Aviation Decision Making

How to save gyro pilot lives - stop Pilot Error

by Greg Gremminger

Let's face facts! There are too many needless fatal accidents in gyros! It is time for all of us to do something about it – for our own safe gyro flying and for that of our friends. It has been just too easy to blame a certain type of gyro, or a deficiency in training or a lack of training! These are certainly major contributors to many or most fatal accidents, but it has also been just too easy to blame these fatalities on "Pilot Error" – with the concession that we just can't do anything about making bad decisions. It is too easy to just say we "can't fix stupid!"

We might not be able to "fix stupid," but we can do a lot about reducing bad decisions. "Pilot error" is often a catch-all phrase that implies an inherent human deficiency that can't be corrected. Not true! Pilots are human, and can learn, we can plan and we can all make better decisions. With proper training, improved knowledge, and a few tools to overcome some human weaknesses, and by learning from past mistakes, we can make better decisions and we can help other pilots make better decisions.

If you have studied for a Pilot's rating in recent years, you have been exposed to "Aviation Decision Making" (ADM). The FAA has been placing great emphasis on providing the knowledge and tools to help people make better decisions, recognize and avoid risks, and understand our human traits that can create hazardous attitudes that lead to mistakes and accidents.

Listen up - this is an even MUCH MORE IMPORTANT ISSUE FOR GYRO PILOTS. More so than most other types of aircraft, and due to the many unique issues and attractions of gyros, gyros can easily create and invite hazardous attitudes, situations and misleading perceptions. Here are some specific reasons why gyros can readily inspire poor decisions:

Reasons why gyros can readily inspire poor decisions:

- Gyros attract crowds, cameras and compelling distractions - crowds and cameras influence impulsive decisions and bravado.
- Gyros attract the more adventurous and independent people – the more Macho types!
- Gyro people are somehow by nature a bit of a rebellious, CAN DO-it-myself lot!
- Gyro people tend to dismiss authority and rules – sorry, but many of us do, that's a major attraction of gyros!
- Gyros appear to perform miraculously impressive maneuvers (deceptively so in the hands of an experienced pilot!).
- Gyros appear to fly with such ease and safety (deceptively so in the hands of an experienced pilot!).
- Gyros may require significant proficiency development – practice, not just training.
- Gyros may have deceptive safety envelopes, the limits of which are often poorly understood, appreciated, or respected.
- Gyro handling characteristics and pilot proficiency requirements can vary dramatically with various gyro configurations.
- Gyro handling characteristics and pilot proficiency requirements can vary widely with the conditions of flight – high airspeed, turbulence, high power, loading, etc.
- Gyro pilots too often do not readily recognize or respect the limits of their own personal safety proficiency envelope.
- Airplane flight principles do not always apply to gyros and can be dangerously misleading.
- Pilots rated in airplanes tend to dismiss training and proficiency requirements for gyros.
- The old gyro culture promotes "train yourself," fly anywhere, cheap flying dreams and attitudes.
- The old gyro culture promotes the ability of gyros to fly in turbulent winds – not safe for many older, traditional gyro configurations.
- Experienced and often respected gyro pilots, because flying their gyro comes easy to them, sometimes don't fully appreciate or promote the training and proficiency requirements of less experienced pilots – too often we hear dismissal of concerns and issues related to gyro configurations and the necessary proficiency development to fly such gyros.
- Experienced and often respected gyro pilots too often influence less experienced pilots to dismiss or confuse important technical and configuration and control characteristics issues essential to safe flight in gyros by those less experienced pilots.
- "Gyro pilots" often tend to lump all gyros into just one category of skills required. The fact is gyros, more-so than even airplanes, have a wide range of control and stability characteristics and the particular skills required to fly them – different gyros often require different types and levels of proficiency.

These issues, not only can influence poor decisions, but they are often a major attraction to the world of gyros.

