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AERONAUTICAL DECISION MAKING FOR STUDENT AND PRIVATE PILOTS

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16. Abstract

Aviation accident data indicate that the majority of aircraft mishaps are due to judgment error. This training manual is part of a project to develop materials and techniques to help improve pilot decision making. Training programs using prototype versions of these materials have demonstrated substantial reductions in pilot error rates. The results of such tests were statistically significant and ranged from approximately 10% to 50% fewer mistakes.

This manual is designed to explain the risks associated with Student and Private pilot flying activities, the underlying behavioral causes to typical accidents, and the effects of stress on pilot decision making. It provides a means for the individual pilot to develop an "Attitude Profile" through a self-assessment inventory and provides detailed explanations of preflight and in-flight stress management techniques. The assumption is that pilots receiving this training will develop a positive attitude toward safety and the ability to manage stress effectively while recognizing and avoiding unnecessary risk.

This manual is one of a series on Aeronautical Decision-Making prepared for the following pilot audiences: (1) Student and Private (2) Commercial (3) Instrument (4) Instructor (5) Helicopter (6) Multi-Crew.

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PREFACE

This training manual was prepared by the AOPA Air Safety Foundation under subcontract to Systems Control Technology, Inc. in support of Federal Aviation Administration contract number DTFA01-80-C-10080.

FOREWORD

This aeronautical decision-making training manual is a result of ten years of research, development, testing and evaluation of the effectiveness of teaching judgment and decision making. This manual is a revision of the prototype publication "Judgment Training Manual for Student Pilots" which was developed jointly by the Federal Aviation Administration (FAA), General Aviation Manufacturers Association (GAMA) and Transport Canada in an effort to improve general aviation safety. Additional support and collaboration in the development of these materials was provided by: the AOPA Air Safety Foundation, Department of Aviation (Australia), Director General of Civil Aviation (France), Flight Safety Foundation and Systems Control Technology, Inc.

The material in this manual is intended for use by student and private pilots in conjunction with one-on-one instruction from a flight instructor. Similar training materials have been developed for commercial, instrument and instructor pilots, and for those pilots operating multi-crew aircraft.

This training manual is the result of extensive revisions to the FAA report "Pilot Judgment Training and Evaluation, Volumes I-III," (DOT/FAA/CT-82-56), Embry-Riddle Aeronautical University, June 1982.

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The editors wish to thank the many individuals within the aviation industry who participated in the development and refinement of these materials. Their contributions are gratefully acknowledged. We also extend our thanks to Ms. Jeanne Jackson (AOPA Air Safety Foundation) for proofing this manual, and Mrs. Deborah Klipp (AOPA Air Safety Foundation) for patiently typing and retyping this manual to its final form.

AERONAUTICAL DECISION MAKING
FOR STUDENT AND PRIVATE PILOTS

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1. INTRODUCTION TO AERONAUTICAL DECISION MAKING

Many factors influence a pilot's decision making process. Knowledge, reasoning ability and skills are all important, as is the individual's emotional make-up, e g., his or her personality and attitudes. Personality traits are deeply ingrained behavioral characteristics that are usually established in childhood. These personality traits are highly resistant to change and are beyond the scope of the judgment training presented in this manual. The other elements of decision making (some of which are discussed in this manual) are outlined below.

Attitudes

Attitudes are less deeply ingrained and may be changed by training. Everyone has attitudes regarding politics, religion, people, etc. We are constantly inundated by attempts to change our attitudes by advertisers, politicians, peers, superiors, etc.

Most of our attitudes regarding flying are developed through experience. We listen to and observe instructors and other pilots, thereby developing attitudes concerning risk taking, assessing our skill and knowledge, and decision making. We also learn pilot behavior through informal methods, e.g., "hangar flying," movies, etc. These attitudes continue to be developed with experience. The exercises in this manual can help you establish safe attitudes towards flying.

Headwork

Headwork is the intellectual process used when formulating decision making strategies and is important in aeronautical decision making. The necessary ingredients in good headwork are knowledge, vigilance, selective attention, risk identification and assessment, information processing and problem solving abilities. Headwork, when properly applied, minimizes the negative influence of attitudes and personality traits. If it were possible to separate the headwork aspect of decision making from the attitudinal part (which it is not), pilots would be able to solve all problems in much the same manner as a computer. Since the two cannot be separated, one objective of this manual is to help you develop and apply good headwork that augments or controls other aspects of decision making in the cockpit. The second objective of this manual is to teach good headwork.

Skills and Procedures

A third factor related to decision making is "airmanship" or "stick and rudder" abilities. This refers to the procedural, psychomotor and perceptual skills that are used to control an aircraft and its systems. These skills are learned during the conventional training process until they become automatic reactions, e.g. stall recovery in airplanes and autorotation procedures in helicopters. These skills are highly specific to the type of aircraft and are taught in traditional flight training programs using a variety of materials. Therefore, such information will not be duplicated in this manual.

Risk Management

Accident statistics indicate that 80-85% of all general aviation accidents involve "pilot error." This is another way of stating that the pilot is a major risk element in decision making. When evaluating flying risks, a developing or potential hazard must first be detected, then analyzed and finally resolved. As an aid to risk assessment, five risk elements are reviewed: pilot, aircraft, environment, operation and situation. The pilot has the capability and responsibility for determining the risks associated with a particular flight. Techniques for risk assessment and management are discussed in Chapter 3.

Stress Management

Pilots must learn how to deal with the various stress levels associated with flying, and must recognize the cumulative effects which stress can have on headwork (the ability to reason) at critical times. Stress coping must occur in three areas:

1) Life Stress Management - This is the long term approach to mental and physical health. This includes items such as diet, exercise, life style, etc. as well as recognizing the negative effects of change-in-life situations e.g., death of a loved one, job change, divorce or financial problems;

2) Preflight "fitness to fly" - The pilot needs to ensure physical well being, e.g., the effects of illness or medication on performance, stress from outside pressures, the influence of alcohol, fatigue and eating habits;

3) Inflight Stress Coping - This includes recognizing the importance of controlling panic; focusing primarily on aircraft control and, secondarily, on navigating and communicating; and not permitting fear or anxiety to paralyze decision making capabilities. These areas of stress coping are discussed in Chapter 7.

Cockpit Resource Management (CRM)

This element of decision making refers to the effective management of all resources available to a flight crew, and is a concept used in multi-person crews. Cockpit resource management emphasizes effective interpersonal communication among crew members and other resources that may be available. This subject area is discussed in another manual in this series.

Pilot Responsibility

When the government certificates a pilot, it grants that pilot the privilege to use public airspace and air navigation facilities. In accepting this privilege, the pilot is expected to adhere to the rules and refrain from any activities which might infringe on the rights and safety of others. The regulations require the pilot-in-command to be the final authority for the safe operation of an aircraft. Although the pilot should conduct safe aircraft operations, his or her operation of the aircraft is influenced by events and conditions, some of which have nothing to do with aircraft operation, e.g., personal problems, controllers, weather, etc.

When certificated, a pilot is presumed to be responsible in behavior and is expected to use "good judgment" to understand and interpret the rules in individual situations. However, accident statistics indicate that pilots do not always fulfill that expectation: Nearly 85 percent of all general aviation accidents may be attributed in part, or in whole, to "pilot errors." To determine why pilots make these errors, it is useful to classify pilots' activities into three categories:

o Procedural Activities - Management of the powerplant, fuel, aircraft configuration, autopilot, displays, navigation and communication.

o Perceptual-motor Activities - Aircraft control, judgment of distance, speed, altitude, hazard detection and geographic orientation.

o Decisional Activities - Self-assessment of skill, knowledge, physical and psychological capabilities, hazard assessment, navigation planning and flight priority adjustment.

Below is an analysis of data for fatal and non-fatal accidents, attributed to "pilot error" during a five-year period. The data are divided into the three pilot activity categories mentioned above and the number and percentage of accidents in each category are listed below.

Pilot Activity Category	Number/Percentage of FATAL Accidents	Number/Percentage of NON-FATAL Accidents
Decisional	2,940 (51.6%)	9,081 (35.1%)
Perceptual-motor	2,496 (43.8%)	14,561 (56.3%)
Procedural	264 (4.6%)	2,230 (8.6%)

The majority of fatal pilot-induced accidents (51.6%) are the result of decisional behavior, also known as cognitive judgment. Cognitive judgment describes the decisional activities involved in choosing a course of action from several alternatives.

Definition of Aeronautical Decision Making

A popular belief is that judgment is good, common "sense" applied to the making of decisions, especially correct decisions. "Sense" involves an intense awareness, realization, and understanding of all the factors involved in making a decision. Sense is generally seen as a person's ability to act effectively and positively in any given situation.

The most significant aspect of pilot judgment and decision making is the "outcome." Judgment is not an end in itself, but involves both a decision to act and a response--be it an action or even an inaction. Before taking action, pilots must consider all relevant intrapersonal, aircraft, and environmental factors which have, or may have, an influence upon his or her decision-making process. Pilot judgment is thus a process which produces a thoughtful, considered decision relating to the aircraft's operation along with the ensuing, e.g., action/inaction, to that decision.

Aeronautical Decision Making (ADM) is:

o The ability to search for and establish the relevance of all available information regarding a flying situation, to specify alternative courses of action, and to determine expected outcomes from each alternative.

o The motivation to choose and authoritatively execute a suitable course of action within the time frame permitted by the situation. The word "suitable" means an alternative consistent with societal norms, and "action" includes no action, some action, or action to seek more information.

The first part of this definition refers to intellectual abilities. It relies on the pilot's capabilities to sense, store, retrieve and integrate information. This part of judgment is purely rational, and if used alone, would allow problem solving in much the same manner as a computer.

The second part of the definition is where the decision is made and indicates that it can be affected by motivations and attitudes. It implies that, in part, pilot judgment is based on tendencies to use other than safety-related information when choosing courses of action. Pilots often consider non-safety items such as job demands, convenience, monetary gain, self-esteem, adventure, commitment, etc., before taking action. If properly developed, this part of pilot judgment would eliminate information unrelated to flight safety, and direct the pilot's decision to the use of more rational processes.

The term "pilot error" is often used to describe an accident cause and is an oversimplification, implying that the pilot intended to have an accident. Pilots usually intend to fly safely, but they sometimes make decisional errors. Their skill or luck is often sufficient to get them out of situations resulting from poor judgment (a term for the general concept of decisional errors). The objective of this manual is to teach instrument pilots the techniques to avoid situations that require luck or skill greater than their capabilities. Good judgment means avoiding situations that require superior skill to overcome.

2. DECISION-MAKING CONCEPTS

The following material contains concepts and terms used throughout this manual. They have been especially designed to lead you to think more carefully about your flight activities and to help improve your judgment and decision-making skills.

Five Subject Areas

Flying is a process, a combination of events, which requires pilots to make a continuous stream of decisions. The events in this process are interactions between people, the aircraft and the environment which occur over time. Therefore, the events which interact during this process can be evaluated in five subject areas:

- Pilot--"P"
- Aircraft--"A"
- Environment--"E"
- Operation--"O"
- Situation--"S"

P = Pilot Pilots are continually making decisions about their own competency, state of health, level of fatigue, and many other variables. Any time the problem focuses on the pilot, it is included under the subject area, "PILOT". One example would be:

The pilot had only four hours of sleep the night before. A friend then asked the pilot to fly him to a meeting in a town 700 miles away. After evaluating his fatigue, the pilot made a good decision and refused to make the flight.

A = Aircraft Decisions are frequently based on evaluations of the aircraft, such as its power, equipment, or airworthiness. Any judgment about the airplane and its equipment is lumped into the subject area, "AIRCRAFT". One example would be:

During preflight, the pilot noticed the fuel cap did not seem to lock securely. The pilot decided to delay takeoff while a mechanic checked the situation. The pilot's good decision was confirmed when the mechanic had to install a new cap.

E = Environment This subject area includes items not previously considered in the pilot and aircraft subject areas. The pilot must make a separate evaluation of these items which can include: weather, air traffic control, runways, etc. Any other item which can affect the pilot and aircraft is part of the subject area called "ENVIRONMENT". One example would be:

The pilot was landing a single-engine aircraft just after a helicopter had departed. The pilot assumed that wake turbulence would not be a problem, but the plane slammed into the runway due to vortices from the helicopter.

O = Operation The interaction of the pilot, aircraft, and environment are influenced by the purpose of each flight operation. The three other subject areas must be evaluated in the context of the desirability of undertaking or continuing the flight as planned - why is the flight being made, how critical is it to undertake the mission or maintain the planned schedule - must it be done now, is the trip worth the risks? Example:

During a VFR cross-country, the pilot calculated the groundspeed and determined that he would arrive at his destination with only 15 minutes fuel remaining. He felt pressured to keep his appointment and tried to "stretch" the fuel supply instead of landing to refuel.

S = Situation Situational awareness is the accurate perception of the conditions affecting the aircraft and the pilot during a specific period of time. More simply, it is knowing what is going on around you. There is a direct relationship between situational awareness and safety. Pilots who have higher levels of situational awareness are safer pilots. Situations combine the pilot-aircraft-environment-operation subject areas. Two examples of the outcome of a lack of situational awareness are:

Pilot/Environment--P/E

With a 90-degree, 30-knot left crosswind (E), the pilot attempted to make a landing. The pilot's left leg was in a cast (P), and he had trouble using the rudder. Upon touchdown, the aircraft veered sharply to the right and collided with an embankment.

Pilot/Aircraft/Environment--P/A/E

In cruise, ideal conditions for carburetor icing existed, and ice did develop (E). However, the pilot, who was unfamiliar with this type of aircraft, concluded that the engine was running rough due to a mechanical failure, and did not apply carburetor heat (A). Instead, the pilot rushed into an emergency landing attempt, landed downwind unnecessarily, and groundlooped the airplane (P).

