NOVEMBER/DECEMBER 2000

FAA Aviation news

AVIATION SAFETY FROM COVER TO COVER

HAPPY HOLIDAYS

ALUMINUM AND STEEL DON'T MIX
INDEX OF 1999 - 2000 ARTICLES

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FRONT COVER: As we fly into another new year, best wishes for safe and happy holidays from the Aviation News staff.

BACK COVER: We could all wish for one of these under the tree! (Photos courtesy of the manufacturers)

Aluminum and Steel Don't MIX

Story and photos by H. Dean Chamberlain

Aluminum and steel don't mix; at least they don't in a Lycoming O-290-D2 engine according to the Federal Aviation Administration (FAA). As outlined in the article "Never Buy An Orphan" in the July/August 2000 issue about never buying an orphan airplane, airworthiness directives (AD's) are another important item that can surprise the unwary new aircraft owner. AD's can cost a new aircraft (or an old aircraft) owner a lot of money if the buyer purchases an aircraft with a pending AD or AD's unless the buyer discounts the cost of compliance when agreeing to the purchase price. These are some of the things I didn't think about when buying my new toy since I was told this particular AD didn't apply. The bad news was the Orphan's engine was one of those "bad" engines. The AD did apply, and, no, I didn't discount it. I am a slow learner. But like buying a cute new puppy, what are a few fleas or AD's among friends. As I am quickly learning, "It is only money."

AIRWORTHINESS DIRECTIVES

For those who are not familiar with airworthiness directives (AD's), they are contained in FAR Part 39, titled, Airworthiness Directives.

Arguably one of the shortest FAR parts, Part 39 can be one of the most expensive FAR safety related parts both in terms of cost, time, and, for commercial operators, lost revenue. About a half page in length, Part 39 provides FAA a method to alert aircraft owners and operators of, as stated in FAR §39.1, "(a) An unsafe condition exists in a product; and (b) That condition is likely to exist or develop in other products of the same type design." Then in §39.3, General, it states "No person may operate a product to which an airworthiness directive applies except in accordance with the requirements of that airworthiness directive."

Subpart B-Airworthiness Directives then states in FAR §39.11, Applicability, that "This subpart identifies those products in which the Administrator has found an unsafe condition as described in FAR §39.1 and, as appropriate, prescribes inspections and the conditions and limitations, if any, under which those products may continue to be operated."

Did I mention that FAR §39.1, Applicability, says, in part, that "this part prescribes airworthiness directives that apply to aircraft, aircraft engines, propellers, or appliances (hereinafter referred to in this part as 'products') when—(a) An unsafe condition..." as noted above is found. As you can see, an AD can apply to all the good aircraft "stuff."

The above is basically all there is to FAR Part 39. However, the impact of these few words can ground an entire world-wide fleet of U.S. registered aircraft. As with all safety issues, since aviation is so global and interdependent these days, an airworthiness directive issued by one government may quickly impact those types of aircraft operated by other nations worldwide. In many cases, the release of a major AD has been coordinated between the various civil aviation authorities around the world before the official announcement.

Although not on the same scale as an AD affecting a fleet of air carrier aircraft, there were two outstanding AD's that applied to the Orphan. I knew about both. I just didn't realize how expensive compliance with both would eventually become. One AD in-

volved the lift struts on all high-wing Piper aircraft. Several years ago, a Piper high-wing aircraft suffered an in-flight wing failure because of corrosion in one of its lift struts. Since then, FAA has required a periodic inspection of all such struts, or to avoid the repetitive inspections, owners could replace the vulnerable struts with FAA approved replacement struts that effectively eliminated the required detailed inspection.

Inspection and replacement are two of the typical ways owners/operators can comply with many AD's. Other AD's may require only a one-time inspection. Others may require some type of repetitive inspection based upon flight hours, time, number of flight cycles, or other means of determining usage and wear. A common way to comply with many AD's is to replace the affected part with another FAA-approved part. Such was the case with the Orphan's lift struts. The previous owner had replaced two of the struts with approved ones. I replaced the remaining two struts rather than do the continuing inspection. That took care of the lift strut AD. Somewhat expensive, but it was relatively easy to do. Scratch one AD off the list.

However, there was the case of the lingering AD applying to the oil impellers of certain Lycoming engines. At issue was the replacement of either aluminum or sintered iron oil impellers with approved steel ones. Although the previous owner believed that the AD didn't apply to the Orphan's engine, being a very safety conscience pilot, I was not comfortable with that determination after reviewing the aircraft records and the lack of specific data saying that a physical inspection had been conducted to determine applicability of the AD. Such was my feelings about the AD before my first annual inspection "AD-P" (After Dean's Purchase).

As a retired Marine, I am a firm believer in the old adage, "When in doubt, check it out!"

Such was the situation at the beginning of what was to be a routine annual (12 month long?) inspection. But like the famous accident theory that says an accident chain is made up of many small links, that if any one link had been broken, that break might have prevented the accident, I wanted to build an equally strong safety chain around the Orphan to prevent an accident chain from ever starting. This is why new disk brakes and wheels were installed on the aircraft to replace the original drum brakes because I didn't like the stopping power (marginal in my opinion) of the original design. Then if you are going to install new disk brakes and wheels, it seemed only logical to install new tires and tubes. So far—so good. It would cost a little more money, but a safety chain had been started and a possible accident chain link broken.

At this point, the idea was to continue using the original single hand-operated brake in the aircraft rather than installing the new foot operated brake pedals purchased under a Supplemental Type Certificate authorization. This was after all a very basic *Tripacer.* Because of the work involved in installing the new rudder pedals and toe brakes, the new foot brakes would be installed later in the year after the weather warmed up. The goal was to complete the annual, install a new instrument panel and new communications/navigation gear and take the aircraft back to its home hangar.

Good intentions always start simple. Such was the case with the Orphan's "annual." As stated, an important part of the annual was to install a new communications-navigation package and new flight instruments. So far—so good.

Then at some point the person doing the inspection and upgrades said, "You know, if we remove the windshield, it would be a lot easier to do the other work." So out comes the windshield; and another link is added to the growing maintenance chain. With the windshield removed, he decides now would be a good time to install the new foot brakes and rudder pedals. Another safety and maintenance link is added to their respective chains. At this point, the only cost is for the extra work being done since the required items had already been purchased.

The reason for the toe brake upgrade is simple. If you have never tried to land an aircraft with one hand on the yoke, one hand on the throttle, and one hand on the hand brake, you suddenly realize that you need one more hand than is attached to your body. Maybe some well-coordinated pilots can pull that three-handed trick off, but there must be a reason most aircraft built in the last 50 years have toe brakes. Enough said. The new toe brakes were going in.

Now for those not familiar with the old *Tripacer* design, in this particular model, the little, single, brake handle under the instrument panel was connected by a cable to a single hydraulic brake cylinder mounted, in the Orphan, on an engine support tube.

Since the hand brake system was no longer needed, the IA (a FAA certificated Airframe and Powerplant mechanic with Inspection Authorization) removed the attached brake cylinder and its mounting hardware. Surprise. A big maintenance and cost link was uncovered at this point. He discovered that whoever had installed or worked on the brake system at some point may have damaged the engine mount tube. Why this had never been discovered during other annual inspections is not clearly understood at this point, nor does it matter. The decision to remove the engine mount and have it inspected by experts meant the engine and propeller had to come off the aircraft. This decision added a big link to the rapidly growing maintenance chain; and especially to the rapidly mounting inspection cost. When everything had been removed and the engine mount checked, the IA doing the work said the mount needed to be sent out for inspection and any required repair.

At this point, since the engine mount needed to be inspected and possibly repaired, it was a simple mental leap to decide to send the nose gear mount along with it so that everything in front of the firewall could be inspected by experts. This decision makes the dollar costs keep mounting since the shipping charges to Georgia for the two mounts totaled $249 one way. Add a few more links to the growing maintenance and cost chains. But the safety chain is growing stronger with each dollar spent.

At this point, since the engine was just sitting on a floor stand and since I had not been too comfortable with the oil impeller AD compliance records, I decided to have the oil pump physically inspected. And guess what, it had an aluminum impeller in it. The AD did apply to the engine. Now was the time to consider the various options specified in the AD. The best and smartest option was to simply replace the oil pump with the correct parts before the required AD compliance date. Add a few more expensive links to the growing maintenance and costs chains. And add one very expensive aluminum impeller paperweight to my collection of used aircraft parts.

Then since the engine was off the aircraft, the decision was made to have the carburetor and propeller sent out for inspection and any required maintenance. This added some very expensive links to the maintenance and cost chains.

As these chains have grown, so has my relationship with my local package delivery service. I feel like an aviation supply warehouse. But, I now know the status of the oil pump AD and the Orphan's compliance. The AD has been complied with by kit number, part number, and impeller serial numbers. All of which will be properly documented in the aircraft records in a legible manner. No one else will ever have to wonder if the oil impeller AD has been complied with. Nor will any of the work done during the annual have to be questioned. Purchase receipts and legible detailed aircraft records will properly document the work and parts used. Work requiring FAA Form 337 will be properly annotated and photographs taken for the local FAA inspectors to approve. The story continues as this is being written.

This rather convoluted story of how a relatively minor decision to remove a windshield and how that decision ultimately lead to a relatively expensive AD compliance illustrates what I have come to believe is another truism in my very limited aircraft owner experience. One must get personally involved in the maintenance of one's aircraft, and if the aircraft records, and I think more importantly, equipment proof of purchase receipts can't show proof of purchases and compliance, then the work probably wasn't done.

