

A Newsletter Written by Mechanics for Mechanics



Nuts And Bolts

DO YOU BELIEVE IN SANTA CLAUS?



Santa Claus

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• If you are interested in safety and would like to help the FAASTeam spread the word in your local aviation community, we need to talk to you. Contact your local FAASTeam Program Manager.

I'm 55 years old and have to admit that I look forward to Christmas morning to see what my wife, (I mean Santa Claus), has slipped under the Christmas tree for me that I wasn't expecting. I would hope that most of us have fond memories from our childhood of the anticipation of Christmas morning. Now as an adult and a FAA Inspector, I thought the days of really believing in Santa Claus were long gone. But to my surprise I'm pretty sure that Santa is real because I hear his name mentioned quite frequently here in the Flight Standards Office. Historically Santa was a real man, St. Nicholas of Myra (now Turkey), who was legendary for his kindness and generosity. However, the Santa I am referring to is the Designated Mechanic Examiner who gives away A&P certificates, the IA who pencil whips annual inspections, and the A&P who signs off work that either was not performed at all or not performed correctly.

A few years back in San Antonio, TX, there was a "Santa" DME that failed to properly test 240 mechanic applicants. This resulted in a reexamination of all 240 applicants under Title 49, Public Law 103-272 section 44709. (We simply call it a 709 reexamination) This was accomplished at a huge cost to the applicants and the taxpayers. It took ten years to locate individuals and complete their 709's. The DME lost every certificate that he held.

In Florida, a college A&P program had a "Santa" DME on staff that failed to properly test 1200 applicants. All 1200 applicants received 709 letters from the FAA. This 709 project started several years ago and is ongoing because it has spread across the whole country. The DME not only lost all of his certificates, we've been told that he is doing jail time as a result of his failure to follow procedures.

I recently learned of another "Santa" DME that is being investigated for the same issue. His count is up to around 200 applicants. I can't say much about this one, it's still being investigated.

The files in my office and any other FAA offices in the country are crammed full of legal enforcement cases that involve a "Santa" IA that failed to properly inspect an aircraft during an annual inspection. I investigated an IA a while back that was known for his quick inspections. The investigation proved that he simply drove to the airplane and found the maintenance logs that had a check tucked inside. He signed off the annual and drove away with the check. Ho, Ho, Ho! By the way, this guy is no longer an IA and one year later we took his A&P certificate for the same type of thing.

The DME's are obligated by law to follow the DME Order 8610-4 to administer the mechanics test. The IA's are required by law to perform inspections in accordance with FAR part 43, appendix D. Mechanics are required by law to perform their work in accordance with FAR part 43 which drives them to the manufacturers instructions for continued airworthiness. If any of these folks do not follow the required guidance they might as well start growing a beard because they fall into the category of a Santa Claus for giving away the farm.

The truth is that the Santa's out there are not doing anybody any favors including themselves. The aircraft owner who got a pencil whipped annual or cheap maintenance just put himself and his passengers at risk of injury or death. The mechanic who got an abbreviated oral and practical test is at risk of performing unsafe work and losing his job when it is discovered that his certificate is invalid. The funny part is that this is usually done in the interest of making money. If the Santa's did their job correctly they could make more money by charging for the actual time it took to do it right. Sooner or later these Santa's are discovered and I can assure you that the FAA does not believe in Santa and will give these folks a present that they probably are not going to like. Be smart, the only good Santa is the one with the white beard that comes down the chimney on Christmas day.

