy**. The safety policy should clearly outline objectives that can be measured against. For a maintenance facility it is imperative everyone in the organization identify with and can get behind the stated objectives. Everyone understanding their contribution and viewing the safety objectives as a clear game plan will lead to a safer overall operation.

A **risk assessment** tool being the second primary element of an SMS is useful in identifying hazards that potentially could pose a risk to the operation. What this means in a maintenance operation is not only recognizing dangerous

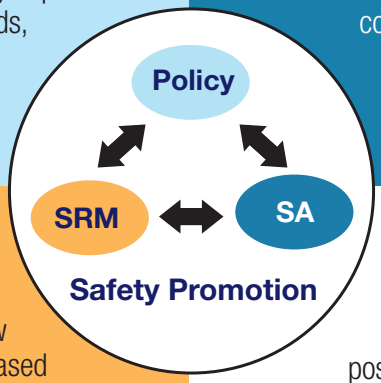
conditions, but looking at or seeing situations from a different perspective, one where you visualize all the ways something could fail, and proactively protect against them.

Thirdly, **safety assurance** is the element that ensures a means to figure out ways to control or mitigate risk. This may be accomplished by assigning people inside and out of the operation who are responsible for both internal process reviews for compliance as well as external vendor compliance with established performance parameters.

The Four SMS Components

Safety Policy
Establishes senior management's commitment to continually improve safety; defines the methods, processes, and organizational structure needed to meet safety goals

Safety Assurance
Evaluates the continued effectiveness of implemented risk control strategies; supports the identification of new hazzards



Safety Risk Management
Determines the need for, and adequacy of, new or revised risk controls based on the assessment of acceptable risk

Safety Promotion
Includes training, communication, and other actions to create a positive safety culture within all levels of the workforce

Finally, we must **promote and encourage safety** throughout the organization by establishing a positive safety culture through ongoing analysis and communication.

The IS-BAO standards for maintenance providers focuses on the maintenance operator's Maintenance Control System which should be described in the company operations manual and identify the accountable person in the organization responsible for the maintenance control system. Additionally, the maintenance provider's control system should define the details, scope, and parameters of maintenance agreements, to include the conditions under which they may be performed. Let's review just some of the areas of maintenance operations where safety is enhanced with the implementation of an SMS.

The maintenance connection

The standards are written to ensure regulatory information and technical data appropriate to the work performed are utilized, and the work is in compliance with the operations manual. Maintenance training must ensure that personnel are familiar with regulations, standards, and procedures associated with certain work. Initial training of personnel, as well as aircraft type training, and recurrent training programs become embedded in the SMS.

Defect reporting and control should be included in the maintenance operator's control system to ensure that defects detected during aircraft operation and during the performance of maintenance or servicing are recorded. Technical

dispatch instructions which form the basis upon which the pilot in command will determine aircraft serviceability in respect of airworthiness directives, maintenance, and operational or operator requirements have their place in the SMS.

Positive tool and material control processes can reduce aircraft accidents and incidents which can result from tools and materials left inside an aircraft after maintenance has been performed. The process should be accounted for within maintenance forms and appropriate checklists such as final inspection checklist.

By now it is apparent that there is a fairly robust portion of the IS-BAO standard devoted to the maintenance function. The areas described are those that an auditor of your operation and facility will look at to determine if you are actually doing what your operations manual states you are doing.

When considering the development of an SMS, and registered compliance with the IS-BAO audit, many companies view the task as overwhelming. Do not let this deter you. In reality, you are most likely already doing about 85 percent of the work that the IS-BAO standard and the SMS would require. Instead look at the SMS as a way to review, prepare, and cross-check everything you are doing currently, then identify the safety gaps, and remedy them.

Effective Aug. 25, 2009, IS-BAO is recognized as an industry standard for business aircraft operations by the European Committee for standardization, which enables a maintenance provider's IS-BAO registration to be recognized within the proposed European Aviation Safety Agency (EASA) Implementing Rule System.

It should be pointed out that the IS-BAO standards have been established with the goal of enhancing safety, not to look over someone's shoulder for what is wrong. Through a second set of eyes, it is verified that things are being done correctly for the benefit and safety of the I/A, the A&Ps, and the customer. The human factor pressures latently inherent in a maintenance operation often overwhelm managerial and nonmanagerial personnel. Complacency can creep in disguised as an attitude of "I am operating safely and don't need to be criticized." Truth be known, with this attitude prevalent, the longer you go without an accident or incident, the closer you are to having one.

Effective Aug. 25, 2009, IS-BAO is recognized as an industry standard for business aircraft operations by the European Committee for standardization, which enables a maintenance provider's IS-BAO registration to be recognized within the proposed European Aviation Safety Agency (EASA) Implementing Rule System. EASA has formally begun the process of implementing SMS regulations for international operations. Additional education and information may be found at www.ibac.org or www.easa.eu.int/home.php. **AMT**

DeborahAnn Cavalcante leads Diversified Aviation Consulting (DAC) and along with her associates has firsthand experience in air carrier operations, private charter aircraft, general aviation operations, military/civilian interface, FBO management, maintenance repair station training, safety training, human factors training, and customer service training. For more information on DAC visit http://www.dac.aero.

Aircraft Components Get Smart

Moving beyond historical RFID perceptions to "smart assets"

By Bob Hamlin

Bob Hamlin is chief technology officer at Tego, the leading provider of high memory RFID tagging solutions. Bob may be reached at bhamlin@tegoinc.com.

From start to future

Originally radio frequency identification (RFID) saw adoption in the retail supply chain where low-memory tags stayed in climate-controlled stores for short durations. In those first deployments, the RFID tag was read-only; it transmitted an identification number, which was primarily used as an index into an inventory database.

While numerous types of tags have existed for many years, what's been missing is the chip technology that can enable truly "smart assets" thereby taking RFID to a whole new level. Now it's not about the tags, it's about the information they manage.

