

# Aviation Instructor's Handbook (FAA-H-8083-9)

## Chapter 10: Teaching Practical Risk Management during Flight Instruction

### Introduction

Examination of accident data leads to the inevitable conclusion that many aviation accidents involve poor risk management decisions. Therefore, effective risk management is one of the most important skills a pilot needs to learn, understand, and practice as a habit. Since flight instructors continually deal with risk, they quickly become subject matter experts.

Instructors know to increase the scope of risk management while teaching. For example, risk management during flight instruction includes a consideration of the dangers from maneuvers performed incorrectly by the learner close to the ground, in addition to all the other risks associated with the flight.

Chapter 1, Risk Management and Single-Pilot Resource Management, discussed the foundations of effective risk management, as well as other critical skills that are a part of single-pilot resource management (SRM). Flight instructors, however, may want additional practical guidance on teaching risk management to pilots of various experience levels and applying risk management to instructional flights. This chapter provides such practical guidance.

### Poor Risk Management and Accident Causality

#### Traditional Accident Investigation Taxonomy

Aviation accidents are investigated by both the National Transportation Safety Board (NTSB) and the Federal Aviation Administration (FAA). The role of the NTSB is to determine the probable cause of accidents and make recommendations, while the FAA seeks to determine if the accident revealed deficiencies in pilot training, aircraft certification, air traffic control or another area of FAA responsibility. The two government entities are often assisted by other interested parties, such as aircraft and/or engine manufacturers, in an effort to determine the facts.

The NTSB role can be illustrated by looking at a typical accident report. [Figure 10-1] While this accident occurred several decades ago and the pilot had LORAN navigation, the lack of risk assessment by the pilot is typical. Pilots have confronted the same type of scenario and many have repeated similar behavior when faced with a significant and potentially lethal hazard.

National Transportation Safety Board Aviation Accident Final Report			
<b>Location:</b>	Seekonk, MA	<b>Accident Number:</b>	BFO94FA008
<b>Date &amp; Time:</b>	11/14/1993, 0026 EST	<b>Registration:</b>	N4224H
<b>Aircraft:</b>	MOONEY MO-20J	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>		<b>Injuries:</b>	2 Fatal
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Business		

<b>Analysis</b>
During a four hour IFR cross country flight, in cruise, the engine's dry air vacuum pump failed. The pilot elected to continue to his final destination, about 180 miles away, navigating by his LORAN. The pilot was notified by air traffic control personnel that in order to continue to his destination, IMC could not be avoided. The pilot stated that IMC was not a problem and he continued the flight. During a no gyro vector approach to the localizer in IMC, at an altitude of about 1,900 feet MSL, the pilot became spatially disoriented and lost control of the airplane. The airplane impacted the terrain and the pilot and passenger were fatally injured. The dry air vacuum pump was examined. The examination revealed that the input shaft of the pump was fractured prior to impact.
<b>Probable Cause and Findings</b>
The National Transportation Safety Board determines the probable cause(s) of this accident to be: <i>The pilot's inadequate in-flight planning/decision to continue flight into known adverse weather conditions after the engine's dry air vacuum pump failed and the pilot's failure to maintain airplane control during approach. A factor in the accident was the dry air vacuum pump failure.</i>

