

AMT

Aircraft Maintenance Technology

*Written by aircraft maintenance professionals
for the professional maintenance team*

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July 2011

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1946 Piper J-3 Cub aft fuselage and tail section.
Photo provided by Kent Johnson

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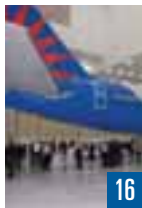
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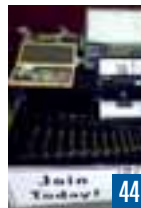
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By Jim Sparks

Oshkosh EAA Supplement

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The Past, Present, and Future

Charles Taylor, unmanned aircraft, and space flight



Ron Donner, Editor

Where do you go to experience aviation history, aviation in its present-day form, and innovation all at the same location? EAA AirVenture is one place. On display and in the air you will see examples of aircraft from yesteryear, today's most modern aircraft and accessories, and innovative ideas from the entrepreneurs and designers of what may be tomorrow's aircraft technology. Numerous attractions and events are planned for attendees to become immersed in aviation. A few highlights for this year's event that caught my attention are the salute to Naval Aviation, the World Symposium on Electric Aircraft, and a tribute to Burt Rutan.

Decades ago Burt Rutan began regular trips to Oshkosh where he'd display his unique experimental aircraft. His designs were

always innovative creations, most of which were a departure from typical design and construction practices of the day. Over the decades several of his designs became hugely

popular and I'd guess hundreds are flying all around the world. I myself have never flown a Rutan aircraft – but I'd like to. His team's more recent creations are designed to experience flight into space and safely return, and yes examples of these aircraft and spacecraft have been on display at previous AirVenture gatherings. Burt Rutan has been one of those entrepreneurs and innovators with deep roots to EAA and Oshkosh.

I recently attended the 2011 UAS Action Summit in Grand Forks, ND. For two days leaders from industry, government, academia, and military discussed the future of unmanned aircraft in both civilian and military applications. Northrop Grumman gifted a full-scale model of a Global Hawk to the area's Northland Community and Technical College Foundation, to be used in the college's new UAS maintenance training program, underscoring the reality that UAS is an emerging industry in civilian aviation. The entire Summit was all about innovation, technology, and entrepreneurial spirit.

With all this talk of innovation, unmanned aircraft, and space flight, let's not forget about the past. The staff of AMT was recently honored by a visit from the great-grandson of the man who is known as the father of aircraft maintenance. Charles Taylor II stopped by the office and visited one morning as he traveled through the area. We reminisced about his great-grandfather, the FAA's Master Mechanic Award that bears his name, and the First Flight Centennial Celebration of 2003.

Connect with the past by visiting an aircraft museum or reading a book on aviation history. Experience the present and visit AirVenture; there really is something for every interest. Embrace the future; unmanned aircraft, electric powered airplanes; private space flight they all appear to coming our way. Look for the entire staff of AMT taking in the sights, sounds, exhibits, and forums at this year's AirVenture Oshkosh.

Enjoy, Ron



Charles Taylor II visited AMT recently. He is the great grandson of Charles E. Taylor. Show with Tom Hendershot, Barb Zuehlke, Ronald Donner, and Jon Jezo.

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The tail section and fuselage on the PA-12 going back together.

Vintage Piper

RESTORATION

Tips and experiences from the shop at Stanton Airfield



By Ronald Donner

Natural fabric materials such as cotton and linen were primarily used for covering the structure of both small and large aircraft back in the day. However the use of fabric covering materials continues to be widely used on many new manufactured aircraft, for restoration of antique and vintage aircraft, and of course used by builders of

many experimental and recreational aircraft. Many factors determined the lifespan of fabric covering primarily the environment the aircraft operates in and whether it's stored inside or outside. On average natural fabrics would last a decade; or more or less.

A benefit if you will, of routinely removing the covering of these older aircraft is that mechanics and owners had the ability to regularly inspect, clean, repair, treat, and paint the generally steel, aluminum, and wood materials used to construct these vintage aircraft.

As a result of longer lifespan synthetic fabrics, one can argue the structure underneath may not be subject to a thorough cleaning and inspection as often as it once had, supporting the need for diligent preparation of the structure being covered. Moisture ingestion in hidden areas, spilled chemicals and oils, dissimilar metals, and other corrosion causing features, may have longer periods of time to attack and do damage. Many areas prone to corrosion are covered and hard or even impossible to

Hank Geissler sands in-between coats of silver pigmented dope.



access making it difficult to spot corrosion forming.

To talk more about restoring and recovering vintage airplanes, I turned to my good friends at Stanton Sport Aviation where they recently restored a 1947 Piper PA-12 Super Cruiser and a 1946 Piper J-3 Cub. Both aircraft were originally manufactured using natural fabrics for covering.

Under the fabric

The fuselages like similar aircraft of this period are a truss built structure using chromium molybdenum steel 4130 tubing or commonly referred to as "chrome moly". Originally the steel parts were painted with a common use primer of the day; how many of you recall the thin green appearing zinc chromate primer? Both wood and aluminum were used for fuselage stringers, floor boards, and miscellaneous other features. The wings for both these



attaching parts need a thorough cleaning and detailed inspection.

Typical discrepancies encountered can be cracked, bent, dented, and of course rusted tubing and other steel parts, as well as the occasional cracked weld-joint or fitting. A close inspection of the lower

Damaged and corroded metal being replaced on the J-3 fuselage.

found both the left and right side rear window channels completely rusted through due to moisture ingestion. They likely had been that way for years but until the

airplane was disassembled and the fabric removed this went undetected."

Rust on the outer surface of tubing will be easily seen, but corrosion caused by moisture that has penetrated its way inside the tubing

can be difficult or impossible to detect. Rust can be hiding inside these 60 plus year old fuselages and attack the steel structure on the inside of the tubing as well as the outer surfaces. One method used to find corroded and weak tubing is to apply pressure using a sharp instrument such as an awl to corroded or suspected areas of tubing. With most tubes having



Hank Geissler and Pat Watson discussing fabric layout for J-3 wing.

airplanes were constructed using aluminum spars and wing-ribs.

The first step to any restoration is the careful disassembly, that is if it's still assembled, and it's advisable to keep a detailed journal of how the aircraft came apart with lots of diagrams and photographs. The entire airplane and all the

fuselage structure particularly on tail-wheel type aircraft near the tail-post area will generally discover tubing in need of repair or replacement. Other areas prone to rust are those subject to water ingestion such as near the landing gear, windows, doors, and other openings.

Kent Johnson, A&P mechanic and manager of Stanton Sport Aviation, says, "On the Cruiser we



J-3 aileron spar corrosion found under the aileron hinge.

thin wall thicknesses, a rusted tube will be weakened resulting in the awl denting or penetrating the tubing, identifying an area in need of repair or replacement. Also look for obvious signs such as rust-red discoloration and flaking.

A similar inspection of the aluminum wings and related parts is also a must. Johnson explains, "The aluminum spars on the J-3 ailerons had significant corrosion under some of the hinges. It appears these hinges were not removed for a long time including at the last recovering." He noted the matting surfaces on the hinges were not rusted, yet the aluminum under them was badly corroded.

Cleaning, painting, and new fabric

Johnson says, "After making needed repairs to the fuselages all the steel parts were cleaned down to bare metal using media blast." He went on to discuss different types of media and grit used for cleaning and the importance with selecting a material not too abrasive as to damage the tubing. Once cleaned all the steel parts were immediately cleaned and painted with an epoxy primer.

"Even a short period of bare steel in a humid environment, or the fingerprints from handling the bare parts will be enough contamination to start the rust

process," Johnson says. Today's epoxy primers withstand environmental conditions much better than the old paints and are compatible with the fabric cements used to attach the fabric to the steel tubing. Also, there are approved

A benefit of routinely removing the covering of these older aircraft is that mechanics and owners had the ability to regularly inspect, clean, repair, treat, and paint the steel, aluminum, and wood materials used . . .

corrosion inhibitors available for flushing and coating the inside of steel tubing if you choose.