There is no such thing as a cheap annual because work not done when required always costs more the second time around. There is an old saying that you only get what you pay for. In the case of aviation, a "cheap" annual may be more expensive than some owners may have bargained for. I am rapidly finding out what aircraft owners have known for decades, aviation is not cheap, but then have you priced a new boat or jet ski recently?

An even more basic aviation truism is once an annual inspection starts, unless you know your aircraft very well, a new owner is never sure where that inspection will lead. At such times, the value of a trusted and knowledgeable IA is worth his or her weight in gold. For although a detailed and very critical inspection may cost more money than either budgeted for or expected at the moment, the growing safety chain that that type of inspection results in will keep you and your passengers safe for many flights to come as long as that safety chain is permitted to grow. Safety is no accident. Safety is not cheap, but have you priced an accident recently.

As in the case of an AD, FAA maintenance rules are designed to protect both those in the aircraft and those on the ground. I have read many electronic mail messages from other Piper *Tripacer* owners questioning the value of various FAA maintenance requirements and rules as well as the use of expensive parts for both the older *Tripacers* as well as other vintage aircraft. A big issue among some owners is their desire to do "owner performed maintenance." This concept goes beyond that permitted in the preventive maintenance regulation. My personal concern is as outlined above and in the original article. I have expressed my doubts about the quality of work performed by some certificated A&P mechanics. I would really be concerned about the quality of work performed by some non-certificated mechanics. Yes, I have seen the quality of work done by some builders of amateur-built aircraft. The quality of some of that work can't be bought. In many cases, it is a true work of love and attention to detail which mere money could never buy. But, what I want to express my opinion about is the possible hidden mistakes that some non-certificated person might make repairing or maintaining an "owner" maintained aircraft. Then the question is when that aircraft is sold, can the new buyer trust the aircraft? We know some aircraft have problems while being maintained by certificated mechanics, can we really trust an aircraft maintained by a non-certificated person? I think not.

Fly safely.

A most expensive paper weight. The aluminum oil pump impeller and its steel drive impeller both were replaced as part of the AD adjustment.

Cleve Couer, MO, airport (Jan Monroe photo)

Flood Damaged Aircraft

by Linda Jew

How did a bank examiner end up at FAA? Well, I came here as part of a training program, and I had selected FAA because: 1) I wanted to see how a publications group operated, 2) I had written reports for my agency, which has different writing requirements (at my agency, some pretty dry words come across the page at times), and 3) it was a chance to work at a large agency. As I met people, talked with the editor and the writers for *FAA Aviation News*, I found writing an article was going to be a challenge for me. I will be the first to admit that I have little aviation knowledge, but then again we all have to start somewhere. It turned out to be a good learning experience, even trying to determine what to write about. I have to say when I selected the topic of flooded aircraft; it was out of curiosity. While we hear about flooded cars, we rarely hear about flooded airplanes. But the same situation exists — that is, what does one do with a flooded possession be it a car or an aircraft. I researched this topic with little knowledge of what was available to the flying public. Then I wondered what a new pilot would have to know about an aircraft beyond flying it. Some people are interested in just flying; others are not only interested in flying, but also learning the nuts and bolts of their aircraft. Regardless of the level of knowledge, one is still left with, "What do I do with my flooded airplane?" Well, in doing the research and talking with people, there really isn't a lot of information out there. From one perspective, a damaged airplane is a damaged airplane regardless of the source of damage (accident, birdstrike, floods, and so on). One focuses on repairing or replacing the parts. Perhaps the one thing to keep in mind is that in the case of water, it can get into spots that are not readily visible.

1999 - "At the Pitt-Greenville Airport hangars, office buildings and aircraft protruded from a lake created overnight by torrential rains spawned by [Hurricane] Floyd. Brown murky water lapped at the belly of a Learjet that was parked on the ramp. Elsewhere, smaller aircraft were almost complete [sic] submerged in rainwater. Some airplanes appeared to have been blown or washed away into other aircraft or buildings."

1998 - "In Broward County earlier local damage assessments indicate as many as 22 homes rendered inhabitable, 40 aircraft destroyed and 40 others damaged."

1996 - "Mud slides and high water prompted the closing late February 7 of Interstate 84 from Portland east to Hood River. By mid-afternoon the next day, members of the 304th Rescue Squadron and its parent unit, the 939th Rescue Wing, began relocating their aircraft to safety. Unit HC-130 aircraft were flown to McChord Air Force Base, Washington, and H 60 helicopters to Evergreen Airport, near Vancouver, Washington. Three helicopters undergoing maintenance were towed to higher ground."

These events took place in the past five years. The resulting floods from the hurricanes or torrential downpours all illustrate the havoc that Mother Nature can create. There is no consideration for worldly possessions or the inconveniences that result from such destruction. We face the problem of dealing with the aftermath of floods. If you own an aircraft and there are rivers near the airport where it's stored, watch out. If it's hurricane season for you, again watch out. You could have some very large problems on your hands.

What if you find that your airplane was one of those submerged in water after a local flood? Do you write it off or try to salvage it? What can be done to get it back to being airworthy? What about buying one? How do you tell whether a plane was flooded or not? What steps do you take to determine that the plane you are buying came from an area that was flooded? As with cars, water damage is a concern with airplanes because of corrosion problems. Numerous states have disclosure laws regarding water-damaged vehicles; however, they usually don't apply to water-damaged airplanes.

How to go about getting a plane back to being airworthy depends upon the circumstances of the submersion. Water can and does corrode an aircraft when it's been submerged for some time. Not only do you have to consider the exterior of the aircraft, but you also have to consider the interior of the aircraft and the equipment in it. Water can get into the engine, the avionics system, the fuel system, and the electrical wiring and do some nasty damage. The type of water involved in the flood may very well make your decision to salvage or write off an aircraft easier. Determining the extent of damage done, however, is best left to an expert.

While we are talking about floodwater damage, it's still a good reminder to review some basics about water and corrosion. Corrosion is a reaction between an anode (a metal that is less resistant to corrosion) and cathode (a metal that is more resistant to corrosion) when electrolytes, such as water, provide an electrical path between the two. The corrosion results from the refined metal trying to revert back to metal ore.

Corrosion is the top damage producer, and the factor that weighs heavily with the extent of corrosion is salinity. The salinity level in the water impacts the likelihood of corrosion developing and whether an aircraft is salvageable: The higher the salinity level of the water, the less of a chance to salvage an aircraft. In terms of salinity, there's saltwater, brackish water, and freshwater. Technically speaking, the distinction between these categories of water is the amount of dissolved salts in the water expressed in parts per thousands.

Saltwater, with a salinity level at a minimum of 30 parts per thousand, is highly corrosive to an aircraft. If an aircraft has been submerged in saltwater and then recovered, corrosion begins almost immediately. Just being exposed to the air in a place surrounded by saltwater can bring on corrosion. One can see that along the coastal areas and particularly on islands like Hawaii. Time becomes very important for any hopes of salvaging an aircraft in saltwater before the damage becomes extensive.

If the aircraft was submerged in brackish water, you may have more of a chance to salvage your plane. The amount of time you have depends upon the oxygen level in the water — the more oxygen in the water, the more chance of corrosion. Technically, the salinity levels of brackish water ranges from 0.5 to 30 parts per thousand and is basically in between salt and fresh water. With all the pesticides, fertilizers, oil, and other items that end up in the water, just about all freshwater will become brackish. Fresh water, presumably then, has less than 0.5 parts per thousand of dissolved salts and is the least corrosive. In all cases, however, being able to flush damaging waters from the aircraft is important in salvaging your aircraft.

As with trying to salvage vehicles that were submerged in floodwaters, there are several factors impacting the salvageability of submerged aircraft:

- the cost of trying to salvage a submerged aircraft
- the level of submersion
- the time spent submerged
- the time needed to salvage
- the amount of corrosion

If the job is properly done in bringing the aircraft back to airworthiness, there may not be any signs that it was flooded. However, there may still be the chance that, in spite of repairing the aircraft, it may not operate as smoothly as before or may be susceptible to accelerated corrosion, i.e., the expected results of exposure to corrosive elements may develop sooner than in an aircraft which was not in a flood.

Let's say that you want to salvage the aircraft and that you will spend the money and time to get the plane back to being airworthy. Consider what you are faced with. Flood waters or standing water will be a mix of water, chemicals, organic material, and mud that have been deposited into and on everything in the aircraft. There are areas of the aircraft that are easily accessible and areas that are not. You need to be able to drain the aircraft and flush it out with clean water to minimize the damage. The faster you can do that, the better the chance you have of salvaging your airplane. However, inspecting and repairing or replacing parts of the aircraft is going to take time, so take the time to get it right. Don't think of just washing the plane and then flying off into the wild blue yonder. You might not make it back.

Steps Involved in Salvaging a Submerged Airplane

Assuming the plane is salvageable, what should you do? Visually check to see what damage has been done, call your aviation maintenance technician, and drain the plane. While he or she will repair the aircraft, there are some basic steps that you the pilot/owner can take as well to aid in the process. As a pilot, you are allowed to do the preventive maintenance that is detailed in Appendix A of Federal Aviation Regulation (FAR) Part 43. You can do a visual check of the airplane to look for any unusual damage that the floodwaters may have

done—mud, garbage, dings, dents, and so on. Keep in mind that several days may pass before you can check out the status of your plane—in most cases home or car takes priority. Floodwaters could have receded and some of the water may have drained from the plane during that time. However, you still need to check the aircraft for any damage.