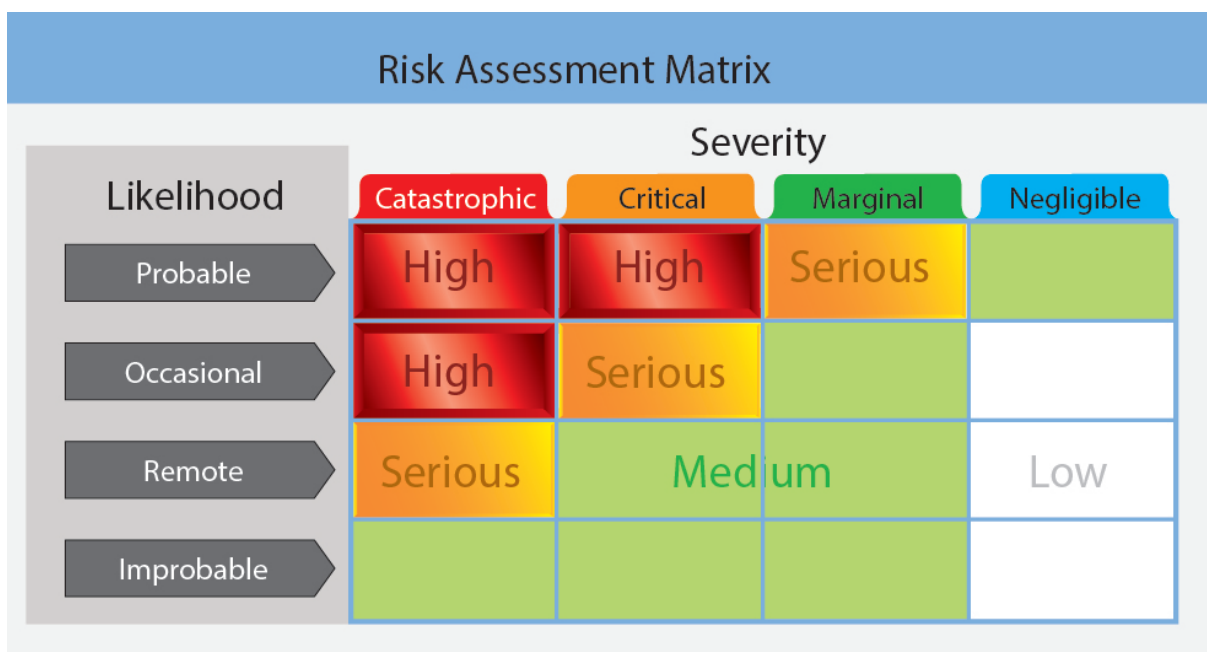
Figure 10-1. NTSB Accident Report.

Key findings of the NTSB final report of the Mooney accident, highlighted in yellow, emphasized the pilot's loss of control of the aircraft and inadequate in-flight planning. These facts accurately described the final events of the flight leading to the loss of control. In fact, conventional accident analysis classifies accidents such as this one as pilot error due to loss of control.

### Risk Analysis Using the PAVE Checklist

The NTSB report on the Mooney accident reviews the accident facts to arrive at its probable-cause finding. Yet, there is more to learn about the root causality of the accident by examining the pilot's reaction to events during the flight using the PAVE acronym from Chapter 1.

The pilot knew about the vacuum pump failure and the instrument meteorological conditions (IMC) ahead of him. The faulty equipment generated an aircraft, or "A" hazard and IMC generated an environment or "V" hazard. The combination of those two hazards created an unacceptable risk once the pilot decided to penetrate the weather. In addition, it is possible that the pilot's desire to get to his destination created an external pressure, or "E" hazard. Finally, the pilot's assumption that he could control the aircraft with critical instruments inoperative created a pilot, or "P" hazard. The risk assessment matrix [Figure 10-2], indicates catastrophic consequences were possible from loss of control in IMC, and the likelihood of loss of control after a vacuum pump failure, was at least occasional or even probable. Thus, the overall risk presented was high or red and needed mitigation of some kind.



**Figure 10-2.** This risk matrix can be used for almost any operation by assigning likelihood and severity. In the case presented, the likelihood of occasional and the severity as catastrophic falls in the high-risk area.

The pilot's most effective mitigation may have been to divert and land while still in visual meteorological conditions (VMC). Why was the pilot unable to practice effective risk management on this flight? Lack of risk management training may have created an inability to cope with a difficult situation.

Instructors have a role and a responsibility to help pilots obtain the necessary risk management training and to adopt a safety culture that embraces risk management and mitigation of risk. The instructor's role in risk management should be incorporated at all levels of training, from a new pilot with little experience to a multi-thousand-hour pilot taking recurrent training.

### When to Teach Risk Management

The importance of risk management suggests that it should be taught at the very start of flight training and should be integrated into any actual flight training, rather than taught as a separate subject. However, it will be even more effective if the learner receives ground instruction on this topic prior to the first flight lesson. This preliminary instruction should also be part of any formal ground school.

Risk management activity and discussion should be included in all preflight and postflight briefings. Learners should be encouraged to participate and even lead such discussions as their experience increases.

Risk management training should not be confined to initial training. Recurrent, transition, flight reviews, instrument proficiency checks, and other training and currency events should also include risk management.