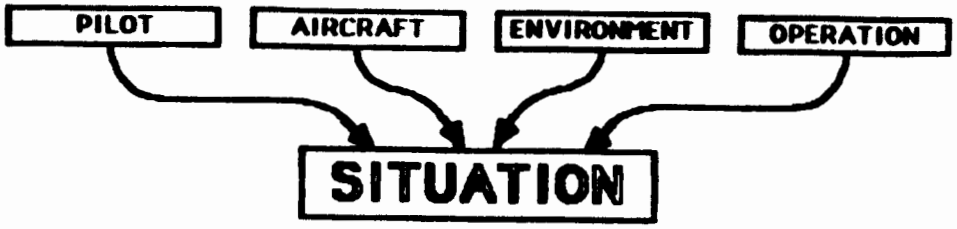


Figure 2.1

The Conventional Decision-Making Process

Conventional flight training prescribes the knowledge, experience, and skills necessary to conduct a flight within operational constraints. For the low-time pilot, the instructor attempts to teach good judgment, behavior, and performance through a set of limited, but supervised, flight situations. In doing so, the flight instructor not only teaches the necessary aviation knowledge and skills required to execute specific flight maneuvers, but also encourages the student to apply previously learned knowledge and skills to subsequent situations. Since the student cannot be taught how to handle every possible situation he or she may encounter, the instructor trys to provide a representative range of learning experiences that the prospective pilot can later apply to similar situations. As the neophyte pilot displays competence in training situations, there is an increase in ability to perform safely. In new situations, the pilot's decision will be based upon two considerations: (1) What the pilot had previously learned which may be applicable to the new situation; and (2) what the pilot chooses to consider as relevant information for arriving at a new decision while operating in "unknown territory."

An accident is the result of an unfortunate combination of events with a harmful outcome. The previous examples have demonstrated that these events are interactions between the pilot, aircraft, environment and the nature of the mission or operation. Flying requires a continuous stream of timely decisions. Recognition and understanding of these events allow a pilot to influence the outcome of the flight, thereby avoiding an accident. For example:

A noninstrument-rated private pilot, with limited experience flying in adverse weather, wants to arrive at his destination by a certain time, and he is already 30 minutes late. In spite of his inexperience, he decides to fly through an area of possible thunderstorms and will reach this area just before dark. Arriving in the thunderstorm area, he encounters lightning, turbulence and heavy clouds. Night is approaching, and the pilot becomes spatially disoriented due to continued flight by ground reference. He should have used his instruments to make a 180 degree turn.

The pilot did not evaluate several of the five subject areas: First, he let his desire to arrive at his destination on time override his concern for a safe flight. He overestimated his flying abilities by flying through an area of thunderstorm activity. Next, the pilot continued into deteriorating conditions instead of changing course or landing prior to his destination.

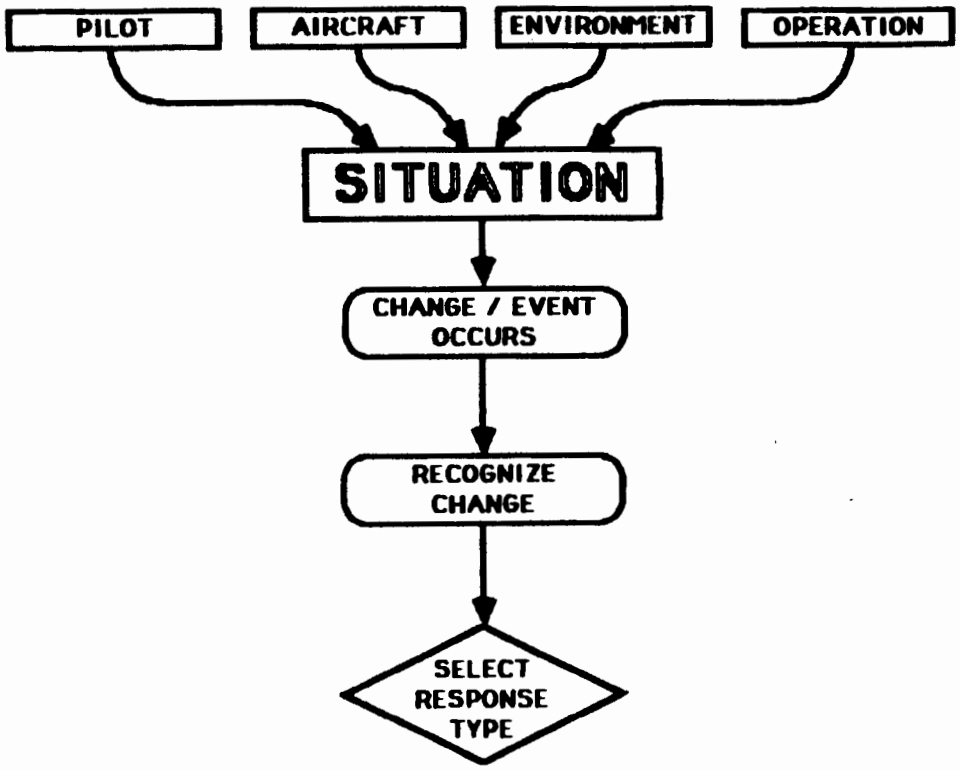


Figure 2.2

The pilot could have selected several alternate courses of action. He could have flown around the adverse weather and accepted the fact that he might be late. Good judgment could have alerted the pilot to avoid the severe weather after encountering the lightning and turbulence.

Normally, the need for a decision is triggered by recognition that something has changed, or an expected change did not occur in the five subject areas. The search for and recognition of change, e.g., groundspeed, weather and fuel, provides the opportunity to evaluate and control the change in order to produce a safe flight outcome.

Failure to search for and recognize change reduces the chance of controlling the change. As time progresses, the alternatives available may decrease, and the option to select the remaining alternatives may be lost. For example, if a pilot elects to fly into hazardous weather, the alternative to circumnavigate the weather is automaticallly lost.

In the conventional decision making process, a change may indicate some action by the pilot is required. A change from normal events; or from expected events; or from desired events should alert the pilot to the action. There sometimes is a difference between what you expect to happen (implying certainty) and what you hope will happen (implying

uncertainty). For example, you depart on a flight into marginal weather, hoping that conditions will improve.

The occurence of change must be detected before a response can be selected. There can be instances when a change may remain undetected for some time. A good example is a pilot who fails to compare actual groundspeed with the planned groundspeed from the flight log. A change has occurred even though it was not detected until later when the situation became critical and the aircraft was low on fuel.

Selection of the proper response relies on a number of elements that affect every pilot's level of situational awareness. These include a pilot's physical flying skills, knowledge, experience and training.

Skills

All experienced pilots can recall their first days as a student pilot. All of their energies were devoted simply to controlling the aircraft. Little time remained for traffic watch, navigation, or deep thoughts about the philosophical aspects of the art of flying. As a result, their awareness of the situations was often extremely low. Many of them are alive today only because their awareness was just high enough to cope with the situations which developed during their initial flight training.

Experienced pilots generally possess greatly improved skills and procedures. Thus many of these actions become almost automatic. As a result, they are able to devote much less of their time to physically flying the aircraft and more time to the mental aspects of flying. Their skills are, nevertheless, still extremely important. They must always attempt to sharpen these skills to ensure that more of their energies can be devoted to other important flying tasks.

Knowledge

Knowledge is the next defense against poor judgment in conventional decision making. Pilots must base the overall safety of any flight on their basic knowledge of the aircraft, the environment (including ATC procedures), the route being flown, weather, etc. They can prepare themselves to detect change by accomplishing thorough preflight preparation and planning, e.g., preparing a flight log, reviewing aircraft performance, calculating weight and balance, obtaining a complete weather briefing, etc. During the flight, the information prepared during preflight planning can be compared to the conditions encountered to determine if anything has changed which might affect the safe completion of the flight.

Experience and Training

Experience is practical knowledge, skill, or practice derived from direct observation of, or participation in, events or in a particular activity. We draw upon our experience every time we fly. In a sense, experience creates a mental file that helps pilots establish how conditions and events are interpreted and how they respond to them.

Many of the actions taken while flying are based on experience. Pilots constantly rely on experience to determine the correct action required for a given situation. In this way, experience allows them to solve problems quickly and therefore devote more time to other problems requiring their attention.

Many problems faced by pilots are solved before boarding the aircraft. By constantly reviewing emergency procedures, problems are solved simply by using experience to select the appropriate solution. The prodecures associated with an engine failure on takeoff become automatic to the carefully trained pilot.

Experience and training are closely related. Training is more then simply an effort to perfect our systems knowledge and physical flying skills. Training is highly structured and represents the most efficient way to build experience.

However, conventional training programs tend to focus on skills and procedures (how to manipulate controls, performing the specific procedures for operating installed equipment, etc.) with only a minimal emphasis on headwork (how to make rational, systematic decisions based on situational conditions). Unfortunately, headwork, or decision making ability, is often developed informally by listening to "hanger flying" sessions and many times through narrow escapes (experience). In addition to this informal "training", better instructors and training programs always discuss previous accidents (case studies) so pilots can learn about mistakes of others. But most of this "training" is intended to provide a systematic approach to improved decision making (headwork) and information management skills.

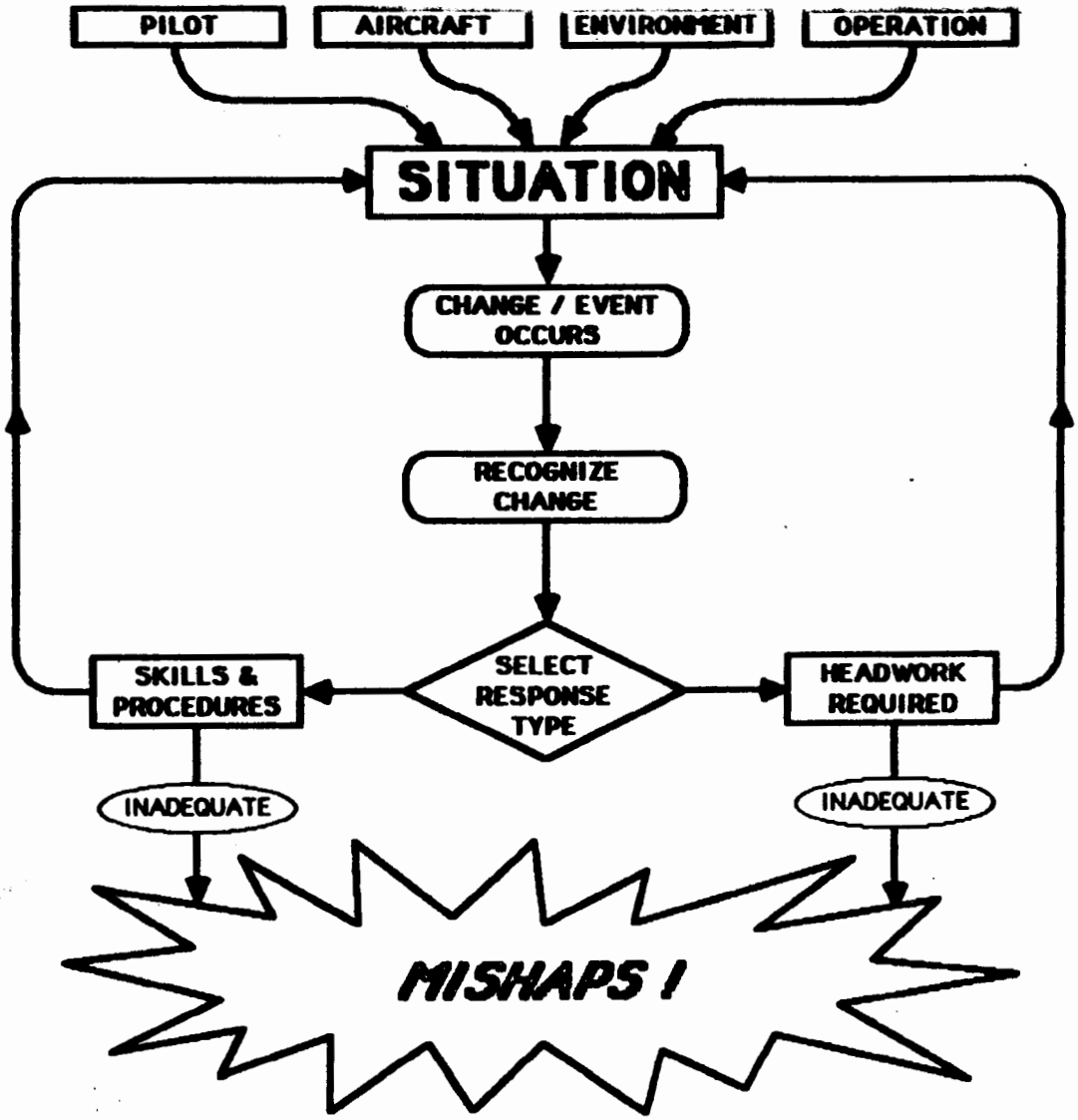


Figure 2.3 Conventional Decision-Making Process.

As shown in Figure 2.3, inadequate skills and procedures or inadequate headwork in conventional decision making leads to mishaps. Review of accident data reveals that there are several categories of pilot error. These include errors of omission - failing to do something one should have done; and those of commission - doing something one should not have done; timing errors - doing something too soon or too

late; errors involving degrees or response - overreacting or underreacting. It is worth keeping these types of mistakes in mind when examining the decision making process.