FAA Advisory Circular (AC) 43.13-1B (Acceptable Methods, Techniques, and Practices - Aircraft Inspection and Repair) provides some general guidelines on what should be done to an aircraft when it has been submerged. As we said, the major concern with submersion is corrosion to the craft, and this advisory circular deals with corrosion damage. Section 14 of Chapter 6 in the AC has the most specific guidance dealing with submerged aircraft. While the AC is directed towards aircraft technicians, an aircraft owner should also read this AC for a general understanding of what needs to be done.

The owner could complete some of the steps on his/her own; that is, what is allowed under Appendix A of FAR part 43. However, the technician should complete the majority of the repair/salvage work. All of the work will need to be inspected by an IA if your technician doesn't have that authority. If an owner wants to assist in the process, the work will need to be completed under the technician's supervision. Realize that a submerged airplane will need to be thoroughly inspected and cleaned. Both the interior and exterior areas have to be examined. A technician will complete the major repairs and cleaning.

Some steps and guidelines that can be taken by the pilot/owner under the supervision of the technician are:

- Thoroughly wash the interior and exterior areas of the aircraft, using a water/detergent mixture such as MIL-D-16791, type I and isopropyl alcohol TT-I-735 mixed with water or a water-emulsion cleaning compound (MIL-C-43616) mixed with water. If you don't have anything like that available, then use any available mild household detergent mixed with fresh tap water.
- Always use clean water to clean the plane.

Jefferson City, MO, airport. (Jan Monroe photo)

- Rinse steam cleaned areas immediately with hot or cold fresh water.
- Touch up all scratches and scars on painted surfaces.
- Remove and replace all leather, fabric upholstery, and insulation. Plastic or rubber foam that cannot be cleaned must be replaced.
- Remove all drain plugs or drive screws in tubular structures and blow out the structure with compressed air. Beware about doing more damage to the structure. You are better off contacting the manufacturer first before doing something like driving screws into the structure that may add more damage to the aircraft. If water has reached these interiors, flush with hot, fresh water and blow out the water with compressed air. Roll as necessary to remove all signs of water.
- Clean sealed wood, metallic, and other non-metallic areas, excluding acrylic plastics, with warm water.
- Remove the propeller from the engine and the engine from the plane.
- Remove major accessories, engine parts, and so forth and flush the surface with hot, fresh water.
- Remove and replace the fabric from fabric-covered surfaces. The adhesive that holds the fabric together may have dissolved.
- Clean the interior and exterior using steam under pressure with a steam-cleaning compound. Take care in not steam-cleaning electrical equipment such as the terminal boards and relays.
- Remove instruments and radios and applicable cables and plumbing. Inspect and repair.
- Drain hollow spaces or fluid trap spaces by drilling out rivets at the lowest point. Install new rivets after drainage.

These are general guidelines from AC 43.13-1B. First and foremost, you should contact the aircraft manufacturer or the parts manufacturer for the specifications they have on their products. They will be the best source of knowledge on your particular aircraft or your particular engine, and so on. As you make the repairs and clean out the aircraft, make the proper entries in the maintenance logbooks.

Just consulting the aircraft flight manual (AFM) or pilot operating handbook (POH) and following general maintenance guidelines may not help you in cleaning and restoring an aircraft that was in floodwater. This is a disaster that has struck the aircraft. You will need additional information and may need to do more to repair a damaged aircraft. After seeing a disassembled plane and all the nooks and crannies that "junk" can hide, it brought home the point of just how thorough you want to be in getting your aircraft back in shape. Just think, if you had a low-wing aircraft and it was flooded. Guess what is residing in the wings. There are a lot of places for that water and muck to go. How are you going to get it out of the wings? Realize that there may be some major disassembling to do such as taking apart panels to gain access. This can be a daunting job and there are those who will choose to not pour the money into it, but there are others who will.

Other factors to consider in getting your plane back to airworthiness are:

- Access for cleaning. Again, think of all those nooks and crannies that you can't see or get to easily.
- Strength of wooden structures. Water damages wood and you definitely want to check out the structure.
- Floodwater debris becoming trapped in the aircraft. Think of your wings, especially low-wing aircraft.
- Flexible wires and cables corroding or becoming brittle.
- Bearings losing their lubrication.
- A thorough cleaning of the engine.
- Accessories such as magnetos containing precision parts.
- Contaminated fuel system.
- Non-functioning avionics systems.
- Corrosion of landing gear.
- Corrosion of electrical system.

St. Charles County Smartt Airport, MO.. (Jan Monroe photo)

Buying an Airplane That Has Been Flooded

Potential owners should also look for the same signs of water damage, as should a technician and current owner. If the owner spent the money to rebuild/repair the aircraft and a good job was done to bring the aircraft back to airworthiness, there most likely will not be any physical indications of its once having been submerged. If the repair work was not well done, then it would take a very thorough inspection and time to check for potential problem areas. Your decision now encompasses wondering what else was not repaired correctly or at all, especially in areas not readily viewed or accessible.

What can you do to find out about the history of the plane, especially if you suspect it may have been in a flood? Unlike automobiles, there are not a lot of disclosure laws regarding flood damaged aircraft. It is caveat emptor, let the buyer beware. Traditionally, aircraft are sold "as is," and that means you are buying that plane or helicopter in its current condition. That current condition may include some problems with the engine, landing gear, avionics systems, and so on. It can also include having been submerged in water. It is up to you to find out what potential problems exist in the aircraft. Refer to the July/August and September 2000 issues of *FAA Aviation News* on what to look for when buying an airplane. Pay for a pre-buy inspection, and select an aircraft technician who is familiar with that type of aircraft. This is money well spent on what will be a large investment of your money and safety.

Tips for determining if an aircraft was flood-damaged:

- Check the logbooks for entries on flood damage repair work.
- Check to see if the plane complies with all applicable airworthiness directives.
- Ask where the aircraft was hangared. If it came from an area that was hit by floodwaters, be careful.
- Check the exterior and interior of the plane, looking for signs of mud, rust, or water damage.
- Check for the well-defined watermark or line and for musty odors resulting from mildew.
- Check the wheel wells and landing gear for signs of corrosion or debris.

- Check around the rivet heads and lap joints for signs of corrosion.
- Get the pre-buy inspection done by a technician that you know.

Will this prevent you from buying a "lemon?" No. Maintenance logs can be detailed or not. Regulations determine the minimum of what needs to be documented. It is up to the technician to determine how much more detail to put in the logbooks. It still is up to you, the buyer, to make sure that you are not buying someone else's problems, or at the very least know what it is that you are buying. There will be some people who are less than honest about the condition of something that they're selling. You may still encounter problems with the plane, but hopefully you will have minimized the "surprises" by having a thorough pre-buy inspection and being on the lookout for any flood-related problems.

Check with the manufacturer of the aircraft for information on submerged aircraft. Check with the various aviation equipment manufacturers. Contact people who have had their planes flooded to see what they did. You may want to check with FAA to see if any AD's were issued regarding submerged aircraft. Contact your local FSDO for more assistance.

Short of flying the aircraft out of an area about to flood, are there other preventive measures that can be taken to minimize water damage from floods? After talking with airworthiness inspectors at several FSDO's, I found the choices are limited. One does the best that he or she can and then hopes for the best. If there is time, the airplane could be flown out to another airport not being impacted by the flood. However, that brings up the issue of flying in adverse weather conditions. If it can't be flown out of the area, then another option would be to tow the aircraft to higher ground. If you can't do that, then elevate the aircraft and hope for the best. One company sells a lift that is meant to raise aircraft about six to eight feet off the ground. Assuming that floodwaters are not raging through the hangar, this would be a way to save the aircraft. One could also try to obtain a ferry permit from FAA. A reminder on ferry permits: they allow you to operate an aircraft that does not meet certain airworthiness requirements, but is safe for a specific flight.

What have I learned from my journey? Well, I learned a lot about aviation, thanks to the folks at the Kansas City and the Greensboro FSDO's; Mr. Dean Chamberlain, one of the writers for *FAA Aviation News*; and Mr. Bill O'Brien, a National Resource Specialist in Continuous Airworthiness Maintenance Division. Do I see a career change in the future? Hmmm...no, that's just what the industry needs to see—me darkening the doorstep. I can see it now, "But sir, my friends don't call me Linda the Toolwoman for nothing." But seriously, I learned about aircraft, preventive maintenance, and floods. I found out more about rust than I ever wanted to know, but you know what? I now know that I was justified in my not buying a car a while back because I thought the rust was a bit funny looking. My instinct said "no" because the rust was very pitted looking. Now I know why. What does that have to do with aircraft? Same thing, if it doesn't look right, it most likely isn't right.

What else did I find out? I found that there isn't a lot of specific information on dealing with flood damaged aircraft. One really has to do one's homework. It pays to have a good technician to get the job done correctly. It's contacting the aircraft and parts manufacturers for assistance. It is a case of knowing people and finding out from others what has been done. Based on my understanding of the general aviation community, it's a community that has very knowledgeable people. What better resources than that are there? There are the organizations such as AOPA and EAA and the various flying clubs which have people noted for their knowledge. Tap into those resources.

What does one do with a flooded aircraft? That truly comes down to what you want to do, but your main focus should always remain on safety. What price are you willing to put on yours and others' safety in order to get back in the air?

Creve Couer, MO, airport. (Jan Monroe photo)

Linda Jew is an examiner with the Farm Credit Administration and served on the magazine staff as a Women's Executive Leadership Program candidate.

Parts is Parts

by Tom Gierhart

Better think again. All Parts are not created equal. Recently, a local FAR Part 135 operator in our Western Pennsylvania area developed a rough running engine during a charter flight. As the vibration became more severe, oil started running out of the cowling, followed by puffs of white smoke. As the aircraft descended, the smoke became a steady stream. At last, the wheels were on the runway. Fortunately, no fire occurred. I am sure that on the way down there were some apprehensive moments. In aviation terminology, we know this as the "pucker factor." This is the short time deviation from the hours and hours of pure boredom to seconds of sheer terror.

