

Regulatory Compliance Pitfalls

Introduction

During some 33 years of regulatory work and nearly 10 years consulting I have probably seen most of the common pitfalls that cause people to run afoul of the regulations and aviation law. In my early years as a maintenance technician in the Air Force and in civil aviation, I was aware of the need to be diligent in recording my work. I can honestly confess that during my Air Force time the awareness came from being trained to do so and fearful of the disciplinary consequences of not doing so. I really do not recall being overly concerned as to why I was doing what I was doing. I suspect that somewhere in my basic training we were exposed to aircraft logbooks, snag sheets, maintenance manuals and such. Since the maintenance records were monitored daily by senior Corporals and Sergeants, I never gave much thought as to how they were part of a system.

Occasionally we were part of a tactical evaluation that included all parts of the base system, including the flying missions. Fortunately, the tactical evaluation team never questioned me on my work as I was too busy launching and fixing aircraft. I am certain the maintenance officer's work was inspected by the team though.

Even in a tightly supervised environment like the Air Force I soon learned that mistakes can be made such as dual control checks signed out but the controls still hooked up incorrectly or logbook entries made but the inspections not done. One event I recall vividly was starting a F-104 when the pilot motioned for me to come up the ladder. His radio was dead. I said I would check the electronics bay and breakers. Lo and behold, there was no radio in the rack! I went back and got one, plugged it in and off he went. He never saw me add the radio. I checked the logbook and sure enough, it was signed out as having been daily inspected by a friend. I gave him heck, but never ever forgot how bad "pencil whipping" something can be. His excuse was that it was raining and he just counted the aircraft. Unfortunately, I saw more examples in my later career.

Later, a lot of incidents, accidents and failure to correctly follow the regulations came to be explained better by the advance of the human factors studies. Human factors science came to be accepted and now is required training. It took a long

time before simply blaming the pilots and technicians was rejected as a safety philosophy. A U.S. colleague recalls flight safety officers and courses becoming common in the U.S. Navy and Marines in mid fifties. An ex RCAF friend recalls a flight safety officer in his squadron in 1963. Another friend I contacted on this subject was an RAF technician and he recalled some early flight safety films in the early nineteen fifties that began to at least consider the effects of human factors, although they didn't use that term. I recall Crew Resource Management courses around the nineteen seventies and so on. Basically all of this led to quality assurance being brought into flight and maintenance operations, which then changed into the overarching Safety Management System we know today.

Before we continue it is important to note that all regulations and standards came from a desire for safety on the ground or in the air. Aircraft falling on populations because of substandard design, manufacturing or maintenance, was soon found to be unacceptable by countries and their legal systems. Operational safety related problems were covered by operational rules and pilot licensing and air traffic control systems. A large number of regulations came from incident and accident investigations and some from national judicial inquiries. Failure to follow such regulations invariably led to accidents and death or injury. That is why not complying becomes such a major issue. The word paperwork in this article refers to electronic versions of records and manuals as well as traditional paper systems.

Safety Management Systems (SMS)

I have lived through so many management styles or fads, call it what you like, that it seems to me SMS is just the latest in a string of aviation safety philosophy developments. I plan on writing a paper on the history of all the philosophies, starting from craftsmanship thru direct inspection, regulation by objective to SMS.

I left Transport Canada just as SMS was being introduced and the reorganization of the department was only in the design phase. I was there during all the run up debates among Transport's senior executives, but not for its implementation. Consequently, my views of SMS issues have been developed through my consulting business. One of the worst pitfalls I have seen is creating an SMS manual without having the foundational management systems in place to fulfill the obligations in the manual. Since SMS is based on the approved organization taking care of issues the operation finds in its own quality systems, etc., it soon

becomes apparent to the inspectors there are no supporting systems. They then have no choice but to find non compliance and walk away. In the days of inspection and auditing the inspectors would remain on site and continue to collect detailed evidence of infractions tied to the regulations and supporting documents. Those corrective actions were easier to follow as they were distinct items rather than systems issues. The point here is not to provide a false picture in your SMS manual and expect it will not be found out.

Quality Assurance

Quality assurance systems have been around for aviation organizations in the maintenance field since the nineteen seventies and eighties. They have developed into robust systems over the last 46 years. Of course, for historical purposes I must note they were in many manufacturing organizations long before that at least from the late nineteen fifties.

Many of the comments that I applied to SMS fit in here. Make sure your quality assurance manuals really do represent your true system. Your records must show that it is being actively used. Not completing and documenting your regular internal audits is an item frequently found. In addition, not documenting any internal findings, analysing them and following up, frequently cause regulatory findings when the governmental inspectors arrive.