Author: Mike Jordan - Editor

R-22 Drive Belt Problems

Our data shows numerous R-22 and R-44 helicopter accidents reported in the last few years. Quite often the Investigator in Charge comes back and says, "I suspect the drive belts broke or came off in flight". I thought this was worth investigating. I visited and conducted interviews of two different and very active Robinson flight school /charter / maintenance type operators. Those were Mike Bisek of Helicopter Experts in Bulverde, TX and Jeff Dalton of Epic Helicopters in Fort Worth, TX. Amazingly, both operators said the same thing, **Baloney**. Neither operator had ever had a problem with a Robinson drive belt. It was their opinion that the missing or broken belts were post-accident issues and not pre-accident. In fact, both operators said if you have a problem with a drive belt it is due to Failure To Follow Procedures. Sound Familiar? Both of these shops reported during inspection and maintenance of customer's aircraft, that they have found clutch sheave height and engine alignment so far out of whack that they were amazed the machines made the flight to their facility. They suspected maintenance being performed by non factory trained mechanics or a lack of the proper tools to accurately make the measurements and adjustments. In fact, I learned from these two gentlemen, and confirmed by a Robinson Helicopter Rep., that these measurements are required every 100 hr. inspection. According to Mr. Dalton from Epic Helicopters, he records the measurements for the clutch sheave height and engine alignment in the maintenance records during every 100 hr. inspection to be able to track any changes. I also learned that there are operating issues that can have a catastrophic effect on the drive belts if the pilot fails to follow procedures. Those are operating above placarded manifold pressures, operating above approved gross weight, operating above the approved VNE speed, or maneuvering at high air speeds at high power settings. (see Robinson Safety Notice SN-37 and Robinson R-22 & R-44 Safety Alert 20 December 2004) So the moral to the story is don't accuse the manufacturer of having a defective product until YOU have followed the FAA approved procedures. And I really like Jeff's idea above about recording the measurements.

Author: Mike Jordan - Editor Please read below what our friend and FAASTeam Representative Mike Bisek has to say about the drive belt question. Mike is a long time operator and maintainer of Robinson Helicopters.

Mike Bisek Says: Greetings Fellow Airman,

I have been asked more than once, "Why does the Robinson R22 have so many drive belt problems?"

At first I became concerned that operators were having a problem that I was not aware of. However, since I have served as a maintenance technician and pilot primarily working with Robinson Helicopters, I have never had a drive belt failure and only once in a while do I change them from normal wear.

As a helicopter operator, you can be certain you will experience problems with the belt drive system by not adhering to the following flight and maintenance practices.

An example would be:

1. Failure to periodically inspect the clutch sheave height and alignment.
2. Improper installation and shimming of the clutch sheaves both laterally and fore & aft after maintenance was performed, such as replacement of a tail boom, driveshaft, belts or clutch shaft assembly.

From an operational standpoint you will surely have drive train and or belt problems by improper pilot technique to include:

1. Flight over the Robinson published gross weight limitations.
2. Acrobatic flight maneuvers.
3. Continually exceeding the manufacturers manifold pressure power limitations.

In short, I can assure you it is time consuming to properly align the clutch sheaves the first time after overhaul, etc., however the time spent is well worth while. From an operational standpoint, you must be certain that maintenance personnel have the proper tooling while performing aircraft maintenance and all flight operations must be performed in accordance with the Pilots Handbook published limitations and safety notices.

Author: Michael D. Bisek

Chief Flight Instructor Helicopter Experts, Inc. Bulverde, Texas

Chief Mechanic Hill Country Helicopters, LLC Bulverde, Texas

Did We Really Mean What We Said?

BRIAN CAPONE - FAASafety Asst. Manager - SW Region

Hey you, yes you, the greatest technician in the world. You're the best because you keep moving forward, learning the new technology, looking for and taking training courses, right? Well, do you reward yourself with the FAA Aviation Maintenance Technicians Award Program? Hopefully so, if not, then get on board this plane!

Since 1991 our beloved friend, co-worker, and infamous Washington bureaucrat, Mr. Bill O'Brien was the mainstay in creating the AMT Awards program and elevating our status as true professionals. It is with deep sadness that we all mourn his passing but his spirit will continue to live with us. Since implementation in 1992 a lot of changes have come forth, one of which was a revision to Advisory Circular (AC) 65-25 to the Delta version that was preparing for automation of the program. OK, the bureaucracy engine is off timing again and some adjustments have to be made. The current AC says application for 2008 awards can be obtained by 'old' paper request as in the past or using the on-line program. We said it, but the on-line program isn't complete. We didn't make it for all the regular excuses the government uses! No need to re-hash those. Now to readjust the big engine timing, **we need all applicants to use the paper method for 2008 as in past years.**

So download the [Advisory Circular 65-25D](#) and follow the guidelines and times for submission. If you use the AC application and cut it out to size, your application will be submitted for the annual industry contest on March 10, 2009 at the Aviation Industry Expo in Las Vegas. Heck, you may win a great prize.

The same applies for employers requesting their award with one exception, the AC gives the entire year for submission. This year we need the employer award **requested by March 15, 2009**, using the AC application. This allows the FAASafety Program Managers a little time for processing to our headquarters' deadline of March 31, 2009. The Employer Plaques will not be ordered until the first or second week in April 2009, so do not expect to receive them before the middle of May 2009.