There are a few different types of synthetic fabric available today and approved with a supplemental type certificate (STC) for use on vintage airplanes. The covering material used on both these airplanes was Ceconite. Hank Geissler, A&P mechanic and Stanton's primary dope and fabric person, says, "All of the



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covering systems available today have pros and cons and your choice is dependent upon what kind of finish you want. I've used most of them and just happen to like using Ceconite fabric with Randolph Aircraft Products nitrate and butyrate dope."

After the fabric is installed and heat-shrunk, two coats of clear nitrate dope were applied. "One

of fabric added to corners and other areas where the fabric directly touches the structure underneath.

Then one more coat of clear butyrate and a series of butyrate coats with silver pigment added to protect the fabric against damage caused by sunlight. "We lightly sand in-between coats with 280 and later 320 grit sandpaper. Before

"Don't think the final color coats will cover imperfections; they won't. You need to be careful and neat all the way through the process." **AMT**

Stanton Sport Aviation Inc. is a full-service FBO providing pilot training, airplane rental including tailwheel and LSA, maintenance, restoration, and aircraft storage,



Newly restored PA-12 and J-3 at home at Stanton Airfield. Photos provided by Kent Johnson.

thing I like is to spray all the dope onto the fabric to eliminate brush marks, and I adjust the thinning percentages depending on which coat I apply," says Geissler. Next is rib-stitching, adding fabric tape to the wings, along with all the extra layers

the final color I like to paint all the fabric parts with a white base coat first. It seems to provide a consistent base and enhances the final color. I used three coats of color with a 400 grit sanding after the first and second coats."

Geissler ends by saying, "Most people develop their own individual techniques and these are mine." He goes on to say,

located at Historic Stanton Airfield in Minnesota. Stanton Airfield is a shareholder owned private airfield open to the public providing a place for recreational and sport aviation enthusiast to enjoy aviation. AMT editor Ron Donner has been a volunteer and member of the board of directors for more than 10 years. More information can be found by visiting www.stantonairfield.com.



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The Golden Age of Aircraft Engines

The Chernikeeff brothers, Matthew and Paul, and the Rotec radial engine



By Brad Groom

What is round and made of metal, comes from Australia, and many aviation people enjoy it? A can of Fosters? Could be, but I'm thinking engines as in the Rotec radial engine. And if you haven't seen one of these you are truly missing one of the most aesthetic looking aircraft engines that come with a high degree of performance and reliability that brings back the golden age of aircraft engines.

This article is not about a big manufacturing company but about the little shop that could and how it succeeded in supplying the aviation world with two radial engines.

Another set of brothers

Rotec Engineering Pty. Ltd. was established in the year 2000 but even before that the ground work was being laid down for this company. Just like the Wright brothers made a good team in aviation so did the Chernikeeff brothers, Matthew and Paul.

It started around 1997 when Paul's first radial design seven-cylinder 350cc radial engine was made for his scale model aircraft which drew great interest from the Australian aviation community. The brothers were taken by surprise by all the attention and were

asked to make a larger engine. Soon they were invited to the Caloolture air show in Queensland to display and run their radial engine. Well, every time they started it up they were

flocked by people and soon were out of brochures about the engine.

Next was to try to find someone to fit one of their engines on for test flights. The process of ground testing and fine tuning with a series of dynamometer tests was completed and the next step was flying. Slepcev Aviation accepted this challenge and installed the R2800 on a specially modified Storch called the "Criquet" named after the French radial powered version of the Fieseler design. Mr. Slepcev was very valuable as he relayed important information back to Rotec Engineering for evaluation.

As mentioned, this is a small company with Matthew, a toolmaker by trade with an operational background in CNC (computer numerically control) machinist, and Paul, a qualified automotive electrician and a skilled machinist with a passion for radial engine design and construction. With the help of a qualified aeronautical engineer, Bill Whitney, this team is very capable of manufacturing some great radial engines. Round this out with an individual with a B.S.c. with honors' combined with many years of business, their "Dad" Jim Chernikeeff brings another great component to the team that navigates the business.

The R2800 radial engine

The R2800 is the seven-cylinder radial engine that started this company and helps it expand and deliver the engines around the world. Dry weight of this engine is 224.4 pounds which produces 110 horsepower at 3,600 rpm via 3:2 planetary reduction gearbox.

It was only a matter of time until the aviation community desired another larger engine and Rotec was asked and looked upon to fill this need. So far, this company was trying hard to pay off bank loans. Exploring another engine was not in the cards at this time, but over the 2003 Christmas break Paul produced



Photo courtesy of Brad Groom.



Photo courtesy of Brad Groom.

and 40 more horsepower making this engine perfect for a lot of builders that are building WWI aircraft like the Nieuport, Sopwith, Fokker DR1, and people wanting a 150-hp radial vs. a 110-hp engine.

We mentioned before the horsepower and weight of the R2800 but let's get into some other technical information.

The ignition system consists of two auto type spark plugs per cylinder that independently fire by both a single self-energized magneto and a Hall-effect 12-volt electronic ignition system. This system in effect eliminates total failure of the ignition system when used in tandem. The timing is fixed at 22 degrees BTDC. An electric

12-volt starter motor, which is mounted in the rear, has a built-in solenoid for reliable engagement and cranking. Also rear mounted is a 35-amp alternator with a built-in voltage regulator.

The fuel is supplied to the engine by an engine-driven mechanical fuel pump, an electric fuel pump (which you need to purchase) and then configure both in series. The carburetor is a single Bing 40mm constant compression that has very good automatic altitude compensating mixture control that gives a smooth delivery of power. A conventional valve train is utilized with two per cylinder with dual row cam rings and roller tappets for smooth valve movements by a pushrod and 1:1 rocker transmission. There is a dry sump lubrication via geared oil pressure primary and secondary scavenge pumps.

the first set of design drawings. Everyone at Rotec agreed this was viable but what about funding? As the word got out that Rotec was trying to build a nine-cylinder radial engine, some individuals committed to purchasing these engines, which helped in the decision making to move forward.

By Jan. 18, 2005 the Rotec R3600 went into production. Basically, this engine is the same as the R2800 with two more cylinders

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The minimum octane is 97 RON or 100LL aviation or high octane mogas is recommended. Compression ratio of 8.5:1 is standard. Fuel consumption with avgas 100LL or high octane mogas is 5.8 gal./hour at 80 percent power. Rotec recommends using a high quality, major brand, four-stroke motorcycle oil, like Pennzoil motorcycle motor oil SAE 20W-50 or Valvoline Dura Blend Synthetic SAE 10W-40. Rotec recommends time between overhaul (TBO) of 1,000 hours.

Beware of corrosion

Builders of experimental aircraft like to have all their parts ready for installation as needed and not have to wait for them to be delivered. This is also true with the engine and sometimes they are delivered and end up sitting in a corner waiting to be installed. This practice will eventually damage your new Rotec engine as corrosion will start. Remember rust never sleeps. In the manual, corrosion protection is outlined but Rotec also has additional recommendations that must be followed if the engines are not in use or are in storage. It is very important to take the necessary steps Rotec outlines to protect your investment.

On a personal note when I was employed at the Aviation Institute of Maintenance in Chesapeake, VA, I would send emails with technical questions about the R3600 we purchased for our WWI student project which was to build a Nieuport 24 aircraft using the Redfern plans. Rotec was very helpful with all our questions and provided the technical answers when we needed help. We even purchased other items like antique looking gauges and a propeller from Rotec.

With hundreds of these engines sold it won't be long before you see one of these engines at your nearby air show and hopefully you will hear that distinctive sound of a radial engine in flight and maybe just maybe you'll have a Fosters in your hand also. How great would that be? **AMT**

Brad Groom has been an aviation enthusiast and an educator for more than 25 years. He has served in the U.S. Air Force, spent many years teaching foreign nationals how to maintain and troubleshoot aircraft for a defense contractor, part of the Navy Adversary Program Quality Assurance, and was employed in a FAA Part 147 school as an instructor and a manager. Currently he is the program coordinator for Centura College's online aviation maintenance management degree program. He holds an Airframe and Powerplant certificate and a bachelor degree in technical education.