ADM is an element of ground training that has been promoted and required by the FAA for only five or six years now. The concept is similar to safety programs developed in heavy industries to improve safety awareness and was derived from successful Crew Management Programs of the airlines. The premise is that through knowledge of the issues and potential hazards and forming habits of making plans, identifying risks and forming options, individuals can avoid surprises that lead to accidents. The program presents human traits and deficiencies that are commonly involved in making poor decisions and how to recognize the associated "**Red Flags**."

To study the full aspects of ADM, I strongly recommend that you obtain a copy of the FAA's Advisory Circular on Aviation Decision Making (AC-60-22)

Available on the WEB at the FAA Advisory Circular search page: http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf

Also, a very good presentation of ADM is included in the FAA's *Rotorcraft Flying Handbook* (FAA-H-8083-21) available through the PRA office or most aviation materials suppliers. (The *Rotorcraft Flying Handbook* is a "must-own" for anyone flying gyros anyway.)

Below I would like to discuss several ADM concepts and techniques that may be especially helpful to gyro pilots and students.

PLANNING

A basic tenant of ADM is to always make and have a plan. The plan may be an entire flight plan for a X-country trip, or it may be a simple plan to visit the hangar to check something out. But, always have a plan at least in mind. A plan consists of a mission, of a consideration of what's involved, of what any risks might be. A plan considers the **ENVIRONMENT** (wind, terrain, potential weather or darkness, etc.), the **PILOT** (proficiency, experience, fatigue, concentration, etc.), the **AIRCRAFT** (airworthiness, fuel, performance, controllability, etc.), and the **MISSION** (course, purpose, urgency, etc.). The plan should especially evaluate any **Risk Factors** associated with these elements of the plan. The plan explores "what ifs" and options and alternative plans of action. The plan sets specific milestones or waypoints to be used as decision points - to proceed with the original plan, or revert to an alternate option, or re-evaluate the plan and modify it.

The plan should be prepared when there is adequate time to prepare and thoroughly think through the plan. The plan does not have to be put in writing, but it can be helpful to write down the major goal or purpose of the plan and any major milestones – if only so they stick in your head. A major purpose of a plan is to provide "**Red Flag**" decision points. At any waypoint or milestone, there is a planned or expected result (over the red barn by 2:30, or 1000 ft before I get to the river). If any milestone is not met, that should activate a "**Red Flag**" in your mind - the plan isn't going the way it is supposed to – time to re-evaluate: Do I need to stop for fuel sooner, are the winds stronger than expected, should I continue this flight?

At any point, where a planned happening does not happen, or an unexpected occurrence happens, this "**Red Flag**" should cause you to re-evaluate the plan from that point, re-evaluate the options from that point, and decide which course of action to pursue. When more than one unexpected issue arises, the re-evaluation should more strongly consider a major change to plans – such as landing or turning back. With good planning, the human being can do a pretty good job of thinking through one surprise issue and still continue to properly attend to the primary task – flying the aircraft! But, when a second or third issue or concern arises, it will be less likely that the human pilot can properly address all the issues and still maintain proper attention to the primary activity. This is when it is time to reduce the risks and take some drastic action – land or return to base or stop for the night – cut the risks! It is no fun flying along with things worrying you and especially when they distract you from your main task.

This example of a plan and the "**Red Flags**" is easily envisioned when we are talking about a flight plan. But, such plans, maybe less involved plans, should be made for everything you do with aviation. If the plan is to show your gyro in the hangar to a friend, then that is your plan. The plan is not to fly the gyro on that windy day – don't deviate from your plan unless you have thoroughly thought through a new plan – taking into account the issues of that new mission and any new risk elements that may now be a part of the new plan! When I go to the airport, a first element of my plan is to check the windsock when I drive onto the airport. Then, while still driving to the hangar, check other elements of the environment – airport activity, field and crop conditions, distractions or crowds of people. That's my plan – if, for some reason, I find I had not able to paid attention to those items of my plan, a "**Red Flag**" goes up to remind me to re-evaluate the plan – the mission, the environment, what is distracting me, etc. Make a habit of making "**Red Flag**" milestones for everything you do in aviation.