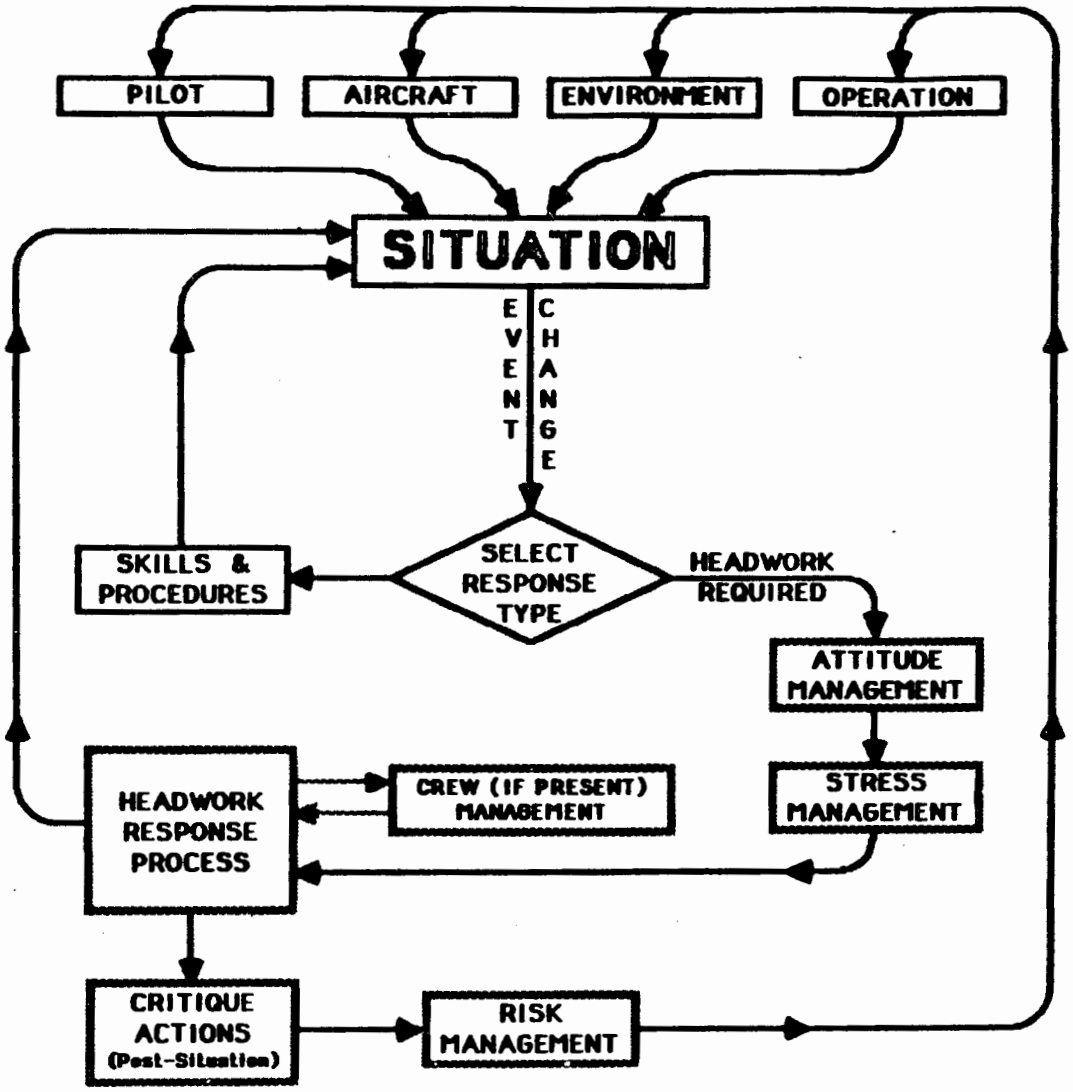


Figure 2.4 Aeronautical Decision-Making Process.

Aeronautical decision making builds upon the foundation of conventional decision making, but modifies and enhances the process to decrease the probability of pilot error. ADM provides a structured approach to our reaction to change during a flight. This structured approach addresses all aspects of decision making in the cockpit and identifies the elements involved in good decision making. These include:

1) Identifying personal attitudes which are hazards to safe flight.
2) Learning behavior modification techniques.
3) Learning how to recognize and cope with stress.
4) Developing risk assessment skills.
5) Considering all resources available in a multi-crew situation.
6) Evaluating the effectiveness of your ADM skills.

As in conventional decision making, such decision making skills start with recognition of change, assessment of impact/alternatives, decision to act (or not) and response. The ADM figure illustrates the interactions of these steps and how to produce a safe outcome.

Attitude Management

How a pilot handles his or her responsibilities as "pilot-in-command" depends to a large degree upon ingrained attitudes--toward safety, toward him or herself, and toward flying. Attitudes are learned and are not innate behavior. Good attitudes can be developed--again, through training--into a positive mental framework that encourages and produces good pilot judgement. On the other hand, bad pilot thinking habits created by previously learned poor attitudes can be "unlearned" or modified through training.

How positive attitudes toward flying can be learned is one aspect of this judgment and decision making training. This aspect is discussed in detail in chapters 4, 5 and 6 of this manual.

Stress Management

Learning how to identify and cope with all aspects of stress which impact decision making is a second important aspect of ADM training. Both general life stress management and flight associated stress management are the topics discussed in Chapter 7. The importance of recognizing the presence of "stressors" in ourselves, the aircraft and the environment must be developed. The impact of stress on decision making is well documented in accident statistics. The goal of ADM training is to minimize this impact.

Headwork Response Process

The headwork response process involves orderly, timely decision making. The ADM program presents a process approach to decision making which differs from many of the traditional methods of teaching judgment based upon personality attributes. The traditional approach to pilot training is to teach student pilots the capabilities and flight characteristics of an aircraft and its systems; knowledge of the national airspace system; general knowledge of meteorology; regulations; emergency procedres and "stick and rudder" skills. The premise being that, if student pilots have this kind of information, they will be able to exercise the "good judgment" required to assure safe flight.

Since aeronautical decision making is a mental process, pilots can be taught to make good decisions in the first place or to diminish the impact of previous poor judgments. A pilot is expected to do more then skillfully resolve emergencies as they occur. It is equally important to actively avoid those situations that might lead to emergencies by recognizing early signs of impending trouble and taking corrective action before a critical situation can develop.

Finally, outcome predictions is a key element of the headwork response process. As a pilot considers an action, the consequences of taking, as well as not taking, that action must be carefully considered. To assist pilots in this process, the AOPA Air Safety Foundation has developed a decision making training program based upon previous experience in researching the decision making process. The initial decision model consisted of the following steps:

1. UNEXPECTED CHANGE OCCURS/EXPECTED CHANGE DOESN'T OCCUR/DESIRED CHANGE CHANGE DOESN'T OCCUR - To the pilot, this begins the headwork response process. The key is that some change occurs in the flight, a change from normal, or from the expected condition, or from the desired condition. In the case of expectation, it seems that there is sometimes a difference between what a decision maker expects to happen (implying certainty) and what the decision maker may hope will happen (implying uncertainty).

2. CHANGE EMITS SIGNAL - The decision maker needs a signal from the change before reaction can begin. In many instances, the decision set is relatively brief and the change emits a signal, however, there are instances where the change may occur and the decision maker does not receive a signal for a period of time, e.g., a controller does not know if an aircraft is low on fuel until informed by the pilot. In this example, the decision set is operating even though the controller cannot act.

3. DECISION MAKER DETECTS SIGNAL - As mentioned previously, an important element in the process is the detection of change.

4. DECISION MAKER CORRECTLY PROJECTS SIGNAL MEANING - The pilot foresees the implication of the change on the outcome or success of the flight.

5. DECISION MAKER RECOGNIZED THE NEED TO COUNTER OR REACT TO CHANGE - Decision makers usually need to counter a change since many of the changes noted have potentially negative outcomes. In some instances, the change is benign in its occurance, e.g., a controller may not react to a call from a pilot due to heavy involvement with other communications. Responding to a pilot's call is not an act of countering but is one of reaction.

6. DECISION MAKER SEEKS POSSIBLE ACTION OPTIONS - The decision maker recalls or seeks options to counter or react to the change.

7. DECISION MAKER ESTIMATES THE LIKELY OUTCOME OF THE OPTIONS SELECTED - This requires a projection of the events likely to occur from each of the selected options.

8. DECISION MAKER PICKS BEST ACTION TO CONTROL CHANGE - This is selecting an action that successfully modifies the change.

9. DECISION MAKER ACTS TO ADAPT TO THE CHANGE - Action is either taken or not taken.

10. DECISION MAKER WATCHES FOR EFFECTS OF THE COUNTERING ACTION OR REACTION - The decision maker may or may not stay involved in the decision process by monitoring his or her action to achieve the desired outcome.

For purposes of teaching pilots the elements of the decision making process, the original model was too complex and was reduced to a six element decision process using the acronym "DECIDE". The steps in the DECIDE process are:

1. DETECT - The decision maker detects the fact that change has occured.

2. ESTIMATE - The decision maker estimates the need to counter or react to change.

3. CHOOSE - The decision maker chooses a desirable outcome (in terms of success) for the flight.

4. IDENTIFY - The decision maker identifies actions which could successfully control a the change.

5. DO - The decision maker takes action to adapt to the change.

6. EVALUATE - The decision maker evaluates the effect(s) of the action countering the change or reacting to it.

The six elements of the DECIDE model are a continuous loop decision process which has been used during accident analysis and during the instruction of pilots of varying experience levels. Figure 2.5 graphically depicts how this condensed version of the original model provides a self-reinforcing training approach in the ADM training program.

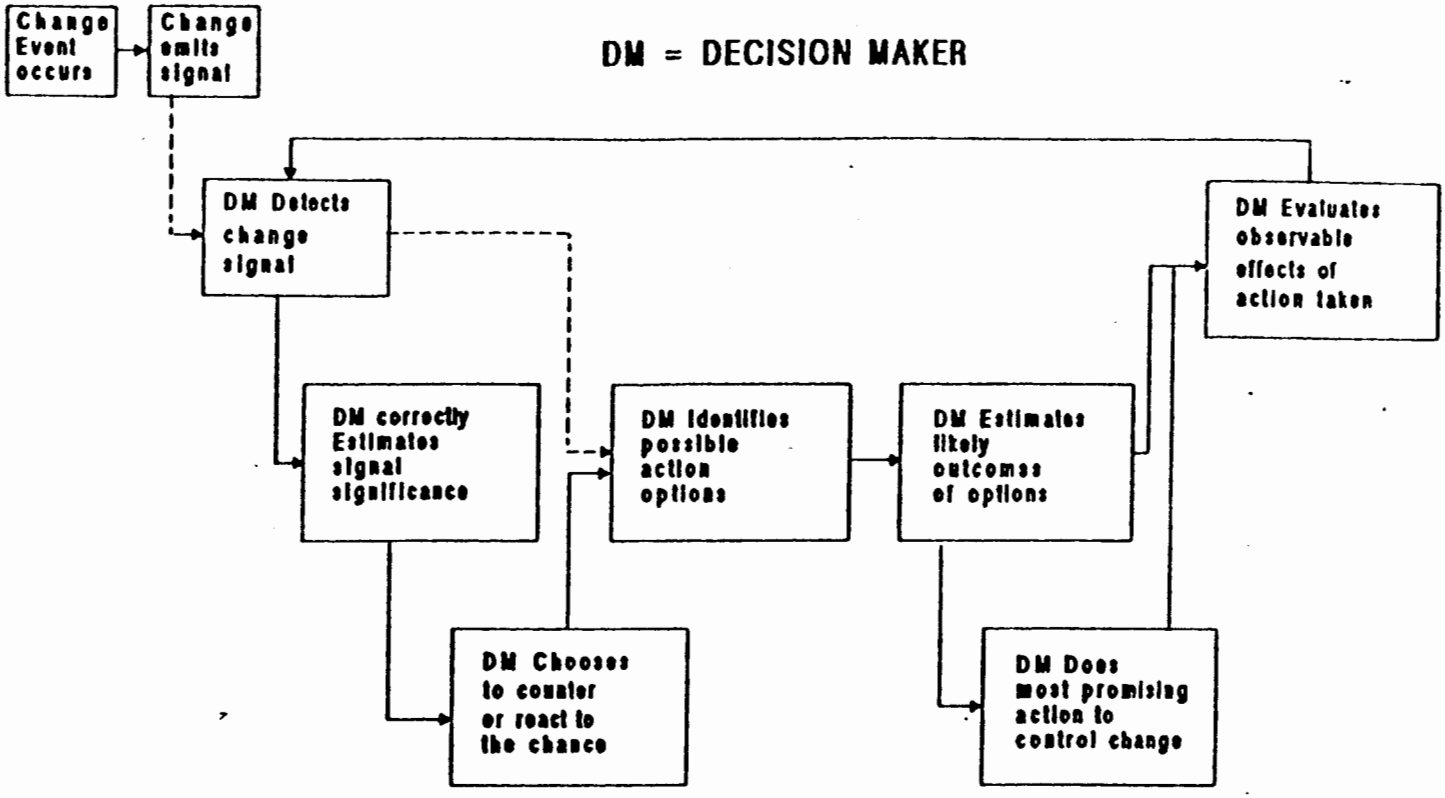
Risk Management

The effects of the change and its probable influence on the safe outcome of the flight must be continually evaluated. An assessment of the risks created by the change helps to focus on those alternatives which are realistic and will produce a safe outcome. This also forces a projection of the events likely to flow from each possible alternative, and, hopefully, results in a rejection of those alternatives which are not realistic.

Risk management includes several previously discussed ADM subject areas such as pilot, aircraft, environment and operational pressures. It is necessary to make an educated guess how change will effect the outcome of the flight. Recognizing the need to react or counter change is the critical element in this step, regardless of whether the change is dramatic, requiring immediate attention, or the change takes place over time, allowing further analysis of the situation. Chapter 3 will discuss how to recognize, analyze and manage risk in detail.

Crew Management

This refers to cockpit resource management methods of making the best use of all crew members (when others are present) through proper communication and coordination techniques. This area is an important adjunct in individual decision making and is covered more detail in a separate manual.



(Source: Adapted from HAZARDOUS MATERIALS EMERGENCIES, Events Analysis, Inc.)

Figure 2.5 Pilot Decision-Making Process Model.

3. BALANCING RISK WHILE FLYING

Every aspect of life involves some element of risk, regardless of whether you drive a car, ride a motorcycle--or fly an airplane. Pilots must learn to cope with the risks associated with flying to ensure years of safe flying.

The purpose of this chapter is to provide a way to manage major and minor risks that occur naturally as part of flying. No flight can be conducted without risk, so decision making is a continuous process of neutralizing that risk. The pilot should always be the one to take action in order to reduce or eliminate the effect of increased risk, and that action must be monitored to be sure it works.

Five Risk Elements

Chapter 2 presented The Five Subject Areas and The ADM process which are important elements in assessing risk. Pilots need to have a systematic way of knowing where to look for risk. The Five Subject Areas are also the five elements of risk in flying, which are:

- Pilot--"P"
- Aircraft--"A"
- Environment--"E"
- Operation--"O"
- Situation--"S"

Each of these risk elements applies not only to the flight itself, but also to the "mission" or reason for the flight. For example, some risks such as unexpected precipitation may be encountered during a flight, but other risks such as the desire to reach home on a Sunday night prior to a big day at work are part of the flight before it ever leaves the ground.

When evaluating risk, a developing or potential hazard must first be detected, then the five risk elements must be reviewed. At this point, it would be useful to consider what makes up each risk element in greater detail.

Pilot

A pilot's performance may be affected in many ways during a flight. The "risk raisers", or things that affect pilots by raising the degree of risk, are called "stressors." The three types of pilot stressors are:

Physical stress - Conditions associated with the environment, such as temperature and humidity extremes, noise, vibration and lack of oxygen.

