For Widest Dissemination:

I realize I recently sent out a monthly safety tip, but I came across the following safety article. I think it is a good discussion point for all our pilots and their crews concerning the unexpected loss of engine situations, partial or complete. Share with your Units and Safety Officers.

Happy flying!

Larry Mattiello, Lt Col, CAP
NYWG 001
SE Ass't.

917-969-1812 Mobile

Things Go Bump In the Night

By Bo Henriksson

So there you are, flying along, proverbially fat, dumb and happy. Suddenly a cacophony of unusual sounds and vibration, accompanied by a pungent smell that pierces the cockpit, and the windshield is sprayed with oil.
Some emergencies are clear cut like this—others more subtle. Some are caused by outside events such as a mechanical engine failure, others by the pilot running a tank empty.
All phases of flight training at various competence levels involve preparing for expected emergencies. In primary training the concept of a forced landing is introduced at an early stage. Flying a complex aircraft involves, among other things, dealing with landing gear malfunctions. Transitioning to a twin involves more flying on one engine than two.
Mishaps that can occur in an airplane are of course too many to even begin to describe, a fact that have kept writers of books and movie scripts in comfortable circumstances since the dawn of aviation. There are however, similar lessons that can be learned from any type of emergency as well as common practices in how to deal with them.
It has been stated that when a good pilot has ten seconds to deal with a problem, he or she should think about it for nine, and then perform the action required. With few exceptions—where split second action is required—this mind-set is probably correct. Two reasons for not being too quick: You want to give yourself maximum time to analyze the problem. And you want to make sure that your actions will not worsen the situation.

Lost An Engine Lately?

Let's look at the typical engine out scenario as practiced every day in airplanes or simulators.

When would an engine out be most critical? Whether in a single or twin the obvious answer is on initial climb out, at night. Over the average flight this will amount to a few percent of the entire trip. Although the risk of an engine failure at maximum power is probably higher, it is more likely to occur in the other 98 percent of the flight.
Statistically, the pilot will have multiple options on deciding a course of action after the engine failure. Note the keyword—decide.
Except on takeoff, there should be no immediate hurry in the event of a power loss. This is true even in a single, as there are likely several thousand feet of altitude with which to work. Since your speed will be well over Vy / Vyse there is time to maintain altitude while bleeding off speed, followed by a gradual descent—a window of decision of perhaps several minutes.
Every situation is different, but when it comes to piston engines, when they do fail, it is often only partially and/or for trivial reasons. Rather than something catastrophic, like a thrown rod or busted crankshaft, it is a problem with fuel flow or ignition. Both are largely controlled by the pilot. Checklists and POH will provide suggestions for a restart. It is obvious that the conscientious aviator will be intimately familiar with both. A thorough systems knowledge is an absolute must to operate an aircraft professionally. There is, in fact, a chance that power may be restored.
Only then, when the options for a restart have been exhausted, need we decide to actually feather, secure and

proceed from there.

A Personal Experience

On a clear and cold winter day I am on initial climb-out in a well-worn Cessna 402 freighter. Although a great airplane in many ways, the turbocharged engines are somewhat finicky.
At an altitude of a few hundred feet one engine starts coughing and shaking, power is severely reduced. This airplane is not a particularly good climber on one. What is working in my favor are the cold conditions, the low takeoff weight for the short ferry flight and fairly flat terrain. So instead of going directly to feather I decide to try for a restart. Knowing how the mechanics struggle with getting the injection system just right and the cold air, I am thinking this may in fact be a rich cut. Consequently, I slowly bring the mixture back some and after a few seconds of back firing, that temperamental Continental is working as if nothing had happened. The subsequent landing was of course uneventful. Had I immediately secured and feathered the engine, I might have faced a more difficult flight.
I describe this minor incident for two reasons: 1) with a thorough knowledge of your aircraft and its systems you are more likely to make the right decision and 2) minimize the risk associated with a problem.

Proactive Mental Preparation

I was also prepared for an engine failure. On the ground I had mentally reviewed different scenarios and actions that might be needed. In the airlines we call this a takeoff briefing and it is performed out loud before every departure. It minimizes the chances of having a situation of "what do I do now?" Because you, and your co-pilot already know what to do. Understanding your aircraft systems will often save the day but you must also know the outside environment you operate in!
In the days when engines were less reliable, single engine pilots always kept a keen eye open for a suitable field in which to dead-stick, if need be. Conscientious pilots still do. The advent of GPS and moving maps have made a similar tactic possible in IFR flight. Multiplying the aircraft height above ground with an approximate glide ratio (eight-to-one works well for many GA types) will show which airports are within gliding range.
Pilots occasionally tune in the ATIS/ASOS transmissions of nearby airports enroute to verify the weather should the need for a quick diversion arise. Technology is replacing this action with airborne weather data through XM or ADS-B.
Weather may be the most challenging of environmental factors but there are others: What type of airspace are you in? What kind of services can ATC provide in case of a problem? Remember that some parts of the country lack radar coverage at the altitudes used by a normally aspirated piston airplane, leaving ATC essentially blind. What is the minimum safe altitude should the need for an unplanned descent arise?

Planning ahead for foreseeable problems is the hallmark of a professional aviator, whether flying is your vocation or avocation. So is a thorough knowledge of aircraft systems and the environment in which we operate. This is largely why airline safety is several magnitudes better than general aviation.
Bo Henriksson is a Captain with a major carrier and has more than 10,000 flight hours.

Larry Mattiello
Matt Aviation Properties, Inc.
PalMatt Aviation Safety & Risk Management, LLC.
Sky Acres Airport
79 Styles Way
LaGrangeville, NY 12540