HAZARDOUS ATTITUDES

As suggested above, gyro pilots may be more susceptible to hazardous attitudes that might lead to bad or impulsive decisions. We all should objectively assess our own characters and recognize the situations where these hazardous attitudes occur in our own personalities. If you are male, and especially if you are Type A personality – pilots usually are - don't deceive yourself that you don't have any of these characteristics – you DO! If you are female, such self-introspection might come easier to you, but check it anyway! As a second check, ask a good friend if you personally might fall prey to any of these hazardous attitudes – your friend or family may be more forthcoming than even yourself, especially if that friend understands it could be a matter of life or death to their friend or loved one!

The FAA ADM program lists five major hazardous attitudes and the antidotes to these:

1. **Anti-Authority** (don't tell me what to do!).
   This may be a significant attitude of many gyro personalities who dismiss the importance of training, that dismiss valid aerodynamic and physical principles and concerns when venturing into doubtfully safe flight conditions.
   - **Antidote:** Recognize this Red Flag! Follow the rules! Maybe they have a reason!

2. **Impulsivity** (quick and rash decisions):
   Certainly this attitude contributes to too many fatal accidents – the impulsive decision to fly over a long expanse of bad terrain – it will be quicker! An impulsive decision to fly low and closer to someone waving – and hit hidden wires! The impulsive decision to push the envelope because I've got an audience that I want to show off for.
   - **Antidote:** Recognize this Red Flag! Not so fast, think first! Make a plan.

3. **Macho** (I'm good, I can do it, and I'll look good!):
   This attitude is probably also rampant among gyro fliers! I'm better than the other guy. And, besides I can impress people!
   - **Antidote:** Recognize this Red Flag! Taking chances is foolish! Accidents don't impress anyone! Making good decisions is impressive!

4. **Invulnerability** (it won't happen to me!):
   Another probably common trait among the self-sufficient gyro personality. Look around, some pretty bad things have happened to people who are even better than me!
   - **Antidote:** Recognize this Red Flag! I'm not special; it CAN happen to me too!

5. **Resignation** (what's the use):
   My time will come when it is supposed to – I can't stop that! If something happens, it's a matter of fate – I can't change that! This may not apply so much to us more macho types, but ladies, don't ever stop trying to remedy a "**Red Flag**" situation.
   - **Antidote:** Recognize this Red Flag! Don't give up. I'm not helpless. I can make a difference.

I'd like to add a couple of other hazardous persuasions that might apply more specifically to gyro people:

6. **Confused** (Who's right? Since I don't know, I won't worry about it!):
   There is far too much controversy and confusing debate over the root causes of fatal accidents. Those new to the sport are confused by all the different opinions from seemingly experienced and responsible people. Too often we hear people say they can't tell who is right and who is wrong, so "I won't worry about it!"
   - **Antidote:** Recognize this Red Flag! Worry about it! Ask more questions, read more technical articles and discussions. Review and learn from accidents. Check your conclusions with more people. Don't dismiss any expressed concerns without thorough investigation to your knowledgeable satisfaction. Review the evidence and the accident reports. Take everything you hear or read with a grain of salt – don't let anyone make your decisions for you! Listen a bit more to those who say "worry," and a bit less to those who say "don't worry"!

7. **Get there itis** (got to get there!):
   This is a common pilot persuasion that leads to poor decisions to continue or proceed with a flight or activity. Getting there in time should never be part of any aviation decision. "get there itis" leads directly to higher airspeeds in perhaps deteriorating conditions.
   - **Antidote:** Recognize this Red Flag! Decide between whether it is important to get there now, or important to get there EVER! That should be a clear choice!

8. **Peer Pressure** (allowing someone else to make my decisions for me):
   Who has the proper tools to make this life or death decision? Who do you want to make this important decision for you? It shouldn't be someone else who doesn't have the tools or the investment.
   - **Antidote:** Recognize this Red Flag! Get yourself and your mind away from that pressure, and make the proper decision yourself.