Physiological stress - Pilot physical conditions such as fatigue, lack of physical fitness, sleep loss, missed meals (leading to low blood sugar levels) and illness.

Psychological stress - Social or emotional factors such as a death in the family, a divorce, a sick child, a demotion at work, etc. This type of stress may also be related to mental workload such as analyzing a problem, navigating an aircraft, or making decisions.

Pilots must evaluate their stress level, and their ability to conduct a flight feeling adequately prepared and qualified. Chapter 7 discusses detailed methods for identifying, reducing and coping with stress while flying.

Aircraft

This risk element focuses on the aircraft equipment, its condition and its suitability for the "mission" or intended purpose of the flight. The best time to make this assessment is on the ground during preflight planning.

Part of this assessment is the condition of the aircraft. Do all of the radios work satisfactorily? Does the engine still develop adequate horsepower? Will the fuel endurance enable the flight to reach the intended destination with adequate reserve? These and other questions which relate to the aircraft form part of a pilot's assessment of the aircraft. Although many pilots already make such an assessment during preflight planning, few recognize it as part of a risk assessment process.

In flight, the assessment needs to be done continuously since conditions, such as winds aloft, change with time even if nothing dramatic appears to be happening. For example, no matter what the flight circumstances, fuel is being burned every instant the engine runs. A safe pilot frequently compares the onboard fuel load with the fuel required to bring the plane to a safe landing at the intended destination or at a diversion airport.

Environment

This risk element is wide reaching and includes situations outside the aircraft which might limit, modify or affect the aircraft, pilot and operational elements. One environmental "risk raiser" which pilots usually consider is weather. Considering the high involvement of weather in fatal general aviation accidents, this definitely deserves attention.

The regulations governing aircraft operations are another less obvious "risk raiser" that should be considered. Pilots must fly safely and legally in compliance with all applicable regulations. Another environmental aspect would be airports which may be used during the flight. Items such as density altitude, runway length, obstacles, landing aids, etc., must be considered before and during the flight.

Operation

As discussed in Chapter 2, the interaction of the pilot, aircraft and environment are influenced by the purpose of each flight operation. The three other risk elements must be evaluated in the context of the desirability of undertaking or continuing the flight as planned, e.g., pressure to arrive by a certain time, an advancing weather front, or fuel being consumed.

The passage of time can also be easily overlooked as a pilot sits in the cockpit totally involved in a problem, wondering how to cope with a worsening situation. If time is short or perceived to be short, impulsive and inappropriate actions may result. Time can complicate an already complex situation. The less time available, the greater the negative effect on the pilot.

Situation

The circumstances regarding a flight, when combined with the previous four risk elements, can increase the probability that an unsafe outcome will result. The combined effects of these risk elements lead into the overall situation which must be continuously evaluated. For example, a pilot feels pressured into keeping an appointment that is already scheduled, or return home from a trip after traveling for several days. The weather is marginal and is not improving. After reassessing the first four risk elements, the pilot decides to delay the flight, not allowing the pressure of the situation to lead into an unsafe outcome.

How Pilots Assess Risk

Within each of the five risk elements, the individual risks which accumulate are called "risk raisers" since they work to raise the level of risk for the flight. In assessing risk, pilots must be aware of the possibilities for risk accumulation so they can determine the need for neutralizing or balancing the risk raisers. Risk can be assessed in a number of ways.

One way to become aware of risk in flying is to look at accident statistics. This can increase your awareness when evaluating the five risk elements during a particular flight. Figure 3.1 compares the accident rate for the various types of flying in general aviation. The category of personal and business flying has the second highest accident rate in general aviation next to aerial application operations.

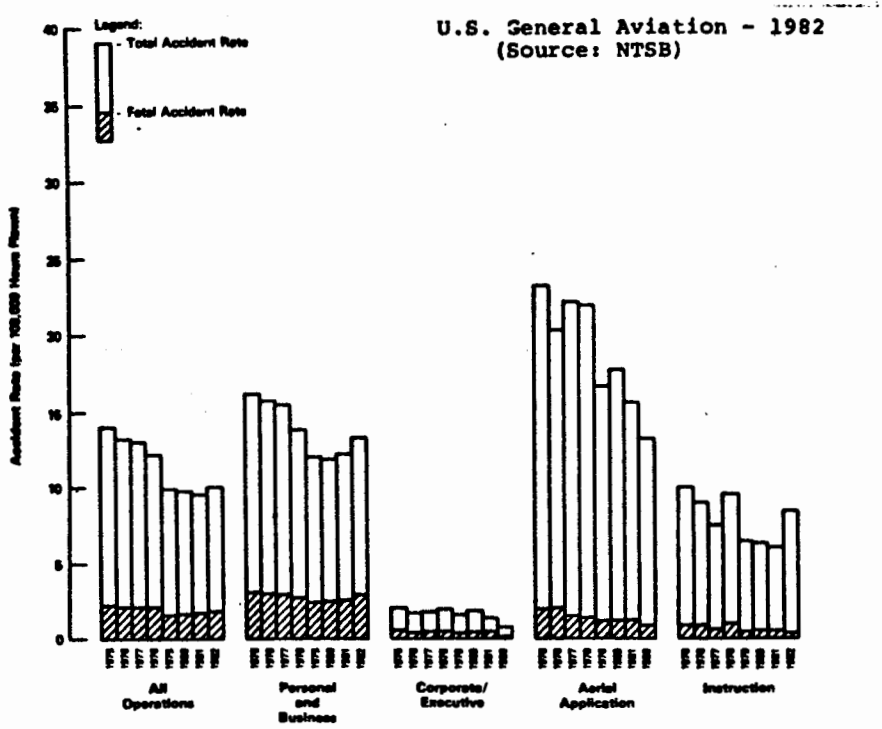


Figure 3.1 Accident Rates by Kind of Flying.

Figure 3.2 indicates that the accident rate for single-engine airplanes is the highest for all general aviation airplane operations. To help evaluate risk, it is useful to review accident data for these type airplanes. Table 3.1 lists the ten most common cause/factors of accidents in fixed-wing aircraft. The majority of these accident causes reflect the unsafe outcome of the pilot's decision-making process.

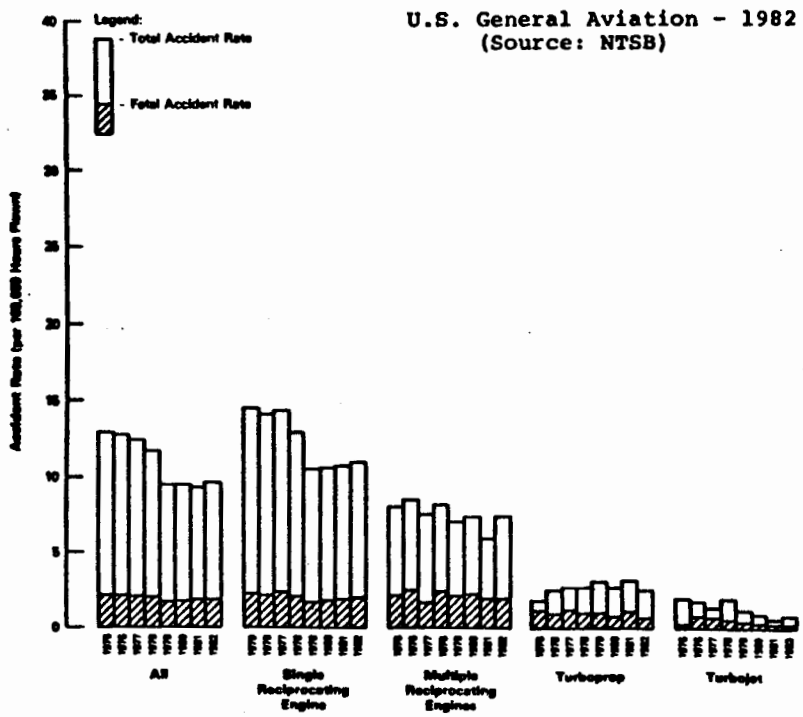


Figure 3.2 Accident Rates by Type of Power.

TOP TEN CAUSES
FOR ALL FIXED WING AIRCRAFT - 1982
(SOURCE: NTSB)

1) Pilot - Failed to maintain directional control.
2) Undetermined.
3) Pilot - Failed to maintain airspeed.
4) Pilot - Misjudged distance.
5) Fuel exhaustion.
6) Pilot - Inadequate preflight preparation and/or planning.
7) Pilot - Selected unsuitable terrain.
8) Pilot - Inadequate aircraft preflight.
9) Pilot - Inadequate visual lookout.
10) Pilot - Misjudged airspeed.

Table 3.1

Knowing the phase of operation in which accidents occur can also increase pilot awareness when evaluating the five risk elements. Figure 3.3 lists general aviation aircraft accidents by phase of flight, and indicates that during 1982, the largest number of accidents (27.1 percent) occurred during landing; 21.5 percent occurred during takeoff; and 19 percent occurred during cruise.

The data in Figure 3.3 indicate that risk should be carefully evaluated for landing, since almost 25 percent of aircraft accidents occurred during flare/touchdown and roll-out. Pilots should ask themselves before takeoff, "Am I proficient enough to safely land this airplane after evaluating all applicable landing environment items such as density altitude, obstructions, crosswind, runway lengths, surface and slope? Have I calculated the aircraft's weight and balance, reviewed the performance charts, and compared the crosswind component with the maximum crosswind limitation of the airplane?"

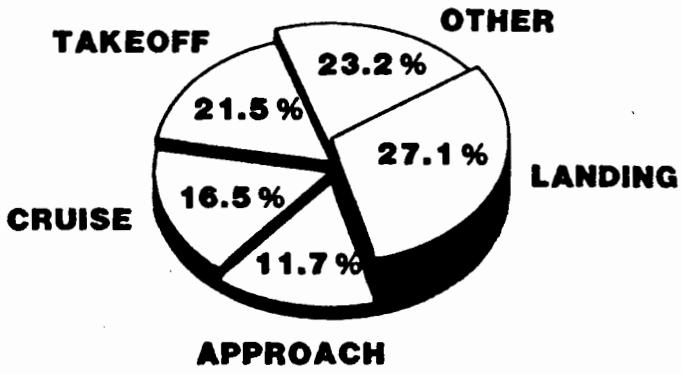


Figure 3.3 Accidents by Phase of Operation (1982).

In 1982, 14 percent of the accidents occurred during initial climb after takeoff. In addition to evaluating the previously mentioned landing items, pilots should review the procedures for responding to an emergency during takeoff, e.g., an engine failure during ground run, liftoff and initial climb. These and other possible emergencies should be reviewed and practiced with an instructor if you do not believe you are proficient.

During cruise, pilots must continue to be alert for emergencies such as engine failure, electrical or engine fire, loss of oil pressure, etc. Limits which you will not exceed must be established in the event conditions deteriorate beyond your abilities, e.g., clouds, visibility and winds.

Figure 3.4 presents accident rates for noninstrument-rated pilots flying single-engine airplanes at night in visual meteorological conditions. With some experience, most pilots learn that night flying is truly an instrument flying situation no matter if in visual or instrument flight conditions. The rates presented are for total pilot time, and indicate a high rate for pilots with less than 51 hours. The rate decreases by 50 percent once a pilot obtains 100 hours, and continues to decrease until obtaining 1,000 hours.

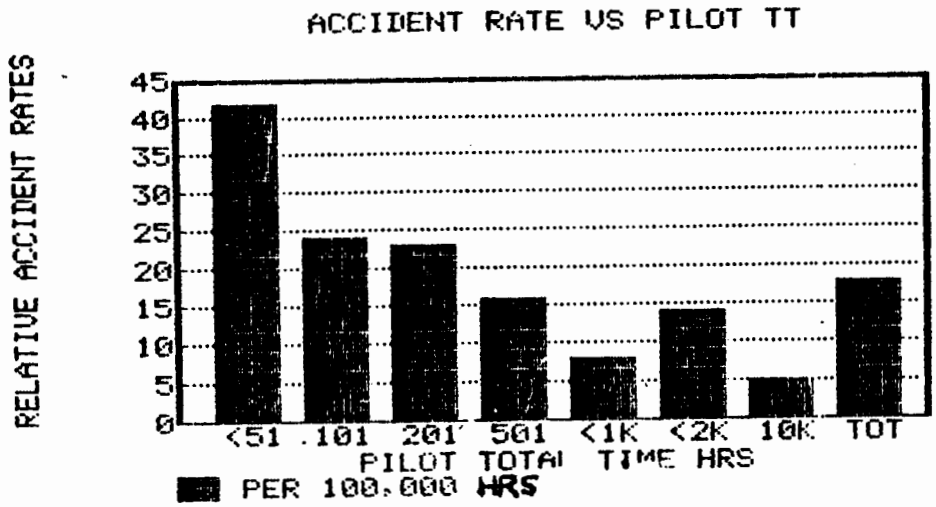


Figure 3.4 Accident Rate vs Pilot Total Time for Noninstrument-Rated Pilots Operating Single-Engine Airplanes in Night Visual Meteorological Conditions.

The data in Figure 3.4 suggests that for the first 500 hours, pilots flying at night should establish higher personal limits than are required by the regulations for VFR flight and apply instrument flying skills to this flight environment. For example, it would be risky to fly at night over mountainous terrain in marginal VFR conditions; or at night with an overcast sky over terrain with few visual references, or with precipitation. These are examples that may have lead you to obtain an instrument rating.

Deal Yourself A Good Hand

Good aeronautical decision making requires a continuous assessment of whether to start a particular flight or to continue a flight as planned. Assume that your evaluation of each of the five risk elements is now a "go/no go" decision. Assign each risk element to the fingers of one hand as shown in Figure 3.5.

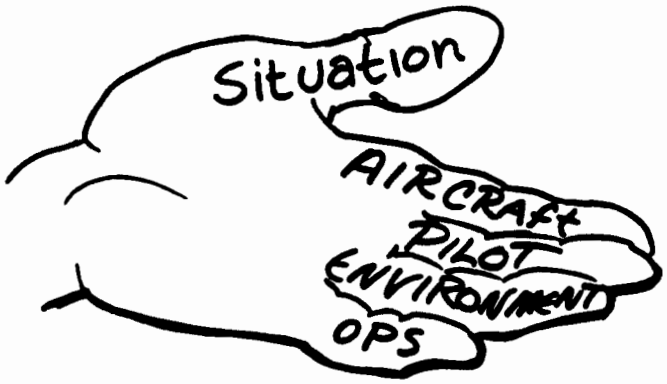


Figure 3.5 The Elements of Risk.