Good news; we are ready to launch the new program for 2009! Final beta testing by some industry participants is taking place at this moment and we should be launching in the first quarter of calendar year 2009. A new advisory circular is making the required routing in headquarters for approval. In addition to on-line application, there are other significant changes to the program. The FAA Safety Team (FAASafety) has had success with the redesign of the Pilot Proficiency Program (read Wings) to a risk management program and that is what the new AMT Program is going to be! The Airworthiness FAASafety is studying the accident causal factors and preparing training courses to address those issues, thereby providing risk mitigations and accident reduction. We will target core training toward this effort in addition to your industry training.

The details and operation of the new on-line program will be located on the [FAASafety.gov](#) website. Register for site access if you aren't already and enter the Maintenance Hangar on the left side of the screen. Once launched, go ahead and enroll into My AMT and start earning toward your award! If you are new to [FAASafety.gov](#), then explore and see all of the great programs and knowledge available to keep you as the greatest AMT in the world!

If you have questions, email me at brian.t.capone@faa.gov. Merry Christmas!

ASK THE FEDS - PART 43

By Bill O'Brien for AMT Magazine

UPDATE: If you have not heard, Bill O'Brien passed away on November 9, 2008. Bill worked most of his career with the FAA at Headquarters and was very active in mechanic issues such as IA renewals and the latest rewrite of AC 43.13. He was also my writing hero and was well known for the articles he wrote for AMT magazine. We lost a great Irish ally in the aviation maintenance field. He will be sadly missed. Below is another of Bill's great articles modified for the space available. Thanks go to AMT magazine Senior Editor Barb Zuehlke for allowing us to reprint Bill's articles.

FAA Feedback

By [Bill O'Brien](#)



Of the 199 Parts and a zillion words that make up FAA regulations in Chapter 1 of Title 14, Aeronautics and Space in the Code of Federal Regulations, only one Part speaks solely to us mechanics. Part 43 is that rule. It sets the requirements for what kinds of U.S. registered aircraft we can work on, who can work on the aircraft, who can sign off the logbook; it defines our performance rules and record keeping.

Part 43 is one of the three core regulations or foundation stones that set the standards for our aviation industry. The other two are Part 21, Certification Procedures for Products and Parts, and Part 91 General Operating and Flight Rules. These three rules achieved "star status" because they are the only regulations identified on the FAA Form 8100-2 Standard Airworthiness Certificate. But star status aside, what is even more amazing is the fact that Part 43 contains only 13 rules and six appendixes. That's all it takes to set the airworthiness requirements to maintain 185,000 U.S.-registered aircraft.

43.13: Performance Rule

For the next three minutes of your time, I would like to cover just one rule in Part 43. It's section 43.13, Performance Rule. I picked this rule because it uses only three paragraphs to set the standards for the work we perform. It is also the one rule that is quoted 95 percent of the time in the Letter of Investigation sent by the FSDO to some hapless mechanic who is accused of noncompliance of the regulations.

You 'shall' use current data and adequate tools

Now to the rule! FAR 43.13 contains three paragraphs. Paragraph (a) contains two requirements. The first requirement for a person performing maintenance on an aircraft or appliance is that they "shall" use the methods, techniques, and practices prescribed in the current manufacturer's maintenance manual or Instructions for Continued Airworthiness prepared by the manufacturer, or other methods, techniques, and practices acceptable to the Administrator, except as noted in section 43.16. Note that the first paragraph sets the tone for the rule. It uses the word "shall." This is a word with hair on its chest because "shall" is used as an imperative and not in the permissive sense as in words like "should" or "may." So the rule requires the mechanic to have current data from the manufacturer or other data acceptable to the Administrator. This reference to other acceptable data allows the mechanic to use data similar to FAA AC 43.13-1B and 2A to work on older aircraft like J3 cubs and 7 AC Aeroncas that never had a manufacturer's maintenance manual. The rule's one exception speaks to section 43.16 Airworthiness Limitations. This rule allows a mechanic to perform maintenance that is called out in an air carrier's FAA approved operations limitations or an inspection program approved under section 91.409(e).