Upon examination of the engine by maintenance personnel, it was found that four of the six studs holding the cylinder base to the engine had broken. Also, one of the two larger through bolts suffered the same fate. The cylinder was loose and could be moved by hand. The studs and the attaching nuts were sent to the manufacturer for metallurgical analysis. The lab found that the studs and through bolt met the required hardness, but the nuts were too soft. The failure of the studs was the result of severe overstress from the constant pounding of the cylinder trying to part company with the engine case each time an explosion took place. The soft nuts, not meeting minimum standards, lost their torque and backed off allowing the studs to be loaded unevenly. The lab also stated in the failure report, that the large nuts were copper-plated when they should have been cadmium-plated.

Who Is Responsible?

The manufacturer, broker, supplier, receiver, mechanic, and inspector may all end up being accountable. Anyone who receives a part should ensure that it can be traced back to its origin, its last overhaul, repair, or enduser. The owner is identified in FAR §91.403(a) as being primarily responsible for maintaining the aircraft in an airworthy condition. However, when we deal with parts, the buck actually stops with the mechanic. By his signature, he approves the engine for return to service. The installer is ultimately responsible for determining that a part installed during a repair or overhaul meets the requirements of part 43 the FAR's (14 CFR part 43).

Let's look at terms as defined by Advisory Circular (AC) 21-29, Detecting And Reporting Suspected Unapproved Parts.

- Counterfeit Part. A part made or altered so as to resemble an "approved part" without authority or right and with the intent to mislead or defraud by passing the imitation as original or genuine. Some counterfeit parts look better than the original.
- Suspected Unapproved Part. A part, component, or material that is suspected of not meeting the requirements of an "approved part." A part that, for any reason, a person believes is not approved. Reasons may include findings such as a different finish, size, color, improper (or lack of) identification, incomplete or altered paperwork, or any other questionable indication.

OK, FAA What Can We Do?

Here it is in a nutshell:

- Use suppliers who ensure traceability of their parts to an FAA-approved source. For standard parts, a source that at least provides a certificate of conformance.
- Be wary if the price is significantly lower than the advertised price.
- Do not use a supplier who cannot provide documentation on parts sold.
- Confirm the packaging identifies the supplier's name.
- Verify that the delivery receipts agree with purchase orders on part and serial numbers.
- Ensure that the identification on the part has not been tampered with (stamped over, labels missing, etc.).
- Verify that the shelf life and/or limit has not expired.
- Suspect any visible irregularities (altered surface, no plating, new paint over old, scratches).
- Do random sampling of large quantities of hardware.

Speaking of Hardware

The same attention is not always given to hardware in comparison with larger parts. Hardware is just as important, as we saw in the failed cylinder nuts. The Fastener Quality Act (Public Law 101-592) mandates traceability and record retention requirements that will hold manufacturers and suppliers responsible for conformance, traceability, and accountability. The supplier must certify to you IN WRITING the parts he supplied were manufactured in accordance with specifications. This includes lot, batch, and serial numbers (if applicable), and the quantity shipped. You have the right to audit your supplier. Co-mingling hardware stock is not recommended. Keeping hardware stock separate makes it easier to determine which fasteners are bad when a notice of non-conforming hardware is published. Keep the original packaging until you have used the last piece. Remember there are various documents that are available describing how to inspect standard hardware. For example, Advisory Circular 65-9A, Airframe and Powerplant Mechanics General Handbook, chapter 6. Of course, there always seems to be exceptions to the rules. The Quality Fastener Act does not apply to fasteners produced by Production Approval Holders who have FAA oversight. There is also no law requiring documentation to be supplied by the manufacturer to the purchasers.

Types Of Documents That Can Make Your Job Easier

Types of documentation needed when making a determination of a part's eligibility for installation:

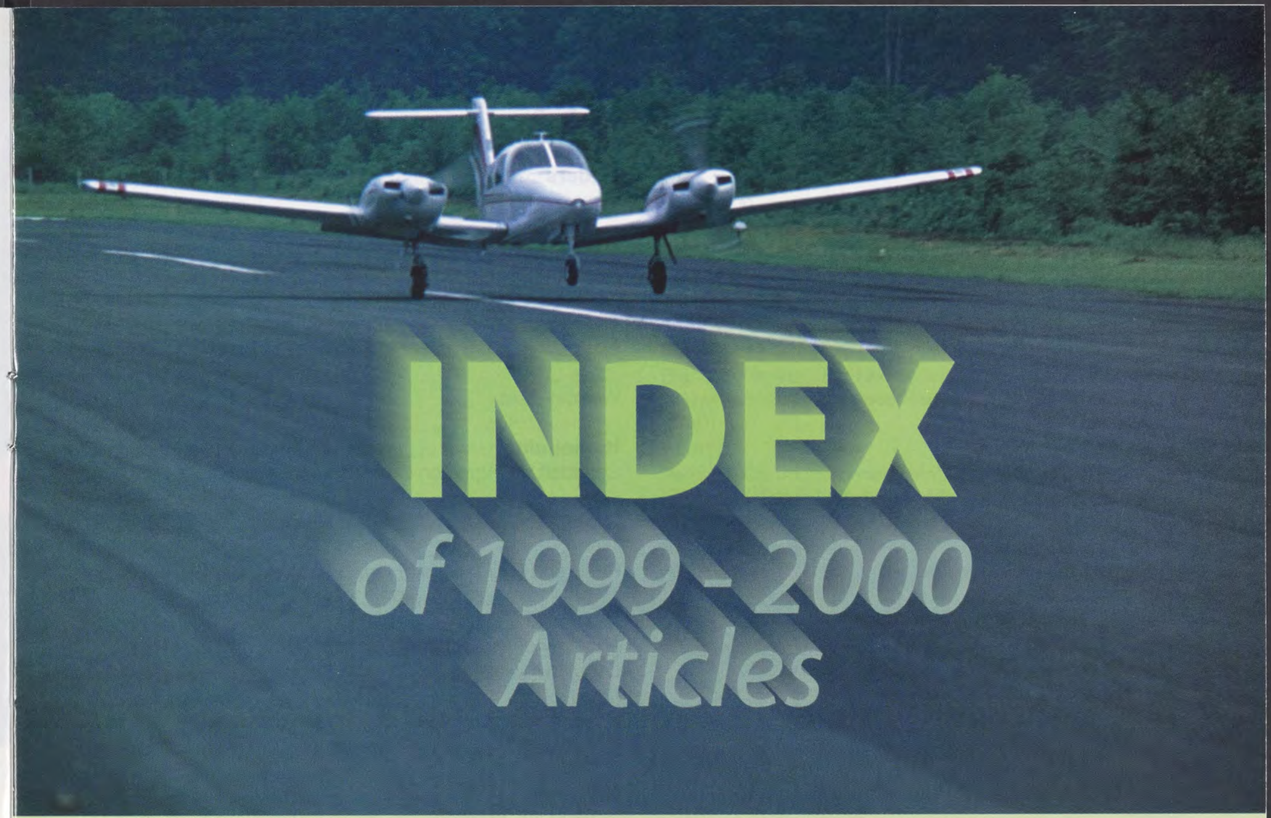
- FAA Form 8130-3 (Airworthiness Approval Tag)
- JAA Form One (Joint Aviation Authorities)
- Maintenance records or releases with approval for return to service noted
- FAA TSO markings
- FAA PMA symbols.

What If I Suspect A Part As Being UNAPPROVED!

Call the Aviation Safety Hotline at 1-800-255-1111. The caller's identification will be kept confidential, if requested. Another means of reporting a suspect unapproved part is to fill out FAA Form 8120-11. We can mail or FAX it to you, and it takes less then 15 minutes to complete. It can also be found on the World Wide Web at <http://www.faa.gov/avr/8120-11.doc>.

Suspect aviation parts have been around for awhile. The FAA's first notification for suspect parts was issued in 1956. Those of us making, repairing, selling and installing aviation parts are the front line defense, where the rubber meets the road, and the information collected is most valuable at the parts receiving stage. It is too late when unapproved parts are found during an accident or incident investigation. Reporting is critical to the FAA's Suspected Unapproved Parts Program and its commitment to remove the potential threat posed by unapproved parts from aviation. For more information on this program see the FAA's website at <http:// www.faa.gov/avr/sups.htm>. It is vitally important for us, as mechanics and pilots, to participate in this program for a safer aviation system.

Tom Gierhart is a Principal Maintenance Inspector at the Allegheny Flight Standards District Office, Pittsburgh, PA.



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RUNWAY SAFETY CORNER

This time we plan to test your runway signage knowledge. In the following multiple choice questions, circle the correct answer. (The answers can be found on page 26.)

Question 1. What is the purpose for the "Runway/Runway Hold Position" sign?

a. Denotes entrance to runway from a taxiway
b. Denotes area protected for an aircraft approaching or departing a runway
c. Denotes intersecting runways

Question 2. What is the purpose for the "Runway Hold Position" markings on the taxiway?

a. Identifies taxiway aircraft is holding on
b. Holds aircraft short of the runway
c. Allows an aircraft permission onto the runway

Question 3. What is the purpose of the "Taxiway Ending" marker sign?

a. Identifies area where aircraft are prohibited
b. Indicates taxiway does not continue beyond intersection
c. Provides general taxiing direction to named taxiway

Question 4. What does the "Outbound Destination" sign identify?

a. Identifies entrance to runway from a taxiway
b. Identifies direction to takeoff runways
c. Identifies runway on which an aircraft is located

Question 5. What is the purpose of the "No Entry" sign?

a. Identifies paved area where aircraft is prohibited from entering
b. Identifies area that does not continue beyond intersection
c. Identifies the exit boundary for the runway protected area

Santa Claus 2000

by Patricia Mattison

"It's a beautiful Fall day. Don't you think, dear?" Martha said as she entered the house. She had been very busy cleaning for the upcoming Christmas Season. Soon she would only have time for supervising Christmas lists and the wrapping of gifts.