PRESENTS

Moving from Technician to Technical Supervisor/Manager : PART 2

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- Hear from industry professionals on moving from technician to first-time supervisor/manager
- Discussion designed for people promoted from technician
- Helpful tips for technical personnel promoted to first-time supervisory/manager



Ronald Donner, AMT Editor

Ronald (Ron) Donner is the current editor of *Aircraft Maintenance Technology (AMT)* magazine. He's spent his entire life devoted to aviation and he holds FAA certificates as an A&P/ IA, and a Commercial Pilot with Single and Multi Engine Land, Instrument Airplane and Glider ratings. Ron has worked in a variety of maintenance related roles, both technical and management in general aviation as well as with a major airline.



SPEAKER: Charles Chandler

Charles Chandler has been involved in maintenance training and leadership development for most of his career. He developed curriculum for maintenance training at FlightSafety International and American Airlines' Maintenance Training Academy. He received his A&P from Spartan College, BA from Tulsa University, and MS in Adult and Occupational Education from Oklahoma State University.



SPEAKER: John Rahilly

John Rahilly has over 36 years of aviation service experience. Currently he works with Global Jet Services. He has an A&P certificate and private pilot license, instrument rated. He graduated from Northrop Institute of Technology and received an associate degree in Aeronautical Technology from Wentworth Institute of Technology.

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Aircraft Painting

What do you do when you get a lemon or an abandoned Navy air field? Build a big new paint hangar and sell lemonade.



By Charles Chandler

There are many reasons to paint airplanes. Some include protecting them from the elements and corrosion, while others identify them as belonging to a company or organization and to personalize them. I would suggest that it may be something more, something in our human nature that drives us to paint ourselves, our homes, autos, ships, and especially our airplanes. It appears that we love to enhance the features, lines, and form of those objects we favor. Nothing enhances the style and shape of an airplane like a beautiful professional paint job.

The industry rule is that aircraft exterior painting must not only look great but must stand the test of time. Those that own, operate or paint aircraft know this is not an easy or cheap process. Painting aircraft is a labor-intensive, multi-step process that requires a steady hand and intense attention to detail. Generally, the paint process includes these steps regardless of aircraft size:

- 1.** The aircraft is washed and moved into a stable clean environment.
- 2.** At-risk components and flight controls are covered or removed.
- 3.** A nonacidic, environmentally friendly chemical stripper is applied.
- 4.** The aircraft is inspected, flaws are removed, corrosion is treated, and necessary repairs made.
- 5.** The aircraft is washed with an alkaline soap.
- 6.** All aluminum surfaces are etched.
- 7.** All aluminum surfaces are treated with alodine.
- 8.** An epoxy chromate primer is applied.
- 9.** An epoxy surfacer can be applied.
- 10.** A polyurethane basecoat is applied.
- 11.** The paint scheme is laid out.
- 12.** The colors are applied.
- 13.** The colors are topped with a clear coat.
- 14.** Touch ups are made and the aircraft is buffed out.
- 15.** The aircraft is weighed if required.

The Aircraft Services Educational Facility was created with a \$10 million grant that Florida State College at Jacksonville obtained along with matching funds from the Jacksonville Aviation Authority.



Over the years painting materials have

certainly improved. It also appears that air carriers are contracting out their aircraft painting to MROs that specialize in painting and have facilities that can accommodate both narrow and wide-body aircraft.

Cecil Field Commerce Center in Jacksonville, FL

The addition of the Aircraft Coating and Aircraft Services Education Facility at Cecil Field is an aviation success story. When the U.S. Naval Air Station at Cecil Field closed in 1999, the Jacksonville Aviation Authority (JAA) took ownership of 6,000 acres and 1.1 million square feet of building space on the 17,000-acre airfield. Senior director of Cecil Field, Bob Simpson says, "We inherited an abandoned airport."

After a decade of hard work and investing \$90 million, the JAA has transformed Cecil Field into an active, modern general aviation airport. These improvements made Cecil Field an attractive destination for government, private industry, and educational institutions. In 2006, Florida State College at Jacksonville (FSCJ) approached JAA about expanding its presence at Cecil Field with a new aircraft coating facility.

According to Gene Milowicki, aviation programs director for the Florida State College at Jacksonville (FSCJ) Aviation Center of Excellence: "FSCJ obtained a \$10 million grant from the state which JAA matched to fund the \$20 million Aircraft Services Educational Facility (ASEF). JAA and Florida State College dedicated that facility on Feb. 1, 2010."

Flightstar Aircraft Services, an FAA-certified Part 145 repair station is the tenant operator of the ASEF. It offers the full range of MRO services from daily line checks to heavy depot level overhauls, avionics and engines upgrades, and passenger-to-cargo conversions at



At the grand opening of the Aircraft Services Educational Facility at Cecil Field.

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MRO OPERATIONS

its Cecil Airport location. Florida State College and Flightstar manage the scheduling of the aircraft coating bay and large paint booth at the ASEF hangar. Flightstar leases a large portion of the facility for its MRO and aircraft coatings operations and FSCJ operates two classrooms, a dry lab, and a paint booth in the remaining space.

FSCJ aircraft coatings program coursework

On Jan. 10, 2011, FSCJ students began pursuing their Aircraft Coatings Technician certificates from Florida Coast Career Tech, a division of FSCJ. I contacted Aircraft Coating Technician program instructor, Terry Perry to discuss the brand new program. Perry is a retired Navy aircraft structural mechanic who specialized in aircraft corrosion control and painting. FSCJ had just graduated the first

class of nine students and was starting the second. Ages of the first class ranged between 18 and 22, eight were recent high school grads, one a retired Navy vet, and one was from the construction trades.

Perry says, "Aircraft painting is a fast track into the aviation maintenance industry. MRO and painting contractors are always looking for skilled and experienced aircraft painters. Five students from the first class have already found jobs. We have a great program specifically designed to help students quickly develop the fundamentals and practical skills necessary to become a professional aircraft painter." The Aircraft Coating Technician program is a 16-week,



The Aircraft Coating and Aircraft Services Education Facility at Cecil Field.

600-hour program with a 40-hour (minimum) internship.

Students get classroom work in aircraft painting, occupational safety and health, environmental protection requirements, aircraft structures, aircraft corrosion control, paint removal systems and processes, and various aircraft coatings systems. They are taught to paint aircraft ranging from

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Global Finishing Solutions developed the Finishing Academy training site to help new paint booth users learn the essentials needed to produce a perfect paint job, as well as provide a place for experienced painters to brush up on the basics of maintaining a clean and efficient work area. The Aerospace Training section of the Finishing Academy focuses on the key factors to consider in the design, layout, and operation of an aerospace finishing facility. Visit www.finishingacademy.com.

During the two-day sessions held at the **Sherwin-Williams** modern Customer Service and Training Center in Andover (Wichita) KS, participants will learn about the latest industry developments and products. Training sessions will be held in the third and fourth quarter of 2011 on Sept. 20-21 and Nov. 8-9 from 8:30 a.m. to 5 p.m. daily. A per-person registration fee includes classroom and hands-on training with skilled industry professionals; a training book and related materials; all necessary safety equipment; catered lunch; and certified training certificate. The training center is equipped with many types of spray equipment, including electrostatic guns. Attendees, however, may bring their own spray equipment if they prefer. Visit www.swaerospace.com.

For information on the 2011 training program or other Sherwin-Williams Aerospace Coatings inquiries, call 1-888-888-5593 or visit www.swaerospace.com.

Cessna 150s to B-767s using Aero Chem, Akzo Nobel, DuPont, and Sherwin-Williams painting and chemical stripping products. They practice with DeVilbiss, Binks, and Ransburg electrostatic paint guns, layout tools, and tape and paper rollers.

Students are currently able to practice on aircraft subassemblies

and 30-foot fuselage sections that were removed by Flightstar during passenger-to-cargo conversions. Eventually, both large and small aircraft refinishing will be integral parts of the course of instruction. With the schoolhouse directly adjacent to the MRO facility, students have the opportunity to experience not

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MRO OPERATIONS

only classroom and curriculum coatings instruction, but also hands-on participation in coatings projects and other MRO maintenance activities in the facility. With the internship opportunities being expanded, many students can expect to find employment immediately following program completion.

