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COVER STORY:

Practical Risk Management in Flight Training

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FEATURES

DEPARTMENTS

FRONT COVER: Seldom do you find such a good-looking seaplane at a flight school. This Twin Bee, *hull number 23, was photographed at Jack Brown's Seaplane Base in Winter Haven, Florida. (H. Dean Chamberlain photo)*

BACK COVER: The Super King Air *B200 in flight. (photo courtesy of the manufacturer)*

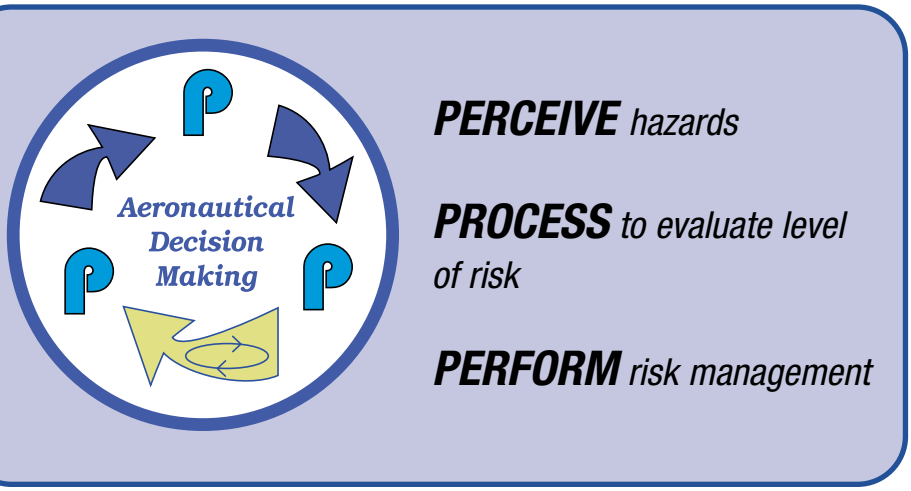
Practical Risk Management in Flight Training

by Susan Parson

There is a lot of talk these days about the need to incorporate risk management concepts and principles into flight training. Most flight instructors would agree that we should minimize the risk inherent in flying. But what does "safety" really mean? What exactly is "risk management?" How can a flight instructor not only ensure the safety of flight training, but also train clients in all stages of training to manage risk after they leave the relatively protected flight training environment?

As an active part-time flight instructor, a Civil Air Patrol instructor and check pilot, and (since May 2004) a full-time employee of the FAA's General Aviation and Commercial Division (AFS-800 in "FAA-speak"), I have been thinking a lot about these issues lately. One of the results of the ongoing process of thinking, talking, and testing practical risk management training materials is Volume 2 of the FAA's three new Flight Instructor Refresher Course developer's guide modules (available on the FAA web site at <http://faa.gov/avr/afs/fits/training.cfm > and also accessible through the Online Resources section at <http://www.faasafety.gov>). Volume 2 focuses on introducing the concepts of system safety and risk management as they appear in the formal literature on these topics.

More importantly, however, this document—which was developed by active flight instructors—seeks to offer a few practical tools for teaching your flight training clients to think, and practice, effective risk management in the real world. These tools start with the Perceive—Process—Perform model developed by the FAA's Aviation Safety Program.



I like to think of this 3P model as a mental equivalent to the physical flow pattern and scan techniques we teach for checking airplane configuration and instruments. In fact, the components of 3P model match up very well to the cross-check (perceive), interpretation (process), and control (perform) elements of the standard instrument scan. Just as in the case of an instrument scan, however, the 3P technique itself is pointless unless you know what to look for, how to interpret what you see, and how to apply that information to controlling the risk inherent in operating several thousand feet above Mother Earth.

Here's how the elements of the 3P scan are intended to work together:

- As you **perceive** (cross-check), the goal is to identify hazards, which are events, objects, or circumstances that could contribute to an undesired event. For example, a large nick in the propeller is a hazard.