## **Identifying Risk**

As described in Chapter 1, the PAVE checklist is an effective and accepted means for identifying risk. Its four categories capture broad areas of risk and provide the learner with convenient “buckets” for risk identification. Instructors should coach learners, as required, to ensure they use the PAVE checklist methodically and consider all the sub-elements in each bucket. For example, the “P” applies to both the learner pilot and the instructor pilot, and has two major sub-elements. The first includes pilot qualification, currency and proficiency. The second “P” sub-element covers aeromedical hazards and risks and, as described in Chapter 1, the acronym IMSAFE can be used to identify those hazards and risks.

Instructors should identify common hazards that generate flight risks. The PAVE checklist can be used to analyze each hazard for its level of risk. For example, the instructor can show that certain weather hazards are almost always “red” and create a need for mitigation when encountered. Examples include a solid line of thunderstorms ahead, or IMC before takeoff if the pilot is not instrument rated and current or the aircraft is not suitably IFR equipped.

The instructor should emphasize that risk can be effectively managed, and learners should acquire the necessary skills to accomplish this. In many cases, learners will be professionals who are used to managing risk in their workplace, although the hazards may be very different. Instructors should acknowledge the learner’s expertise in those areas. The instructor should involve the learner in aviation risk management decisions.

## **Assessing Risk**

In some ways, risk assessment is the most difficult part of the risk management process. Assessing risk severity (consequences) and likelihood (probability) can be subjective during flight operations. In other aviation applications, such as aircraft certification, the likelihood of an event is calculated mathematically, and consequences are also precisely defined. Nevertheless, risk assessment accuracy can improve with practice and experience.

Instructors should initially lead learners through the assessment phase of each risk identified and provide examples that will help the learner gain confidence in risk assessment. For example, the instructor could suggest an event with a low but generally fixed likelihood, such as an engine failure after takeoff. The learner should consider the outcomes from various responses to that event. A review of the outcomes identifies the severity for the risk matrix.

## **Mitigating Risk**

As explained in Chapter 1, risk mitigation is the “payoff” for the risk management process. Effective risk mitigation may allow for a proposed flight to begin or an ongoing flight to continue. However, this is not always the case, and the pilot should be prepared to delay or terminate any flight.

Instructors should teach that the risk management process begins days or even weeks before a specific flight. Early in the process, if a pilot identifies a risk that cannot be easily mitigated, such as a forecast weather system with widespread icing conditions, then the pilot can transfer the risk by getting an airline ticket. Alternatively, if the flight’s purpose is just recreational, then the pilot can eliminate the risk by cancelling the flight. Other examples of risk elimination include not flying if the crosswind exceeds a limit or not practicing stalls if the ceiling is below a set value.

Whenever a flight is contemplated, the process to mitigate each identified risk assessed as high (red) or serious (yellow) can begin. Instructors should emphasize to learners that medium (green) risks may be mitigated, if possible, following the principle of not accepting unnecessary risk.

Instructors should emphasize that even though risk management may begin days before a flight, it continues into the immediate pre-flight planning and throughout the flight itself. Instructors can plan to introduce scenarios in-flight that simulate hazards and ask the learner to practice how to identify, assess, and mitigate.

The final step in risk mitigation is to consider whether or not to accept the remaining risk. A pilot accomplishes this step consciously and on behalf of any passengers. During flight instruction, the instructor mitigates the risk associated with a learner’s actions by operating at a safe altitude and by guarding the controls. The instructor consciously accepts the risk that remains. Although the mitigation process completes, the instructor is vigilant for any hazard that needs consideration.

The acronym TEAM describes the steps in the mitigation process. TEAM represents transfer, eliminate, accept, and mitigate. These steps describe actions pilots take to deal with risk appropriately. During flight instruction, the instructor takes steps to ensure safety through risk mitigation and then operates with lower risk when the learner flies. Note that an unprepared learner constitutes a serious hazard. Prudent risk mitigation includes using a syllabus, providing quality ground instruction, and conducting a thorough briefing before each training flight.

## **Risk Management Tools**

The risk management process is largely intuitive, but as with many new concepts, it can be daunting to the learner, especially at the beginning of training. Accordingly, the instructor should use available tools to simplify or make the process more orderly and effective.

The TEAM acronym and the risk assessment matrix discussed previously should be considered as primary tools for teaching risk management. Learners should be encouraged to use these simple tools as a basis for conducting risk management during and after their flight training.

On many flights, the risk management process can be more complex, and a more sophisticated risk management tool is needed. As discussed in Chapter 1, a flight risk assessment tool (FRAT) can serve this purpose.