RFID technology has been making its way into the aerospace industry for several years now, and it's starting to change the way suppliers, airframe manufacturers, airlines, and maintenance organizations approach their jobs. Now RFID tags can store everything from the simple information often found on an identification placard such as part number, serial number, and expiration dates to detailed historical MRO information typically stored in a centralized database. And with the tag physically attached to a particular component, the information is easily associated with that component.

Many tags in production today have specifically targeted flyable parts. Industry standards address environmental factors such as humidity, pressure, and flammability. Tags that meet these standards can be used in external aircraft locations as well as pressurized cabin spaces.

Using standard reader equipment, aircraft maintenance staff can read a part's condition information from its attached tag; information that was formerly accessible only by opening difficult to reach or secured areas in order to read the unit's data nameplate.

Ultimately, the same information can be shared across the supply chain between the operator and the maintenance organization, from one MRO to another, and between inventory management staff and parts suppliers. Technicians can immediately determine component status in the field in an efficient and economical manner.

At the core of RFID-enabled smart assets is Tego's high-memory silicon chip that is 3 mm high.

Airbus' MRO Strategy with RFID

Airbus is tracing both flyable and nonflyable components over their total lifecycle with its new MRO strategy that uses RFID tagging solutions. Its flyable parts marking program includes high-memory RFID tags with the capacity to store lifecycle data. Airbus has announced it is using RFID tags which incorporates Tego's high memory RFID chip, the TegoChip, on its A350 XWB aircraft. It is tagging more than 1,500 pressurized and nonpressurized parts and components on each aircraft. The A350 XWB is the first aircraft in the Airbus fleet to use RFID on flyable parts. It is rolling out the program in cooperation with its suppliers. Airbus views RFID as an infrastructure it can deploy across many areas of its business, delivering value to the company, its suppliers, and customers.

In-flight entertainment systems are among the most maintenance-intensive items in the cabin. The system on the Airbus A380 can display output from several video cameras installed on the exterior of the aircraft. Because of the high maintenance effort involved, these systems are a priority for high-memory tagging efforts. Birth record information will help crews identify the exact make and model being serviced, and maintenance history records will help keep track of things like firmware and software updates.


Photos provided by Bob Hamlin

A380 cabin shows the in-flight entertainment system.

"Smart" aircraft components

New capabilities are being developed that go beyond what has been typically thought of as RFID. For example, Tego Inc. has made advances in semiconductor technology to create RFID tags with up to 8 kilobytes of usable space, more than 640 times the memory capacity of those first 96-bit retail tags. Additionally, specialized processing capabilities have been added to the high-memory semiconductor chips, which allow part information to be indexed and accessed with greater speed and ease.

With these latest innovations we are turning components on an aircraft into "smart assets" that can assist maintenance staff with making on-the-spot decisions. A smart asset can store and communicate information about its history throughout its lifecycle. Whether an asset stays in one place or moves around, the information remains intact throughout the asset's life, potentially decades. That information can be vast, taking the form of historical maintenance records or scratchpad messages from one technician to another. It could also be the airworthiness certificate from the MRO that completed the last overhaul or modification.

This technology provides the ability to share critical data about the asset with those who are responsible for its maintenance and performance over time. Maintenance staff can read about the asset, location/position on the aircraft, service/maintain or replace it as necessary, and then document the action directly on the part.

Information where you want it when you need it

For maintenance activities, it ultimately comes down to having all of the information in one place

at the time it's needed. Yet information can end up in many different places throughout the lifecycle of an aircraft part. This is typically what happens at each stage:

Parts manufacturer: Records critical data, i.e., part number, serial number, date of manufacture, when it's shipped. Some data goes on the nameplate; other data is written down on hardcopy records, and/or in an electronic database. Some information is shipped along with the part; some stays behind with the manufacturer.

Airframe manufacturer – receiving: Receives the part, takes whatever data came along with it, and adds its own, i.e., date received, shipping carrier, warehouse location. This information is now stored in its own system.

Airframe manufacturer – assembly line: Installs the part on an aircraft and additional data is generated, i.e., location on aircraft, date of installation. This information typically stays behind with the manufacturer after the aircraft is delivered to a customer.

Aircraft owner/operator: Performs in-service maintenance activities; stores identification information and records related to maintenance and replacement tasks. This data is property of the airline.

MRO organization: Stores historical record information, in-service maintenance tasks, overhaul records, engineering, and modification status, etc. Data from the owner/operator would help the MRO process but is difficult to access.

Not having updated information follow a part creates one of the biggest challenges for an MRO organization. If the part is actually a smart asset, the situation is much different. Using a handheld reader, the maintenance crew can instantly learn the manufacturer's CAGE code, the *current* part number, who did the last installation. That data is now known with certainty, without a database lookup. After a part is changed or repaired, technicians can write the new activity information back to the part. They can also upload the new information to a Maintenance Information System database reducing their administrative time and risk of manual error.

Smart assets will soon have the capability of forming a complete information system that can capture, compute, communicate, and collaborate around the data they contain. By embedding input devices like sensors, and output devices like displays or indicators, smart assets will be able to automatically monitor and interact with their environment without human participation, an advantage in remote or inhospitable locations. AMT

Maintenance Software

Avtrak GlobalNet

Avtrak's GlobalNet system now has the capability to calculate "alternate cycle tracking" data using customized flight log interfaces. The system incorporates formulas unique for each make and model of helicopter and are kept up-to-date through Avtrak's propriety algorithms and master data sheets. Avtrak offers aviation compliance services for virtually all makes and models of business aircraft including jets, turboprops, and helicopters. For more information visit www.avtrak.com

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Corridor Aviation Service Software updates include enhanced work order and quoting modules to speed performance and provide additional work order management tools. Upgrades to the integration of regulatory compliance and work orders provide a streamlined compliance process, taking compliance events as they become due directly to a work order or work order quote, and updating the compliance records upon work completion. For more information: (512) 918-8900 or www.corridor.aero.