Santa looked busy too, sitting at his desk, frowning at some paperwork that was scattered before him.

"Sorry, did you say something, Martha? I received a letter from the Federal Aviation Administration concerning Aging Flying Sleighs. I was thinking that our trusty sleigh and team are getting up in years and, if any sleigh was aging, it's our faithful sleigh and team."

"Didn't we just have an inspection of the sleigh by the FAA?" Martha inquired. "Everything was alright then, except for a runner problem as I recall."

"Martha, that was almost six years ago. I've got to have another inspection according to the letter I've just received. According to this letter, I might have to get a new rig. I'd better call the FAA and see how soon an airworthiness inspector can get out to us and inspect the sleigh and team."

Santa immediately called the local FAA office. Speaking to a Supervisor, Santa found that he was able to get an appointment the following week for an inspection with Airworthiness Inspector Ebenezer Scrooge.

Santa had a lot to accomplish to prepare for the inspection. So he called Gunther, his most senior elf and Director of Maintance, into his office. "Gunther, we have a whole laundry list of things to look at before the FAA gets here next week to inspect the sleigh."

"What do you mean, Santa? The FAA was just here."

"No Gunther, as I explained to Mrs. Claus it has been almost six years and a lot can go on in that length of time." Handing a to-do list to Gunther, Santa began to talk about the inspection that would take place the following week.

"The reindeer harnesses have to be made airworthy. The harness fittings will be inspected to meet conformity standards. There have been reports of suspected unapproved parts on the Swan Queen's sleigh.

"The reindeer need to be fueled with the highest quality of tundra moss. A special inspection because of a recent Airworthiness Directive on ailing reindeer will cause Dasher and Vixen to be looked at closely. They were not well last year, if you recall, Gunther. They will be scrutinized because I received a warning letter about them.

"We both know that the sleigh is old, and it's been through a lot in the past few years. Lately the FAA requires a special inspection called the Aging Flying Sleigh Inspection Program. Inspector Ebenezer Scrooge will be our inspector. I understand from the grapevine that Inspector Scrooge can be somewhat difficult to deal with. Now, get busy, Gunther. There's a lot of work to be done."

The week passed all too quickly to suit both Santa and Gunther. Before they knew it Inspector Scrooge was knocking at the door.

"Hello Santa, I'm Inspector Ebenezer Scrooge, here to ensure that your airworthiness program meets the Regulations. Is your Director of Maintenance available?"

Gunther, being the only maintenance elf Santa had, is the obvious Director of Maintenance. He had been trying for the past year to find other maintenance elves. There had been no elves trained or qualified for the job. As a consequence he has been doing the enormous job himself. Walking toward the Inspector, Gunther is apprehensive and concerned about the inspection of the sleigh and team. Nervously extending his hand he says, "Hello Sir, I am Gunther, Santa's Director of Maintenance."

"Hello Gunther, are you the only mechanic taking care of Santa's sleigh?"

"Yes sir, I have worked for Santa for several years, and I have never seen such a shortage of flying sleigh mechanics. We have tried to hire some help, but haven't been successful."

And so the inspection began. First the reindeer were inspected and Donner and Comet were in need of new shoes. Cupid had a cold and a broken antler that needed attention. Special attention was paid to Dasher and Vixen who had been sick last year. They passed with flying colors.

Next the harnesses were looked over for unapproved parts. Fortunately none were found. Bridles and reins were inspected for wear and buckle conformity. Tassels and bells were added to the maintenance manual.

The sleigh was another thing again. A few years ago, as you recall, Santa had to get a new runner from the English Snow Queen. Santa's sleigh was so old that the Airworthiness Inspector had not been able to find a part number on the broken runner. Either there never was one, or it had worn off.

Walking around the sleigh, Gunther had removed his cap and was scratching his head worrying about what the Inspector might find. He had done his best to bring the sleigh up to the standards required for hauling cargo. The sleigh was an old style with a high back for cargo and low front where Santa sat in the pilot's seat. The sleigh had been replaced once and Gunther was sure that another replacement was due sometime in the near future.

The Inspector went over every inch of the sleigh very carefully. He looked at the dash, the crossbar on the front, and the running lights on the side. One of the lights had a broken cover and Gunther was instructed to get a new one. The seat was worn almost beyond repair.

"Gunther, just look at that seat," said Inspector Scrooge. "Why, if Santa fell through he might lose control of the team, and that could be very dangerous. That item needs repair before Santa flies the sleigh again."

Down on his knees, the Inspector looked underneath the sleigh. "The attachment points where the runners connect to the sleigh are worn and need to be secured, if not changed altogether. If the runners collapsed on landing Santa might be hurt or someone on the ground could be injured."

Gunther was concerned that he might not be able to repair some of the parts of the sleigh that the Inspector had pointed out.

"Sir, if it were up to me I would ask Santa to get a new sleigh. I have seen the wear and tear that the sleigh goes through each year. This one has seen better days," remarked Gunther.

Inspector Scrooge frowned, "This sleigh is far too old and worn out to be used carrying cargo. I would like to see Santa buy a new sleigh, too. It certainly is time to do so. However, flying sleighs are hard to come by, and even if you began today there might not be one available until after Christmas."

Santa came by just as the inspector was telling Gunther the bad news. "Well, what do you think of the old sleigh, Mr. Scrooge?" said Santa as though he had not overheard the conversation.

"I am sorry to tell you that the sleigh is almost beyond repair. If you continue to use it to carry as much cargo as you do each year, there could be a serious problem especially with the landing gear." Scrooge was being painfully honest with Santa. "Mr. Claus, I suggest that you look for a new sleigh. Either that or repair the items that I have mentioned as soon as possible."

"Oh my, what am I going to do? A new sleigh could take months to locate and then one as big as mine is could even take longer." Santa was getting worried now. "Thank you for you time, Inspector Scrooge." Santa shook the Inspector's hand. "I'll do all in my power to effect the repairs and get back to you."

Once the Inspector was out of sight, Santa turned to Gunther and said, "Get busy on the repairs as soon as you can and have Samuel help you."

And so Gunther and Samuel began to work. They repaired the seat so that Santa wouldn't fall through. The seat wouldn't be as comfortable as it had been, but at least it would be safe.

On closer inspection the left runner needed to be replaced because of a crack at the attachment point that was too far gone to be welded. Gunther called the English Snow Queen's mechanic to see if they had an FAA-approved left runner available. As luck would have it, they did and sent it off to Santa via Elf Air Express.

Gunther replaced the old broken light cover, while Samuel looked after Cupid's antler and called the vet for Cupid's cold.

A few weeks later Santa called the FAA Office. "Inspector Scrooge, this is Santa. I think we are ready for a re-inspection. When can you be out to see us?"

"I have an opening next Thursday. Will you be available?" queried Inspector Scrooge.

"I'll make the time see you." With a sigh Santa hung the phone on the receiver.

Thursday arrived, and all had been done to meet the requirements of the inspection. Santa and Gunther were on pins and needles.

"Well, I see that you have made progress, Santa. The sleigh looks a lot better than it did a few weeks ago. It's difficult to keep the older sleighs in flying order. This sleigh has almost used up its time in service. I can help you out this year, but next year you really have to replace the sleigh."

"What are you going to recommend?" said Santa holding his breath.

"I will give you a waiver that will allow you to use the sleigh this Christmas. Then you will have to replace it with a new one. I won't be able to give you another waiver to fly the sleigh, at least not while carrying cargo."

"I promise to look for a new sleigh starting right now," said a relieved Santa. "I would like to thank you for all the help you have given us with a waiver and all. The children of the world would have been mighty disappointed if they had no gifts on Christmas."

And so it was that Christmas gifts were delivered, and Inspector Scrooge turned out to be a good guy after all—no matter what people said about him.

Patricia Mattison is the Safety Program Manager at the Juneau Flight Standards District Office and wrote this article with the technical assistance of Airworthiness Inspector Hugh Devlin.

SURFACE TENSION Part 2

Runway Incursions Happen at Non-Towered Airports, Too

by Phyllis Anne Duncan

Several years ago I was getting a student ready for his certification practical test, and, on this particular day, we were going over emergency procedures and decided to work on aborted takeoffs. It was a weekday afternoon, and we had been the only aircraft in the pattern and at the non-towered airport a few miles southeast of Washington, DC. I broadcast our intentions over the UNICOM even though we were, seemingly, the only ones around.

Note I used the word, "seemingly."

We reviewed the aborted takeoff procedures, discussed what was expected, rolled onto the runway, and applied full power. At the point where I knew we had enough runway left to roll out, I "failed" the engine by retarding the throttle and called out, "Engine failure on takeoff." The student performed superbly, putting the aircraft back down on the runway and controlling it throughout the roll-out. This particular runway has a down-slope about midway down its length, and we had rolled out on the downhill side. Also, to reach a taxiway, you had to back-taxi about 50 feet or so. We dutifully broadcast the fact that we were back-taxiing on the runway, and, without wasting any time (it was an active runway, after all) my student 180-ed the aircraft. As we faced the direction of takeoff and began taxiing to the taxiway, a twin crested the hump in the runway and bore down on us. I took over the aircraft and taxied onto the grass beside the runway, the twin cleared us (just barely), and my stricken student turned to me with images of not being recommended for his check ride and said, "What did I do wrong?"