There are a variety of FRATs available from various sources. Many of these FRATs have numerical scoring systems. A fixed list of hazards and associated risks are presented and assigned “scores” based on the severity of the hazard. Typically, if the total score is below a certain number, the pilot can begin the flight. If the score is above a certain number then some sort of mitigating action is required.

Numerical FRATs should be used with caution. A low score can still have one or more hazards and associated risks that, if not properly mitigated, can create unacceptable levels of risk. This can happen because a risk on a particular flight is not included in the FRAT’s list, or there is only one risk, but it is extreme. As an example, a line of embedded thunderstorms may block your route. If that is the only item identified as a risk then the “score” may suggest a “go” decision without requiring mitigation.

## **Risk Management Teaching Techniques by Phase of Instruction**

Instructors should teach risk management using a building block approach. This method will be effective with both new pilots as well as existing pilots who have not previously been exposed to formal risk management training.

### **Risk Management Training through the Private Pilot Level**

A new learner’s exposure to risk management should begin before the first flight and become part of a routine that continues throughout initial training. Instructors should emphasize both practical risk management techniques and skills needed to comply with the Airman Certification Standards (ACS).

#### ***Pre-Solo***

Instructor-led and guided risk management training should occur during pre-solo instruction. Risk management should be part of every preflight and postflight brief. To assist in structuring the risk management process, the learner should be introduced to a non-numerical FRAT, and its use should be demonstrated by the instructor during the first few flights. By the first solo, the learner should be able to conduct a basic risk management analysis.

#### ***Post-Solo Prior to Cross-Country Training***

During the initial solo and dual flights following the first solo, the learner should be able to perform a risk analysis of the planned flight, with occasional coaching from the instructor. The instructor should review the learner’s risk analysis for all solo flights and provide any required feedback. At the completion of solo flights, the learner should de-brief the instructor on the risk management aspects of the flight.

#### ***Cross-Country Training***

During the cross-country phase of training, learners should master risk management techniques commensurate with the complexity of flights and the terrain along the route to the destination(s). This could include, for a private certificate, flights at night, flights in complex airspace, or to unfamiliar airports. Instructors should ask the learner to accomplish a full risk analysis for every dual and solo cross-country flight. The process should include use of a FRAT or other method of analysis. The instructor should review and approve the risk analysis, just as would be done for other aspects of the learner’s preflight preparation and calculations.

## **Risk Management Training for Experienced Pilots**

Risk management is not a task confined solely to the initial training environment. Instructors should ensure that risk management is part of all training events for all certificated pilots. This is especially important for pilots who have not been exposed to risk management standards now contained in the ACS.

### ***Instrument Training***

Risk management training is vital during instruction for the instrument rating because of the potential hazards related to IMC. Instructors should emphasize broad risk management techniques and strategies that will allow a pilot to analyze and evaluate complex weather and other elements that generate risk. For example, an instructor might suggest that a pilot consider the risk management aspects of flight in:

- single-engine aircraft or over terrain higher than the single-engine service ceiling of a multiengine aircraft
- aircraft with a single alternator or a single radio and navigation system
- night conditions
- low IMC
- icing conditions or at altitudes above the freezing level

### ***Transition Training***

Pilots transitioning to more advanced aircraft will encounter additional types of risk associated with such aircraft. These include more complex systems and avionics, enhanced performance, and expanded abnormal and emergency procedures. Pilots transitioning to lighter, slower aircraft will also encounter additional risk due to less performance capability than the pilot has come to expect.

Before teaching in advanced aircraft, instructors should ensure that they have familiarity with the aircraft and equipment. Instructors should employ scenarios that emphasize risk management aspects of operating advanced aircraft in the National Airspace System. In addition to risk management, other SRM skills such as automation management, task and workload management, and maintaining situational awareness should be emphasized. In most instances, the pilot seeking training will be instrument rated and the instructor should evaluate the pilot's risk management and other SRM proficiency under an IFR scenario.

### ***Recurrent Training, Flight Reviews, and Instrument Proficiency Checks***

Instructors should particularly emphasize risk management during any kind of recurrent training or proficiency event. Many pilots who held certificates prior to the introduction of the ACS may not have been exposed to formal risk management training or evaluation.

Instructors should consider using scenarios to evaluate pilot risk management proficiency. The scenario should be constructed in a way that mirrors the pilot's typical operating profile. However, if the pilot plans to change that operating profile, the instructor should discuss or evaluate the pilot's ability to address any potential new risk management issues. For example, a pilot usually operates flights between rural airports in Class E airspace, but is soon planning to begin flying regularly to a location in Class B airspace. In this case, the instructor should address the operating requirements, such as Mode "C" and ADS-B, and the environmental risk factors related to Class B operation.