CribMaster

CribMaster provides RFID tool control solutions. In collaboration with Proto, CribMaster has recently developed ProtoID. With this, CribMaster has an additional feature called "Discovery Mode" which will automatically recognize the ProtoID tools and automatically create the item data and bin information in the software. This makes system setup fast, easy, and reliable. For more information call (888) 419-1399 or visit www.cribmaster.com.

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Pentagon 2000 Software

Pentagon 2000SQL is an aerospace and defense MRO software that supports parts distribution and brokerage, repair and overhaul of complex equipment, logistics support and supply chain management, and heavy aircraft, depot level, and line maintenance. The Audit Trail module enables Pentagon administrators to designate mandatory fields for a complete audit trail. For more information: (800) 643-1806, (212) 629-7521 or www.pentagon2000.com.

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Global Positioning System

GPS III is currently in development and on schedule for launch in 2014

By Jim Sparks

Jim Sparks has been in aviation for 30 years and is a licensed A&P. He can be reached at sparks-jim@sbcglobal.net.

The global positioning system (GPS) is a space-based satellite navigation system providing location data coupled with time information worldwide. This coverage is predicated on an unobstructed line of sight between the user and the dedicated satellites. The service is funded by U.S. taxpayers and maintained by a department within the U.S. government. Anyone with a GPS receiver can access the system without charge.

As a navigational resource, the orbiting satellites provide critical capabilities to military, civil, and commercial users around the world. It is intended to become the backbone for modernizing the global air traffic system.

The project was conceived in 1973 to overcome the limitations of previous ground-based navigation systems. GPS was created and undertaken by the U.S. Department of Defense (DoD) in 1994 and was fully commissioned with 24 satellites. In recent years, three additional orbiting units have been added to enhance worldwide coverage. As of December 2010, there were 30 operational satellites orbiting the earth actively broadcasting positioning, navigation, and timing messages to users, 24/7, around the globe. In addition, five older satellites are maintained in orbit in a standby mode that can be brought back to operational status if required.

Next generation

Advances in technology and new demands on the existing system have now led to efforts to modernize the GPS system and implement the next generation of GPS III satellites and Next Generation Operational Control System (OCX). In 2000, U.S. Congress authorized a modernization effort. Renovation of the constellation, which should enhance the performance and capabilities of the system, began with the launch of eight GPS Block IIR-M satellites during 2005-2009 and the first of 12 GPS Block IIF satellites in May 2010. The next generation of satellites, GPS III, is currently in development and on schedule for a first launch in 2014.

In addition to the U.S. owned network, the Russian GLObal NAvigation Satellite System (GLONASS) was in use by only the Russian military, until it was made fully available to civilians in 2007. A Galileo project is in works by the European Union along with the Chinese Compass Navigation System, and Indian Regional Navigational Satellite System.

Signals from satellites

The design of GPS is based partly on similar ground-based radio-navigation systems, such as LORAN. A GPS receiver calculates its position by precisely timing the signals sent by GPS satellites high above the earth. Each satellite continually transmits messages that include the time the message was transmitted, precise orbital information (the ephemeris), and general system health including the orbits of all GPS satellites (the almanac).

The receiver uses the messages it receives to determine the transit time of each message and computes the distance to each satellite. These distances along with the satellites' locations are used to compute the position of the receiver. This position is then displayed, perhaps with a moving map presentation or latitude and longitude. Elevation information

Signal interference is often difficult to detect but can render the GPS useless so finding out when and where the problem occurred is a good starting point.

may also be included. Many GPS units show derived information such as direction and speed, calculated from position changes.

Three satellites might seem enough to receive information to resolve a position since space has three dimensions and a position near the earth's surface can be assumed. However, even a very small clock error multiplied by the very large speed of light coupled with the speed at which satellite signals propagate would result in a large positional error. Therefore, receivers use four or more satellites to solve the receiver's location and time. The accurately computed time is not displayed in all applications. A few specialized devices do use the time; these include time transfer, traffic signal timing, and synchronization of cell phone base stations.

Having four satellites in view is required for most operations, fewer apply in special cases. If one variable is already known, a receiver can determine its position using only three satellites. For example, a ship or aircraft may have a known elevation. Some GPS receivers may use additional clues or assumptions (such as reusing the last known altitude, dead reckoning, inertial navigation, or including information from the vehicle computer) to give a less accurate (degraded) position when fewer than four satellites are visible.

Interference

Like all radio-based services, GPS is subject to interference from both natural and human-made sources. A civilian GPS unit can lose reception in the presence of a device designed for intentional radio jamming. This can also occur during a solar flare. For this reason, the U.S. government strongly encourages all GPS users to maintain backup capabilities for positioning, navigation, and timing. In addition, new GPS signals that are more resistant to jamming are being developed. Even conditions within the earth's Ionosphere impact satellite transmissions.

All satellites broadcast on several frequency bands termed L1 through L5. Basic military applications use two frequencies, 1.57542 GHz (L1 signal) and 1.2276 GHz (L2 signal) while civilian receivers monitor the L1 transmission. The satellite network uses a Code Division Multiple Access (CDMA) technique where the message data is encoded with a pseudo-random (PRN) sequence that is different for each satellite. The receiver is programmed to be aware of the PRN codes for each satellite

to reconstruct the message and extract the required information.

The L5 frequency band at 1.17645 GHz was added in the process of GPS modernization. This frequency falls into an internationally protected range for aeronautical navigation, promising little or no interference under normal circumstance.