To prevent such things, do your internal audits on time and document all findings and follow-ups. Develop good internal work and performance control forms so that each job has a defined beginning and end, all documented and checked and certified by the person responsible.

Manuals and Forms

Keep your manuals and forms amended and current. Not doing this automatically means there will be findings by the regulatory inspectors. Pitfalls are created by inappropriate forms because the technicians then begin to ignore them or simply write 'n/a' across sections that are not sensible to them or appropriate to the jobs.

This area of activity can generate many findings of non compliance. Mistakes or lack of explanations and signatures on forms show a lack of diligence. This will

quickly raise the inspector's suspicions; "what else will I find"? A case can be made that sloppy paperwork can also lead to sloppy aircraft or component work. Personally, I have seen very poor paperwork and the aircraft is in excellent condition but more often I found the two went together; sloppy administrative work and poor aircraft condition. Good paperwork and good aircraft condition.

The old saying that the job is not done until the paperwork is done is so true. Always remember that if you are ever before a court, tribunal, or inspectors asking questions, only your records will save you. The fact that you have a good reputation or are a good person carries some weight but the legal documentation is what you want. Knowing your records are current and accurate is insurance and by knowing that, you can sleep better. As a regulator I have been involved in courts and tribunals so I know how good it is to have records to back up your testimony.

Records

Record keeping is problem area number one, a good hunting ground for inspectors looking for regulatory and quality system failure problems.

Records in this case are meant to be a "record" of how you complied with your manual and therefore the regulations and standards. Not keeping accurate and complete records indicates that you cannot prove you are in compliance. Records are vital if you are found to be non compliant and wish to dispute the findings. Common record problems found are missing signatures, missing pages, or required records missing from the file. Record packages should tell a complete story from the start of the job or task to its finish. Lack of appropriate signatures are evidence of a hurried approach to reviewing the documents. These may seem like small potatoes when an inspector finds them but a small number of such findings can give the inspector a feeling that you are not paying attention to record keeping. I have seen aircraft that were in pristine condition but the operator was unable to prove it due to poor records. It is not worth the hassle to not keep good records.

Aircraft

Generally, the aircraft inspections are used to validate the effectiveness of your system. I have seen messy and incomplete records in an operator with good aircraft. Rarely have I seen good records and aircraft in rough shape. Don't ask me to explain it, but that has been my observation. I guess the explanation is that some people are very good craftsmen but think the paperwork is not necessary.

Probably one of the biggest issues regarding aircraft is Airworthiness Directive (AD) compliance, closely followed by weight and balance issues. Behind those would be inspection and life limited part overruns and defect logging and rectification.

Normally good planning takes care of some of these items. We used to say that poor planning on your part does not make it an emergency on mine. I have seen many Fridays turned upside down in Transport as operators try to get last minute extensions for weekend flying because of poor planning.

Regulatory inspectors are normally experienced maintenance personnel and therefore know where to look. Aircraft appearance tells you a lot about an operation, as do oil and fuel leaks. Once your interest as an inspector is aroused you can start having panels removed and go deeper into the guts of the aircraft. Checking installed part numbers and working back across the records to original sources can show you any weaknesses in their aircraft inspections and records.

Sometimes I found people trying to hide unapproved modifications, always an interesting subject. It is difficult to hide the illegal heater installation in the cowling, so do the right thing and use approved data and products.

Tools

Technicians generally are proud of their work and their tools. My experience has shown that this area can have problems but not to the extent that other areas such as manuals and records have. I suspect it is because technicians understand the critical importance of tools.

Calibrations out of date are found but not usually in great numbers. Infrequently used electronic test equipment that is occasionally found not to have been calibrated. If the records are generally in poor shape one may find the calibration cannot be traced back to national standards.

Homemade tools not called up in any qualitative document can sometimes be found. The issue then becomes whether the tool is effective and how is it to be calibrated? Examples escape my mind but I have seen this. Usually the maintainers and their managers have the right tools and keep them properly calibrated. Just watch the record keeping and keep calibration stickers neat and readable so your techs do not inadvertently use the item when calibration is overdue.

Stores

Stores can be a problem area simply due to the volume of parts and pieces and the paperwork attached to running the system. Busy techs sometimes just grab the part and plan to tag the unserviceable one later. Later does not happen and the part ends up on the store shelf for the inspector to find. Parts that should be in quarantine are found in regular stores. The locked quarantine area is often unlocked, waiting for trouble.

Batching of the small and numerous items can be found lacking, simply due to workload. Dedicated stores people have to be very detail oriented and committed to ensuring all items are marked appropriately. Stores processes need to be followed absolutely. It is amazing how an inspector can find the one or two parts that are not correctly documented. Forget about leaving a couple of poorly marked parts for the inspector to find so they will quit and leave the rest of stores uninspected — It won't work! Inspectors follow the sampling rules and will adequately sample your stores.