Begin the evaluation with a closed fist and raise one finger for each risk element that you believe is safe for the flight, e.g., raise the finger for the aircraft if you are confident that the airplane will fulfill the purpose for the flight. If you end up with less than a full hand with all fingers extended, reevaluate whether the flight should be conducted or continued. Consider how the "no go" risk elements could be changed, e.g., waiting for better weather, utilizing a more capable aircraft, taking a qualified passenger who can ease your workload by performing communications or navigation duties, etc.

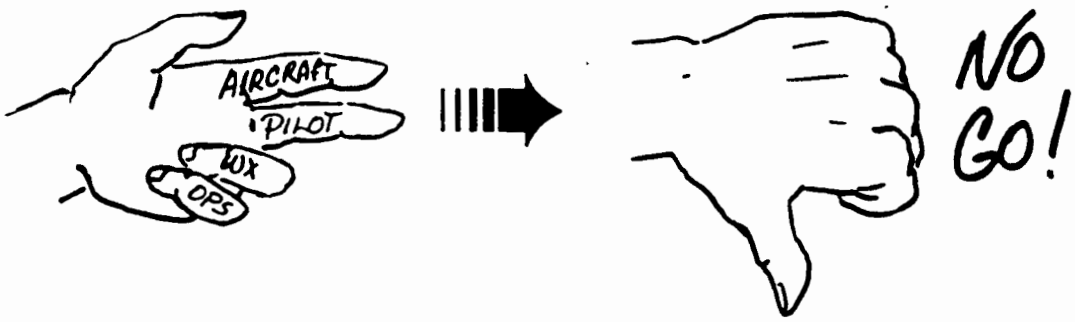


Figure 3.6 Risk Element Evaluation.

A good decision maker in aviation does not act hastily upon "gut" feelings. With an accurate assessment of the risks associated with each of the five risk elements, pilots are best able to arrive at decisions that ensure a safe conclusion to a flight, even if it means not taking off. The measure of good decision making in flying is maintaining the pilot, passengers and aircraft in good health and condition no matter the airport at which the takeoff and landing occurs.

4. SELF-ASSESSMENT OF HAZARDOUS ATTITUDES

In this chapter you will learn about the five hazardous attitudes affecting pilot judgment and how to understand these attitudes as they apply to your flying. In subsequent chapters, you will learn ways to limit your own hazardous attitudes and to reduce the effects of high stress.

As a first step, you are now to take a self-assessment inventory to give you a personal insight for the following discussions and training. This information is only for your own use. It is not intended to be shared with your flight instructor or anyone else, unless you choose to do so.

This assessment asks you to decide why you, as a pilot, might have made certain decisions. Ten situations will be presented, each involving a flight decision. After each situation, you will find a list of five possible reasons for a decision. No "correct" answer is provided for any of the 10 situations. You may indeed be correct in believing that a safe pilot would not choose any of the five alternatives. Be assured that most people know better than to act as described in the situations. Just recognize that the inventory presents extreme cases of incorrect pilot decision making to help introduce you to the five special types of hazardous attitudes described later in the chapter.

Instructions:
Attitude Inventory

1. Use the answer sheet on the next page.

2. Read over each of the situations and the five choices. Decide which one is <u>the most likely reason</u> why you might make the choice that is described. Place a numeral 5 in the space provided on the answer sheet.

3. Continue by placing a numeral 4 by the next most probable reason, and so on, until you have filled in all five blanks with ratings of 5, 4, 3, 2, and 1.

4. Do all 10 situations and <u>fill in each blank</u>, even though you may disagree with the choices listed. Remember, there are no correct answers.

EXAMPLE:

a. __1__ (your least likely response)

b. __3__

c. __5__ (your most likely response)

d. __2__

e. __4__

ATTITUDE INVENTORY
Answer Sheet

Situation 1
a. _____
b. _____
c. _____
d. _____
e. _____

Situation 2
a. _____
b. _____
c. _____
d _____
e. _____

Situation 3
a. _____
b. _____
c. _____
d. _____
e. _____

Situation 4
a. _____
b. _____
c. _____
d. _____
e. _____

Situation 5
a. _____
b. _____
c. _____
d. _____
e. _____

Situation 6
a. _____
b. _____
c. _____
d. _____
e. _____

Situation 7
a. _____
b. _____
c. _____
d. _____
e. _____

Situation 8
a. _____
b. _____
c. _____
d. _____
e. _____

Situation 9
a. _____
b. _____
c. _____
d. _____
e. _____

Situation 10
a. _____
b. _____
c. _____
d. _____
e. _____

ATTITUDE INVENTORY

Situation 1

You are on a flight to an unfamiliar, rural airport. Flight service states that VFR flight is not recommended since heavy coastal fog is forecast to move into the destination airport area about the time you expect to land. You first consider returning to your home base where visibility is still good, but decide instead to continue as planned and land safely after some problems. Why did you reach this decision?

a. You hate to admit that you cannot complete your original flight plan.

b. You resent the suggestion by flight service that you should change your mind.

c. You feel sure that things will turn out safely, that there is no danger.

d. You reason that since your actions would make no real difference, you might as well continue.

e. You feel the need to decide quickly so you take the simplest alternative.

Situation 2

While taxiing for takeoff, you notice that your right brake pedal is softer than the left. Once airborne, you are sufficiently concerned about the problem to radio for information. Since strong winds are reported at your destination, an experienced pilot who is a passenger recommends that you abandon the flight and return to your departure airport. You choose to continue the flight and experience no further difficulties. Why did you continue.

a. You feel that suggestions made in this type of situation are usually overly cautious.

b. Your brakes have never failed before, so you doubt that they will this time.

c. You feel that you can leave the decision to the tower at your destination.

d. You immediately decide that you want to continue.

e. You are sure that if anyone could handle the landing, you can.

Situation 3

Your regular airplane has been grounded because of an airframe problem. You are scheduled in another airplane and discover it is a model you are not familiar with. After your preflight you decide to take off on your business trip as planned. What was your reasoning?

a. You feel that a difficult situation will not arise so there is no reason not to go.

b. You tell yourself that if there were any danger, you would not have been offered the plane.

c. Your are in a hurry and do not want to take the time to think of alternate choices.

d. You do not want to admit that you may have trouble flying an unfamiliar airplane.

e. You are convinced that your flight instructor was much too conservative and pessimistic when he cautioned you to be thoroughly checked out in an unfamiliar aircraft.

Situation 4

You were briefed about possible icing conditions, but did not think there would be any problem since your departure airport temperature was 60°F (15°C). As you near your destination, you encounter freezing precipitation, which clings to your aircraft, and your passenger, who is a more experienced pilot, begins to panic. You consider turning back to the departure airport, but continue instead. Why did you not return?

a. You feel that having come this far, things are out of your hands.

b. The panic of the passenger makes you "commit yourself" without thinking the situation over.

c. You do not want the passenger to think you are afraid.

d. You are determined not to let the passenger think he can influence what you do.

e. You do not believe that the icing could cause your plane to crash in these circumstances.

Situation 5

You do not bother to check weather conditions at your destination. En route, you encounter headwinds. Your fuel supply is adequate to reach your destination, but there is almost no reserve for emergencies. You continue the flight and land with a nearly dry tank. What most influenced you to do this?

a. Being unhappy with the pressure of having to choose what to do, you make a snap decision.

b. You do not want your friends to hear that you had to turn back.

c. You feel that flight manuals always understate the safety margin in fuel tank capacity.

d. You believe that all things usually turn out well, and this will be no exception.

e. You reason that the situation has already been determined because the destination is closer than any other airport.

Situation 6

You are forty minutes late for a trip in a small airplane, and since the aircraft handled well on the previous day's flight, you decide to skip most of the preflight check. What leads you to this decision?

a. You simply take the first approach to making up time that comes to mind.

b. You feel that your reputation for being on time demands that you cut corners when necessary.

c. You believe that some of the preflight inspection is just a waste of time.

d. You see no reason to think that something unfortunate will happen during this flight.

e. If any problems develop, the responsibility would not be yours. It is the maintenance of the airplane that really makes the difference.

Situation 7

You are to fly an aircraft which you know is old and has been poorly maintained. A higher than normal RPM drop on the magneto check is indicated, and you suspect the spark plugs. Your friends, who are travelling as passengers, do not want to be delayed. After five minutes of debate, you agree to make the trip. Why did you permit yourself to be persuaded?

a. You feel that you must always prove your ability as a pilot, even under less than ideal circumstances.

b. You believe that regulations overstress safety in this kind of situation.

c. You think that the spark plugs will certainly last for just one more flight.

d. You feel that your opinion may be wrong since all the passengers are willing to take the risk.

e. The thought of changing arrangements is too annoying, so you jump at the suggestion of the passengers.

Situation 8

You are on final approach when you notice a large unidentified object on the far end of the runway. You consider going around, but your friend suggests landing anyway since the runway is "plenty long enough." You land, stopping 200 feet short of the obstacle. Why did you agree to land?

a. You have never had an accident, so you feel that nothing will happen this time.

b. You are pleased to have someone else help with the decision and decide your friend is right.

c. You do not have much time, so you just go ahead and act on your friend's suggestion.

d. You want to show your friend that you can stop the plane as quickly as needed.

e. You feel that the regulations making the pilot responsible for the safe operation of the aircraft do not apply here since it is the airport's responsibility to maintain the runway.

Situation 9

You have just completed your base leg for a landing on runway 14 at an uncontrolled airport. As you turn to final, you see that the wind has changed, blowing from about 90°. You make two sharp turns and land on runway 11. What was your reasoning.

a. You believe you are a really good pilot who can safely make sudden maneuvers.

b. You believe your flight instructor was overly cautious when insisting that a pilot must go around rather than make sudden course changes while on final approach.

c. You know there would be no danger in making the sudden turns because you do things like this all the time.

d. You know landing into the wind is best, so you act as soon as you can to avoid a crosswind landing.

e. The unexpected wind change is a bad break, but you figure if the wind can change, so can you.

Situation 10

You have flown to your destination airfield only in daylight and believe that you know it well. You learn that your airplane needs a minor repair which will delay your arrival until well after dark. Although a good portion of the flight is after dark, you feel that you should be able to recognize some of the lighted landmarks. Why did you decide to make the flight?

a. You believe that when your time comes you cannot escape, and until that time there is no need to worry.

b. You do not want to wait to study other operations, so you carry out your first plan.

c. You feel that if anyone can handle this problem, you can do it.

d. You believe that the repair is not necessary. You decide you will not let recommended but minor maintenance stop you from getting to your destination.

e. You simply do not believe that you could get off course despite your unfamiliarity with ground references at night.

SCORING INSTRUCTIONS FOR ATTITUDE INVENTORY

Now that you have completed taking the inventory, the next step is to score it to determine your hazardous attitude profile. You will need to use your answer sheet (page 26), the scoring keys on pages 33 through 37, and the profile graph on page 39.

1. Place the left side of the answer sheet on top of the first scoring key (Anti-Authority, page 33) so that it is lined up with the scoring key blanks for situations 1 through 5. Add the numbers written on your answer sheet which appears next to the "x's" on the scoring key. Keep these totals on a separate piece of paper.,

2. When you have done this for situations 1 through 5, move the answer sheet so that its right edge now lines up with the blanks for situations 6 through 10. Add the numbers next to the "x's" for situations 6 through 10 to the first total which you recorded on a separate piece of paper.

3. Write this sum on the top of the profile graph (page 38).

4. Repeat this procedure for all five scoring keys.

See the example below for the use of the scoring key.

EXAMPLE OF SCORING KEY USE

Scoring Key For Anti-Authority		Answer Sheet:	
Situation 1		Situation 1	
a.		a.	4
b.	x	b.	3
c.		c.	1
d.		d.	5
e.		e.	2
Situation 2		Situation 2	
a.		a.	3
b.		b.	2
c.		c.	5
d.	x	d.	1
e.		e.	4

3	(number next to "X" on scoring key at 1-b)
+1	(number next to "x" on scoring key at 2-d)
= 4	sub-total for situations 1 and 2
+...	(numbers next to "x's" for situations 3 thru 10)

Grand total of all 10 numbers next to x's.

Transfer this total to the "Anti-Authority" blank at the top of the profile graph, page 38.