One recent situation involving communications service provider LightSquared resulted in a reassessment of a plan to launch a nationwide broadband service using frequencies bordering those of GPS. LightSquared is trying to build a cell phone network out of satellites, but the technology may, potentially interfere with GPS. LightSquared wants the military and other federal agencies to refit its equipment with filters. There have been reports of aircraft onboard GPS anomalies where data transmissions broadcast through the Inmarsat satellite communications systems have been identified as the culprit. This is another system utilizing filters to prevent interference.

Troubleshooting

When troubleshooting reports GPS problems it is often beneficial to employ techniques common in diagnosing basic radio problems. Signal interference is often difficult to detect but can render the GPS useless so finding out when and where the problem occurred is a good starting point. Many aircraft are equipped with dual receivers so questioning the status of both systems can provide direction to problem resolution. An aircraft inside a metal hangar is often blinded to satellite signals so installing a GPS repeater unit can be a value. This device includes an antenna that can be affixed to a building exterior, a receiver transmitter unit that will accurately reproduce satellite transmissions, and a transmit antenna that can be located within the hangar. This is a means to allow system alignment while the aircraft is indoors plus a valuable tool when on a fault-finding mission. Solar activity is another known detractor of GPS reception. An improperly bonded receiver antenna can render the navigation feature useless. Portable receivers or even remote antennae located in the cockpit may become blinded by electrically anti-iced windshields which may result in signal error.

GPS is no more than measuring time and distance to determine where you are. But when it comes to the actual measuring, there are so many external factors to be accounted for that without the benefit of high tech you could easily be thrown off by half a continent. AMT

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COVER STORY:

Regional Service CENTERS

One OEM's approach to global aircraft maintenance support

By Charles Chandler

Charles Chandler received his A&P from Spartan College, BA from Tulsa University, and has been involved in maintenance training and leadership development for most of his career.

On Feb. 8, 2012, the Aeronautical Repair Station Association (ARSA) gave a collective cheer. After years of delays and many short-term extensions, the House and Senate have approved the FAA Modernization & Reform Act (H.R. 658). At last American MRO companies feel that they should be able to compete head on with other international companies for the growing global aircraft maintenance and service business.

International competition, in-sourcing, outsourcing, and protecting American jobs are hot political topics. Whatever your position, most can agree that the global aviation industry is interconnected and very competitive. Entrepreneurs and business owners will always follow the money and aircraft sales of and service for commercial passenger and

Inside the facility at Bombardier Customer Services "Zone Two Hub" located in Amsterdam at Schiphol Airport. Photo provided by Bombardier Customer Services.

Bombardier Customer Services "Zone Two Hub" located in Amsterdam at Schiphol Airport. Photo provided by Bombardier Customer Services.

business aircraft in the Asia-Pacific markets are strong and growing.

Bombardier is one of the international companies that has been developing facilities and competing for aviation services business in Asia-Pacific and other global markets. As in any game or business it is always a good strategy to know where new opportunities lie and the strengths of your competition, especially the leaders.

OEM-owned regional service "hubs"

The economies of China, India, and Brazil are growing nicely and the United States is rebounding, albeit slowly. Eric Martel, president, Bombardier Customer Services & Specialized and Amphibious Aircraft, predicts that by "2030, there could be more than 1,100 business jets in service in the Asia-Pacific region and we expect a large share of their owners and operators will be Bombardier customers. We are ready and committed to supporting our existing and future customers in the Asia-Pacific region by ensuring they have access to the full range of support and services in their own time zone and in their own region. It is a reflection of our commitment to current and future operators that no matter where they fly, they will have our service."

On Feb. 15, "Bombardier Aerospace announced that it will open a full-scale company-owned and operated service center in Singapore in 2013. The new facility will be its second fully owned and operated service center outside of North America, bringing the total number to 10 worldwide. It will be capable of performing a variety of light to heavy maintenance tasks on all Bombardier Learjet, Challenger, and Global aircraft."

The Singapore Regional Support Office (RSO), opened in late 2011, will work in conjunction with the new service center location as well as the company's current Singapore parts depot. Together with other facilities based in the Asia-Pacific region, this will create a full-service customer support hub in the region to complement existing regional networks in North America and Europe.

Bombardier is developing and operating three of these global

hubs. They are organized by geographical zones, Zone One Hub serves North and South America customers; Zone Two Hub is anchored in Amsterdam at Schiphol Airport and, with the support of regional support offices (RSOs) and parts depots including Frankfurt, serves Europe, Middle East, and African customers; Zone Three Hub is being developed to serve Asia-Pacific and the RSOs and parts depots currently in the region will be anchored by a maintenance facility in Singapore, that will be operational in 2013.

When asked about the philosophy behind this regional "hub" approach, President Martel says, "Our business philosophy for international service is simple. We want to provide the best service that we can for our customers — where they are and when they need it. In 2001, the installed Bombardier fleet was about 2,500 business jets and about 80 percent of those were North American customers. Today we have more than 4,000 business jets in-service around the world — approximately 60 percent are North American customers, 40 percent are at international locations. Our international customer base is growing and we will be building service hubs to support them.

"At Bombardier we are refining a "yes" service philosophy. In the past when our service centers and parts depots were located in North America, our answer to international customer requests for service was sometimes "no" because of time and logistical constraints. We recognize that

our customers operate their business jets around the globe and around the clock and we are bringing OEM quality service to them. We are being proactive and hiring, training, and building capacity to service our customers 24/7."

Developing and staffing international hubs

Stan Younger, Bombardier's vice president of Aircraft Service Centers, discusses the business strategies and process for developing a new OEM service hub and the phased approach to maturing a hub. "Initially a team is sent in to help organize, develop, and certify these international hubs at the FAR 145 level.

"We work with whatever regulatory agencies are involved with certification in a region." According to Younger, they "monitor the density of aircraft in a geographical region and as that grows we begin ramping up customer support, networking assets, and increasing maintenance support personnel at the RSOs. We staff our international service centers with a combination of local technicians, staff from North America, and some supplied by sourcing agencies. We accept AMT avionics and electronic technicians with A&P certificates or the equivalent from their country.