Training

This seems to be a bigger problem on the operational side mainly because pilots need a lot more recurrent training and other special courses than techs do. Generally, once a tech is trained there is update training and repetitive human factors training but not to the same extent as for our pilot friends.

Once the basic system is approved in your manuals it becomes the same due diligence tests as in other areas. Document and record all your training actions on the individual's file using the approved forms. A common area of findings relates to missing due dates for recurrent items and not properly certifying the records.

Keeping details of the course curriculums is a good practice as well, to demonstrate that the tech has covered all required areas. Missing signatures and incomplete forms are frequently found in the records. This arouses suspicions that following the manuals and proper record keeping may be a low priority, and alerts the inspectors to increase the number of records reviewed.

Workload

Although most regulatory bodies do not have detailed standards or regulations relating to workload, inspectors have enough experience to note when a shop is overloaded by work. It is a common practice to work overtime as it is less costly at times because new employees require training and added expense of benefits. Some aircraft manufacturers do provide suggested ratios of technical staff to aircraft and the military has similar plans. However, keep in mind that the manufacturer has a vested interest in showing his product in the best light, and may not be using the same task scope as you (for example, the estimated man hours for a component change may only consider the flight line work, and ignore all the preparation in the workshop). The DOM and other management staff have a duty to monitor workload so that production and quality can be maintained. In recent years much discussion has taken place around technician fatigue due to the increased regulatory system failures, like not doing enough quality control to catch trends in regulated areas, like records. Work orders not completed properly and sometimes evidence of rework being required on components and aircraft. Sickness and fatigue issues may arise and cause personnel problems, if not regulatory ones. Incidents may be increasing in frequency and noticed by your regulatory body through the reporting systems.

Intelligence from inspections and visits may lead the inspectors to believe you have systemic issues which then may result in your program validation, inspection or audit schedule being advanced in comparison to others.

Shops and cleanliness

This is another unregulated section of an organization. When I left the military and commenced working in civil aviation, the lower standard of shop neatness and sometimes cleanliness surprised me. In the military cleanliness was next to Godliness. There is good reason for that — clean weapons do not jam and clean

people do not get sick or infected. Clean hangars and runways do not cause foreign object damage to engines and aircraft.

After I joined Transport Canada as a working level inspector I asked my supervisor why I could not comment on shop cleanliness after inspecting several and finding them messy. He agreed they should be clean, but to whose standard? I did find helicopter repair organizations to be spotlessly clean compared to their fixed wing cousins. Old piston powered aircraft shops were to me, out of control.

I still do not find any real standards in regulations for general housekeeping. I can tell you that a clean shop, office and any other work area can give your inspectors a good feeling about your operation. I did some work in the early days with the automotive sector on how they had come to the conclusion that clean dealerships brought more customers and customer satisfaction. Today most automotive dealers are very well organized and clean. Same idea applies to aviation. Good housekeeping and cleanliness may help prevent damages I noted above and impress customers and regulators as well.

Trying to Fool the Regulator

This rarely works, but I have seen some interesting examples. The most egregious one was when we were auditing a small air carrier and found a note written in pencil in the logbook. It said, 'tell Transport that we weighed the aircraft between midnight and 1 a.m. and erase this before they see the logbooks'. A quick check of tower records showed the aircraft was on the ground for less than an hour. Of course, we took a copy of the logbook page and we won the case. Others try to beat the snag system by writing notes on other paper rather than logbook entries. Usually the notes are forgotten and inspectors find them later. If you remember that the inspectors have also seen such things when they worked in the industry, it is obvious what they will look for. I must stress that deliberately trying to fool the inspectors is rare, and most things that look that way are really just human factors issues

Conclusions

In 43 years of regulatory and consulting work I have only seen one organization that I and two other inspectors could not find one thing to write a finding on. It

was so frustrating as we were sure we were missing something. One of the inspectors was long in the tooth and an excellent AME and inspector. We could not even find a snag on the aircraft inspections.

In the thousands of inspections and audits over my 43 years, findings were frequent. One can soon tell if the quality assurance and quality control systems are working. Whatever your system is, make sure you follow it diligently and if it does not match how your organization works, amend the system rather than be found wanting on inspection.

Do make sure you do your internal quality work; it is much better to face customer audits or regulator audits knowing you're in reasonable shape. If either make findings, use them as learning experience and change as necessary.

Last but not least, be totally honest with inspectors. They know everyone can make mistakes, it is how you deal with them that really matters. Confront the issue, correct the problem, compliment the inspectors and your staff who find the issues and move on.