The recognition or mere hint of any of these attitudes or persuasions in yourself should be a definite "**Red Flag**" in your brain - to stop and reevaluate – to apply the antidote and make a new, well thought out plan and decision.
If you recognize any of these hazardous attitudes, or even the hint of any of these hazardous attitudes in a friend or family member, the best favor you could ever do for them is to help them understand their possible susceptibility to that hazard. This is not a time to feed their macho or over-confidence. This is the time to perhaps say "I Love You" and I care about your safety. If a friend brings any concern to your attention, say "Thank you," and take time to consider their advice thoroughly. They care for your safety and they didn't approach a perhaps difficult topic lightly.

KNOWLEDGE

You can't make good decisions without a good understanding of the knowledge issues involved. What are the issues and limiting factors in the aircraft's safe flight envelope, and why? Try to understand or find someone to thoroughly explain the full issues of PIO, Bunt-Over, Precession Stalls, Horizontal Stabilizers, etc. Don't just dismiss these issues as just for the technical types. You can't make good decisions about some very basic things unless you understand the issues of what, why and when!

Ultralight Training:

We all appreciate the ability in our country to fly under the ultralight rules. This is a great thing. You don't really even need to take a written, oral or flight test – a great freedom! But that doesn't mean we still don't need to take the time to learn all the basic principles and issues with flying gyros – written resources, ground school and face-to-face ground instruction. This includes a thorough understanding and application of Aviation Decision Making tools and principles. Just because we don't like rules or regulations or limitations, doesn't mean they aren't important – to your own safety – and important to your friends and loved ones. You owe that to yourself and to them. They are proud of you, and they want you to succeed in your ambitions. A way you can best assure their pride and your success is to take the time to learn everything you need to know to make good decisions. Take ground instruction seriously. Recognize that **you probably don't even know what you don't know**! Take the time necessary to get all the exposure to gyro issues you can - so you at least know more of the questions to ask.

Transition Training:

Already rated pilots who are transitioning to gyros also need exposure to the special issues with gyro flight. These not only include mastering the different flight characteristics and capabilities, but they include a thorough understanding and appreciation of the stability and control and wind and speed issues with gyros. They also include an understanding of the particular misleading airplane analogies that don't apply to gyros – and why! They include the often unappreciated skills development to fly at or near the limits of the safe flight envelope for that particular gyro – and why! They also include a thorough appreciation and understanding of the differences in control characteristics and why and when those might occur.

"Pre-rated" pilots also may have not even been introduced to the tools and principles of ADM. ADM has only been a part of the FAA curriculum for 5 or 6 years. And, just because a rated pilot had studied ADM for an earlier rating, doesn't mean they understand the particular hazards and knowledge issues associated with this different form of flight. At least a refresher is in order. ADM should be taken seriously, especially as it appears it could have prevented most gyro fatal accidents.

Instructors:

Instructors, we should be requiring and spending quality time with our students making sure they have mastered the tools and principles of ADM, and that they have developed habits to apply them. This applies to ultralight students, transition students, as well as to those studying for a gyro rating. Our

students should be able to make good decisions. To do that, they also need good ground training on all the technical and safety issues related to gyros. There is no reason we should not be assuring that any student has the knowledge and tools to at least pass the FAA written test on ADM. To make good decisions in their sport gyro pursuits, they need a thorough grounding on all gyro safety issues – the foundation on which good decisions are made. Instructors should place restrictions on solo flights consistent with that student's proficiency and knowledge of the issues. When limitations are placed on a student's flight conditions, the student should thoroughly understand why that limitation is important. These are not subjects that can be properly covered in an hour or two of hangar talk.

PROFICIENCY

The individual pilot's understanding of his/her own proficiency to fly that particular gyro, to fly that particular gyro in these particular conditions, is vital to that pilot making a good decision to do so. In so many fatal accidents, it appears to be just this mis-understanding or poor assessment of their own proficiency level that has contributed to the bad decision that ended in that pilot's demise!

A full appreciation of one's own capabilities and proficiency level is fundamental to making a good decision to fly in that gyro, in that situation. Very often that full appreciation is faulty – or why did that pilot make a decision to fly in that gyro in that situation where his/her skills were obviously deficient.