The international AMTs usually speak several languages and have a good understanding of the culture of the local and regional customers. They are brought to one of the service centers for several months of on-the-job training to learn about the company culture, maintenance processes, and procedures, and especially Bombardier's customer service philosophy. This philosophy is very important because the business jet customers are becoming more sophisticated and want to be involved in the maintenance activity.

"Like Starbucks's business model, I want our customers to be able to take their aircraft to any Bombardier Service Center and get the same level of reliable and predictable service," Younger says. "The faces behind the counter or the toolbox may change but the customer gets the same quality experience and product. This is one of our tactics for building the Bombardier brand. To do this we need a higher level of contribution from our AMTs. First we need qualified AMTs that can effectively maintain our customers' aircraft. We also need our AMTs to understand our cost and pricing models and when asked, can discuss these with the customer.

"Our business jet maintenance service is built on and will be sustained by customer trust. It is most important that our customers understand and trust our technicians' recommendations. This makes the conversation about pricing and cost much easier. Our customer-facing staff is much more important to our customers than our management and back office staff." During the interview it became very obvious that training and

staff development was a passion for Younger and an important part of the corporate culture.

Advice for AMTs

Younger graduated from Spartan College of Aeronautics in the mid-'70s and through hard work, personal development, and perseverance is now a vice president for a major OEM. He offered some very appropriate advice regarding development and promotion for the AMT.

"In my opinion and experience most companies don't do a very good job of developing AMTs for promotions to management or other key positions. We often take our best AMTs and promote them to management without adequate training and development. AMTs, as well as members of management, must develop business acumen and have essential business and financial knowledge and skills. Bombardier is addressing that gap by providing training to help our maintenance staff develop these capabilities. Training and staff development is one part of our 'rebranding initiative.'"

Bombardier Customer Services "Zone Two Hub" located in Amsterdam at Schiphol Airport maintains a variety of aircraft either based or operating in Europe. Photo provided by Bombardier Customer Services.

During the week of our interview it was announced that "each of Bombardier's eight wholly owned service centers in the United States was awarded a 2011 FAA Aviation Maintenance Technician (AMT) Diamond

Award Certificate of Excellence, the industry's highest honor for aviation maintenance.

This award recognizes Bombardier's commitment to offering customers access to the most highly skilled work force through an extensive training program. As for the AMTs, Younger suggests they consider their own personal brand by looking at how they are marketing their skills and abilities and improving their value in today's marketplace.

He recommends a personal continuous improvement program where AMTs take business and finance courses or learn a second language. "Business aviation AMTs must stay current with technology and as customer-facing employees, develop good customer service and communication skills. They also must be developing their capacity for larger roles and positions with their companies."

Younger's position was echoed by a panel of three executives from major business aircraft MRO companies during the recent Cygnus Aviation Expo in Las Vegas who stated that their businesses were growing again so they were looking for and hiring AMTs that demonstrated good values, ethics, and communication skills.

After hearing from Bombardier's executives about their business strategy and implementation of service hubs, we can only conclude that other MRO companies wanting to enter and compete in the global marketplace have their work cut out for them. It was also apparent that aviation company executives are placing much greater importance on AMTs having or developing business and customer service skills. **AMT**

Editor's note: These interviews were made possible through the diligence of Mark Masluch, Advisor, Media & Public Relations, and Bombardier Customer Services.

Technician Shortage?

I don't think so . . .

By Stephen P. Prentice

Stephen P. Prentice is an attorney whose practice involves FAA-NTSB issues. He has an Airframe and Powerplant certificate and is an ATP rated pilot. He is a USAF veteran. Send comments to aerolaw@att.net.

Some news reports are announcing that a maintenance technician shortage is looming shortly because of the so-called emergence of the industry from a long-term recession. There is some doubt about this. Just take a careful look.

AMR bankrupcy

We are all familiar with those laid-off technicians seeking employment in other fields which pay better and offer more security. And, of course we know of the recently announced 4,600 or so technicians who will go out the door along with 400 pilots in a total of 13,000 odd total planned layoffs in the American Airlines bankruptcy filing. (AMR has 130,000 employees.) We can only wonder where all the technicians will go. Oh, and incidentally, American "reassured" its employees on their pensions. But, it terminated its defined benefit pension program only recently. It has since handed it over to the Pension Benefit Guarantee program … funded by the pension sponsors and most likely taxpayers as backup, because the PBGC is running out of money.

The government operates the PBGC, which routinely will pay only a small part of what is owed. American on Feb. 1 announced that it will lay off the 13,000 total employees but was still interested in plans from their unions to ameliorate this result (early retirements, voluntary termination, etc.). The union contracts are canceled in the court proceeding. They also said that they intend to outsource 40 percent of their aircraft maintenance activities! (USA, China, South America, Europe?) There is no doubt that there will be further consolidation in the airline industry which means more layoffs will probably come. (For info on pension crisis in U.S. generally see: JackDean@PensionTsunami.com.)

General aviation and avgas

General aviation activities are at all time low … fuel costs going to between $6 and $15 a gallon in the near future … depending on who you believe. Private and business owners have curtailed their flying substantially and will continue to do so as the costs rise. Flight schools will come to a halt as the spike in av-gas prices continues.