- As you **process** (interpret), the goal is to determine whether the hazards you have identified constitute risk, which is the future impact of a hazard that is not controlled or eliminated. The degree of risk posed by a given hazard can be measured in terms of exposure (number of people or resources affected), severity (extent of possible loss), and probability (the likelihood that a hazard will cause a loss). For example, the hazard described above— a nick in the propeller—poses a risk only if the airplane is flown. If the airplane stays on the ground, there is no risk. If, however, the damaged prop is exposed to normal engine operation, there is a high risk that it could fracture and cause catastrophic damage not only to the airplane and its occupants, but also to people and property on the ground.

For those who like charts, the graphic on the next page provides a visual illustration of how measures of probability and severity come together to create different levels of risk.

RISK ASSESSMENT MATRIX				
	Severity			
Likelihood	Catastrophic	Critical	Marginal	Negligible
Frequent	HIGH			
Probable				
Occasional		SERIOUS	MEDIUM	LOW
Remote				
Improbable				

- In order to **perform** (control) by mitigating the risk identified in the perceive and process stages, you need to determine what you can do to maximize safety (i.e., freedom from those conditions (hazards) that can cause death, injury, or illness; or damage to equipment, property, or the environment). Since flight training is not possible without some level of risk, you also need to decide what constitutes an "acceptable" level of risk. In this connection, it is helpful to use the four basic rules of risk management:

1. *Accept no unnecessary risk.*
Unnecessary risk comes without a corresponding benefit. With a brand-new instrument student, for example, the risk of training in instrument meteorological conditions (IMC) may outweigh any benefit from the experience.

2. *Make risk decisions at the appropriate level.*
Risk decisions should be made by the person who can do something to reduce or eliminate the risk. Although you, as the instructor, retain final responsibility for the safety of the flight, remember that you are training clients to act as pilot-in-command. Asking them to identify hazards, assess risk, and suggest ways to mitigate the risk will instill good habits and help them develop judgment. Their answers to these questions will also give you valuable insights on the extent of the student's aeronautical decision-making skills.

3. *Accept risk when benefits outweigh costs (i.e., dangers).*
With an advanced instrument student, the benefits of training in IMC may outweigh the potential dangers, so long as there has been a careful risk assessment and implementation of appropriate risk controls.

4. *Integrate risk management into planning at all levels.*
Because risk is an unavoidable part of flying, safety requires the use of appropriate and effective risk management before every flight. As flight instructors, therefore, we need to help our clients develop the risk management skills they need to handle challenges that are not addressed by the rules or (more likely) beyond their experience.

Practical Risk Management Tools

So how can you incorporate the 3P risk management model into your training practices, and how can you help your clients develop the habit of a continuous risk management "scan?" There are many ways to approach this question, but here are two methods you might try out in both your flight training work and your own personal flying.

Ask Questions

At the quickest and most fundamental level, using the 3P method of practical risk management can be as simple as requiring your students to ask and answer a few basic questions before every flight. For example:

- To **perceive**, try to make a mental list of the hazards that can hurt you or others.
- To **process**, consider how likely it is that a given hazard will hurt you, and how bad the injury or damage would be.
- In order to **perform** risk management, ask yourself what you can do to reduce or eliminate each hazard or risk you have identified, and then implement the measures you have selected.

Use Checklists

For those (like me) who need or want a more structured approach to using the 3P model, here are three simple checklists that can be associated with each of the three components:

- To help students perceive

(cross-check) the hazards in all critical areas associated with a flight, you can encourage use of the PAVE checklist (available online at<http://www.faa.gov/avr/afs/FITS/pub_practices.cfm>) to identify hazards as well as establish personal minimums.

- To help students process (interpret) the possible impact and likelihood of each hazard identified through the PAVE checklist and begin to think about risk controls, you can suggest use of the CARE checklist:

- To help students perform (control) risk management, you can point to the TEAM checklist as a way of recalling the four major options for risk management and control:

- Putting it all together creates a continuous process much like the cross-check, interpretation, and control steps of the familiar instrument scan. See the illustration on page 4 for how it works:

Pilot	experience, recency, currency, physical/emotional condition
Aircraft	fuel reserves, experience in type, aircraft performance, aircraft equipment (e.g., avionics)
en***V***ironment	airport conditions, weather (VFR & IFR requirements), runways, lighting, terrain
External pressures	allowance for delays and diversions

Consequences	Think through the possible outcomes (consequences) posed by each of the hazards identified in the first phase, and determine (or "guess-timate") the level of risk involved
Alternatives	Develop a mental list of alternative courses of action
Reality	Acknowledge reality and avoid wishful thinking that might lead to poor decisions
External pressures	Be mindful of external pressures, especially tendencies toward "get-home-itis."