FSCJ is also in the process of purchasing two virtual reality spray paint training systems developed by the University of Northern Iowa, Iowa Waste Reduction Center. Students will have the ability to get unlimited practice without having to go through the expensive and time-consuming steps of mixing paints, waiting for their projects to dry, and cleaning equipment, and it completely eliminates hazardous waste. (Editor's Note: See the article on STAR4D virtual paint training in the next issue of AMT.)

MRO Flightstar and Associated Painters Inc.

Tucker Morrison and Reed Friese gave me a top down view of the aircraft coating operations at the Cecil Field paint hangar. Morrison is the Flightstar Aircraft Services COO and Friese is manager of Associated Painters Inc. - Jacksonville Paint Operations. Flightstar manages the MRO operations and Associated Painters Inc. (AP) is the in-house painting contractor. According to Friese, it takes a 30 person crew seven days, working two and a half shifts, to paint a narrow-body aircraft. It takes eight to nine days to paint a B-767 type aircraft. They typically use about 50 to 75 gallons of paint for a B-737 type aircraft. Most AP customers choose paints that are designated by airline or operator engineers and approved by the aircraft OEM.

The Aircraft Coating Technician program at Florida State College at Jacksonville is a 16-week, 600-hour program with a 40-hour internship. Photo courtesy of Florida State College at Jacksonville.



FSCJ aircraft coating program internship

I asked Morrison and Friese about their involvement in the FSCJ Aircraft Coating Technician Program. It was very obvious that they were proud of their participation and helping bring this facility and educational program to fruition. Flightstar also donated \$26,500



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to a five-year scholarship fund. Morrison says that his company is committed long term to working with the FSCJ to facilitate students' learning experience. Friese agrees as well. They feel that this was a big win for the Jacksonville area and the aviation industry.

Friese says that it has been a challenge for aircraft painting companies to find trained and qualified aircraft finishers. Now they have the opportunity to help develop a training curriculum for refinishers and to meet and observe those technicians that had chosen refinishing as a career field.

"We pair them up with our experienced aircraft painters," Friese says, "because there is no substitute for one-on-one training. The students perform many tasks from sanding, to sealing, to masking, to equipment setup and take-



Students at Florida State College at Jacksonville are able to practice on aircraft subassemblies and 30-foot fuselage sections from Flightstar Aircraft Services. Photo courtesy of Florida State College at Jacksonville.

down, to painting small areas of the airplane. For major paint shoots, the students shadow our painters and observe the teamwork and precision that is required to make a large paint shoot successful."

Morrison and Friese say that they want to help FSCJ staff develop a "holistic" program that would closely match the actual painting process as it takes place

in the paint bay. After the first class both suggested enhancements such as more flexibility in the curriculum, starting hangar work earlier in the program, and extending the internship.

It is obvious that this initiative is a work in progress and a great aviation success story in the making. The charter members: Flightstar, Associated Painters Inc., Jacksonville Aviation Authority, and Florida State College at Jacksonville are totally committed to building an Aviation Center of Excellence that can provide unique, world-class MRO services, education, and training to meet the work force needs of our industry. **AMT**

Charles Chandler is an A&P based in Michigan. He received his training from the Spartan College of Aeronautics.

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What's in Your Toolbox?

Part 2: What should be in the SMS toolbox?



By Majella McDonald

Knowing what a safety management system (SMS) is does not equate to implementing one. It is an endeavor that takes time, effort, and money. However, it produces a return on investment that can be measured directly and indirectly. These measures of success of the SMS will be discussed later. First we need to know what needs to be considered for a successful implementation.

There is no “one-size-fits-all.” Each organization has its own vision, culture, customers, financial constraints, etc., which will influence the way in which they go about developing and implementing the four required mainstays of the SMS. These four “pillars,” as noted in the FAA Advisory Circular No. 120-92A are: safety policy, safety risk management, safety assurance, and safety promotion.

The FAA will eventually be providing mandated SMS guidelines for different sections of the industry once having a SMS becomes a rule.

Structure of the toolbox

The most effective way to approach the implementation of a SMS is through a phased approach. A phased approach allows the operator to plan, develop, prepare their employees, implement, and conduct appropriate evaluation of the SMS in practical consecutive steps. It also allows for any required adjustments to be made with the minimal possible impact upon resources.

The phases of implementing a SMS need to be well documented and clearly understood by those who will be implementing them. Even if you are not responsible for the direct implementation of the specific SMS phase, you should be aware of what the implementation process encompasses to ensure you know your part in the process. To better understand the “tools” or activities and steps involved in the different phases of the implementation of a SMS, a phase guide follows.

Phase 1

1. Identification of the following:
 - a. The accountable executive
 - b. The person (or possibly group) responsible for implementing the SMS
 - c. Manager’s safety accountabilities; what managers are responsible for
2. Describe and document the system.
 - a. SMS components — general and/or specific to divisions
 - b. Ensure employees are aware of these descriptions
3. Conduct a gap analysis.
 - a. Obtain an organizational baseline. Include a safety culture assessment
 - b. Determine how the organization will measure the success of the SMS
4. Develop an SMS implementation plan.
 - a. Document how it is to be rolled out and the accountable person(s)
 - b. Develop a realistic timeframe for the overall rollout plan
 - c. Consider the human resource needs and financial implications of each phase
5. Develop documentation relevant to the company’s safety policies and objectives.
 - a. What currently exists and what is still needed (e.g., discipline policy, definition of terms, investigation policy, etc.)?
6. Develop and establish ongoing means for safety communication.

NOTE: This step is often overlooked or underestimated and the complete SMS can suffer due to poorly developed — or nonexistent — communication channels.
7. Determine and formalize divisional interfaces to share safety information and learn from experiences.
8. Determine how all the SMS data is to be collected and dealt with.
9. Commence development of safety performance indicators and performance targets. Determine how the SMS will be evaluated, both in terms of process evaluation as well as outcome evaluation.
 - a. The process of implementation should

Majella McDonald is a human factors expert with over 20 years of professional experience in the aviation and health industries. She currently works as a consultant for Baines Simmons Americas and teaches for Embry-Riddle Aeronautical University (ERAU).

be continuously evaluated to ensure it is being implemented as planned.

- b. Outcome evaluation is the customary evaluation of a program — is it reaching the targets or goals we wanted it to?

Phase 2

1. Implementation of reactive risk management processes.
 - a. Document (and follow) event investigation processes conducted by formally trained personnel
2. Deliver training relevant to reactive risk management processes.
 - a. Make all personnel aware of the processes, their own responsibilities, and how these reactive processes work together
3. Document all aspects relevant to reactive risk management tools for trend analysis.

4. Develop formal communication to personnel of findings from reactive safety events.

- 5. Determine SMS software needs/packages available as well as current and future company needs.

Phase 3

Implementation of risk management processes such as a confidential safety reporting system, hazard identification and tracking system with feedback mechanism, FOQA, regularly scheduled systemic safety audits, and task analyses for all safety-related activities.

1. Set up a risk-management working group to assess acceptable levels of risk.
2. Define the risk assessment tools and risk control mechanisms when an unacceptable level of risk has been identified.
3. Deliver training on these proactive and predictive safety

management processes.

4. Provide formal communication to personnel concerning these proactive and predictive tools including why they are beneficial.
5. Coordinate and maintain reactive safety data synthesized with proactive and predictive safety data (when this becomes available) from combined analyses tools.

Phase 4

1. Refine the safety performance indicators and performance targets commenced in Phase 1 (Part 9).
2. Develop SMS continuous improvement initiatives.
3. Develop training and documentation relevant to operational safety assurance.
4. Maintain and upgrade as needed the processes for safety communication.

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Tools for the toolbox

In implementing a SMS there are many areas within our own organization where we can (and probably will) make mistakes. It may be the right toolbox, but we may not have the right tools or we may not be using them correctly. It helps to have external evaluations conducted to ensure we are not biased in what we see, or fail to see, within our own confines.

To achieve individual ownership, each of us can personally have an impact on the process by considering the following:

1. Be aware of what is expected of us — and others — in the new system.
2. Make a conscious effort to educate ourselves about changes.
3. Don't be afraid to ask if you don't understand why you are making the changes.
4. Be prepared to provide

constructive feedback.