Necessary tools, equipment

The second requirement of this paragraph requires the mechanic to have the tools, equipment, and test apparatus necessary to assure completion of the work in accordance with accepted industry practices. If any special equipment or test apparatus is recommended by the manufacturer, the mechanic must use that equipment or apparatus or its equivalent acceptable to the Administrator.

OK, this paragraph says a mechanic has to have the right tools or test equipment to do the work. Now back when I had calluses on my hands and I could part my hair, my lower toolbox drawer had all kinds of "special tools." Over 99 percent

ASK THE FEDS - by Bill O'Brien Continued.

of them were box or open end wrenches that were modified by hammer, torch, and bench vice to extreme angles that allowed me to get a bite on that elusive nut or fitting buried behind an unmovable object in an inaccessible location.

However, the rule is not speaking to those kinds of mechanic modified tools. What the rule is talking about when it uses the word "equivalent" is the other 1 percent of the tools each of us has stashed in our toolboxes or tool rooms. You know the one; it's the wind-driven counter-clockwise safety wire twister that you made for \$99.95 that is the "equivalent" of the \$1,499 nuclear powered counter-clockwise safety wire twister that is called out in page 187 of the manufacturer's maintenance manual as the tool to be used to safety wire the frazzlebath valve on the main auxiliary biofeed transfer pump.

Since it is the mechanic or certificated organization who determines if the "home designed special tool" is equivalent to the manufacturer's "special tool," it is in your own best interest to have something down in writing on how that determination of special tool equivalency was determined, when it was determined, and who determined it. Also, if the "equivalent" special tool requires some sort of calibration, the calibration times and standard to be used should also be noted in the mechanic's documentation or company's manual. I am offering you this advice so you can have a better answer than I had when I had to answer those embarrassing questions from an FAA inspector who just happened to notice one of my special tools peeking out of the lower drawer of my toolbox.

Equal to the original, not better than

Paragraph (b) of the rule is where an often repeated maintenance myth began. The paragraph starts off by saying that each person maintaining or altering or performing preventive maintenance shall do that work in such a manner and use materials of such a quality that the condition of the aircraft will be at least equal to its original or properly altered condition. When I went to A&P school, the instructors always told us that if you do the work at least equal to or better than, the original, then the FAA can't write you up. But the rule does not say "better than". Besides, if you repair a part by making it better than the original, you have, in fact, altered it. So stick with "equal to" and send "better than" to your memory's recycle bin. The paragraph also uses the words "properly altered condition." This is speaking to the three ways you can alter a Type Designed product. They are Supplemental Type Certificate (STC), Airworthiness Directive (AD), or FAA Field Approval. So if you have to do a repair on a PMA part that is part of an STC you have to get the data from the STC holder or other approved source.

Follow the manual

Paragraph (c) allows Part 121, 129, and 135 operators respite from paragraphs (a) and (b) of the rule and instead requires them to meet the performance requirements spelled out in their operating limitations and manual. Not fair, you say! We give the big boys relief from meeting manufacturer's manuals and Instructions for Continued Airworthiness requirements and the work does not have to be "equal to" the original or properly altered condition. Not so! In reality, air carriers are held to a much higher standard of performance than Part 91 operators because they have to meet the requirements in their continuous airworthiness maintenance manuals and other special requirements found in their operating limitations. To ensure that the big boys do not take a sabbatical from complying with the regulations, the FAA headquarters has ensured that each FAA certificating managing office (CMO) and the air carrier are joined at the hip just to prevent that from happening.

In closing, all you have to remember to stay out of trouble 95 percent of the time when working on aircraft are the performance rules in section 43.13. They are:

1. Have available and use the manufacturer's current data and any special tool or its equivalent.
2. Do the work at least equal to the original or properly altered condition.
3. Airline mechanics follow your company's manual.

As it turned out Part 43's 12 other rules are not hard to understand either. This is because Part 43 was written by mechanics for mechanics and is designed to be light on the number of words and heavy with substance. But then again, what did you expect, after all, Part 43 is our rule.

Let's not meet by Accident!



Propeller Tips By Dr. Dan The Prop Man!

Lightning Strikes

An April shower brings thunder to the skies and lightning leads the way! Hopefully you're not caught flying your airplane in a thunderstorm but if you do get caught, my explanation in this article will help show you what to look for when performing your preflight inspection on the propeller and what to do about it if a lightning strike is found.