Transfer	Should this risk decision be transferred to someone else (e.g., should you consult an A&P mechanic?)
Eliminate	Is there a way to eliminate the hazard?
Accept	Do the benefits of accepting risk outweigh the dangers?
Mitigate	What can you do to mitigate the risk?

Real-World Risk Management

That's all great in theory, you say, but I fly and teach in the real world! Who has time for all this risk management rigmarole? In fact, using the 3P risk management cycle need not be a time-consuming chore. With practice and consistent use, running through the 3P cycle can become a habit that is as smooth, efficient, and automatic as a well-honed instrument scan. One way to implement these ideas is to include a 3P risk management discussion as a standard feature of your preflight briefing with the student or client. For example:

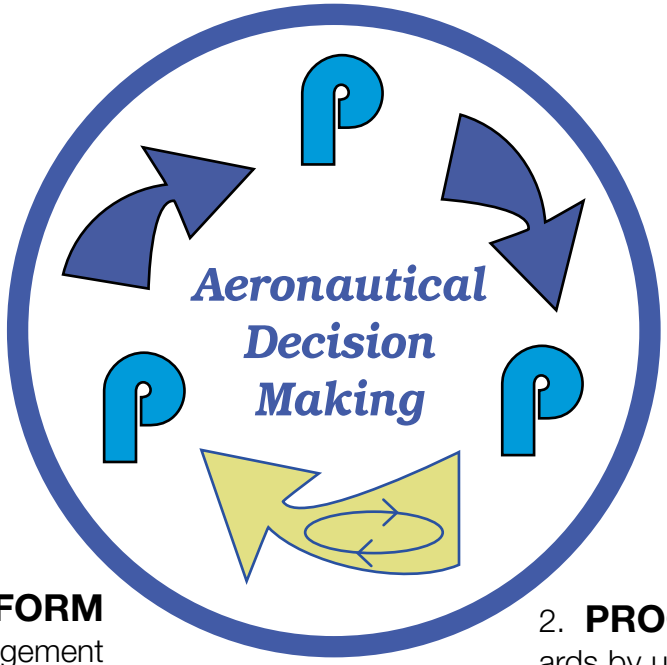
Perceive: Preflighting the *Pilot* should be the first step. Both you and your student should be healthy, well-rested, and alert. The next step is preflighting the *Aircraft*. Before you send your student out to the plane, though, help him or her think of the preflight process in terms of hazard identification (e.g., what could hurt me or people on the ground if I take off with less than the minimum quantity of oil?) A good weather briefing is part of identifying hazards related to the flight *enVironment*, and so is preflight planning for information on runway lengths, frequencies, and other factors. Last, but not least, teach your student to list any *External pressures* that might create a hazard. For example, is the client trying to fit a flight lesson into a busy day, with "can't miss" appointments scheduled after the lesson?

Process: To assess the level of

risk you face on a given flight, talk through the *Consequences* of each hazard you just identified. In the case of the pilot, for example, what should you do if your student or client rushes in looking harried, exhausted, and stressed out? If you charge ahead without first giving the person time to calm down, he/she will learn little from the aeronautical lesson, but may well learn the wrong lesson about risk management. As an *Alternative*, consider making it a ground training day, or use the simulator if it is appropriate to the student's stage of learning. Simulator sessions—even if only a "flight" on Microsoft® FlightSimulator—can teach students a lot about the impact (so to speak) of stress and fatigue on basic airplane control and aeronautical decision-making. Ensure that your students and clients acknowledge the *Reality* of each situation and hazard. One of my instructor friends reminds her students that any statement requiring use of the word "probably" needs another reality check. Finally, the number of accidents resulting from a "get there" mentality requires that you assess the potential influence of *External pressures*. For example, will tight scheduling of the aircraft induce you or your student to rush through the preflight and engine runup? A (young) student of mine once requested another instructor because I refused to do just that on his first lesson. I can only hope he remembers something from the fact that I actually practiced what I was preaching about priorities.