### ***Risk Management during Operational Flights***

Pilots who are already certificated conduct most of their flights without an instructor present. As an instructor, you should encourage them to practice effective risk management on all their flights.

Realistically, pilots will not always follow the risk management procedures discussed in this chapter. Instructors should encourage pilots to scale their risk management procedures to match the complexity of the flight. For example, for a local flight, it is acceptable to use an abbreviated risk management protocol using the PAVE acronym to briefly review the major elements of potential risk. However, for longer or more complex flights it may be desirable to complete a FRAT. A key objective for instructors is to provide risk management guidance that will allow pilots to think of risk management intuitively, as a part of the preparation for every flight and continuously while the flight progresses.

## **Risk Management Training for Professional Pilots**

Instructors may encounter pilots who fly professionally. Many professional pilots operate as a crew and receive ongoing and recurrent training at a Part 142 training center. Instructors who work in classrooms or simulators at such a facility will likely be proficient in subjects such as crew resource management (CRM). They may also be exposed to other training and operating concepts, such as threat and error management (TEM), which has similar elements to risk management.

Instructors may encounter professional pilots who own their own aircraft and fly them outside of their professional environment. An instructor who provides transition or other flight instruction services to professional pilots should emphasize risk management as part of the training. Pilots who operate professionally as a crew may not be used to operating as a single-pilot, without the support infrastructure of their professional employer. Their risk management responsibilities may need adaptation to flying their own aircraft.

## **Managing Risk during Flight Instruction**

Instructors know the need to manage risk during flight instruction. The risk management techniques are the same as taught to learners, however, there are a few hazards that are unique to flight instruction. The resulting risk can be identified, assessed, and mitigated. For example:

- Ask the learner to fly specific maneuvers after giving appropriate training.
- Choose practice locations that provide safe options.
- Perform maneuvers with sufficient altitude.
- Stay alert for the unexpected either from the learner or external elements.
- Be prepared to take over the control of the aircraft.

In flight, instructors can manage risk by constantly being aware of potential risk elements and managing them in real time. To do this, the instructor needs to maintain situational awareness of pertinent information, not only of the state of the aircraft, the surrounding traffic, the weather, the airspace, and the surrounding area; but also what the learner is doing and planning to do.

## **Common Flight Instruction Risks**

The best process for analyzing flight instruction risks is to identify them as you would on any other flight, using the PAVE acronym. There may be many potential risks to conducting flight instruction. The examples below are only meant to be representative. Instructors should always conduct a risk analysis prior to providing instruction.

### ***Pilot Risks***

This category involves both qualification and aeromedical risks. From a qualification perspective, instructors know that the learner will generally be less proficient than the instructor. Instructors may also have qualification, currency, and proficiency issues. Instructors should be familiar with aircraft, avionics, and procedures. Any unfamiliarity creates a hazard. The aeromedical risks require the instructor to be tuned in to not only his own aeromedical state, but that of the learner.

During flight instruction, pilot risk includes both the learner pilot and the instructor pilot. The instructor needs to be prepared for the learner to make mistakes such as those listed in the Airplane Flying Handbook. The risks of these mistakes can be mitigated by being proactive in planning activities based on current conditions, and by allowing enough time and space both to allow the learner to practice and to allow the instructor to take over control of the aircraft before the situation deteriorates beyond the instructor's ability to fly the aircraft.

### ***Aircraft Risks***

Aircraft used in flight instruction may not always be under the direct control and maintenance supervision of the instructor, resulting in the instructor not being aware of inoperative systems and equipment or overdue inspections. For two-place trainer aircraft, payload is often limited, requiring a reduction in the amount of fuel carried. Performance may also be marginal in high density-altitude situations.

### ***Environmental Risks***

The airspace used for flight training and practice may be crowded, creating a potential collision hazard. Many areas of the country where flight instruction is conducted often have restricted visibility due to haze, pollution, or other factors that aggravate a potential collision hazard. Airspace in these areas may also be complex and subject to restrictions. Conducting certain maneuvers can also create hazards and potential risks. For example, practicing full stalls can result in inadvertent spins. Simulated engine failures, if performed incorrectly, can and have created real emergencies and caused accidents. Practice approaches without ATC surveillance can concentrate aircraft along the same path.