5. Try to fight the normal human urge to resist change.
6. The human can be both the strongest tool — as well as the weakest tool — in our toolbox.
7. It is up to you as to what influence you will have on the success of the SMS.
8. This is about making our industry safer and therefore more financially viable.
9. We all win if the SMS is successful.

We need to constantly remind people what is in it for them. If we fail to let our people know, they are much less likely to support the initiative.

So we have a toolbox, and we now know the basic structure of the toolbox, and have a few tools that may need to go in that toolbox. Keep in mind, not all tools are needed in all toolboxes, and we

may change the look of some of our tools to do the work we want to do in our organization. However, we must use the tools in the toolbox for this to work. Managing our personnel as individuals, many with a normal fear of change, is the best tool for success in this process. As noted by the title, a SMS is a toolbox, but it is only as good as the tools we have in it, and how those tools are used and maintained.

Ready to throw the tools out with the toolbox yet?

This process may seem a little daunting initially, but many organizations are already actively using parts of a SMS. Remember, it will be a change, it will be somewhat uncomfortable, and it will not happen overnight. But we should not be afraid to embrace this new system as it is about keeping our industry — and each of us — safer. **AMT**

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Repair on Thin Skinned Aircraft

The business of shrinking and stretching

By Robert Behrend

Sheet metal fabrication is considered a blend of art and science, requiring finesse to achieve desirable results. Sometimes the experience to achieve the desirable results can be costly.

If you have ever worked with aircraft sheet metal you have undoubtedly done something to that metal and then noticed that it had an unexpected effect somewhere else. Getting unwanted shrinking and stretching where you didn't intend is a costly and time-consuming mistake. The ability to straighten thin skin before riveting can make all of the difference to achieve a professional result.

One of the more common hand operated forming tools is the shrinker-stretcher. This may be one of the first metal forming tools you get to use, but you may not fully understand its operation. It works by applying tremendous pressure on dies that grab the surface of the metal to push the metal together or apart.

Always practice first on a scrap piece of metal the same thickness and temper as the aircraft skin being repaired in order to learn how the jaws will affect the material. Over time, the jaws become clogged with aluminum dust and do not grab the same way as they did the last time they were used. It's a good idea to keep the jaws clean with a file card, not a wire wheel, and remove material buildup in the textured surface. After cleaning and testing on scrap material of the same thickness you are using, you're ready to do some shrinking or stretching.

Hangar rash is common on aircraft, both fixed wing and rotary wing alike. They are both built from the same thin aluminum skins and difficult to work with. Often times you will find metal on an aircraft has been bent and subsequently stretched. If you take a hammer and dolly trying to straighten this you will just be chas-



Rob Behrend using his shrinker-stretcher tool.



ing your tail. You may reach for the steel hammer next but hitting the metal will probably stretch it even more. In

this case the metal needs to be shrunk not stretched.

The correct process is to take the part or metal over to the vice where the shrinker is located. But what if this damage is on the horizontal stabilizer of a general aviation aircraft and removal from the aircraft to facilitate bench work is labor intensive and costly? The vise-mounted shrinker-stretcher has been around for a long time and the value is undeniable. However, it was designed to be strong, heavy, immovable, and cumbersome.

The right tool for the right job

When initially looking for the right shrinker-stretcher tools for my shop I became frustrated. While tools were available I felt they were heavy in terms of weight and cost. The cost of acquisition now exceeds some \$7,000 when buying all the required tooling. I felt a better tool was needed for specialized spot repairs so I set out to design and

build my own tool which I call the "Minimizer™" shrinker-stretcher. The hand-held shrinker-stretcher is a fraction of the cost, much lighter and easier to use, handcrafted in the USA, cadmium plated, about half the weight, and uses the same interchangeable dies that fit in a standard shrinker.

"The right tool for the right job," I remember these words from A&P school. After you have the right tool you need to be able to use it properly. This does not start with the tool, but with studying both the metal and the damage you want to repair.

My method is to mark the high spots with a pencil on the stretched material. This is where you will use the tool and center the jaws. Smaller shrinks over a larger area is much better than a large shrink in one area which results in buckling the skin. This is difficult to remove and might crack the skin; either way buckling the skin makes the job much harder. Using the small shrink method will get the metal to lay straight. Push on the aluminum to see if it wants to spring back. If it does spring back you may need a small shrink or two in the right place to remove the "oil canning."

Using this process not all of the shrink lines need to be in the same plane, and they can be varied 45 degrees to break up the lines and remove the shrink marks. It is also better to regularly study the damage and the effect



Typical example of bent thin aluminum skin.

that you are having on the aluminum rather than go too far and buckle the skin. Trying to stretch metal that is already stressed with lines stamped in the surface can very easily result in a crack in the skin. It's best to proceed slowly and with caution.

Take your time

Let's say this takes care of the damage on the left side of the stabilizer, but what about the crack and the stop drilled hole on the right side? A typical example is a crack that also happened from being over stressed sometime in the past with a pair of pliers or wrench used to remove the elevator hinge bolts. If you want to make a flush repair that looks nice you may have a dilemma. This skin is too thin to use flush rivets, so dimpling will serve the purpose but some shrinking may be required for the skin to lay flat. Dimpling also shrinks the material even more but it also adds rigidity to the repair.

If you spend a little time to consider the known elements of a repair before forging ahead, then you will be less likely to paint yourself into a corner because you were rushing. When using any shrinker-stretcher designed for thin metals it's important to check that it is adjusted properly. In the case of the Minimizer this is done by loosening up the lock nuts on the eccentric bolts and moving them until both edges of

the beveled blade edges are parallel and touching. This adjustment will ensure that the pressure on the dies is equal which is important on thin metal. The more that you cold-work the material the harder it gets, so try to complete your shaping or repairs in as few moves as possible.

Hopefully I've been able to provide you a few new ideas to achieve better results the next time you have a thin sheet metal repair or fabrication job. Make it fun and be creative, but above all make it as easy as possible by thinking the job through first and then use the right tools.

Don't be afraid to ask questions and to share knowledge because we are all interdependent upon



Curved sections fabricated by shrinking and stretching.

one another. Be proud to learn something new everyday as our industry is a learning process that never stops! **AMT**

Robert Behrend holds an A&P and IA. He founded his business Aerostructures of the Palm Beaches Inc. in 2003 which specializes in structural repair work on corporate use and general aviation aircraft, government prototype design, and commercial use aircraft. Behrend graduated from Teterboro School of Aeronautics and has 25 years experience in the aeronautics engineering and fabrication business. For more information visit www.metalminimizer.com.



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LYCOMING

Corrosion Detection in GA Aircraft

Time not flown means greater challenges in corrosion detection for mechanics



By John Goglia

Soaring fuel prices and a tanked economy have unfortunately grounded more and more general aviation aircraft for longer and longer periods of time. For GA pilots, this has meant a sad curtailing of a favorite pastime. For the mechanics who maintain these aircraft, time not flown means greater challenges in corrosion detection.

As many of you know, the longer these aircraft spend on the ground, the more vulnerable they are to the effects of humid and coastal climates. The damp, wet air is a perfect “breeding” ground for corrosion; the salty air common in coastal areas is even more corrosive. Spend enough time on the ground in these locations (where the heat of the day and the cool of night results in condensation) and corrosion springs up in unexpected places and its effects become more pronounced.

Usually corrosion is found where water tends to settle or close to the ground. But constant exposure to optimal conditions and corrosion can wind up in unusual places. And it’s not just GA; major airlines are not immune. Back in the ‘70s, I recall a brand-new aircraft USAir leased to Hawaiian Airlines ended up with corrosion above the overhead luggage bins after just one year of island hopping in the Pacific. Up until then, no one I worked with had ever found corrosion in that location.

Because GA aircraft are spending more time on the ground, the jobs of mechanics conducting annual inspections has been made that much more difficult — and critical. The effects of corrosion on safety are well known. The metal breaks down and loses its structural integrity. Loss of integrity can and has led to loss of structural strength with catastrophic results.

Aircraft skin corrosion is particularly insidious because it tends to start in areas that are difficult to see, such as lap joints where it can grow unobserved between layers of metal and crevices, which are any areas where moisture can collect. But corrosion or rust is frequently observed on other parts, even stainless steel will corrode under the right conditions.