Speaking of fuel you should have noticed that Chevron, Exxon, BP, and other major brands have stopped their brand retailing in California and perhaps other states to come. They all have sold the retail market for av-gas to distributors so that they no longer appear as the seller. Pretty soon, if not by the time you read this, only one distributor of av-gas in the U.S. will handle sales of all the av-gas. You should know what this means: The major brands will still provide the fuel, but who knows for how long and at what cost? By the way, jet fuel will not be affected directly since it has no lead. Av-gas from China or Canada may be in our future … As usual, we have the environmental people, among others, to thank for this because of Prop. 65 in California, which relates to lead in aviation fuel. All of the principal fuel people and some FBOs have been sued and the case is presently winding its way through the courts of California. This will raise the bar on fuel costs once more to whatever the traffic will be able to bear …

No doubt, there will be a greater need for technicians over the next 20 or 30 years simply because some of the people working now will be retiring. However, many technicians today looking toward retirement are faced with little or no pension support or any other type of financial security. These people can only look forward to working well into their 70s to pay the bills.

If this should occur, general and other piston business aviation could come to a halt. Technicians will be affected naturally since no flying means no maintenance work…

And, finally, of course, the coming election poses the specter of more taxes, user fees, and the like, from our present leader, if he is re-elected. I think it's time for further tightening of your seat belt, until we see what will happen in November. It's going to be bumpy and by then, it won't be pretty.

Overseas work

Some commentators have suggested that you can earn big technician salaries overseas. This of course requires that you give up your family and homes and move, in most cases. You can take short-term employment to fill your money gaps but on the whole they will require longer term commitments. There are some tax advantages in working overseas, so long as the local taxes are reasonable over there.

Some laid-off techs are seeking work overseas. There seems to be strong growth in overseas maintenance activity, according to some observers, and there are reports of salaries over 100Gs with expenses. Not a bad deal, if you want to leave. At home, salaries vary greatly but not anything like 100Gs. Before you accept any overseas position you should examine the deal very carefully … because once you are overseas you are locked in by costs of return and other restrictions usually involving money. If it sounds too good to be true, it's usually not true!

MRO report

Look at the MROs … all mostly non-union with most paying less wages than an airline or corporate flight department, attracting new less-trained mechanics to do their work. They will be expecting to hire many laid-off technicians. All the technicians laid off so far that I know, seek jobs with more security, like with FedEx and UPS. These technicians would have more security than any other firms. Of course many technicians have gone to the government and found the best security in the FAA (jobs forever, never laid off, great pensions) and other government agencies, ICE, DEA, and various local law enforcement, and fire-rescue activities. There are still many technician maintenance opportunities in the government area. If you are still in a private enterprise

maintenance activity you better have "plan B" ready for next year if not before. Remember, it's always easier to obtain a new job while you are still employed. Pretty soon we'll have more government employees than private enterprise … are you ready? Remember just because a company is large is no real protection … think Boeing … closing its plant in Wichita.

I have a report on MRO activities from a reader. He was in the airline maintenance field for many years and the layoffs hit him with some finality. He joined an MRO thinking it would be different. He said it's not. In the airlines, he said, he had a union to protect him from the poor decisions of upper management related to safety. This protection allowed him to perform his job function with safety uppermost in his mind. He could do the "right thing"… as he said. He continued by saying in his opinion the rise in unlicensed and less skilled mechanics is going to lead to increased risk of accidents. (Note AMR above ... 40 percent). The increase in the number of unlicensed and less-trained mechanics is overtaking the number of those who are licensed with more training. He says this situation, if allowed to continue throughout the industry, can only lead to eventual disaster. FAA, by the way, has frequently admitted that it cannot conduct adequate surveillance on many MRO's and other outsourced maintenance activities, especially those located overseas. They say they don't have the staff … just look around you at the FSDOs and regional offices for example and count the staff …

What's the future?

Some will contend that by continuing to indicate a need for technicians employers are guaranteed a continuing source of applicants at low starting pay. Some think that if there is a surplus of applicants for jobs then the salary levels will continue to be kept at a low level, acceptable to fringe and marginal maintenance activities, thus guaranteeing more profit for their work.

Yes, no doubt, there will be a greater need for technicians over the next 20 or 30 years simply because some of the people working now will be retiring. But this is nothing new, and is expected as normal attrition. However, many technicians today looking toward retirement are faced with little or no pension support or any other type of financial security. These people can only look forward to working well into their 70s in order to pay the bills. AMT

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2012 Maintenance Skills Competition

The 2012 *AMTSociety* Maintenance Skills Competition continued the tradition of the previous four years. This year there were 27 teams with international representation from China and Australia, with additional teams from aviation schools and military branches.

This year two events were removed and eight introduced. Two were created by mechanics that participated in the event last year. It shows that the event has struck a chord in the industry and people who want to give back to the industry have a way to do so; it's a win-win. The mechanics went back to management and said they wanted to do this and the events were created with sponsorship by Boeing and Alaska Airlines.

A mechanic from PPG introduced a product and an event at this year's show, an aircraft windshield hump seal repair kit. A mockup of a 767 fuselage made a colorful and bold attention-getter as part of the event.

This year's event was more successful in terms of awards presented. Each team that achieved the fastest score for an event won tools. A thank you to all the companies that provided events along with judges; the event wouldn't happen without you.

It's been an honor and a privilege to be a part of this. It's a positive event, and I'm lucky to be a board member and chairman of the event. And wait till next year, it promises to be even bigger. Mark your calendars for March 12-15, 2013 in Las Vegas.

— Ken MacTiernan, MSC Chairman/AMTSociety Director

Toolbox raffle

The winner of the *AMTSociety* toolbox raffle is Richard Sanders. He works for Lockheed Martin Aeronautics in Marietta, GA. He is going to donate the Snap-on toolbox and tools to the Institute of Aeronautical Technology, Craven Community College, Havelock, NC. Thank you Richard for giving back to the industry.

O'Brien Award

The U.S. Coast Guard team was first in the Military category and also achieved the overall fastest score among all 27 teams that competed this year for which they received the William F. "Bill" O'Brien Award for Excellence in Aircraft Maintenance Award. Marie O'Brien, Bill's wife, presented the award.