### ***External Pressure Risks***

Learners often experience scheduling problems, and this can be aggravated by aircraft problems, weather issues, and other unpredictable events. Learners are also subject to other external pressures involving work, family, finance, and other issues. All of these can create distractions, anxiety, and other responses that can degrade learner performance.

### **Best Practices for Managing Risk during Flight Instruction**

Instructors can best assess and mitigate identified risks by following the risk management procedures outlined in this chapter. In all cases, the instructor should include the learner in the risk management during dual instruction. For example, the instructor should emphasize that they are both responsible for maintaining a lookout to see and avoid other air traffic. The learner should also be instructed on how to assist resolving items such as aircraft airworthiness status and issues involving the training environment, such as airspace, NOTAMs, or TFRs.

Specific mitigations for the instructional hazards and risks identified in previous paragraphs include, but are not limited to, the following procedures.

### ***Pilot Risks***

The instructor's qualifications are paramount in mitigating currency and proficiency issues. Instructors should familiarize themselves with aircraft models and avionics before instructing. This could be as simple as reviewing the pilot operating handbook (POH) or avionics manuals or as extensive as acquiring flight time in such equipment before giving instruction.

Instructor aeromedical risks should be constantly monitored using the IMSAFE model. Similarly, the instructor should communicate with the learner to establish a confidence level that will encourage learners to come forward to disclose their own aeromedical issues well in advance of scheduled flights, so that they may be rescheduled if necessary.

### ***Aircraft Risks***

The instructor should determine the aircraft's official airworthiness status before scheduled flights and before conducting the actual preflight. Unless instructing in their own aircraft, instructors should be familiar with the aircraft operator's procedures for reporting and correcting discrepancies and review the current discrepancy report. Any questions regarding airworthiness status should be resolved with maintenance personnel before conducting the preflight inspection. The instructor should consider involving the learner in this process and should emphasize that it is intended to manage risk by reducing the likelihood and/or severity of potential hazards and risks arising from failed equipment.

### ***Environmental Risks***

Environmental risks are one of the most frequent causes of accidents. These notably include risks generated by weather, terrain, and night operation hazards and additionally include airports, airspace, and other environmental factors. All these hazards and risks will likely come into play at some point during the instruction process. Accordingly, instructors should emphasize accurate assessment and mitigation of such risks when providing instruction.

The instructor should involve the learner in every step of the assessment and mitigation process. For example, the weather may be marginal VFR. If the scheduled dual instruction called for practicing stalls and slow flight, the instructor should coach the learner to identify the risks involved in conducting stall practice under such conditions, such as inadvertently entering IMC or practicing stalls at too low an altitude. The instructor and learner can discuss ways to mitigate the risk, such as changing the lesson plan to stay in the traffic pattern, conducting a lesson in a flight simulation training device or ground school, or rescheduling the lesson altogether.

### ***External Pressure Risks***

External pressures can create the most insidious of hazards and risks. Instructors should ease learner concerns about schedule conflicts with events in their professional and personal lives. Instructors should be conscious of each learner's schedule limitations and other external factors that could affect their performance. Instructors should also emphasize the ability to make schedule changes as needed, change training from an airplane to classroom instruction, or terminate a lesson early if the learner appears apprehensive about time pressures or other external concerns.

### **Notes on Instructional Risk Management in the Flight Deck**

The instructor is involved with risk management on multiple levels, which include not only managing the risk of a particular phase of flight or maneuver, but also teaching risk management and managing the risks of providing in-flight instruction. Some concepts an instructor should bear in mind while teaching most maneuvers include:

- Identify relevant hazards systematically and keep track of hazards during maneuvering (the learner manipulating controls may be a significant hazard).
- Avoid creating a hazard by attempting to teach something at an inappropriate time (e.g., discussing takeoff technique while entering the runway, when attention should be devoted to aircraft control and ensuring that the runway is clear) or at an inappropriate altitude (e.g., teaching stalls below a cloud layer, which does not allow an adequate amount of altitude to recover).
- Discuss hazards and risk mitigation in detail during preflight and postflight.
- Prompt the learner to identify hazards in flight and on their own and to verbalize thought processes and risk mitigations (e.g., while preparing to execute a ground reference maneuver, ask the learner to identify potential collision hazards and a safe place to make an emergency landing).