Repair and replacement

The good news for aircraft owners is that corrosion caught early can be relatively inexpensive to fix. But wait too long and repair and replacement costs escalate rapidly. While minor corrosion can be ground out or sanded, more extensive corrosion will require skin or part replacement. The best mechanics, of course, are the ones who find corrosion early and are able to mitigate its impacts before costly repairs are needed.

My experience has been that the best way to do a thorough corrosion inspection is to develop a routine so that you have a consistent approach and methodology to your inspection. Some suggestions: 1. familiarize yourself with corrosion indicators — such as bubbling paint; 2. conduct the inspection as a separate item on your annual inspection checklist; 3. plan ahead with the proper tools, including picks and scrapers; 4. establish beforehand appropriate start and stop points; and 5. always remember to look at the hard-to-reach areas, that’s where corrosion tends to hide. **AMT**

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.

AMT Day Celebrations

Some of the events around the country.

Companies celebrated AMT Day in many different events around the country in May.

AAR Corp.

AAR Corp. leaders, Cheryl Jackson, vice president of government affairs and corporate development; C. Rayner Hutchinson III, vice president of quality and safety; Danny Martinez, general manager of AAR's Indianapolis facility; and Greg "G-Man" Dellinger, director of recruiting, along with AAR's Great Place to Work Team, coordinated and sponsored an out-of-the-classroom experience for the entire eighth-grade class of Ariel Community Academy, a Chicago charter school, as a special way to honor Charlie.

Ariel's Class of 2011 was transported to Purdue and Vincennes Universities, within the Aviation Technology Center (ATC). In addition to seeing a variety of aircraft, the students were given a ride on a 737 (for most their first) as they were tugged

between AMT education and aviation maintenance employment opportunities was reinforced.

Baker's School of Aeronautics

Baker's School of Aeronautics hosted its 7th Annual AMT Day picnic on Friday, May 27. There were about 140 attendees. Grilled hamburgers, hot



This year Baker's School of Aeronautics had a jazz band instead of a bluegrass band for its AMT Day celebration.



Here is an AMT Day picture of some of the guys that work Graveyards in SAN for American Airlines Aircraft Maintenance. From left to right: Tito DeGuzman, Aaron Klippel, Ken MacTieman, supervisor Jose Montes (white shirt), Larry Costanza, Bob Norris, Frank Hope, Al Thompson, and Chris Abelia (black jacket). Photo was taken by Afternoon Shift Crew Chief Lenny Evans.

across the airfield to the AAR repair station, while being served lunch onboard. As the students deplaned, they were met and welcomed by Indiana and Illinois aviation/community leaders including Landon Larson,

a fuel system analyst from Southwest Airlines, and Cheryl Chew, the executive director of the Organization of Black Aerospace Professionals.

The group also toured AAR's 1.6 million-square-foot hangar at IND. All along the way, the link

dogs, and barbecued bologna were served, along with pork and turkey barbecue with all the fixings catered by Whitt's.

This year there was a jazz band instead of blue grass. "The Halfbrass Band" really put on a great show and had the crowd dancing and marching to the tune of "When the Saints Go Marching In" toward the end.

More than 200 door prizes were donated this year including tools, posters, hats, t-shirts, and complimentary overnight rooms at local hotels. The dunking booth ended up being the most popular attraction. Wally Bevan, Nashville FSDO manager; Joe Hawkins, *AMTSociety* board member and MTSU professor; and one of our instructors, Jimmy Holderfield, volunteered to be the "dunkees." Baker's offered the chance to throw the balls in exchange for donations to be given to the *AMTSociety* Scholarship Program and collected \$185.

Cincinnati

AMTSociety and PAMA worked together and planned the first annual AMT Day cookout in Cincinnati, OH, on May 24. The cookout was a huge success with well over 150 attendees. The



Tom Hendershot and Mark May, director of maintenance services for Epic Aviation Services, at the Charles Taylor program at Centennial Airport.

event was sponsored by West Star Aviation and Apex Aircraft Detailing, who provided food, drinks, and door prizes. The cookout was open to everyone and was attended

by aviation students, corporate aircraft personnel, general aviation personnel, and the FAA. Cincinnati State Technical and Community College scheduled a tour of a corporate flight department and showed up to the cookout with more than 40 aviation technician students. AMTSociety Director Gary Goodpaster and PAMA's Dale Forton attended.

Denver Centennial Airport

The fourth annual Charles E. Taylor Day program was held on Saturday May 27 at Centennial Airport and was sponsored by Mark May, director of maintenance services, Epic Aviation Services.



The South Carolina Aeronautics Commission AMT Day celebration honored past Charles Taylor Award winners. Photo courtesy of Neil Baker.

There were 15 aircraft and 12 antique cars on display for the 109 people who attended to view and ask questions of the sponsors/operators who were on hand. The food was great and the weather cooperated fully for the day's festivities. Also contributing to the day's activities were Dan Bryant and Tac Air, and Chuck and Jackie Mangan who supplied the entertainment. Mark's comment: "Next year will be bigger and better."

South Carolina Aeronautics Commission

The South Carolina Aeronautics Commission AMT Day event included some of its past Charles



Gene Grant received the Charles Taylor Award at the South Carolina AMT Day event. Here, he receives a gift from Paul Werts, director of the South Carolina Aeronautics Commission. Photo courtesy of Neil Baker.

Taylor Award winners, playing a jeopardy game made for aircraft maintenance, Gene Grant being presented the Charles Taylor Award from Dwayne Pittsenbarger, the FAAS Team manager, and the director of the South Carolina Aeronautics Commission, Paul Werts, presenting a gift to Gene Grant from the State of South Carolina. **AMT**

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Say Goodnight, Gracie

When you speak about aircraft maintenance, confusion is best left to the experts



By Stephen M. Carbone

George Burn's and Gracie Allen's genius in comedy was in their routines, where neither one understood the track the other's conversation was going; nothing is funnier than listening to a confusing discussion going in two different directions. But no matter how exasperating it got, George would take a puff of his cigar and gesture toward the audience with the sign-off, "Say goodnight, Gracie."

Misinterpretation isn't always funny

George and Gracie were comedy legends; they were experts at sleight of tongue and employing verbal deception was their bread and butter. But in our field misinterpretation isn't always so funny; when you speak about aircraft maintenance, confusion is best left to the experts. In my article, *Submitted for Your Approval*, I stated that regulations were being reviewed for future updating; that house cleaning initiative may be communicated through notices and orders, which may get adopted into policy. This will ensure the FAA is addressing the public's concerns.

The 'acceptable to', 'accepted by', 'approved', and 'approved by' ambiguity issue stands out as a very popular head-slapper. In April 2011, the FAA published in its Flight Standards Information Management System (FSIMS) under Volume Six, Chapter Fourteen, policies on Technical Data. Following close behind that, the FAA is circulating the final draft of a Notice out for comment; it provides guidance on applying the four terms listed above correctly. A notice, like an order, is a "directive that the FAA uses to issue policy, instructions, and work information to its own people and designees."

AFS-300 tackling the terms

AFS-300, the Aircraft Maintenance Division has chosen to tackle these terms, which have been irregularly employed, e.g. *acceptable-to* is missing from guidance but is used commonly in the regulations. By use of this Notice, AFS-300 expects to streamline the application of the expressions. Let's look at these terms and use the interpretations agreed upon for the language being reviewed.

Acceptable To — "any item (data, methods, techniques and practices) that does not require specific FAA review and acceptance/approval before use."

Accepted/Accepted By — "any item (data, methods, techniques and practices) not requiring specific FAA acceptance/approval but that is required to be submitted to the FAA for review prior to use."

Approved (Approved By) — "the item (data, methods, techniques and practices) is required to be and has been reviewed and formally approved by the FAA (or appropriate civil aviation authority [CAA], or national aviation authority [NAA]). Approvals are granted only by letter, by a stamp of approval, or by other official means."