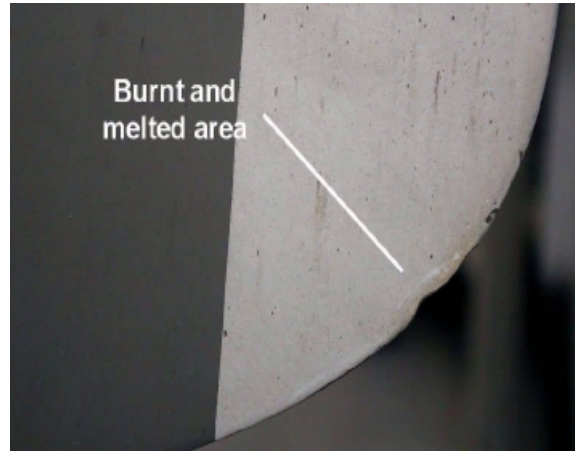
Check for burns or signs of arching on the blades and hub area.

Using a magnetism detector check all steel parts for signs of magnetism.

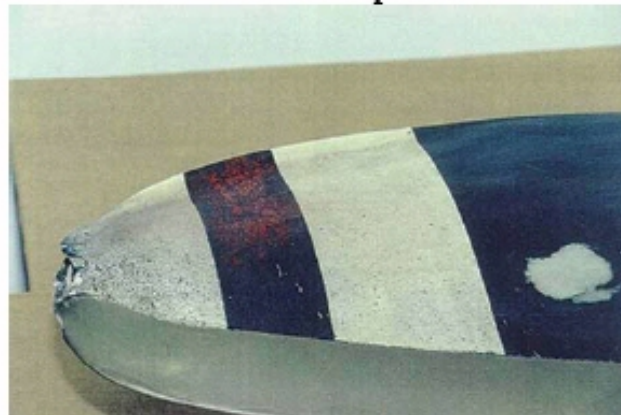
Look for any signs of localized melting or metal flow, particularly around the blades.

For electric de-ice systems, check for broken or burned leads & terminals.

If you find any of the above indications you have had a lightning strike. So what can you do about it? First, let's discuss the indications you found. A burn or arch anywhere on the propeller indicates either an entrance point or an exit point. Can you tell the difference? Not really. This means the propeller would have to come apart in the case of a constant speed propeller to look for the entrance or exit point. In the case of a fixed pitch propeller, it would need to be removed from the crankshaft and all bolt holes and attach surfaces inspected. If you found any magnetism, the propeller would have to come apart to be completely demagnetized (*Could you imagine how your compass would react?*). Any arching damage would have to be repaired by a certified propeller shop. Even a composite blade can have an arch or burn mark in which a tap test would have to be conducted to check for de-bond surface. What does all this mean? Overhaul! McCauley and Hartzel propeller manufacturers require a complete overhaul for any lightning strike so a thorough inspection and repair can be accomplished. The good news: In some cases the manufacturer will allow as much as a 10 hour grace period to get your aircraft back home or to a propeller repair station after a preliminary inspection and minor repairs have been accomplished. It will be up to the operator of the aircraft to consult with the aircraft manufacturer, propeller manufacturer, and the FAA for permission to operate the aircraft after such a strike. Below are a few examples of a lightning strike.



**Strong Lightning Strike on a Composite
Blade Tip**



Too Much Government Regulation? - You Decide

As a result of the recent presidential campaigns, I frequently heard on the news that the American People were concerned about “Big Government” and “Over Regulation”. As I absorbed that concept, I realized that I was part of the government and as an FAA employee pondered if I was part of the problem. Then as I analyzed the issue, I came up with the following which I hope helps you understand the dynamics of the situation. Let’s discuss the issue of over regulated first.

OVER REGULATED:

The Federal Aviation Regulations were an off-shoot of the Civil Aviation Regulations, (CAR’s) that were enacted after World War II in order to establish a minimum level of safety in air commerce. The FAR’s ensure that at a minimum, if you comply with them, the aircraft or operator should be safe for flight. These regulations were based on accidents that resulted in death to passengers and crewmembers.

In 2007 there were 1,893 aircraft accidents filed with the NTSB. So far in 2008 there are 1,587 accidents on file. Without reviewing each and every one of these accidents, I can assure you after 18 years of accident investigation experience that every one of them involved at least one violation of the minimum standards of the Federal Aviation Regulations that were written to ensure the safety of the flying public.

Are we over regulated, perhaps we are under regulated. Considering above, you decide.

