

SAFETY FIRST!

Using Airline Safety Techniques in GA Operations

by Matthew McDaniel

A hearty eye-roll is often the first reaction when it is suggested that general aviation pilots should apply “airline techniques” to their operations to improve safety. First of all, GA is so multi-faceted that lumping so many types of aviation into such a catch-all term is ridiculous. How can one term encompass both FAR Part 135 charter operations in a Gulfstream and a student pilot soloing a Light Sport Aircraft (LSA) for the first time? Yet, it does! Secondly, many elements of typical airline techniques simply don’t translate into some segments of general aviation. To clarify, for this discussion of airline style safety techniques within GA, we are targeting primarily turbine aircraft operations within standard, non-training, missions. Most King Air operations certainly apply.

The majority of turbine GA pilots adhere to at least some level of SOP (Standard Operating Procedures). Accordingly, within the GA accident rate, turbine operations exhibit a far lower accident and fatality rate than general aviation, as a whole. Yet, even when extracted from other segments of GA, turbine operations still continue to maintain an accident rate far higher than that of airline operations. While closing that gap has remained elusive on a large scale, each and every one of us can contribute to greater safety on a small scale (within our personal and business flying and/or within the operations of our non-airline company). Here are some ideas to consider applying to your King Air operations.

Pre-Flight Planning

Airlines have the luxury (and sometimes requirement) of having dispatchers, load planners, and weather specialists on their payrolls. This takes a fair amount of flight planning burden off the pilot’s backs at the very beginning. While the buck always stops with the pilots, having other professionals checking weather, analyzing routes, and creating a recommended flight plan for you can be a real workload reducer. This does not have to exist only in the form of actual employees though. Today’s

computer technology, programs, apps, and various flight planning service companies can put all manner of pre-flight planning information right at the pilot’s fingertips. Amazing websites (like FlightPlan.com[®]) have gained wide acceptance by turbine pilots. Equally amazing are flight planning apps/software (like ForeFlight[®]) that can be used on various tablet devices, giving pilots the ability to take the information with them in the cockpit and access it whenever the need arises. Apps and software exist to assist in load planning (weight and balance), fuel planning, and performance calculations. Plus, a truly dizzying array of weather websites and apps are available, from the popular Aviation Digital Data Service (ADDs) website (www.aviationweather.gov/adds), to ultra-specialized websites where you can analyze radar plots or various aviation weather charts/services. Using the tried and true FAA/Flight Service-approved information via Lockheed-Martin Flight Services, has become increasingly advanced since Lockheed-Martin’s tenure began (www.lockheedmartin.com/us/products/afss). Finally, there are also a variety of flight planning/services companies that can provide bundled flight planning services nearly on par with that of a scheduled airline’s dispatch team. Such companies do so as a contracted service, available via annual membership fees or on an as needed, fee for service, basis. So, while you or your company may not have the luxury of employing full time helpers, there are many ways to improve both the quality and the ease of your pre-flight planning tasks.

Pre-Flight Inspection

Airline pilots are required to perform pre-flight walk-around inspections before every flight. Sometimes that task falls exclusively upon the first officer, while some airlines have written SOPs designated the Pilot Flying (PF) or Pilot Monitoring (PM) be assigned the task. However it is incorporated into your SOP, and however elementary it may seem, it is always the first brick in the safety foundation of any flight. Yet, in GA, it is often overlooked; especially when the same pilot/crew is flying multi-leg days in the same aircraft with short turn around times, or added time pressures from early-arriving passengers or approaching weather systems. As basic as it may seem, a pre-flight inspection should happen prior to every flight, without exception.

Crew Briefings

Obviously, most airline operations are conducted with a multi-person cockpit crew (two pilots being the most common in today’s airline fleet). While this might not apply to all King Air operations, many King Air operators utilize a two-pilot crew, as well. This may be the case for a variety of reasons, such as insurance or company-policy requirements, Federal Aviation Regulation (FAR), Operating Specifications (OpSpecs), or Management Specifications (MSpecs) requirements for the type of operation being conducted. There’s obviously a safety

enhancement that this requirement provides and sometimes a two-pilot crew is simply required because the PIC has an SIC-Required limitation on their type rating, which could be the case in King Air 300/350 (and 1900 models) if their training and type rating checkrides were conducted using an SIC. Whenever multiple pilots must interact as a team, ensuring they are always on the same page is critical to flight safety. Assuming that is the case, simply because the pilots might be old pals or commonly fly together, is a bad idea!

Airline crews generally do crew briefings several times over the course of a day and within a single flight. The initial briefing is not just an introduction, but a quick review of SOPs that will apply across all phases of ground and flight operations. Typical items would include:

- Statement of safety culture
- Statement of the division of duties
- Review of CRM expectations
- Flight deck communications
- Security issues and concerns
- Aircraft status, to include performance concerns, Minimum Equipment List (MEL) items, maintenance items, or anything out of the ordinary

Prior to engine start, it is common to discuss items more specific to the upcoming flight, such as:

- Weather and turbulence
- Runway/Takeoff performance
- Rejected takeoff criteria
- Flight time and any anticipated delays
- Routing, clearances, and altitudes
- Engine failure procedures specific to the airport, the runway, the expected Standard Instrument Departure (SID) or Obstacle Departure Procedure (ODP), and/or the surrounding terrain, obstructions, and airspace
- Flight and duty time issues (whether they be regulatory, company policy, or personal limitation related)



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In-flight briefings go by several names and typically coincide with a similarly named checklist (Descent, Approach, In-Range, and WIRE Checklists/Briefings are all common in turbine operations). Regardless of name, they are usually conducted prior to the initial descent or (at the latest) prior to beginning the Standard Terminal Arrival (STAR) or other arrival procedure. Typical items to review and discuss include:

- A thorough review/briefing of the arrival procedure, with special emphasis on crossing altitude restrictions, speed restrictions, and navigation system programming
- A thorough review/briefing of the approach procedures, with special emphasis on altitude minimums and courses for each phase of the approach, weather, ceiling and visibility minimums, missed approach procedures, and navigation system requirements and programming
- Runway conditions, landing performance considerations, and airport layout for expected runway exit points and anticipated taxi routings

Alternate Airport and Performance Planning

All U.S. airlines operate not only under applicable FARs, but also under OpSpecs specific to their operations. FAR 135 and FAR 91 Subpart-K operators do this, as well. Such OpSpecs or MSpecs may be (and

Appendix A. Sample OpSpec Paragraph C055, Alternate Airport IFR Weather Minimums: 14 CFR Part 121

a. The certificate holder is authorized to derive alternate airport weather minimums from Table 1 below, according to the limitations and provisions of this operations specification.

Table 1—Alternate Airport IFR Weather Minimums		
Approach Facility Configuration	Ceiling	Visibility
For airports with at least one operational navigational facility providing a straight-in non-precision approach procedure, or Category I precision approach, or, when applicable, a circling maneuver from an IAP.	Add 400 ft to MDA(H) or DA(H), as applicable.	Add 1 statute mile or 1600 m to the landing minimum.
For airports with at least two operational navigational facilities, each providing a straight-in approach procedure to different suitable runways.	Add 200 ft to higher DA(H) or MDA(H) of the two approaches used.	Add ½ sm or 800 m to the higher authorized landing minimum of the two approaches used.
<input type="checkbox"/> One useable authorized Category II ILS IAP. 300 feet and ¼ statute mile (1200 m) or RVR 4000 feet (1200 m).		
<input type="checkbox"/> One useable authorized Category III ILS IAP. 200 feet and ½ statute mile (800 m) or RVR 1800 feet (550 m).		

Figure 1: An example of a typical airline (FAR 121) Alternate Airport OpSpec.

usually are) more restrictive than applicable FARs, but may never be less restrictive. One area covered in great detail in most OpSpecs and MSpecs is that of alternate airport minimums and requirements, to include both takeoff and landing alternates (see Figure 1). Another area covered, is that of performance calculations related to takeoff, climb, and landing. OpSpecs, MSpecs, and even the basics within FAR 135 and FAR 121, require much greater margins be added to basic performance calculations in order to ensure a safer margin for error. King Air pilots operating strictly under FAR 91 must only adhere to the applicable standard FARs. However, the stricter limits and greater redundancy built into airline operations have a direct effect on safety and the positive outcome of flights that do not end at the planned

destination or which are conducted to/from performance critical airports. For this reason, FAR 91 King Air operators should strongly consider creating their own set of OpSpecs, in order to achieve the same levels of safety the airlines have proven to be effective. Many FAR 91 operators have adopted this technique by simply copying the OpSpecs of an FAR 135 or 121 operator who's flying similar equipment and/or missions. Your local FSDO would be an easy starting point for obtaining an example of such OpSpecs which you might use for reference.

Post-Flight Inspection

To be honest, most airline pilots do not perform post-flight inspections. This is because they are, more often than not, handing off the aircraft to a subsequent flight crew or to a ground maintenance crew, who will quickly launch into their own pre-flight or routine maintenance inspections. While it is rare for airline crews to simply park the plane without any sort of handoff, it is common within turbine

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GA operations. In which case, post-flight inspections are important. They allow the crew to discover and handle any problems today that, left unnoticed, might cause a flight delay or cancellation tomorrow. Depending on how many pilots operate the airplane in question, you could be doing yourself or your fellow pilots a big favor by conducting a simple post-flight inspection, and initiating corrective action for any abnormalities found, before calling it a day.

Conclusion

Hopefully, it is obvious, that this is a very basic overview of airline safety techniques which can be easily applied to King Air operations. The depth of more specific information is overwhelming and is not the purpose of this article. Yet, in the end, it is usually the simplest matters which are most often overlooked and become the first link in the accident chain. SOPs are only as good as the pilot's (or crew's) discipline to apply them exactly as their name implies – standard! Any set of rules, guidelines, or procedure that are routinely ignored in the name of convenience or expense are effectively meaningless. In the airlines, there is a great deal of FAA oversight of pilots, mechanics, dispatchers, etc., and both the routine operations and the training/checking events that each are subjected to. Because it

is impractical to impose such levels of oversight on all operators of turbine aircraft, the burden of such oversight rests on the owners and operators themselves. While we may be policing ourselves out there for the most part, that should not relax us. Instead, it should encourage us to be even more vigilant and to seek ideas for safer operations from any avenue that has proven itself to be high-achieving in that regard. **KA**

About the Author: Matthew McDaniel is a Master & Gold Seal CFII, ATP, MEI, AGI & IGI. In 25 years of flying, he has logged nearly 15,000 hours total, over 5,500 hours of instruction-given, and over 2,500 hours in the King Air and BE-1900. As owner of Progressive Aviation Services, LLC, (www.progaviation.com), he has specialized in Technically Advanced Aircraft and Glass Cockpit instruction since 2001. Currently, he also flies the Airbus A-320 series for an international airline and holds six turbine aircraft type-ratings. Matt is one of less than three dozen instructors in the world to have earned the "Master Certified Flight Instructor" designation for six consecutive two-year terms. Mr. McDaniel can be contacted at (414) 339-4990 or matt@progaviation.com.

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