Why it's an issue

What isn't clear to many is why *approved* and *accepted* are even an issue. A Thesaurus suggests that *approve* and *accept* are synonyms, or mean the same. But *approved* is more selective in its use; in the FARs it applies only to operational issues as found in 14 CFR 65, 91, 121, and 135. *Acceptable* or *accepted* are limited to documents like AC 43.13A where the methods, techniques, and practices used are *acceptable-to* the Administrator in the absence of manufacturer's repair or maintenance instructions for continued airworthiness (ICA), which is, for the most part, *acceptable* data anyway.

(This is where George Burns would deadpan for the camera.) My critics would say I just contradicted myself. But what exactly is *approved* data? *Approved* technical data is composed of, but not limited to: test information, analyses, dimensions, material specifications, allowable damage, etc; *approved* technical data is also proprietary. That's why you'll only see the methods, techniques, and practices for, e.g. a Supplemental Type Certificate (STC), because the manufacturer is generally reluctant to give out the technical aspects of the *approved* data; they make money off it. It's like giving away your award winning secret barbeque sauce; Sacrilege!

An ICA — like manufacturer's maintenance manuals (MM) — is only required to be *acceptable* to the FAA, not *approved*. (NOTE: Airworthiness Limitations are the exception to this; they require approval.) The ICA information however is written using the technical data that was used to define the configuration and design features of the article, but more often than not, doesn't contain the actual technical data as defined above.

What about an air carrier's maintenance training or deice program? They're approved. Kee-rect, but the burden is on the air carrier to determine how they will train, e.g. computer, stand up class, or OJT. Their fleet dictates the type of deicing they will accomplish and where. These programs are proprietary, but their concepts aren't as guarded as an engineer's investment in a design or product.

FAA review to determine which

Why *accepted/acceptable*? Either the FAA will determine the item to be *acceptable* for the intended use when and if the FAA reviews

it or it will be *accepted* only after the FAA reviews it. When the item speaks to specific regulation sections, it is ensured the item is *acceptable* to the FAA.

An ICA for a STC is *acceptable* data because, again, the *approved* technical data is proprietary and not made available to the general public; not even the FAA FSDO has access to technical data behind a STC; it's not necessary.

But let's go back to the MM example: when a carrier receives the first MM for a brand new aircraft, e.g. the Boeing 7X7, it

Approved technical data is composed of, but not limited to: test information, analyses, dimensions, material specifications, allowable damage, etc; approved technical data is also proprietary.

may receive incomplete manuals; pages might say the procedures are yet to be written. So let's say the airlines are flying the 7X7 for six months and Boeing produces the procedures for changing a nose gear steering cylinder and they're entered as a revision. Should the airlines ground the 7X7 until the FAA can review, test, and *accept* the procedures? No, because Boeing has the approved technical data developed during type certification of the product, it's written the procedures and published them with oversight by the FAA Aircraft Certification Office.

Let's look at two other terms:

Administrator and FAA
Acceptable to the Administrator — "items

required to be acceptable to the Administrator do not require FAA review prior to a person using it. It is considered acceptable unless shown by the FAA to be unacceptable"; and,

Accepted by the FAA — "if it is a requirement that the FAA accepts items, the applicant must submit them to the FAA prior to use. If the submittal is unacceptable, the Aviation Safety Inspector (ASI) must inform the applicant in writing of the specific deficiencies based upon a regulatory section or paragraph. It is important to keep the applicant advised of the status of their proposal. Make it clear to the applicant/certificate holder that if the ASI takes no action or does not inform the applicant within an agreed time frame, that the submission is either deficient or accepted, the applicant may assume that the FAA has accepted the submission."

Acceptable to the Administrator is an older version, but the FAA still must prove an item is unacceptable. *Acceptable to the Administrator* will eventually become *Accepted by the FAA* in the language; it just makes sense. It's understood your ASI actually approves your designs or issues Airworthiness Certificates.

Technically, nothing is changing, though the intent of *approved*, *accepted*, and *acceptable* to will gain more clarity. Because we'll understand better what is being said in time we'll put more confusion to bed. Then all that's left to say is, "Goodnight, Gracie!" **AMT**

Stephen Carbone is an aviation industry veteran of 28 years. He works at the Boston regional office in the Flight Standards Airworthiness Technical Branch. He holds a master's degree in aviation safety systems.

The Fictional Right to Privacy

Going, going, gone?



By Stephen P. Prentice

Constitutional Law 101 Supreme Court Justice Louis Brandeis in 1928 said it best in his dissent in the *Olmstead vs US 277 US 438* (1928) wiretapping case ...

“The makers of our Constitution understood the need to secure conditions favorable to the pursuit of happiness, and the protections guaranteed by this are much broader in scope, and include the right to life and an inviolate personality, the right to be left alone ...”

Justice Brandeis had it right a long time ago ... But things do change ...

Related privacy issues

It comes as no surprise that there have been strenuous objections by business aircraft people to the FAA's recent proposal to monitor private aircraft movements. There have been more than 700 objections filed against the FAA's proposal.

This policy will give anyone in the world the equivalent of an Internet homing device to track movements of citizens and company aircraft in real time through sites such as Flight Aware and others. How true. The “do not track” program (BARR) for operators of private aircraft will be eliminated so that all IFR flights may be tracked by anyone. So much for privacy.

The DOT has already approved the new proposal to drop protection under the BARR program. The FAA's proposal is in the works and will only allow protection of flights if they can show “a valid security concern,” if their flight information is disclosed on line. Keep in mind that all jets must file IFR in order to go anywhere. By the way, many of your personal cell phones are also programmed to track your calls and your location. When will all private aircraft be

tracked? Who needs a warrant anymore?

We have to keep in mind that where the corporate boss has no privacy, the technicians who look after his aircraft and crew have no privacy either. Technicians in certificated activities have already had their privacy rights invaded in regard to drug and alcohol testing. Interesting to note that European activities have not. It's no wonder they can outbid our domestic repair stations on outsourced work.

The Obama administration had pledged to protect citizens' privacy rights, but it looks like they are allowing the FAA to trample them. What's to stop government from releasing airline passenger manifests, your credit card use, driver E/Z pass hi-way information, cell phone traffic, etc. Again, no warrants necessary here.

There is a long history of a citizen's right of privacy even where there have been compelling reasons to deny such privacy. The FAA and DOT could be responsible for a dangerous and invasive release of aircraft flight activity. Lives could easily be in danger as well as private business interests.

Privacy: SMS and ASAP

Private proprietary information is a primary objection to many of the FAA data collection programs recently enacted by FAA fiat including the new vaunted SMS program which is now being required of all Part 121 air carrier operators. Further, it is planned to be extended to repair stations, airports, and no doubt Part 135 operators in the near future. No one really knows the scope of the data to be collected, but it will be large and probably sweep up much private and proprietary operating information.

We all remember when ATOS and CSET were impressed upon airlines and FAA personnel, both wholly unprepared or incapable of applying the standards required. ATOS

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.

was labor intensive and time consuming and only recently found to be a failure by the FAA Inspector General. The FAA never could have enough inspectors to complete the ATOS program and still does not. This failed program is still active even though it has been declared a failure. Now FAA moves on to a new initiative promoted by ICAO and its EU partners, that will allow for "sharing" of safety operating data among other things.

The significant initial issues dealing with the implementation of an SMS system and still of concern, has to do with the collection, sharing, and management of safety information and protection of and access to private, personally identifiable information, more particularly, proprietary operating data. Information, for example, that has been submitted through FAA programs such as ASAP, the Aviation Safety Action Program, was also initially rejected by some air carriers because of the lack of guarantees for protection of sensitive information.

I can recall the American Airlines, Cali, Colombia accident and the litigation it spawned. The airline tried unsuccessfully to prevent the release of proprietary safety data related to that crash.

The whole purpose of voluntary safety data collection must be based on the absolute protection of the data from use during trials or otherwise made public. Where it becomes apparent that ASAP and SMS data may be available to the public then there will be no participation in these programs. So far, that protection has not been shown.

A second objection has been cost. Some have pointed out that the whole program is designed to make money for the people who prepare program manuals and audit systems.

Since overseas flying activities will require a SMS in place before you can operate overseas, there

is a whole homegrown industry now established for the creation of and implementation of the system. Third-party participants are clearly in business to make money on the program, but the bottom line is that somebody has to do the work. Some have even suggested that a SMS should be only a voluntary program. Why not?