The following discussion contains examples of instructor considerations while providing in-flight instruction on various maneuvers. Among other things, the examples demonstrate the extent to which instructional techniques and instructional risk management are interconnected, and why a systematic, integrated approach to risk management provides safety.

### ***Managing Risk while Teaching Takeoffs***

The time it takes for an aircraft to begin its takeoff and initiate a climb is only a matter of seconds. There may not be time to teach effectively during the takeoff. Apart from introducing unnecessary hazards (e.g., missing a radio transmission from tower), the learner's attention is placed almost entirely on trying to safely maneuver the aircraft. Any information an instructor is trying to convey during the takeoff may not be heard or processed by the learner. The instructor should conduct the majority of their teaching (e.g. airspeeds, pitch attitudes, visual references, flight control inputs, engine parameters) prior to contacting tower or announcing their intentions on the CTAF at a non-towered airport. This will avoid over-stimulating the learner's senses, help maintain a sterile flight deck, and support situational awareness and collision avoidance.

When teaching a learner to take off, it is imperative that the instructor create realistic scenarios of takeoff types. The scenario should not create hazards that result in the learner attempting to maintain an unsafe climb rate or excessive pitch attitude. An effective scenario should mimic what a learner will encounter outside of flight training. For example, if the instructor wants to prompt the learner to conduct a confined or obstacle clearance takeoff, the instructor could specify where an (imaginary) obstacle exists. The point where the obstacle exists should be realistic. During soft-field takeoffs in an airplane, the instructor should monitor aircraft drift while the learner is trying to remain in ground effect. The instructor should not let the drift escalate beyond the learner's control and should pay close attention to pitch attitude and airspeed throughout the maneuver.

Insufficient spacing from preceding aircraft during takeoffs also creates various hazards. Some hazards include wake turbulence, insufficient in-trail spacing, and insufficient separation from an aircraft approaching to land. The instructor ensures that there is sufficient spacing from landing and departing aircraft prior to entering any space being used for departures and arrivals. This will also help teach the learner sound decision making and risk management skills.



### ***Managing Risk while Teaching Landings***

Many complex decisions are made during the landing phase. Novice learner pilots have little experience to rely on. Instructors sometimes fall prey to teaching landings mechanically. Instead, it is necessary to convey problems and solutions (power, control, and configuration changes) based on what is actually happening on that specific approach. When an instructor teaches mechanically, they cause the learner to be ill-equipped to identify or manage constantly changing conditions. This teaching method may result in unstable approaches and faulty landings. The instructor should prompt the learner on the current conditions and how to correct the situation to maintain a stabilized approach. The decision on choosing aiming points and touchdown points should not be made mechanically either. It is the instructor's responsibility to teach the learner how to pick appropriate aiming and touchdown points based on the type of aircraft, the landing being attempted, the environment and conditions present, and the expected landing performance.

Some of the same hazards associated while teaching takeoffs are also present while teaching landings. The instructor may want to convey a lot of information while simultaneously verifying that the aircraft is being flown safely. This may cause a decrease in attention to collision avoidance or loss of situational awareness. Excessive teaching and coaching on final approach may cause missed radio transmissions from air traffic control or aircraft in the pattern. To avoid this, the instructor should only use concise prompting on approach to landings with the learner.

Certain landings present unique risks. The instructor teaches the appropriate pre-landing reconnaissance for unfamiliar landing areas or uncontrolled fields. During landings in strong winds, the instructor should have the skill sufficient to deal with the wind conditions. During a short-field or confined area landing, certain aircraft may fly at a slower approach speed. The instructor should be aware of any risk associated with flight at slow speeds or any other condition that reduces safety margins. During all types of approaches to landing, instructors need to remain aware of risks associated with a variety of learner errors. For example, if an airplane pilot makes a 180° power-off accuracy approach and landing, the instructor should anticipate potential landing errors. Learners may understand not to sacrifice a stable approach and a safe landing for the sake of accuracy, but they might not be ready to apply that knowledge.

### **Chapter Summary**

Poor risk management contributes to many fatal accidents. Accordingly, instructors should emphasize and practice risk management in all types of instruction, from primary to advanced training. Instructors should use accepted risk management tools to make training more effective and consistent. Instructors should also use a building block approach to teaching risk management. Risks encountered while giving instruction are similar to those that learners will encounter on operational flights, giving instructors the opportunity to highlight risk management as a tool to be used for safe and enjoyable flying.