Professional AMT Award

A new award this year is *AMTSociety* Professional AMT award. It is an award given to the one AMT or AME from among all the AMT/AMEs competing who displays the most professional appearance, attitude, and knowledge. This individual was chosen by the judges of all the MSC events. The judges each wrote down the name of one person who they felt deserved this award. Senior Airman

Captions: Opposite page, above left from top: First Place in General Aviation, Team Colorado; First Place Commercial Aviation, Southwest Airlines, for the third year in a row; Redstone College Team Red, First Place in Schools; First Place in Military, U.S. Coast Guard; right from top: *AMTSociety* Thomas E. Hendershot Lifetime Achievement Award, Douglas Lynn; First Place in MRO/OEM, Boeing; and William O'Brien Award for Excellence in Aircraft Maintenance, U.S. Coast Guard.

The Winners

General Aviation
1. Team Colorado

Commercial Aviation
1. Southwest Airlines (Third year in a row!)
2. Australian Licensed Aircraft Engineers Association (ALAEA)
3. FedEx Team LAX

MRO/OEM
1. Boeing
2. Lode

Schools
1. Redstone College Team Red
2. Aviation Institute of Maintenance Kansas City
3. Redstone College Team Black

Military
1. U.S. Coast Guard
2. U.S. Navy Fleet Readiness Center Southwest
3. U.S. Air Force, Charleston Team 1

More photos on Page 38







Professional AMT Award winner Senior Airman Kevin Meredith with USAF Col. Robert Miglionico and the gold engraved wrench from Snap-on.

(SRA) Kevin Meredith from the Charleston AFB Team 1 received the most ballots. He was presented this award by USAF Colonel Robert E. Miglionico, AFSOC 1 SOMXG/CC, who was on hand to help present awards to the Military Category teams. SRA. Meredith received a "Professional AMT Award" plaque, a Snap-on Gold Engraved 2012 MSC Professional AMT Award Wrench, and other tools.

Hendershot Lifetime Achievement Award

The recipient of the *AMTSociety* Thomas E. Hendershot Lifetime Achievement Award is Douglas R. Lynn from Euclid, OH.

Lynn is employed as the director of maintenance for PACE-Cleveland Steel Container, which operates a Hawker 800 located at the Cuyahoga County Airport in Richmond Heights, OH.

He is a 1963 graduate of Spartan College of Aeronautics and Technology and has been nominated to receive the Charles E. Taylor Master Mechanic Award from the Cleveland FSDO.

The number of nominations and the comments speak volumes as to the involvement and passion that Lynn displays every day.

Lynn has served as the president, vice president, and secretary of Northern Ohio Aviation Maintenance Association (NOAMA), and also served a two-year term as vice president and two-year term as the secretary for PAMA. As part of the award he receives a lifetime memberbership to *AMTSociety*.

The plaque reads: "For outstanding personal efforts in improving knowledge of aircraft technicians and inspiring others to enhance aviation safety through self-education. And for your leadership and exemplary dedication to aircraft maintenance, safety, training, your professional attitude, and adherence to the Mechanic's Creed. With Sincere Appreciation, the Board of Directors, March 9, 2012."

Tom Hendershot presenting a plaque to the FedEx vice president of maintenance for sponsoring the engine event at the Maintenance Skills Competition.

MSC Participant: FedEx

For the last several years FedEx has donated engines for use in the Maintenance Skills Competition, along with having teams compete in the event.

FedEx Express manager Mike Sanford has attended the *AMTSociety* Maintenance Skills Competition the three years to support the FedEx Express AMTs from Indianapolis, Los Angeles, and Memphis who compete. He comments, "I'm always impressed by the professionalism and dedication I see in all the AMTs who participate in the annual skills competition. We are honored to be associated with the program."

History: In 1965, Yale University undergraduate Frederick W. Smith wrote a term paper about the passenger route systems used by most airfreight shippers, which he viewed as economically inadequate.

Today FedEx Express has the world's largest all-cargo air fleet, including Boeing 777s and MD-11s and Airbus A-300s and A-310s. The planes have a total daily lift capacity of more than 30 million pounds, and deliver to customers in more than 220 countries and territories. In a 24-hour period, the fleet travels nearly 500,000 miles while its couriers log 2.5 million miles a day — the equivalent of 100 trips around the earth.

FedEx Express is the flagship operating company of FedEx Corporation, which provides strategic direction and consolidated financial reporting for the operating companies that compete collectively under the FedEx name worldwide: Other operating companies include FedEx Ground, FedEx Freight, FedEx Office, FedEx Custom Critical, FedEx Trade Networks, FedEx Supply Chain Solutions, and FedEx Services.

So You Want to See the World as a MECHANIC

By John Goglia

John Goglia has 40+ years experience in the aviation industry. He was the first NTSB board member to hold an FAA aircraft mechanic's certificate. He can be reached at gogliaj@yahoo.com.

There are still opportunities for mechanics who want to combine work and travel

It's not just pilots who get the travel bug and want to see the world. A lot of mechanics — myself included — want a job which offers international travel as a benefit.

Early in my career, I did contract maintenance for a number of operators. In those days, if an aircraft broke down away from one of its bases, it was not unusual for a mechanic to pick up the parts and go to wherever the aircraft was located to fix it. In some countries it was just easier to send a mechanic with the part than try to ship it and get it through customs.

My travels took me all over the Caribbean, Europe, and the Middle East. Some trips were

pure drudgery with very long days and nights across time zones — but there were others where I got to spend a day or two exploring a new and exciting city. While those days are gone, there are still opportunities for mechanics who want to combine work and travel.

The airlines

Some mechanics who want international travel look to the big airlines. No, not for the travel perks; those free space-available seats have just about vanished as the airlines cut flights. With sky-high load factors, even paying passengers have difficulty finding last-minute seats. But there are opportunities for maintenance work abroad with many airlines: overseeing the work done at foreign repair stations. So while most, if not all, the airlines use these repair stations for at least some of their maintenance, they still send their own employees to ensure oversight of the work. While this isn't hands-on maintenance work, most companies want the qualifications and experience that comes with holding an A&P.