Bilateral maintenance sharing agreements

On top of this is the fact that we have a "sharing" agreement with EASA in the works already. The Bilateral Accord (BASA) was signed in 2008 and already expands the relationship of the FAA and EASA (the European Aviation Safety Agency). It requires cooperation on such matters as aviation safety and other areas of operations and includes the exchange of what may be confidential safety information with EASA and whoever else in Europe has access. What has happened to that program?

Make no mistake, there are some serious implications in this arrangement that could be another step toward having ICAO and EASA, being the single management source for aviation safety matters.

We initially refused the BASA agreement on the issue of inspection of foreign repair stations. And, so far as I can see, we have not been successful in demanding that or drug and alcohol testing of personnel at these facilities.

Accident investigation is another area of serious concern. In France, and other EU countries, for example, every accident can be considered a crime and a trial commenced on that issue. The Concorde crash trial and conviction of four people including three U.S. mechanics, is an example. The conflict between accident investigation for cause and judicial proceedings is not resolved and can present huge obstacles to cooperation between the parties to these agreements.

Other privacy issues

The European Union, to its credit, has just instituted a law to prevent "cookies" from being installed in citizens' computer programs. The EU's new Internet privacy law came into effect on May 26, 2011. Whether or not it will be enforced remains to be seen.

As we all know by now, many people collect information about you when you visit their web sites. They use something called "cookies," which allow them to collect all sorts of information. The EU makes this illegal without your permission. Online privacy has become a growing concern for many consumers and business interests. The recent example of several high profile hacking incidents are making people increasingly concerned about what type of information should be collected and stored about them.

In California, however, an online privacy law recently failed to pass the legislature. This law was designed to limit the data visible on social networking sites. Aggressive lobbying by Facebook, Google, Twitter, and other interested firms argued against this law. Some have suggested that we need a federal law like the EU just put into effect. We'll see ...

Our own IRS also is coming under attack for aggressively seeking to collect more taxes by ordering small businesses to turn over exact copies of their electronic records in their business software programs. Many fear that customer lists, personnel data, confidential client information, and other unrelated information will trigger other fishing expeditions beyond the scope of IRS interests. Besides endangering customer privacy, this could drive customers away.

Until the right of privacy in all aviation safety data collection programs is guaranteed by federal law there can be no purpose in promoting such programs. **AMT**



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State of AMTSociety Address

Maintenance safety requires training/recurrent training. Although you may have been working in the aviation industry for a number of years, perhaps for the same company and even on familiar equipment, situations may arise where changes have occurred to company policy, procedures, or modifications have been implemented to equipment and/or systems, and/or there have been additions to the fleet. All too often we rely on our past knowledge and experience, unblemished record, or peer pressure, and then continue on with business as usual.

Instead maybe we should say "I don't know," stop, and get help or get training. This may be a good time to take a moment and evaluate the entire situation to see if indeed you do meet the training requirements needed to accomplish the task at hand. Don't let ego or peer pressure get in the way of safety.

Spartan tool presentation

Spartan College of Aeronautics and Technology hosted the presentation of the Snap-on toolbox and tools to the college on Thursday June 2, 2011. The tools and toolbox worth more than \$5,000 were offered as part of AMTSociety's scholarship

toolbox raffle won by Michael A. Molzahn, an alumnus of Spartan. When Molzahn won, he said he would donate the tools and toolbox to Spartan and contacted the school to get a list of what the school needed. When Snap-on was notified of what



Michael A. Molzahn and Tom Hendershot at the presentation of the AMTSociety toolbox and tools to Spartan College. Photo courtesy of Damon Bowling.

Molzahn intended to do with his prize, the company added another \$1,000 worth of special tools for the school. On hand at the presentation was Malcolm Tracy, account manager, Snap-on Tools; Damon R. Bowling, vice president, marketing/admissions, Spartan; Ron Worthington, vice president, student services (also the organizer of the program); Michael A. Molzahn; and Tom Hendershot.

I hope that you and your family enjoy a very nice summer. Be safe.

— Tom Hendershot



The donation of the Snap-on toolbox and tools totaled more than \$6,000. Photo courtesy of Damon Bowling. AMTSociety offers a toolbox raffle each year to fund its scholarship programs.



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UAS Action Summit

During the recent UAS Action Summit in Grand Forks, ND, Northrop Grumman gifted a full-scale model of a Global Hawk to Northland Community and Technical College Foundation. It will be used in the college's new UAS maintenance training program.

Charles Taylor and AMT

The staff of AMT was recently honored by a visit from Charles Taylor II, the great grandson of the father of aircraft maintenance. We reminisced about his great-grandfather, the FAA's Master Mechanic Award that bears his name, and the First Flight Centennial Celebration of 2003. (See Page 4.)

Charles Taylor Award

The Seattle Flight Standards District Office recently presented the Charles Taylor Award to Jerry Weiler of Port Angeles, WA. He worked for William Fairchild from July 1959 as a mechanic in exchange for his flight training. With his on-the-job training, he received his Powerplant rating in 1962 and Airframe rating in 1963.

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Business Aviation Update

A report from EBACE



Jon Jezo, Publisher

The European Business Aviation Convention & Exhibition (EBACE 2011) held in Geneva, Switzerland, had good attendance and the figures were up from 2010 to nearly 12,751, from 108 countries, with more than 500 exhibitors, and 62 aircraft on static display.

One session I attended was the global business aviation update presented by panelists from the International Business Aviation Council (IBAC). Host Brian Humphries of the European Business Aviation Association (EBAA) explained an issue now is the UK has imposed a 20 percent value added tax (VAT) on all aircraft. Formerly, this was applied when flying in the UK and was based off the maximum take-off weight (MTOW). With budgets tight and fuel costs rising, the impact of this VAT is much greater than anticipated.

Doug Carr, representing the NBAA, summed up the U.S. business aviation situation by hitting on the fact that a major hold-up is the 19th extension of the FAA reauthorization (big surprise). Carr also touched on SMS programs and the importance of future SMS data protection.

Francisco Lyra of the Brazilian Association of General Aviation (ABAG) explained that Brazil's biz aircraft fleet has grown 21 percent over the last year and are mainly piston aircraft. Of Brazil's 5,000+ cities, only 124 have commercial service! Regular maintenance of Brazilian registered aircraft is often sent to Europe or the United States.

Ali Al Naqbi represented the Middle East Business Aviation Association (MEBA) and he spoke about the rise of high net worth individuals due to the 1990's oil boom and how that created a market of private family travel. The Middle East has about 450 biz aircraft today and growing. This trend will likely continue with

forecasted growth of 1,330 registered biz aircraft expected by the year 2019.

Leonid Koshelev, chairman of the Russian United Business Aviation Association (RUBAA), spoke about the government being against monopolies in airports and pushing for more affordable use of airports. When reviewing the business aircraft activity in Russia, Koshelev said it has come back to levels seen before the global financial crisis.


Capt. Karan Singh, vice president of the Business Aviation Association of India (BAAI), spoke about the booming business aviation market as well as the economy (sixth largest world economy by 2020) in India. Its business aircraft fleet has doubled in size since 2006; in 2009 India experienced 10 percent biz aviation growth, and it expects to triple its fleet by 2020. Some challenges in India: currently it takes at least nine months to get an aircraft operator permit in India, a 40 to 50 percent fuel tax, and limited ground handling options. India has less than 150 airports, FBOs are nonexistent, and training is a growing problem.

Business aviation in Japan is starting to develop more according to representative Kazunobu Sato of the Japan Business Aviation Association (JBAA). The Japanese government has been reluctant to develop biz aviation and therefore has extremely restrictive regulations. Deregulation and improvement of Tokyo International Airport as well as Narita International Airport are underway. Japan has 98 airports, all with extremely limited general aviation landing spots and this will be changing as local governments are becoming much more supportive of business aviation.

Challenges exist but the global business aviation market looks positive.

Thanks for reading! Jon Jezo

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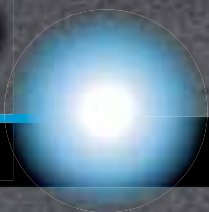
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