BIG GOVERNMENT:

Without a doubt the government is big. And I am part of the government. Because I came out of a small maintenance shop before the FAA, I was offended when I was referred to as part of the “BIG GOVERNMENT” that was over regulating and killing general aviation. That ticked me off. I did a little research and found out that the Big Government does exist, but in Flight Standards, which is my world, the FAA is still hands on and personal. It’s a relatively small group of aviators that are interested in maintaining and flying aircraft. Let me see if I can put this in perspective for you.

According to the latest Administrator’s Fact Book there are 240,832 registered aircraft operating in the United States. There are 1,255,908 airmen flying, and maintaining those aircraft. The FAA, which includes several lines of business, has 44,423 employees. AVS (aviation safety) which includes the manufacturing oversight, totals 6,842 employees. Flight Standards, the safety oversight branch of the FAA, has 4,825 employees. Now let’s boil that down to our world. In Flight Standards approximately 30% of all employees are in Managerial or Administrative positions. So how many actual working inspectors does this leave to be your PMI, PAI, or POI, with oversight responsibility for you or your company? The answer is approximately 3,400 inspectors world wide. That equates to the following numbers:

For every FAA Inspector there are 369 airmen and 71 aircraft to be inspected. These numbers **do not** include the required annual, semi-annual or tri annual safety inspections required by the inspectors annual work program for companies operating under FAR 121, 129, 133, 135, 137, 141, 145, and 183. There are thousands of these required inspections. An inspector can easily have several hundred required inspections per year and this does not include the daily demand work.

Ask yourself this question, How many times have I or an aircraft that I maintain been inspected by a FAA Inspector in the last year, or ever for that matter? You decide if the government is too big? Are we over regulated? As you can see, maybe we ain’t so big after all. In effect, the FAA needs your help to keep our aviation system the safest in the world. We need your integrity to be alive every minute and we need your eyes and ears helping in rooting out the bad apples that can give our profession a bad image. So go out and mentor a new mechanic or influence correct behavior when you see something being done wrong.

Author: Mike Jordan - Editor

Credits: Administrators Fact Book July 2008

Do You Need Contact Information For Your FAASTeam Program Manager or FAASTeam Representative

1. Go to faasafety.gov. and sign in.
2. Click on FAASTeam Directory, left side of the page.
3. Click on View All Directory Information.
4. Click on Region, click on your FSDO or region from the drop down box.
5. Click on GO.

The system will display all of the FAASTeam folks sponsored by the office you selected.

6. Select the Program Manager or Representative that you need to contact. By clicking on his/her name that persons information will be displayed.

WHAT IS IT?

If you know, be the first to send me an e-mail at "nutsandbolts@faasafety.gov" and we will publish it in the next issue and give you credit for your aviation savvy.



HAPPY HOLIDAYS TO YOU AND YOURS



The first correct response to the 08-03 edition came from Mr. Shannon Hauck from Colorado Springs, Colorado, currently working in Townsville, Australia. Shannon correctly identified the aircraft as a Westland-Hill Petrodactyl V, built in the mid 1920's. It is a British two seat tailless fighter prototype powered by a 600 hp Rolls Royce Goshawk engine. The prototype finished its career in the late twenties flying RAF air shows.

Do you need to find or get information about any FAA office?

http://www.faa.gov/about/office_org

FAASTeam “Nuts and Bolts” Newsletter Article Submissions

If you are interested in submitting an article, please type your article using 10 point Times New Roman font in a word document. Articles should not exceed 800 words maximum. If pictures are submitted, please title by number to match required caption. It would be best to paste the pictures into a word document with the captions printed. Limit pictures to reasonable quantity and size for article.

Your submission may be slightly modified to ensure correctness and due to space considerations. No major content change will be made without your notification. You are responsible for content and the FAA assumes no liability and/or implied endorsements. Upon completion, please submit to Mike Jordan at

nutsandbolts@faasafety.gov

If you are interested in offering a suggestion for an article or if you have a question or issue that you would like clarification on in our “Ask The Feds” column, simply send us an e-mail with your suggestion or request at the address above and include the form below.

Please submit the following information with your article, suggestion or request.

Your Name:		Phone #:	
Title:			
Company:		email:	
City:		State:	

	YES	NO
Do you wish to have your article published?		
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I agree and attest to information provided		
Signature:		