Perform: Let's assume that your primary student heads out to do some solo work in the local practice area. Shortly after takeoff, he/she discovers that the C-152's attitude indicator has tumbled, even though the vacuum pressure is well within normal limits. The weather is good and he/she knows that the altitude indicator is not required for day VFR flight. However, the student has not previously encountered such a problem, and recognizes the malfunction as a hazard that could lead to the risk of distraction or disorientation. The student's uncertainty also creates a degree of stress, which also raises the level of risk associated with this flight. What are the options for performing risk management? Since the CFI is legally the PIC for this flight, the student could seek to *Transfer* the decision by making a radio call for instructions. The second option is to *Eliminate* the risk inherent in continuing the flight by returning to the airport. Knowing that the attitude indicator is

1. **PERCEIVE** hazards using the **PAVE** checklist (Pilot, Aircraft, enVironment, External factors) What conditions might create risk?



2. **PROCESS** hazards by using the **CARE** (Consequences, Alternatives, Reality, External factors) checklist to help you evaluate the level and severity of risk.

3. **PERFORM** risk management by using the **TEAM** checklist (Transfer, Eliminate, Accept, Mitigate) to deal with each factor

not required, that the weather is good, and that he/she is supposed to be controlling the aircraft by outside visual references rather than instruments, the student might choose to *Accept* the risk and complete the practice session. There are several ways to *Mitigate* the risk; the most obvious is to cover the malfunctioning instrument to minimize its ability to distract or disorient the pilot. What would your student(s) do in this situation? What would you want them to do? There may not be a single "right" answer. The point is to teach your students and clients to recognize the hazards and options they will face in any given flight, and to equip them with the tools they need to evaluate their options in a logical and safety-conscious way.

It's All About Habits

It is never too early to start teaching your students about risk management. You may find that the 3P model is not all that different from what you have been doing all along. So why use it at all? Here are two reasons. First, I'm willing to bet that many of your flight training clients will have no idea what to do if you simply tell them they need to manage risk. The 3P model gives you a tool to teach them a structured, efficient, and systematic way to identify hazards, assess risk, and implement effective risk controls. Second, practicing risk management needs to be as automatic in GA flying as basic airplane control. Consider making the 3P discussion a standard feature of your preflight discussion. As is true for other flying skills, risk management thinking habits are best developed through repetition and consistent adherence to specific procedures. In the increasingly complex aviation system, we owe it to the pilots we train to equip them with the tools to practice this vital skill.

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Susan Parson is a special assistant in Flight Standards Service's General Aviation and Commercial Division.

FAA's New GA Manager Envisions Lowering Accident Rate

story and photo by Mario Toscano

Peter Dula is the new manager of the General Aviation and Commercial Division in the FAA's Flight Standards Service. Dula assumed the new position April 2005, bringing into General Aviation over 30 years of wide-ranging aviation experience and a goal aimed to bringing down the General Aviation fatal accident rate. "My belief is that through training and standardization we can achieve that vision," he says.

Peter Dula's experience and aviation career is varied and extensive. He holds an air transport pilot rating with over 7,000 hours and is qualified in numerous military, transport category, and general aviation aircraft.

Dula received his "Wings of Gold" in 1979 by qualifying as a tactical strike carrier Navy pilot. As a pilot in the United States Navy, United States Customs Service, and the Federal Aviation Administration he has flown and worked in many parts of the world, including the Arctic, the Far East, the Middle East, North Africa, Asia, Europe, and Central and South America.

He joined the FAA in 1991 as an Aviation Safety Inspector at the Anchorage Flight Standards District Office (FSDO). During his 14-year FAA career he has held positions as a regional operations specialist, congressional liaison officer, and manager of Flight Standards District Offices in Texas and Arkansas.

In FAA headquarters, Dula was assistant division manager of the Flight Standards Service Technologies, and Procedures Division. Most recently, he served as an FAA executive in the Associate Administrator for Aviation Safety's Air Traffic Safety Oversight Service. That group is responsible for the development and maintenance of policy and requirements for the agency's Safety Management System that provides safety oversight of the FAA Air Traffic Organization.