Cross training

But if you like fixing airplanes yourself, there's no reason to give up your dream of combining that with travel to far-flung destinations. You just may need to be a little more creative. Recently, I did some consulting for a large American corporation that owns a mixed fleet of aircraft. The top executives frequently fly to China and other parts of Asia. Because of the difficulty of getting maintenance done in some of the places they travel to — getting a tire changed can be tough in some of these locations — the company decided it wanted a mechanic on every flight. The problem was that their aircraft only had one additional crewmember seat. Not wanting to give up having a flight attendant — or giving up an executive seat — the company offered the mechanic the opportunity to cross train as a flight attendant.

He now routinely flies around the world as a mechanic and as a flight attendant. I have to admit this is not a job combination that many mechanics of my era would have anticipated. But in this economy, flexibility and cross-training are key. I admire the company for acknowledging the importance of having qualified and skilled maintenance available on all trips and I admire the mechanic for taking advantage of an interesting opportunity. AMT

Aircraft Maintenance Globalization

Europe and EASA are currently leading the way in aircraft maintenance and pilot regulatory reform.

By Nick Sergi

Nick Sergi served as FlightSafety International's Director, Maintenance Training Services and was with the company for more than 34 years.

This is the season for another round of trade shows with more and more of these events being held overseas. There are airline shows, business aviation shows, aircraft financing and leasing shows, air law shows — it goes on and on. Some of these have been taking place for a while, like those in Europe and Latin America, while others are relatively new like those in China, India, the Mid-East, and the new Russia. All bring to our attention the ever-expanding global nature of our business and influences on the aviation maintenance.

So, let me start with a question. How many of you have attended any of these meetings? I'd venture to say, very few of you. It's hard for you to attend events in this country, much less overseas. I know from experience few of you attend ATA or MRO expos and maybe the manager or supervisor of your operation attends the NBAA show or its maintenance symposium to be held soon in Nashville. Some of you are able to attend seminars and initial and refresher training, but that's not the same.

What goes on at these meetings is important because these events often determine the future rules and practices in your workplace. In my onion, due to the over-grown bureaucracy in our FAA, Europe and EASA are currently leading the way in aircraft maintenance and pilot regulatory reform. For instance, I recently read EASA will be tightening its requirements on third-party maintenance contractors at approved repair stations to include training, experience, etc. This means EASA approved stations here will have to have more oversight of its contract personnel. How about drug testing and fatigue issues? Aren't these your concerns?

What can the individual technician do to participate in this competitive structure?

First, is it important for you to participate? The answer is, most definitely, yes. And for several obvious reasons — stop the jobs from flowing overseas, out of the country. Yes, a lot of this is related to less cost of doing business overseas and in Latin America, but American excellence is still a driver in aviation and business will come in a growing market. And it is predicted that 33,500 new aircraft will be added by 2030 and that the MRO business will grow from $40B to $100B by 2032.

Another motive for your participation is to have a say in current issues like ICA and PMA. The latter has seen more OEMs restricting its information output putting competitive stress on MROs. This may limit the information you will have to work with. The former has seen EASA proactive in defining these instructions.

A voice for maintenance

Second, how do we participate? Technicians, mechanics, aircraft maintenance engineers, whatever, need to unite as a group. This does not mean a union. As those of you know, that have been reading my writing these last couple of years, I have been on a soapbox advocating the need for an effective voice for the aircraft maintenance individual. As a single person you will not be able to do anything, but as a group of more than 50,000 licensed technicians you will have a say, and that's for sure.

Let's start by making sure you are included in any ARAC committee that pertains to aircraft maintenance topics. Representatives should also be sent to participate in international maintenance meetings and seminars. Finally, and not necessarily last, there needs to be a center point for providing a single, powerful voice to the media on aircraft maintenance issues. There are too few John Goglias to go around.

So lets get going. Join in and if there is no place for you to join, contact me or the magazine and I/we will attempt to find one.

Thanks for reading. AMT

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AMTSociety MSC 2012: The Winners

Jon Jezo, Publisher

The 5th Annual *AMTSociety* Maintenance Skills Competition (MSC) was held in Las Vegas just a few weeks ago. Twenty-seven teams participated in the events this year and I am excited to report there were quite a few new faces and several new teams participating as well. It is refreshing to see the up-and-coming AMTs joining in to test their skills and network amongst their peers.

Now onto the important stuff, the MSC 2012 winners! Congratulations to our first place team winners, yes, that's a *threep-eat*: Southwest Airlines representing the Commercial Airlines; U.S. Coast Guard team representing the Military; Redstone College Team Red representing Schools; Team Colorado representing GA; and Team Boeing representing the MRO/OEM category. The team that achieved the fastest score overall was the U.S. Coast Guard and therefore they have won the William "Bill" O'Brien Award for Excellence in Aircraft Maintenance which was presented by Marie O'Brien.

I would like to thank MSC Chairman, Ken MacTiernan and the rest of the *AMTSociety* board of directors for doing a great job arranging the events and the overall competition.

Looking ahead to next year, there is plenty of time to get your team together and sign up for the 2013 competition on March 13-16, 2013 in Las Vegas

Until next time we'll see you online: AviationPROS.com

Thanks for reading! *Jon Jezo*

Aviation Institute of Maintenance Kansas City won second place in the Schools category.

U.S. Air Force Charleston Team 1 won third place in the Military category. More photos on pages 28-31 and on www.AviationPROS.com.

Redstone College Team Black, third place in Schools category.

Lode, second place in MRO/OEM category, with Tom Hendershot, executive director, AMTSociety.

FedEx Team LAX, third place in Commercial Aviation category.

U.S. Navy Fleet Readiness won second place in the Military category.


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