Scoring Key For
ANTI-AUTHORITY

Situation 1
a. _____
b. __x__
c. _____
d. _____
e. _____

Situation 2
a. __x__
b. _____
c. _____
d. _____
e. _____

Situation 3
a. _____
b. _____
c. _____
d. _____
e. __x__

Situation 4
a. _____
b. _____
c. _____
d. __x__
e. _____

Situation 5
a. _____
b. _____
c. __x__
d. _____
e. _____

Situation 6
a. _____
b. _____
c. __x__
d. _____
e. _____

Situation 7
a. _____
b. __x__
c. _____
d. _____
e. _____

Situation 8
a. _____
b. _____
c. _____
d. _____
e. __x__

Situation 9
a. _____
b. __x__
c. _____
d. _____
e. _____

Situation 10
a. _____
b. _____
c. _____
d. __x__
e. _____

Scoring Key For
IMPULSIVITY

Situation 1
a. _____
b. _____
c. _____
d. _____
e. __x__

Situation 2
a. _____
b. _____
c. _____
d. __x__
e. _____

Situation 3
a. _____
b. _____
c. __x__
d. _____
e. _____

Situation 4
a. _____
b. __x__
c. _____
d. _____
e. _____

Situation 5
a. __x__
b. _____
c. _____
d. _____
e. _____

Situation 6
a. __x__
b. _____
c. _____
d. _____
e. _____

Situation 7
a. _____
b. _____
c. _____
d. _____
e. __x__

Situation 8
a. _____
b. _____
c. __x__
d. _____
e. _____

Situation 9
a. _____
b. _____
c. _____
d. __x__
e. _____

Situation 10
a. _____
b. __x__
c. _____
d. _____
e. _____

Scoring Key For
INVULNERABILITY

Situation 1
a. ____
b. ____
c. x
d. ____
e. ____

Situation 2
a. ____
b. x
c. ____
d. ____
e. ____

Situation 3
a. x
b. ____
c. ____
d. ____
e. ____

Situation 4
a. ____
b. ____
c. ____
d. ____
e. x

Situation 5
a. ____
b. ____
c. ____
d. x
e. ____

Situation 6
a. ____
b. ____
c. ____
d. x
e. ____

Situation 7
a. ____
b. ____
c. x
d. ____
e. ____

Situation 8
a. x
b. ____
c. ____
d. ____
e. ____

Situation 9
a. ____
b. ____
c. x
d. ____
e. ____

Situation 10
a. ____
b. ____
c. ____
d. ____
e. x

Scoring Key For MACHO

Situation 1
a. x
b. _____
c. _____
d. _____
e. _____

Situation 2
a. _____
b. _____
c. _____
d. _____
e. x

Situation 3
a. _____
b. _____
c. _____
d. x
e. _____

Situation 4
a. _____
b. _____
c. x
d. _____
e. _____

Situation 5
a. _____
b. x
c. _____
d. _____
e. _____

Situation 6
a. _____
b. x
c. _____
d. _____
e. _____

Situation 7
a. x
b. _____
c. _____
d. _____
e. _____

Situation 8
a. _____
b. _____
c. _____
d. x
e. _____

Situation 9
a. x
b. _____
c. _____
d. _____
e. _____

Situation 10
a. _____
b. _____
c. x
d. _____
e. _____

Scoring Key For
RESIGNATION

Situation 1
a. _____
b. _____
c. _____
d. __x__
e. _____

Situation 2
a. _____
b. _____
c. __x__
d. _____
e. _____

Situation 3
a. _____
b. __x__
c. _____
d. _____
e. _____

Situation 4
a. __x__
b. _____
c. _____
d. _____
e. _____

Situation 5
a. _____
b. _____
c. _____
d. _____
e. __x__

Situation 6
a. _____
b. _____
c. _____
d. _____
e. __x__

Situation 7
a. _____
b. _____
c. _____
d. __x__
e. _____

Situation 8
a. _____
b. __x__
c. _____
d. _____
e. _____

Situation 9
a. _____
b. _____
c. _____
d. _____
e. __x__

Situation 10
a. __x__
b. _____
c. _____
d. _____
e. _____

PROFILE GRAPH

1. Enter the raw scores obtained from each scoring key in the correct blank space below. The sum of the five scores should equal 150. If it does not, go back and check your work.

Anti-Authority _____

Impulsivity _____

Invulnerability _____

Macho _____

Resignation _____

TOTAL.....150

2. Now look at the hazardous attitude profile form on the next page. Notice that there are five columns, one for each of the raw scores. Place a mark on each line at the height that matches your score. Now draw lines connecting the five marks.

HAZARDOUS ATTITUDE PROFILE

Anti-Authority	Impulsivity	Invulnerability	Macho	Resignation
50	50	50	50	50
40	40	40	40	40
30	30	30	30	30
20	20	20	20	20
10	10	10	10	10

Profile Explanation

You now have a profile graph which indicates the comparative strength of each of the five hazardous attitudes for you. (Remember, your scores are confidential and need not be divulged to anyone!) The higher the relative number, the greater the likelihood that you will respond with that hazardous attitude. Keep your results in mind as you read further. Let us begin the explanation of your profile by describing an all-too-common flight situation.

A pilot of a single-engine airplane checks the weather and notes that there is a possibility of a thunderstorm at his destination airport. He has never operated an aircraft in bad weather, and he knows that his flight instructor would advise him not to fly. Despite this, he takes off, crashes in poor weather, and seriously injures himself.

Why does this occur so often? Because many accidents involve pilots who allow themselves to be influenced by one or more of the five hazardous attitudes. These attitudes get pilots into trouble by causing them to take chances that invite accidents. (The five hazardous attitudes are the ones recorded on the assessment inventory which you just completed.)

Summary

If you have not already done so, look back at your profile to see which hazardous attitudes most often matched your own thinking when you answered the questions. This shows which patterns you tend to use when your judgment becomes influenced by hazardous thinking. The inventory does not show that you are bound to act in the manner of one or more of the hazardous thoughts. Having thoughts similar to the ones described as hazardous is common and normal. But as you progress in your flight training, you will find yourself thinking fewer and fewer hazardous thoughts as you become able to identify and counteract them. The important thing to learn is to balance all your thoughts against possible outcomes so that you act only in a safe manner. A critical part of your training, then, is learning to examine your own thinking and control hazardous attitudes. Whether you now engage in one or more of these thought patterns, often or only rarely, learning to control them will be worthwhile; you will become a safer pilot the less often you act upon a hazardous thought.

When you work on all five hazardous attitudes in the next section, pay particular attention to the ones on which you scored the highest. (Note: The next section is to be completed as soon as possible after you finish the self-assessment profile.)

THE FIVE HAZARDOUS ATTITUDES

1. **Anti-Authority:**
   "Don't tell me!"

   This thought is found in people who do not like anyone telling them what to do. They think, "Don't tell me!" In a sense, they are saying, "No one can tell me what to do." They may either be resentful of having someone tell him or her what to do or may just regard rules, regulations, and procedures as silly or unnecessary. However, it is always your prerogative to question authority if you feel it is in error.

2. **Impulsivity:**
   "Do something--quickly!"

   This is the thought pattern of people who frequently feel the need to do something, anything, immediately. They do not stop to think about what they are about to do; they do not select the best alternative--they do the first thing that comes to mind.

3. **Invulnerability:**
   "It won't happen to me."

   Many people feel that accidents happen to others but never to them. They know accidents can happen, and they know that anyone can be affected; but they never really feel or believe that they will be the one involved. Pilots who think this way are more likely to take chances and run unwise risks, thinking all the time, "It won't happen to me!"

4. **Macho:**
   "I can do it."

   People who are always trying to prove that they are better than anyone else think, "I can do it!" They "prove" themselves by taking risks and by trying to impress others. While this pattern is thought to be a male characteristic, women are equally susceptible.

5. **Resignation:**
   "What's the use?"

   People who think, "What's the use?" do not see themselves as making a great deal of difference in what happens to them. When things go well, they think, "That's good luck." When things go badly, they attribute it to bad luck or feel that someone is "out to get them." They leave the action to others--for better or worse. Sometimes, such individuals will even go along with unreasonable requests just to be a "nice guy."

5. REINFORCEMENT THROUGH REPETITION

This chapter is designed to help you identify and understand the five hazardous attitudes and to see how they can influence a pilot's reaction to judgment situations. As you recall, these five hazardous attitudes are:

1. ANTI-AUTHORITY:
   "Don't tell me!"

2. IMPULSIVITY:
   "Do something--quickly!"

3. INVULNERABILITY:
   "It won't happen to me!"

4. MACHO:
   "I can do it."

5. RESIGNATION:
   "What's the use?"

Following these instructions you will find another series of situations. At the end of each situation, you will be asked to select an alternative which best illustrates the reactions of a pilot who is thinking a particular hazardous attitude. After you select what you feel is the best alternative, look immediately at the adjacent page for the proper response. This page will tell you if your answer is correct or incorrect. If you answered correctly, go on to the next situation. If you answered incorrectly, you will be told why. Then, go back to the situation and select another alternative.

KEEP SELECTING ALTERNATIVES UNTIL YOU SELECT THE CORRECT ONE. Do not be concerned if you select a wrong alternative. You will learn something from the feedback given to you. The lessons are deliberately repetitious, and, thus, get easier as you go along.

Sample Situation

You arrive at the airport late, and decide to take off without cleaning the windshield. On final approach, you are barely able to see the runway due to the sun's glare on the dirty windshield. Which of the following alternatives best illustrates the ANTI-AUTHORITY hazardous attitude.

a. You feel that it's the lineman's job to clean the windshield.

b. You refuse to clean the windshield because your flight instructor always insisted that you do so.

c. You just wanted to get going--now!

d. You feel that your vision is sharp enough to see through the dirty windshield.

e. You've flown with dirty windshields before without any problems.

Sample Situation Response:

Alternative a:
No! Assigning responsibility for cleaning the windshield to someone else is an example of the hazardous attitude resignation. Go back to the sample Situation and select another alternative.

Alternative b:
This is the correct hazardous attitude involved. The pilot obviously resented the authority of the instructor.

Alternative c:
This is the impulsivity hazardous attitude. Go back and select another alternative.

Alternative d:
This clearly is an example of the macho hazardous attitude. Select another alternative.

Alternative e:
No. This is the invulnerability hazardous attitude. Just because you got away with it before doesn't mean you can get away with it again. Select another alternative.

THE ANTI-AUTHORITY HAZARDOUS ATTITUDE

From the choices following each situation, pick the ONE choice that is the best example of an anti-authority hazardous attitude. Check your answers on pages 45-47 before continuing. REMEMBER--if you did not choose the correct answer, select another until you choose the correct one.

Situation 1:

You do not conduct a thorough preflight. On takeoff you notice that the airspeed indicator is not working, but, nevertheless, continue the takeoff roll! Your passenger feels strongly that you should discontinue the flight and return to the airfield. You then become upset with your friend. Which of the following alternatives best illustrates the ANTI-AUTHORITY reaction?

a. You tell your passenger to "cool it" for butting in.

b. You start banging the indicator to get it working.

c. You think that the preflight check is something thought up by bureaucrats just to waste a pilot's time.

d. You tell the passenger that nothing dangerous will happen on the flight.

e. Your passenger continues to become more upset, but you do nothing, because you feel there is no use trying to calm the fellow down.

Situation 2:

You have been cleared for an approach to a poorly lighted airport. You are not sure if this is the airfield where you want to land. The surrounding buildings do not look familiar, but it has been over a year since your last visit. A much larger, more familiar airfield is 15 miles away. Which of the following alternatives illustrates the ANTI-AUTHORITY reaction?

a. You decide to land anyway, thinking, "Of course I can handle this situation."

b. Rather than confuse yourself by thinking about options, you decide to land and get the flight over with.

c. You feel nothing will happen since you have gotten out of similar jams before.

d. You decide to land since the controller cleared you.

e. You decide to land because the regulations do not really apply in this situation.

Situation 3:

As you are preparing to take a friend for his first airplane ride, you announce that you do not believe in wearing shoulder harnesses. Rather than explaining the regulations and the potential dangers involved you simply take off. Which of the following alternatives best illustrates the ANTI-AUTHORITY reaction?

a. You know that, as a good pilot, you could handle any emergency long enough to buckle up.

b. It's just a local flight on a beautiful day so nothing could go wrong.

c. You feel that "seat belt" bureaucrats have invented yet another unnecessary regulation.

d. You feel that if you're going to crash the harnesses won't save you.

e. You just want to get going.

RESPONSE LIST 1:
THE ANTI-AUTHORITY HAZARDOUS ATTITUDE

Situation 1:

Alternative a;

By acting in a superior way, you are being macho, thinking, "I can do it." Go back to Situation 1 and select another alternative.

Alternative b:

By becoming upset and banging the airspeed indicator and by not thinking about the situation, you are being impulsive, thinking "Do something--quickly!" Go back to Situation 1 and select another alternative.

Alternative c:

You have correctly identified the hazardous attitude involved. Looking on rules and procedures as just a "waste of time" instead of taking them seriously is an indication of the anti-authority hazardous thought, "Don't tell me." Go on to Situation 2.

Alternative d:

Thinking that nothing will happen to you illustrates the hazardous attitude of invulnerability, "It won't happen to me." Go back to Situation 1 and select another alternative.

Alternative e:

By assuming that what you do has no effect on the passenger, the pilot is illustrating the resignation hazardous attitude, "What's the use?" Go back to Situation 1 and select another alternative.

A good attitude...

If your airspeed indicator is not "alive" on your takeoff roll, abort your takeoff providing you still have sufficient runway remaining.

Situation 2:

Alternative a:

Thinking that you can handle the situation even when there is reason to be concerned is an example of the macho hazardous attitude, "I can do it." Go back to Situation 2 and select another alternative.

Alternative b:

This is the hazardous attitude of impulsivity: "Do something--quickly!" Go back to Situation 2 and select another alternative.

Alternative c:

Anyone who thinks that nothing will happen to him, even in a problem situation, is illustrating the hazardous attitude of invulnerability, "It won't happen to me." Go back to Situation 2 and select another alternative.

Alternative d:

The belief that "the controller is watching over me" means that the pilot expects the outcome to be decided totally by that controller. He has left himself out of the process. That is the hazardous attitude of resignation, "What's the use?" Go back to Situation 2 and select another alternative.

Alternative e:

Well done--you have identified the correct hazardous attitude. Disregarding regulations or not taking them seriously is the anti-authority thought, "Don't tell me." Go on to Situation 3.

A good attitude...

A night landing at a well lighted airport is much less dangerous than landing at a poorly lit field.

Situation 3:

Alternative a:

Thinking that you are good enough to handle any situation shows a degree

of overconfidence which is associated with the "I can do it" macho hazardous attitude. Go back to Situation 3 and select another alternative.

Alternative b:

Sometimes even local flights result in mishaps. This response suggests a belief that, "It won't happen to me"--the invulnerability hazardous attitude. Go back to Situation 3 and select another alternative.

Alternative c:

Correct! This is the hazardous attitude involved. Most regulations are based on a lot of evidence. In this case overwhelming data indicate that shoulder harnesses and lap belts save lives. Go on to the next hazardous attitude.

Alternative d:

No! This kind of response suggests an attitude of resignation--"What's the use?" Go back to Situation 3 and select another alternative.

Alternative e:

No! The unreasoning desire to "just get going" is indicative of the impulsivity hazardous attitude--"Do something quickly." Go back to Situation 3 and select another alternative.

A good attitude...

Life is fragile--buckle up.

THE IMPULSIVITY HAZARDOUS ATTITUDE

From the five choices following each situation, pick the ONE choice that is the best example of an impulsivity hazardous attitude. Check your answers on pages 48-51 and keep selecting until you have made the correct choice.

Situation 1:

As you enter the pattern (circuit) you normally lower the flaps. The tower suddenly changes the active runway. Distracted, you forget to use the before-landing checklist. On short final you find yourself dangerously low with a high sink rate. Glancing back, you realize that you forgot to extend the flaps. Which of the following alternatives best illustrates the IMPULSIVITY reaction?

a. You feel that nothing is going to happen because you've made intentional no-flap landings before.

b. You laugh and think, "Boy, this low approach will impress people on the ground."

c. You think that using a checklist is a stupid requirement.

d. You immediately grab the flap handle and add full flaps.

e. You think, "It's all up to whether I get an updraft or downdraft now."