He did nothing wrong. I was the PIC, after all, and it was my responsibility and my 20/20 hindsight that practicing aborted takeoffs on a runway where I couldn't see the full length probably wasn't such a great idea. I had, however, done this in the past with other students and during my own aircraft checkouts at this very airport with no problem. I assured my student that there would no hitch in his check-ride recommendation. I also waited all day for the pilot of the twin to return to base.

When he did return, his attitude, needless to say, was not particularly positive. He never turned the radios on at a non-towered airport because "Who needs 'em? It's too distracting," and that was why he didn't hear our pattern call-outs and intentions. He further stated, "What was I so worried about anyway because there was no accident, and it wasn't like the FAA was around, right?"

Ahem. I handed him my business card.

Despite the fact that I was on annual leave that day, I'm still a safety professional. I admitted to him my newbie instructor mistakes and sorta expected a similar acknowledgement about not using radios or just listening at non-towered airports. He handed me back my card and alluded somehow that I was a female canine who had just given birth before he got in his car and left the airport.

All in all, it was one of those instructor days where you walked away with not very positive feelings, and I didn't realize it at the time; but we'd just had a runway incursion. Yes, they occur at non-towered airports, too. (Just for clarification's sake, a non-towered airport can be one where there is no tower or one where the control tower is not operating.)

Much of the publicity and attention for the prevention of runway incursions has focused on towered airports, where the potential for an accident is more visible. As with Part 1 of Surface Tension in the October 2000 issue, situational awareness is just as important to pilots at non-towered airports in preventing runway incursions. Some of you might say, why do we bother to worry about runway incursions at non-towered airports? By definition, can they even occur at non-towered airports? The answer to the latter is maybe, and the answer to the former is that it's not acceptable to have near-collisions on the ground or in the air regardless of the amount of positive control exercised over the airspace or airport surface.

Besides, if you practice runway safety at your local, non-towered airport, that attitude will carry over to your operations at towered airports, and vice versa. The same broad categories of standard operating procedures we talked about in the earlier article on towered airports apply to operations at non-towered airports as well. At airports without control towers, you will need to increase your vigilance and remind yourself of the differences in communications procedures, i.e., is it UNICOM or CTAF? Even when operating at non-towered airports, you can also keep in mind the standard operating procedures (SOP) for towered airports—the planning, the communication, situational awareness, and airport familiarity—and be perceived by your peers as a more professional and safe pilot.

Hopefully, no one will call you names for it.

Situational Awareness

Perhaps more so at a non-towered airport, being aware of your surroundings is essential. As I learned the hard way, you cannot rely on things today being just like yesterday or last week. You can't assume that because you're following recommended procedures regarding communications at non-towered airports that everyone else is. Non-towered airports have signage and markings, also—maybe not as extensive or complex as a towered airport, but they serve the same purpose: to get you to the proper position on the airport for takeoff or for taxiing to your parking spot.

In periods of poor visibility, non-towered airports may not have the same kind of lighting as a towered airport would, so awareness of the physical layout of the airport is important. An airport doesn't have to be O'Hare or JFK or DCA to have an airport diagram, and there are plenty of commercial sources that produce airport diagrams and include non-towered fields.

To improve your situational awareness at non-towered airports, make the following part of your operations:

- Monitor the appropriate frequency. Listen to what other pilots are saying—especially if there are areas on the active runway that are blocked from view by weather or physical layout. Be absolutely certain of the status of the tower, if there is a part-time one on the airport.
- If there is an instrument approach to the non-towered airport, monitor the appropriate approach control frequency to be aware of any inbound IFR traffic
- Before you enter or cross any runway, check the full length of the runway, including approach areas, and be mindful of blind spots. While crossing the runway, give your full attention to that maneuver and hold off on any other cockpit duties.
- Use exterior lighting to make yourself more visible. (More on this later.)
- Use caution when landing on a runway where your exit taxiway soon intersects another runway.

Planning

Don't be lulled into thinking that planning your taxi route as part of your preflight preparation is not necessary at a non-towered airport. Give surface movement at a non-towered airport proportionally as much attention as you would for a towered airport. Refer to the planning items discussed in the previous article as well as consider the following practices.

- Study the airport layout and use an airport diagram to plan your taxi route based on the active runway. Even at a non-towered airport, there can be intersecting runways or complex intersections. While you're taxiing to the active, remember that landing aircraft may be taxiing to the parking area by the same route.
- Learn the local traffic pattern. Most airports follow the recommended standard pattern, but some don't. What does this have to do with runway safety? In times of calm or no wind, pilots may choose which runway or which approach end to use, and that may conflict with your ground operations.
- Consider the fact that the instrument runway may intersect another runway and plan how aircraft landing on that runway will affect your taxi route.
- Make certain you use the correct UNICOM or CTAF frequency to broadcast your intentions or to listen to.
- If you have another crewmember on board, or even a passenger, brief them on the taxi route and make certain everyone is clear on what that route is so that they can help.

Communication

If necessary, take a look at communication procedures for non-towered airports in the Aeronautical Information Manual (AIM). Recommended communications procedures at non-towered airports can also be "customized" for the particular airport (i.e., Piper 32X, left base at the water tower, etc.), but there is a core set of procedures and standard phraseology that assure that anyone communicating has an understanding of what is going on at the airport.

- First and foremost, in order for your information to get to the right people or for you to be able to visualize what other aircraft may be doing on the surface or in the pattern, you have to be on the appropriate frequency. Is it UNICOM or CTAF? And the answer might be," it depends." The AIM and the Airport/Facility Directory, charts, or approach plates, which are FAA publications, as well as commercial publications and databases, are a source to obtain and use the appropriate frequency.
- Before starting your taxi, monitor the appropriate frequency to "get the picture" and visualize the flow of traffic.
- Listen before you transmit. If you see activity on the airport but hear no communications on the frequency you have tuned in, you could have the wrong frequency or a radio problem.
- Be clear but brief in your transmissions, and, again, the standard phraseology in the AIM assists with both. Make certain you include the name of the airport at the beginning and the ending of the transmission.
- If your call sign is similar to another aircraft transmitting on the frequency, use your full call sign.

As with the anecdote at the beginning of this article, don't assume that every pilot on the airport is in a radio-equipped aircraft or is using the radios he or she has. There's no real clincher way to determine if an aircraft is not radio-equipped (absence of antennae may be a clue, but plenty of aircraft sprouting antennae have had their radios pulled for repair), so you simply have to keep in mind that they are a possibility at any non-towered airport. As general aviation grows and non-towered airports see an increase in activity, those pilots with aircraft without radios might consider using a handheld transmitter, especially for listening to or transmitting surface movements.

Taxiing

As with the previous article, we're

not going to instruct you on how to taxi but rather emphasize the issue of how distracting cockpit duties during taxiing can be. Again, don't let the fact that you're at a non-towered airport lull you into letting up on good operating procedures.

- Before taxiing, have a copy of the airport diagram available for each crewmember, and refer to the aircraft's progress on the surface, checking it against the diagram.
- Keep your head up. You can't see what's going on around you if your head is down looking at an airport diagram that you should have studied before getting underway.
- Use the compass or heading indicator to confirm taxiway or runway alignment, especially at intersecting runways.
- Use the compass or heading indicator to confirm taxiway or runway alignment, especially at intersecting runways.
- In periods of low visibility, use all available resources—signage, lighting, markings, passengers, cockpit instruments, etc.—to verify your position on the planned taxi route.
- If you are uncertain of your position or become disoriented on the surface, stop until you can re-establish your situational awareness. Remember to broadcast the fact that you've stopped on an active taxiway. Even at a non-towered airport, DO NOT stop on an active runway. Exit the runway to re-orient yourself.
- Enter, exit, or cross a runway as expeditiously as possible, and do all the pre-takeoff checklist items before entering the runway and the after-landing items once you're off the active runway.
- Before entering a runway, scan right and left and the full length of the runway and the approach areas. If there is more than one pilot, both should do the full scan, i.e., not just be responsible for his or her "side" of the aircraft. Both should verbally state "clear" or "not clear." And, even if you're alone, saying "clear" or "not clear" out loud is just good reinforcement. No one is going to know—unless, of course, you've inadvertently keyed the mike.
- Remember—stop, look, and listen.

Exterior Aircraft Lights

Even though the use of exterior lights to be more visible was alluded to earlier, we'd like to expand on that a bit. In day or night, your exterior lights make you more conspicuous to other aircraft operating on the surface or in the air. The use of exterior lights is voluntary, but there is a precedent for their use—Operation Lights On, an FAA program from a few years back designed to help prevent midair collisions in the vicinity of airports. We are encouraging you to use as much exterior lighting as the operating limitations of your aircraft will allow during the following stages of surface movement.

- Engine running – turn on the rotating beacon.
- Taxiing – before taxiing, turn on navigation, position, anti-collision, and logo lights (as applicable). Strobe lights shouldn't be turned on if they create a problem for other pilots' vision or for ground personnel.
- Crossing a runway – all exterior lights should be on.
- Entering a runway to take off or position and hold for take off – one or more landing lights plus all other exterior lights should be on. The same caution about the strobes as above holds here as well.
- Take Off – turn on all remaining landing lights.