Why is this so? I believe this is so because of a common lack of appreciation that almost every different configuration of gyro flies differently – requires different skills and different skill levels. Even the same gyro can fly differently in different corners of its flight envelope – speed, power loading! More so than in most other types of aircraft, this is the case in gyros. But, from mis-applied airplane analogies, from limited performance capabilities of past or more basic gyros, and from observations of other experienced pilots, often the misleading impression is that, because I'm comfortable with my gyro in these (moderate) conditions, there's no reason I can't push the envelope or fly a different gyro OK. That's just wrong. In the same way a pilot who has only flown a light Cessna would not even consider getting into a Pitts Special alone, the gyro pilot should not assume their skills are adequate for all other gyros or even for pushing the flight envelope in the one gyro they might feel familiar with.

Different gyros fly differently:

The reasons why different gyros can fly much differently from other gyros, requiring much different skills and proficiency levels, are very technical. But, just looking at all the various gyro configurations, certainly you can assume they must have much different handling characteristics. They have different response rates, they have different dampening factors, and they have different inertial airframe and rotor responses. Also, realize that our gyros are not certificated; they do not have to pass any standard flight characteristics or control handling flight standards – as certified aircraft do. The FAA classifies certified aircraft according to some common and required control characteristics – Normal, Utility or Aerobatic categories. The FAA does this so that a pilot, most any pilot, can get into another airplane of that category and expect to have the proficiency skills to safely fly that other airplane. There is no such guaranteed consistency in our very experimental gyros. Our gyros, so far, do not have even agreed-upon standard criteria to define some common set of flight handling and control characteristics. Without getting too technical, suffice it to say many gyros fly differently from other gyros, and the skills to fly one type may not apply to another type of gyro without significant additional proficiency development. It is important for making good decisions to thoroughly appreciate this and why this is so.

Some gyros fly differently at high speeds:

Perhaps even more insidious is the fact that the same gyro can have dramatically different control and handling characteristics AND proficiency requirements just by flying faster, or with more power. The reason for this is also very technical, but it has a lot to do with the gyro not being a fixed-wing aircraft. The analogy that an airplane flies pretty much the same at 100 mph as it does at 70 mph is misleading. Because a gyro is not a fixed-wing aircraft, the flight proficiency required to fly that gyro at 70 can be very different from the well-practiced skills required at 55 mph. Dramatic changes can occur in the stabilizing properties and response rates to pilot and wind transients. These different characteristics can be so dramatic as to be the difference between safe flight at 55 mph and a fatality at 70 mph. It is important for making good decisions to thoroughly appreciate this - and also why. Many a gyro pilot, comfortable with flying at a certain speed in familiar conditions, has met their Maker at just a few mph higher airspeed in that same familiar gyro! It is important that we all understand and appreciate what gyro configurations and conditions can lead to such dramatic proficiency shortfalls and accidents.

Gyros behave differently in wind:

Another too often over-looked proficiency issue is flying in wind turbulence. Gyros have a very dramatic range of control and response characteristics in turbulent winds. Some

gyro configurations are simply unsafe in turbulent winds of any significance – pilot proficiency in that particular gyro is critically important. Some gyro configurations can handle winds with little pilot concern or intervention. The reason for this is also very technical. Airplanes can have a wide spread of degrees of self-correction and stabilization to transient disturbances. But gyros, because of some very important physical attributes that too many people dispute or don't understand, can be several times even more diverse in these safety/stability characteristics. Some gyro configurations can be much safer, more insensitive and more self-correcting to very turbulent conditions than any other comparable aircraft type. But, some gyro design configurations can be treacherously much worse, requiring skill levels that even many experienced gyro pilots do not have. To make a good decision on perhaps flying in windy conditions, it is imperative that the pilot recognize, understand and fully appreciate the wind turbulence characteristics of their gyro and of their pilot proficiency abilities to handle that wind. If you are not sure of either your machine's or your personal capabilities, if any doubting thoughts arise, that should be an obvious "**Red Flag**" to consider that decision very, very closely – preferable a decision not to test your skills.