Situation 2:

Landing at an unfamiliar airport for fuel, you tell the linemen to "fill it up" and run inside the terminal to make a phone call. Returning, you pay the bill and take off without checking the aircraft, the fuel caps, or the fuel. Which of the following alternatives indicates the IMPULSIVITY reaction?

a. You feel that it's a silly requirement to preflight an aircraft which you've just flown.

b. You just want to get underway--quickly.

c. You know that you have skipped preflights before and nothing bad ever happened.

d. You have every confidence that a pilot with your skill level could handle in flight anything that might have been overlooked on the ground.

e. You feel that since you paid top dollar for the fuel, it's the responsibility of the linemen to ensure the airplane was refueled correctly.

Situation 3:

After dark two friends talk you into going for a short hop. You eagerly drive to the airport without checking the weather because it looks clear and you intend to stay in the pattern. After takeoff you fly into a low hanging cloud layer. Which of the following alternatives best illustrates the IMPULSIVITY reaction?

a. You never check the weather because you always thought your instructor was overly cautious when it came to weather.

b. You feel that because you had several hours of hood time recently, flying in the clouds would be a piece of cake.

c. You think that you'll be out of these clouds soon because the sky looked clear from the ground. Besides, you have flown through light clouds before in daylight.

d. You figure that you can always get air traffic control to talk you down.

e. You just want to push the nose over immediately to get below the clouds.

RESPONSE LIST 2:
THE IMPULSIVITY HAZARDOUS ATTITUDE

Situation 1:

Alternative a:

Feeling that nothing bad can happen suggests the invulnerability hazardous attitude, "It won't happen to me." Go back to Situation 1 and select another alternative.

Alternative b:

When you are thinking about impressing people on the ground, watch out for the macho hazardous attitude, "I can do it"--this can cost you dearly. Go back to Situation 1 and select another alternative.

Alternative c:

Thinking that checklists are stupid suggests that you feel the aircraft designers, the government, and your instructor--all of whom urge the use of checklists--are wrong. This suggests a "Don't tell me" reaction which is the anti-authority hazardous attitude. Go back to Situation 1 and select another alternative.

Alternative d:

Right! Immediately adding full flaps without thinking is an example of the impulsivity hazardous attitude, "Do something quickly." Unfortunately, in this situation, full flaps will probably only increase the sink rate. Go on to Situation 2.

Alternative e:

If you are convinced that it's up to the wind, this implies the hazardous attitude of resignation, "What's the use." Go back to Situation 1 and select another alternative.

A good attitude...

Distractions can be dangerous--always use your checklist!

Situation 2:

Alternative a:

Thinking that regulations requiring a preflight inspection are silly suggests a definite anti-authority hazardous attitude. The belief that rules are for other people--a "Don't tell me" attitude--indicates the anti-authority hazardous attitude. Go back to Situation 2 and select another alternative.

Alternative b:

That's correct. Just wanting to get going indicates the impulsivity hazardous attitude "Do something--quickly." Go on to Situation 3.

Alternative c:

Just because you got away with it before does not mean that it is safe. This type of hazardous attitude suggests a feeling of invulnerability, "It won't happen to me." Go back to Situation 2 and select another alternative.

Alternative d:

This overconfidence suggests a macho hazardous attitude. Even though you may think, "I can do it," you will soon find this attitude will get you into dangerous situations. Go back to Situation 2 and select another alternative.

Alternative e:

Feeling that it is up to somebody else to be responsible is usually associated with dependence on others and suggests the hazardous attitude of resignation--"What's the use?" Go back to Situation 2 and select another alternative.

A good attitude...

It's your responsibility to ensure that your aircraft has been properly refueled.

Situation 3:

Alternative a:

This attitude of revolting against a practice that your instructor made you adhere to is a definite hazardous attitude resulting from anti-authority feelings--"Don't tell me." Go back to Situation 3 and select another alternative.

Alternative b:

This response suggests an "I can do it" attitude, associated with the macho hazardous attitude. Go back to Situation 3 and select another alternative.

Alternative c:

The feeling that things will work out is usually associated with the invulnerability hazardous attitude. You falsely believe, "It won't happen to me." Go back to Situation 3 and select another alternative.

Alternative d:

This idea that you can always rely on others for help is associated with the resignation hazardous attitude, "What's the use." Go back to Situation 3 and select another alternative.

Alternative e:

Correct! The clue here is the word immediately. To act without thinking is the impulsivity hazardous attitude--"Do something quickly." This would be very dangerous, especially at night, where spatial disorientation can occur. Go on to the next hazardous thought section as the directions indicate.

A good attitude...

Temperature and dew point--when they come together, watch out!

THE INVULNERABILITY HAZARDOUS ATTITUDE

From the five choices following each situation, pick the ONE choice that is the best example of an invulnerability hazardous attitude. Check your answers on pages 52-54 and keep selecting until you have made the correct choice.

Situation 1:

You are making a pleasure flight with four friends, all of whom are drinking. You refuse to drink, but your friends remind you that you have flown this route many times and that the weather conditions are excellent. They begin to mock you for not drinking with them. Which of the following alternatives best illustrates the INVULNERABILITY reaction?

a. You decide to drink, thinking that a little liquor will not have any bad effect on you.

b. You believe that the government is far too rigid in its regulations about drinking.

c. You resent your friends' insults and start drinking, saying to yourself, "I'll show them."

d. You bend to their will saying to yourself, "If my time is up, it's up whether I drink or not."

e. You suddenly decide to take a drink.

Situation 2:

The control tower advises you to land on a runway other than the one you prefer. You see larger planes using the runway of your choice and wonder why you have been denied permission. Since the tower-recommended runway is on the far side of the airport, you radio the tower and ask for a reconsideration. Which of the following alternatives best illustrates the INVULNERABILITY reaction?

a. Before you receive a reply, you start making your approach to the unauthorized runway.

b. You feel that if other pilots can land their airplanes on the other

runway, so can you.

c. You think that nothing dangerous will occur because you believe wake turbulence is very unlikely.

d. Regardless what the tower tells you, you are going to do what you want to.

e. You figure there is no sense in waiting for instructions because the tower is going to do whatever it pleases, regardless of your wishes.

Situation 3:

Because of strong headwinds on a cross-country flight, you land at an airport to refuel only to learn they are out of gas. A local instructor suggests you backtrack 40 miles to an airport that has fuel. Which of the following alternatives best illustrates the INVULNERABILITY reaction?

a. You ignore this unsolicited advice. You feel flight instructors are always complicating matters.

b. You feel sure you can make it to the next airport because things always seem to work out well for you!

c. You continue your flight because your own instructor approved your flight plan.

d. Rather than taking the time to calculate your fuel requirements and analyze your alternatives, you hop in the plane and go.

e. You decide to go on, thinking how impressed your friends will be when they hear you beat the headwinds without refueling.

RESPONSE LIST 3
THE INVULNERABILITY HAZARDOUS ATTITUDE

Situation 1:

Alternative a:

This is the correct response. Liquor affects everybody, and a pilot who believes that it will not affect him considers himself invulnerable. He thinks, "It won't happen to me." Go on to Situation 2.

Alternative b:

Regarding the authority of the government as too rigid is one way of thinking "Those rules are much more strict than they need to be, so I can disregard them." That is the hazardous attitude of anti-authority. Go back to Situation 1 and select another alternative.

Alternative c:

The desire to show somebody how great you are, the need to prove yourself represents the macho hazardous attitude, "I can do it." Go back to Situation 1 and select another alternative.

Alternative d:

You are thinking what will happen is determined by fate, that you have nothing to do with it. That is the resignation hazardous attitude. Go back to Situation 1 and select another alternative.

Alternative e:

The sudden decision to drink, omitting any serious thought about the situation, is an example of impulsivity: "Do something--quickly!" Go back to Situation 1 and select another alternative.

A good attitude...

If you drink, don't fly.

Situation 2:

Alternative a:

Rushing into action without thinking or waiting for a reply, represents impulsivity. Go back to Situation 2 and select another alternative.

Alternative b:

Thinking that you can do anything that they can do is like saying, "I can do it," in an effort to prove yourself. This is a macho response. Go back to Situation 2 and select another alternative.

Alternative c:

Yes, this is the correct hazardous attitude. The tower is concerned about wake turbulence. The fact that you are not and that you feel there is nothing to worry about is a sign of the hazardous attitude of invulnerability. Go on to Situation 3.

Alternative d:

This is an anti-authority response: "I'll do what I want to do, regardless of what the authority says." Go back to Situation 2 and select another alternative.

Alternative e:

Believing that nothing you do will make any difference is resignation. "What's the use?" Go back to Situation 2 and select another alternative.

A good attitude...

There are many reasons why controllers might want you to land on a certain runway--always feel free to inquire, but then follow explicitly their instructions.

Situation 3:

Alternative a:

The pilot who has no respect for authority figures (such as flight instructors) and disregards their advice, thinking they are always complicating plans, illustrates the hazardous attitude of anti-authority, "Don't tell me." Go back to Situation 3 and select another alternative.

Alternative b:

That's right! Thinking things will always work out is the invulnerability hazardous attitude. "It won't happen to me." Go on to the next hazardous attitude section.

Alternative c:

Feeling that en route decisions are always the responsibility of others (such as your flight instructor) suggests the resignation hazardous attitude, "What's the use?" Go back to Situation 3 and select another alternative.

Alternative d:

No! Making hasty decisions without examining the alternatives suggests the impulsivity hazardous attitude, "Do something--quickly." Go back to Situation 3 and select another alternative.

Alternative e:

This is the "I can do it" attitude often associated with the macho hazardous attitude. Go back to Situation 3 and select another alternative.

A good attitude...

On cross-country flights, situations often arise that require a change of plans.

THE MACHO HAZARDOUS ATTITUDE

From the five choices following each situation, pick the ONE choice that is the best example of a macho hazardous attitude. Check your answers on pages 56-58 and keep selecting until you have made the correct choice.

Situation 1:

Visibility is just over three miles in blowing snow with a 1,100 foot ceiling. Earlier you cleared the airplane of snow, but takeoff has been delayed for 15 minutes. Snow and ice are forming again, and you wonder if you will be able to take off. Which of the following alternatives best illustrates the MACHO reaction?

a. You feel that there is no use getting out and removing the snow since it is only going to form again.

b. You believe that you can take off in these conditions and think of how impressed your friends will be when they hear of it.

c. You take off immediately, thinking that any further delay will worsen the problem.

d. You reason that you can do it because other pilots have done so and nothing happened to them.

e. You resent being delayed 15 minutes and decide you are not going to clear the snow and ice again for anybody.

Situation 2:

The weather forecast calls for freezing rain. En route you notice ice accumulating on the wings. You are not sure what to do because you have never encountered this problem before. Because the airplane is still flying well, you are tempted to do nothing. A passenger suggests you might radio for information. Which of the following alternatives best illustrates the MACHO reaction?

a. You feel that there probably will not be any problem since you have always come out of difficult situations rather well.

b. You feel that there is nothing you can really do because radio information won't change the weather conditions.

c. You quickly tell the passenger to stop butting in.

d. You tell the passenger that you are the boss and will handle the problem your way.

e. You radio for information but decide to ignore the advice since the airplane continues to fly well.

Situation 3:

The runway is short with high trees beyond the runway threshold, and a strong crosswind is blowing. You are asked to take an additional passenger, who will overload the airplane by about 170 pounds. The extra passenger is waiting for your reply. Which of the following alternatives best illustrates the MACHO reaction?

a. You take the passenger, reasoning that if fate says you are going to crash, you will, with or without extra weight.

b. You take the passenger, fearing that you will lose respect if you do not.

c. You take the passenger, remarking to yourself that the weight and balance rules are unnecessarily strict.

d. Since the passenger seems friendly, you take him on board right away and do not give another thought to it.

e. You take the passenger, thinking that accidents only happen to others.

RESPONSE LIST 4:
THE MACHO HAZARDOUS ATTITUDE

Situation 1:

Alternative a:

When a pilot does not see himself as affecting what happens, he is illustrating the hazardous attitude of resignation. He thinks, "What's the use?" Go back to Situation 1 and select another alternative.

Alternative b:

Absolutely! This is the correct hazardous attitude involved. You want to prove yourself, to show off, to have others think that you are great. This is the hazardous attitude of macho: "I can do it." Go on to Situation 2.

Alternative c:

You take off immediately. No thinking; no planning; no looking ahead. Action without thought illustrates impulsivity. Go back to Situation 1 and select another alternative.

Alternative d:

When you think, "Nothing happened to them," you are really saying, "It won't happen to me." That is the hazardous attitude of invulnerability. Go back to Situation 1 and select another alternative.

Alternative e:

Pilots who resent using appropriate safety procedures because they are prescribed by some authority are illustrating the anti-authority hazardous attitude, "Don't tell me." Go back to Situation 1 and select another alternative.

A good attitude...

Any frost, snow or ice on any airplane surface adversely affects performance.

Situation 2:

Alternative a:

When you think that since nothing has ever happened before, nothing will happen in the future, you are thinking, "It won't happen to me," which is the hazardous attitude of invulnerability. Go back to Situation 2 and select another alternative.

Alternative b:

Thinking, "What's the use?" illustrates the resignation hazardous attitude. Go back to Situation 2 and select another alternative.

Alternative c:

Acting without thinking is impulsivity. "Do something--quickly!" Go back to Situation 2 and select another alternative.

Alternative d:

This is the correct hazardous attitude involved. This tendency to say, "We'll do it my way," is a good indication of the macho hazardous attitude, "I can do it." Go on to Situation 3.

Alternative e:

Those who ignore information or advice certainly do not take authority seriously. They are determined to do what they want to do. This illustrates the anti-authority hazardous attitude of "Don't tell me." Go back to Situation 2 and select another alternative.

A good attitude...

Freezing rain or drizzle is the worst icing hazard and can build up rapidly within minutes.

Situation 3:

Alternative a:

Trusting in luck is the same as assuming that whatever happens will happen, in spite of anything you might do to change it. This is illustrating the hazardous attitude of resignation: "What's the use?" Go back to Situation 3 and select another alternative.

Alternative b:

Good thinking! Once again, you have selected the correct hazardous attitude involved. The pilot is more concerned about what others think of him than he is about safety. This illustrates the macho hazardous attitude, "I can do it."

Alternative c:

This is anti-authority: You are not taking the weight limits seriously, disregarding them, thinking, "Don't tell me." Go back to Situation 3 and select another alternative.