Conclusion

Runway incursions can and do occur at non-towered airports, and runway safety there is just as important as for towered airports. At times, general aviation operations are inaccurately perceived by the public to be "dangerous" or "unprofessional." Adopting standardized procedures for surface movement at non-towered airports, enhances safety and heightens the professionalism. Even at a non-towered airport, situational awareness, planning, coordination, and communication of surface movement can be habits that will bode well for any operation.

To obtain airport diagrams for free, go to www.aopa.org/asf/taxi or check the FAA's Runway Safety Program's web site for information on airports posted by airport managers: www.faa.gov/runwaysafety.

AIRPORT SURFACE MOVEMENT CHECKLIST NON-TOWERED AIRPORTS

Before Taxi
- ❑ Operating hours and status of control tower confirmed, as applicable.
- ❑ CTAF or UNICOM frequency confirmed and monitored.

Taxi for Departure
- ❑ Monitor CTAF or UNICOM.
- ❑ Monitor approach control, as applicable.
- ❑ Head up.
- ❑ Stop, look, listen.

Departure
- ❑ Announce intentions.
- ❑ Expedite takeoff.

Exterior Lighting
- ❑ Engine running – rotating beacon
- ❑ Taxiing – navigation, position, anti-collision, logo lights/use caution with strobes
- ❑ Crossing runway – all exterior lights
- ❑ Entering runway/position and hold – one or more landing lights and all other exterior lights/caution on strobes
- ❑ Takeoff – all remaining landing lights

Flight FORUM

In this issue we are answering only one very long FlightFORUM letter, but it has an intriguing question that none of us have really thought about before. How is weight and balance calculated for a part 135, on-demand, cargo only, air carrier?

• A Weighty Question

Our company is a FAR Part 135, on-demand, cargo only air carrier. We are a "check hauler" utilizing Cessna 310's, R and Q models with rear seats removed. We state in our operating manual (GOM) that we will use weights provided by the vendor, and if not provided, we will use scales which are carried in the airplane to determine the actual weight.

About two weeks ago one of our aircraft was ramped by a Flight Standards District Office (FSDO) aviation safety inspector (maintenance) who is unknown to us, although he is from our local FSDO. His review of our scales and a discussion with the pilot resulted in an "unsatisfactory" notation in the FAA's Program Tracking and Reporting Subsystem (PTRS) because the small scales carried in the aircraft were not calibrated, and the pilot so admitted that they were not calibrated. As a result of the "unsatisfactory" remark, our principal operations inspector (POI) and principal maintenance inspector (PMI) visited our office the following day requesting information about the "uncalibrated" scales. They each indicated that they had to clear the "unsatisfactory" from the system.

Our Director of Operations (DO) proceeded to tell them that in the past, when ramped and when asked about calibration, the standard reply was that we could not find any regulation which required small commercial scales (top limit 250 lbs.) to be calibrated. These scales are set to zero prior to use. These are United Parcel Service (UPS) approved for use in shipping and charging costs related to their company. In other words we could ship a crankshaft via UPS based upon the weight reflected on the UPS approved scale. There are no calibration adjustments available or visible on the scale, with the exception of being able to zero the scale prior to each use. The cost is about $80 per scale.

The inspectors insisted that they had to clear the PTRS system and the inspector who ramped us was insisting on a follow through on the subject.

Through an arrangement with the local county office of Weights and Measures, three brand new scales were tested for accuracy. All were within "acceptable" limits for "use in commerce." The scales were tested using large iron test weights. The men who did the testing told us we could sell potatoes, carrots, etc., with the scales. They affixed a county seal showing they had to be re-tested in one year if we wanted to continue to use them for "use in commerce." The cost of testing was $30 per scale. Our POI was happy since he was looking at reams of paperwork if he wanted to research the subject of "calibrating" these small scales.

I have researched the following material: Advisory Circular (AC) 120-27C Aircraft Weight and Balance Control; HBAW 95-14 and HBAT 95-15; Element Performance Inspection (EPI) Job Aid, Element 3.2.2.: Flight/Load Manifest/Weight and Balance Control; FAA Order 8300.10, Vol. 2, Chapter 75, Evaluate FAR Part 135 (Nine or Less) Weight and Balance Control Procedures; FAA Order 8400.10; FAA Order 8700.10; FAR Parts 91, 135, and 23; and AC 91-23 Pilot's Weight and Balance Handbook (replaced by FAA-H-8083-1 Aircraft Weight and Balance Handbook).

It is the operator's (nine or less passengers) responsibility to use actual weights for Part 135 reciprocating powered aircraft. (FAA Order 8300.10 as cited above. See also AC 120-27C, p. 10, para. 13.) However, none of the above material indicates the requirement to utilize calibrated scales in determining weight. This is not to say that scales, which are obviously in poor condition or which any reasonable person would question when a bogus weight is portrayed, should be used.

In fact, accuracy seems to be compromised when an operator may ask the passenger for his/her weight and then add a predetermined constant. (AC 120-27C, p.9, para. 11, b., (1) and (2).) Average passenger weights may also be used. (AC 120-27C, p. 7, para. 10, a.) See also: "A suitable commercially available scale should be available for use when passenger, baggage, and cargo weights are otherwise undeterminable." (AC 120-27C, p. 7, para. 9.)

However, should an operator want to conduct a survey to establish average weights, the scale accuracy is defined. (AC 120-27C, Appendix 1, p. 3, para. 4. Scales.) Scales utilized to weigh an operator's aircraft are also mentioned with regard to calibration. (AC 120-27C, p. 6, para. 7, f.) In addition, FAA Order 8300.10, p. 75-3, para. D. (1) does establish different standards, i. e., National Institute of Standard and Technology, for weighing aircraft.

There is no regulation requiring these scales to be calibrated. However, good operating practice, and common safety sense would require that high quality scales be used when they are carried in the airplane for use. In fact, perhaps the scale testing procedure, which we utilized, would be reflective of a safe operation. However:

a. Where is the regulatory requirement for calibrating such scales?
b. To what standard are such scales officially tested or calibrated?
c. Will other FSDO's, while conducting a ramp check, accept such a test as we have?
d. Is the inspector mixing up scales; i.e., scales for weighing an aircraft or to establish an average

weight through a survey, with small scales that can be carried in the aircraft should an item have to be weighed?
e. Is this setting a precedent in that the scales will now always have to be tested within this FSDO?
f. What about Part 91 operations? If an individual has a scale in his C172, will it have to be calibrated?

I have been asked this question about calibrated scales for years while being ramped, but never once was anything written up.

Finally, I have been a subscriber to the *FAA Aviation News* since about 1967 and still have all of my copies. I still utilize them by reviewing subject matter and incorporating great safety information in our ground schools and publications. They are priceless to me.

By the way, can we keep my name and company confidential for now? We don't want to irritate the inspector who did the ramping since he feels so strongly about this. Thanking you in advance.

Name Withheld by Request

Your request was forwarded to the Flight Standards Continuing Airworthiness Division here at Washington Headquarters. The following information was provided by the Division.

The Aviation Safety Inspector researching your issue said he contacted your local Flight Standards District Office's (FSDO) airworthiness supervisor on this subject.

The FSDO supervisor is aware of the surveillance ramp inspection involving your operation. The FAA's overriding issue is safety and the assurance of safety. The FSDO informed your company in order to insure the accuracy of the aircraft's weight and balance the weight of the cargo must be accurate. To achieve this end the scales used by your company must be calibrated to a standard to insure this accuracy.

The regulations don't speak to the scales' use for cargo on small Part 135 operators specifically. However, the regulations speak to the overall assurance of safety of the operation, which includes the accuracy of cargo weight on the aircraft.

Therefore, the discretion of your primary maintenance inspector (PMI) is to have you place in your manual the policy that the scales will be calibrated to a standard traceable back to the civil authority for weights and measures for which the scales are used or to the National Institute Standards Technology (NIST).

Because of this question, the Continuing Airworthiness Division will develop guidance for inspectors and the industry to have these types of scales calibrated to a recognized standard.

FAA AVIATION NEWS welcomes comments. We may edit letters for style and/or length. If we have more than one letter on the same topic, we will select one representative letter to publish. Because of our publishing schedules, responses may not appear for several issues. We do not print anonymous letters, but we do withhold names or send personal replies upon request. Readers are reminded that questions dealing with immediate FAA operational issues should be referred to their local Flight Standards District Office or Air Traffic facility. Send letters to H. Dean Chamberlain, FORUM Editor, FAA AVIATION NEWS, AFS-805, 800 Independence Ave., SW, Washington, DC 20591, or FAX them to (202) 267-9463; e-mail address:

Dean.Chamberlain@faa.gov

RUNWAY SAFETY CORNER

Answers to Runway Safety Corner Quiz: 1-a, 2-b, 3-b, 4-b, and 5-a.

BACK TO BASICS VIDEOS

The Flight Standards Service's Aviation Safety Program has released two recent videos in its Back to Basic series that pilots may be interested in. The new videos include one produced in cooperation with the United States Parachute Association titled "Flying For Skydive Operations." The video shows the special safety considerations that jump pilots need to know to fly safely while jumping skydivers. From weight and balance requirements to air traffic announcements to proper loading and unloading, the new video is designed to enhance the safety of sport skydiving.

Another important video is titled "Runway Safety." Using the familiar trigger tape concept, the video shows four situations designed to encourage audience participation. One situation involves two general aviation pilots becoming distracted on an airport. Another involves an aircraft being towed. The third shows an air carrier crew and air traffic control having a communications problem on the airport. The fourth example involves an air taxi flight problem.

Pilots should contact their local Flight Standards District Office (FSDO) Safety Program Manager for more information about the next presentation of the videos in their local areas.