What are my safe flight safety envelope limits? How do I recognize them? A good suggestion on how to make a good decision on these issues is to ask yourself the following "**Red Flag**" questions:

- Am I an experienced pilot? – This means more than just a couple hundred hours flying in moderate conditions only.
- Are the conditions beyond what I have significant experience flying in?
- Are the characteristics and capabilities of my gyro questionable under these conditions? If there is controversy on the subject or on that gyro configuration, the characteristics and capabilities ARE "questionable"!
- Have others cautioned me against flying in these conditions?
- Do I understand why my flight in these conditions is questioned or questionable? If I don't understand why, I probably don't have the knowledge elements necessary to make a good decision on this issue.

All of the above questions should be "**Red Flags**" that in most situations should result in a decision not to fly in those conditions. For these issues, good planning has no "what if" options to plan for. The nature of PIO and other pitch/stability issues is that it is already too late when you discover your plan isn't working!

CULTURE

Gyro Patriarchs:

Those of us to whom others look to for advice and confidence have a special obligation. We must help others of less experience to appropriately appreciate the safety issues they are facing. If we are preserving an antiquated culture that, either consciously or inadvertently, dismisses the real challenges for neophytes, we should take steps to correct that culture. The ease with which we fly our gyros, the maneuvers we "WOW" the crowd with, may leave unduly dangerous images and perceptions on which others might base poor decisions. If we present flying examples that tempt emulation by the lesser informed and skilled, we must take the extra steps to ensure those same people recognize that these performances are not safely emulated by the less experienced. And, if we might be somehow influencing or endorsing neophytes to dismiss safety issues or good practices or requirements, we have the duty to change our ways. The continuation of deaths and grief in our sport is testimony to people who were somehow influenced to ignore, or were deprived of, the knowledge and cautions to make good decisions that may have prevented their demise. Just because we personally might have survived our own neophyte days without meeting our Maker, that is no reason that the people who look to us for example and guidance should be influenced to take more risks than are necessary. The patriarchs in our sport have this special obligation to look after and help those whom we have influenced to join this sport.

SELF-EXAM

It is essential to recognize any predispositions we might have to fall prey to any of the cultural or attitude influences that might affect our decisions. Sometimes it is difficult to appreciate or even to accept that we might have any of these predispositions.

That's why we should take advantage of a resource we all have – our family, our spouses, our friends. Ask these people closest to you to read the above and to give you some very personal feedback on which pitfalls above might apply to you. Your family and friends do care about you, and your predisposition to any pitfalls might be much more apparent to them. Especially ask them if you might display any attitudes which might someday hinder your ability to make good decisions. Let them know they will be doing you a big favor to be honest and revealing to you.

As another tool to help in your own self-examination, take the following test yourself:

1. Am I often impulsive and make decisions on the spur of the moment?
2. Do I like to "please" the crowds? Do I like to impress crowds?
3. When I fly past a crowd, which direction am I looking – my flight path or towards the crowd?
4. Do I make a habit of forming a plan for the intense things I do, especially flying?
5. Review the list of hazardous attitudes above. Which ones do I think MIGHT apply to me
6. For any hazardous attitudes that might apply to me, in hind-sight, list a number of instances you can think of where my decision making process was possibly flawed. Why?
7. For any hazardous attitudes that might apply to me, list some antidotes that should work for me.
8. Do I understand cautions that some people might have passed on to me about my flying?
9. Do I thoroughly understand any technical safety issues that my gyro might have? Am I aware of any cautions, controversial or not, about my particular gyro that I am dismissing?
10. What is my personal proficiency safe flight envelope? – airspeeds, winds, wind gusts?
11. What is the safe flight envelope of my particular gyro? – airspeeds, winds, wind gusts?
12. What should be my "never exceed" flight envelope? – airspeeds, winds, wind gusts?
13. List some "**Red Flags**" that should be apparent to me when I am subject to any of the hazardous attitudes I might at times have.
14. Is this self-assessment consistent with what my family and friends have honestly told me?

This is a "new age" test – no scores, no failures, no curve, no posted results - just honest self-examination! Ask yourself "How good are my decision making skills?"

Have a safe day – Greg Gremminger