CHANGE OF ADDRESS AND OTHER GOOD TIBITS

Recently, a pilot asked about how to report a change of address. FAR §61.60, Change of address, establishes the requirement for pilots, flight instructors, and ground instructors to notify the FAA of a change in permanent mailing address. The rule states that these certificate holders may not exercise the privileges of their certificates after 30 days of changing their permanent mailing address, unless they have notified the FAA of that change in writing. The rule further states that if the new permanent mailing address includes a post office box number, then the holder's current residential address must be provided.

Change of address information should be sent to Flight Standards Service, Airmen Certification Branch, AFS-760, FAA, P.O. Box 25082, Oklahoma City, OK 73125. The information should include your name, date of birth, social security number and/or certificate number.

For those with Internet access, they can download a form to submit their change of address data at http://registry.faa.gov/airmen.htm and then click on the link to the form. The form must be signed and mailed to the above address.

In addition to providing change of address information, the Airmen Certification website provides information on how to replace your lost or destroyed certificates, how to get copies of your airman records, how to replace your lost or destroyed knowledge test report, how to report a name change, how to change your airman certificate number, and other such information as DUI/DWI program information, and other types of airman data. Some of the services may require a fee. For more information on the site and what it offers, please log onto the site.

FAA MANAGEMENT ADVISORY COUNCIL TAKES FORM

The first seven members of the Federal Aviation Administration (FAA) Management Advisory Council have been sworn in. The advisory council, established by the FAA Reauthorization Act of 1996, will provide advice and counsel to the FAA's Administrator on policy, spending, funding and regulatory matters affecting the aviation industry.

The council will consist of 18 members. The president appoints ten members, representing aviation interests. Five members, appointed by the secretary, will serve as a subcommittee, with emphasis on air traffic services. There also is one designee each from the Department of Transportation, the Department of Defense, and an air traffic services union.

The first seven advisory council members to be named include: J. Randolph Babbitt, former president of Air Line Pilots Association; Robert W. Baker, vice-chairman of AMR Corp.; Edward M. Bolen, president of General Aviation Manufacturers Association; Geoffrey T. Crowley, president and CEO of Air Wisconsin; Robert A. Davis, former Boeing vice president; Deborah Branson, private attorney; and Kendall W. Wilson, private financial analyst.

Initially, advisory council members will serve from one- to three-year terms. Subsequent appointments will be for three years.

WAAS SIGNAL AVAILABLE

After a successful 21-day stability test of the Wide Area Augmentation System (WAAS) signal in space, the FAA declared that it is now available for some aviation and all non-aviation uses. The test demonstrated required system stability allowing immediate use of the WAAS signal by a broad range of users.

WAAS augments the Global Positioning System (GPS) by improving the GPS position signal. The test demonstrated that the system can operate without interruption, providing a stable and reliable signal to augment GPS. The system demonstrated one to two meters horizontal accuracy and two to three meters vertical accuracy throughout the contiguous US. Raytheon will operate the system for the FAA on a continuous basis, interrupting it only as necessary to upgrade or test the system. To provide information on these outages, the WAAS broadcast schedule is available at <wwws.raytheontands. com/waas>.

The current WAAS signal is available to aviation users for increasing situational awareness during flight under visual flight rules (VFR) and on the air-

port surface, among other uses. For non-aviation users, the signal supports a variety of applications in recreation, boating, agriculture, and surveying.

WAAS continues to be developed to provide the necessary integrity for the WAAS-required, safety-critical applications. Until the system design is completed and initial operational capability is declared, the WAAS is not an approved source of aircraft navigation under instrument flight rules (IFR).

SOAR REACHES OUT TO "AT-RISK" YOUTH

The Experimental Aircraft Association (EAA) Aviation Foundation has announced a new program named Special Outreach with Aviation Resources (SOAR), which will provide to young people in underprivileged or "at-risk" situations opportunities to discover the possibilities available through the world of aviation. In conjunction with the Foundation's current aviation education programs, SOAR will operate as part of the Foundation's "Vision of Eagles" mission to young people.

SOAR will be directed toward specific groups who are usually not touched by many aviation education efforts. According to EAA's press release, "several Vision of Eagles initiatives have already reached groups of 'at-risk' youth, with positive results. Young Eagles is designed to introduce young people to aviation through free demonstration flights. More than 600,000 kids have received those flights since the program's start in 1992. Included in that total are hundreds of young people flown at Meigs Field in Chicago through a special activity for inner-city children sponsored by the legendary Tuskegee Airmen of World War II. Programs in the Los Angeles area reach underprivileged youth in that region. While Young Eagles flights have also been made with Native American youth in northern Minnesota and through numerous Boys and Girls Clubs, anti-drug abuse programs, and Scouting groups, as well as children with disabilities."

SOAR will operate as part of the Foundation's "Vision of Eagles" mission to educate, motivate, and provide direction to young people through the excitement of aviation.

FAA REFINES INTERNATIONAL SAFETY PROGRAM

The Federal Aviation Administration (FAA) has changed the categories used in its International Aviation Safety Assessment (IASA) program to rate a foreign civil aviation authority's ability to meet international aviation safety standards. The agency moved from a three- to a two-category rating system.

Since September 1994, the FAA has provided the public with safety information about countries with air carriers that operate to the United States. Foreign civil aviation authorities, not individual airlines, are assessed for adherence to International Civil Aviation Organization (ICAO) aviation safety standards. ICAO, the United Nations' technical agency for aviation, establishes international standards and recommended practices for aircraft operations and maintenance.

Until now, the FAA has used three categories to rate a country: (1) acceptable, (2) conditional, and (3) unacceptable. Countries in Categories 2 and 3 did not meet international standards. Category 2 was distinguished from Category 3 by the fact that, at the time of the assessment, an air carrier from the Category 2 country was providing air service to the United States. Countries in the former Category 1 will remain Category 1. Countries in the former Categories 2 and 3 will be laced in the new Category 2. The FAA is changing the categories to eliminate any confusion from having two different categories that address non-compliance with ICAO standards.

IASA ratings will now be as follows:

- Category 1, Does Comply with ICAO Standards: A country's civil aviation authority has been assessed by FAA inspectors and has been found to license and oversee air carriers in accordance with ICAO aviation safety standards.
- Category 2, Does Not Comply with ICAO Standards: FAA inspectors assess a country's civil aviation authority and find areas that do not meet ICAO standards. This rating applies if the country: lacks laws or regulations in accordance with ICAO standards; lacks the technical expertise or resources to license or oversee air carriers; does not have adequately trained and qualified technical personnel; does not provide adequate inspector guidance for enforcement and compliance with ICAO standards; or has insufficient documentation and records and inadequate ongoing oversight of air carriers.

Countries in Category 2 with existing operations to the United States will only be permitted to continue operations at current levels under heightened FAA surveillance. New services may only be added if aircraft are wet-leased from a U.S. carrier or a carrier authorized by a Category 1 country. Carriers that do not have air carrier service to the United States will not be permitted to commence service while in Category 2, except by using wet-leased aircraft.

The FAA has assisted civil aviation authorities with less than acceptable ratings by providing technical expertise, assistance with inspections, and training courses. Working with ICAO, the FAA hopes to continue to assist countries that have Category 2 ratings.

Travelers may call 1-800-FAA-SURE (1-800-322-7873) to obtain a summary statement about the foreign civil aviation authority assessment results. Visit the FAA's IASA web site at <www.faa.gov/avr/iasa/index.htm>.

Editor's Runway

from the pen of Phyllis-Anne Duncan

My Holiday List

I can remember as a child sitting down in the autumn with the Sears Catalog, turning to the toy section, and making my holiday wish list. This list usually ended up being two to three notepaper pages long, both sides, and I wrote really, really small. Needless to say, I got maybe a hundredth of what I asked for with an encouragement from my parents each year that perhaps next year I needed to be a bit more realistic. Hah! Each succeeding year's list was progressively longer until I finally figured out if I wanted all this stuff, I had to find some way of earning the money for it. Now that I'm earning my own money, I've managed to tick quite a few more items off that list, despite the fact that the list still outstraps my salary.

I thought for my end-of-year column, I'd pose some things on my aviation wish list and see how they compare to yours.

- *An AMES rating.* If the funds for that could magically appear this holiday, I'd be one happy camper. That's my "missing" class rating under my airplane category.
- *Fewer general aviation accidents and a commensurate reduction in fatalities.* No one can argue with that.
- *The elimination of the phrase "runway incursion" from our aviation glossary.* That's up to you and me; it's not in Santa's bag.
- *Continued growth of general aviation.* That continued growth is contingent upon our continued increase in the safety record, and we need to export not only our love of general aviation but our commitment to safety to those countries just coming to understand what we've enjoyed for nearly a century.
- *An instrument rating for every pilot.* The FAA has made it easier than ever to get an instrument rating, and it's some of the cheapest insurance you can buy.
- *That Assistant Editor Dean Chamberlain's "Orphan" Tripacer takes to the air again.* A bunch of us are lined up to take a ride in what will essentially be a brand new antique aircraft.
- *A top of the line, Star Trek™ like GPS.* Of course, having an airplane to put it in would be nice, too.
- *New faces at Aviation Safety Program seminars and meetings.* We want the old faces to keep coming, but we would also like to reach those who don't come to these free, educational seminars. Add to your New Year's Resolutions the commitment to bring a pilot who's never been before to a safety program meeting—or better yet, encourage a friend to start the WINGS program.
- *Last but not least, I'd like for all of your aviation wishes to come true.* Barring the elimination of the FAA, of course, because I need the job to finish getting the things on my list.

Best wishes to all for a happy holiday and a prosperous new year, which, by the way, is the real new millennium.

'Til next year...

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Federal Aviation
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