Alternative d:

Making an immediate decision without any thought of its consequences or any consideration of alternatives illustrates impulsivity--the hazardous attitude, "Do something--quickly!" Go back to Situation 3 and select another alternative.

Alternative e:

When you think that accidents happen only to other people you believe you are invulnerable. The pilot in this situation is thinking, "It won't happen to me." Go back to Situation 3 and select another alternative.

A good attitude...

Don't be pressured by anyone into overloading an airplane.

THE RESIGNATION HAZARDOUS ATTITUDE

From the five choices following each situation, pick the ONE choice that is the best example of the resignation hazardous attitude. Check your answers on pages 60-62 and keep selecting until you have made the correct choice. Then move on to the next situation.

Situation 1:

You would like to arrive early for an important business meeting. If you stick to your flight plan, you will just about make it, assuming there are no problems. Or, you can take a route over the mountains, which will get you there much earlier. If you choose the route through the mountain passes, it means you might encounter low hanging clouds while good weather prevails over the planned route. Which of the following alternatives best illustrates the RESIGNATION reaction?

a. You take the mountain route even though the weather briefer has advised against it.

b. You take the mountain route, thinking that a few clouds in the passes will not cause any trouble for this flight.

c. You feel it will be a real victory for you if you can take the mountain route and arrive early.

d. You tell yourself that there is no sense sticking to the planned route because, "There's nothing else to do to be sure to make it early."

e. You quickly choose the mountain route, deciding that you just must get there early.

Situation 2:

The weather briefer advises you of possible hazardous weather conditions at your destination, but you elect to go. En route you encounter a brief snowstorm and increasingly poor visibility. Although you have plenty of fuel to return to your departure point, you have a hunch that the weather will improve before you reach your destination. Which of the following alternatives best illustrate the RESIGNATION reaction?

a. You feel there is no need to worry about the weather since there is nothing one can do about it.

b. You immediately decide to continue, and block the weather conditions out of your mind.

c. You feel nothing will happen to you since you have plenty of fuel.

d. You think that the weather people are always complicating your flights, and sometimes, such as now, it is best to ignore them.

e. You fly on, determined to prove that your own weather judgment is sound.

Situation 3:

On final approach at night, you fly into patches of ground fog which severely limit visibility. Your altitude is 150 feet, and you debate whether you can level off at the correct height and land properly or whether you should abort the approach. Which of the following alternatives best illustrates the RESIGNATION reaction?

a. You think the rules which indicate you should abort the approach are much too rigid.

b. You feel that the situation presents a challenge and that you are going to make the landing.

c. You begin to level off immediately saying, "To heck with the fog."

d. You continue, feeling that the decision has already been made.

e. You say to yourself, "I'm going in because nothing is going to happen."

RESPONSE LIST 5:
THE RESIGNATION HAZARDOUS ATTITUDE

Situation 1:

Alternative a:

Not accepting the advice of the weather briefer is an example of the hazardous attitude of anti-authority. Rules do not apply to me, "Don't tell me." Go back to Situation 1 and select another alternative.

Alternative b:

This illustrates the hazardous attitude of invulnerability, "It won't happen to me." Go back to Situation 1 and select another alternative.

Alternative c:

Vying for a victory means you are trying to prove you are better than others, making the situation a personal challenge rather than a problem to be solved with care. This illustrates the macho hazardous attitude, "I can do it." Go back to Situation 1 and select another alternative.

Alternative d:

Correct! Well done--you have correctly identified the hazardous attitude involved. Thinking that there is nothing you can do is an illustration of the hazardous attitude of resignation: "What's the use?" Go on to Situation 2.

Alternative e:

A quick decision, without careful thought or consideration of the consequences, illustrates impulsivity, "Do something--quickly!" Go back to Situation 1 and select another alternative.

A good attitude...

Low hanging clouds and flying through mountain passes don't mix.

Situation 2:

Alternative a:

Yes, this is the correct hazardous attitude. If you decide that there is nothing that you can do about the situation, this is the hazardous attitude of resignation. People who think this way say to themselves, "What's the use?" Go on to Situation 3.

Alternative b:

When immediately you block thoughts from your mind and decide to go on without considering the consequences, your thinking is, "Do something--quickly!" and this is impulsivity. Go back to Situation 2 and select another alternative.

Alternative c:

Having plenty of fuel does not mean that something will not happen to you. This illustrates the hazardous attitude of invulnerability, "It won't happen to me." Go back to Situation 2 and select another alternative.

Alternative d:

Having no respect for authority (weather forecasters) and disregarding their advice illustrates the hazardous attitude of anti-authority, "Don't tell me." Go back to Situation 2 and select another alternative.

Alternative e:

When a pilot tries to show how good he is, instead of taking careful action, he is being macho and thinking, "I can do it." Go back to Situation 2 and select another alternative.

A good attitude...

Use all your resources, both your eyes and your radio, to determine what weather lies ahead.

Situation 3:

Alternative a:

By regarding the rules as too rigid, you are acting on the anti-authority hazardous attitude, "Don't tell me." Go back to Situation 3 and select another alternative.

Alternative b:

Seeing a situation as a challenge, as a time to prove oneself instead of as a problem to be solved is an illustration of the macho hazardous attitude, "I can do it." Go back to Situation 3 and select another alternative.

Alternative c:

A quick decision without thinking through the alternatives or consequences illustrates the hazardous attitude, "Do something--quickly!"--an example of a pilot who is impulsive. Go back to Situation 3 and select another alternative.

Alternative d:

Nice job--you have identified the correct hazardous attitude. When you believe that a decision has already been made, that you can do nothing more about it, is an example of thinking, "What's the use?"--the hazardous attitude of resignation. Go on to the next chapter.

Alternative e:

The belief that "nothing is going to happen" is the hazardous attitude of invulnerability. Go back to Situation 3 and select another alternative.

A good attitude...

Fog can lead to spatial disorientation, especially at night.

6. ANTIDOTES FOR HAZARDOUS ATTITUDES

Now you know there are five major hazardous attitudes which contribute to poor pilot judgment. Because you worked extensively with these thoughts in the previous chapters, you are already more aware of and alert to them in your own thinking. This is an important first step in eliminating them from your judgments. This next chapter is designed to teach you a way to counteract hazardous attitudes so that they do not affect your actions.

By telling yourself something different from the hazardous attitude, you're "taking an antidote" to counteract the hazardous attitude. You remove a hazardous thought by substituting the antidote. Thus, if you discover yourself thinking, "It won't happen to me," mentally tell yourself, "That is a hazardous attitude." Recognize a hazardous attitude, correctly label the thought, and then say its antidote to yourself.

To do this, you must MEMORIZE THE ANTIDOTES for each of the hazardous attitudes. Know them so well that they will automatically come to mind when you need them.

THE FIVE ANTIDOTES

Hazardous Attitude	Antidote
ANTI-AUTHORITY: "Don't tell me."	"Follow the rules. They are usually right.
IMPULSIVITY: "Do something--quickly."	"Not so fast. Think first."
INVULNERABILITY: "It won't happen to me."	"It could happen to me."
MACHO: "I can do it."	"Taking chances is foolish."
RESIGNATION: "What's the use?"	"I'm not helpless. I can make a difference.

EXERCISE 1--ANTIDOTE RECALL

You must not continue this lesson until you have learned the antidotes thoroughly. Practice them now. Without referring to the text, write the antidote to each hazardous attitude below. Check your statements with page 63 and, if you are correct, continue. If not, study the antidotes until you can write them word for word from memory.

Hazardous Attitude	Antidote
ANTI-AUTHORITY:	
IMPULSIVITY:	
INVULNERABILITY:	
MACHO:	
RESIGNATION:	

EXERCISE 2--ANTIDOTE IDENTIFICATION

Each of the following situations contains a description of what is happening in a flight situation and what the pilot is thinking. Correctly apply the hazardous attitude antidotes.

Instructions:

1. Cover the answer key on the adjacent page with a blank piece of paper. Then, in situation 1, review the thinking and actions of the pilot, then look for signs of hazardous attitudes. When you recognize one, write its name and its antidote in the space provided.

2. After completing situation 1, remove the blank sheet of paper and review the answers. Do not proceed with the other situations until you have done so. Your response should closely match the hazardous attitude responses identified in the key. (Note: different people may see the same situation slightly differently, so your answers may not be identical to the key. However, your answers should agree with the key for at least three of the hazardous attitudes, and you should have written, word for word, the correct antidote).

3. If you do not do well on Situation 1, study your answers to discover what misunderstandings you have about the hazardous attitudes and their activities. If necessary, return to earlier chapters in this manual to clear up any confusion before going on to the next situation.

4. Continue with the remaining situations in the same manner. Follow the instructions at the end of the situation key to guide you to the completion of this section.

Situation 1

On her third solo flight, a student pilot decides to take a friend for an airplane ride. In the air the pilot thinks, "It's great to be up here without an instructor criticizing everything I do. His do-it-by-the-book attitude takes all the fun out of flying."

As the pilot nears her friend's farm, she remembers that it is about eight miles from the local airport. The pilot thinks, "I'll land on the road that runs by my friend's farm. It won't be dangerous at all...the road's straight and wide, just like a runway. I'll just tell Joan not to tell anyone I did it so I won't get into trouble with anyone who knows it's against the rules."

"No one other than Joan's family lives anywhere near there, but if anyone happens to check one me, I'll just tell them it was an emergency landing. OK. I'll do it. The plan is foolproof."

The student pilot makes a hard landing on the road and nearly runs off the pavement before she gets the aircraft stopped. However, she is very proud of herself and she thinks, "Way to go, Ace! You're a natural for being a great pilot."

The pilot secures the aircraft and starts walking towards her friend's house as a sheriff's car drives up. Surprised that anyone observed her landing, she starts cursing this unpleasant turn of events. "I just know this cop is going to foul up my whole day. Why don't they stick to catching robbers and murderers, and leave people like me alone to have some harmless fun? If it weren't for my bad luck, this cop wouldn't have come along and this would have been a great afternoon."

Antidote

Example:

ANTI-AUTHORITY
"Follow the rules: They are usually right."

Do not proceed with Situation 2 until you have reviewed the answer key to this situation on page 67.

KEY TO SITUATION 1

Compare your response to Situation 1 with those given below. Remember, your responses may not be identical to those in this key. Still, you should have identified most of the hazardous attitudes indicated.

On her third solo flight, a student pilot decides to take a friend for an airplane ride. In the air the pilot thinks, "It's great to be up here without an instructor criticizing everything I do. His do-it-by-the-book attitude takes all the fun out of flying."

Anti-Authority: Follow the rules. They are usually right."

As the pilot nears her friend's farm, she remembers that it is about eight miles from the local airport. The pilot thinks, "I'll land on the road that runs by my friend's farm. It won't be dangerous at all...the road's straight and wide, just like a runway. I'll just tell Joan not to tell anyone I did it so I won't get into trouble with anyone who knows it's against the rules. "No one other than Joan's family lives anywhere near there, but if anyone happens to check one me, I'll just tell them it was an emergency landing. OK. I'll do it. The plan is foolproof."

Impulsivity: "Not so fast. Think first."

Invulnerability: "It could happen to me."

The student pilot makes a hard landing on the road and nearly runs off the pavement before she gets the aircraft stopped. However, she is very proud of herself and she thinks, "Way to go, Ace! You're a natural for being a great pilot."

Macho: "Taking chances is foolish."

The pilot secures the aircraft and starts walking towards her friend's house as a sheriff's car drives up. Surprised that anyone observed her landing, she starts cursing this unpleasant turn of events. "I just know this cop is going to foul up my whole day. Why don't they stick to catching robbers and murderers, and leave people like me alone to have some harmless fun. If it weren't for my bad luck, this cop wouldn't have come along and this would have been a great afternoon."

Resignation: "I'm not helpless. I can make a difference."

After you have compared your responses with those above, go on to Situation 2.

Situation 2

Antidote

Tom and George are flying in Tom's single-engine airplane, and they decide to "buzz" some friends who are swimming in a nearby lake. Tom is an experienced pilot who has done buzzing many times before. In fact, he often brags that someday he will be a stunt flier, and then everybody can see his talents on display.

George likes Tom and likes to go along on "buzzing" runs. However, George is a low-time pilot, and he sometimes wonders if Tom is not pushing his luck. George is not worried about an accident, however, because he is convinced that Tom is a great pilot who can handle anything that might happen.

As they are buzzing the lake, both are interested in watching for the reactions of their friends on the ground. Tom descends lower than usual on the third pass. When he tries to climb out, the plane does not make it over a power transmission line. The wing brushes the power line, sparks fly, and the wing sustains minor damage. George panics and yells, "We're going to crash, we're going to crash!"

Tom is also shaken, but he maintains control of the airplane and tells George, "Calm down and help me fly this thing back to the airport, or we're going to be in big trouble over this. I told you I could handle anything in this airplane."

As they head for the airport, the airplane continues to fly without difficulty. They have a good laugh over the incident, telling one another that it is another great adventure in their flying careers. Tom tells George, "You know, if the power company has any sense, they would bury all those power lines. If they would do that, pilots like us would have an easier time of flying safely."

Check your answers to this situation with the key on page 69.

KEY TO SITUATION 2

Tom and George are flying in Tom's single-engine airplane, and they decide to "buzz" some friends who are swimming in a nearby lake. Tom is an experienced pilot who has done buzzing many times before. In fact, he often brags that someday he will be a stunt flier, and then everybody can see his talents on display.

Macho: "Taking chances is foolish."

George likes Tom and likes to go along on "buzzing" runs. However, George is a low-time pilot, and he sometimes wonders if Tom is not pushing his luck. George is not worried about an accident, however, because he is convinced that Tom is a great pilot who can handle anything that might happen.

Invulnerability: "It could happen to me."

As they are buzzing the lake, both are interested in watching for the reactions of their friends on the ground. Tom descends lower than usual on the third pass. When he tries to climb out, the plane does not make it over a power transmission line. The wing brushes the power line, sparks fly, and the wing sustains minor damage. George panics and yells, "We're going to crash, we're going to crash!"

Impulsivity: "Not so fast. Think first."

Tom is also shaken, but he maintains control of the airplane and tells George, "Calm down and help me fly this thing back to the airport, or we're going to be in big trouble over this. I told you I could handle anything in this airplane."

Macho: "Taking chances is foolish."

As they head for the airport, the airplane continues to fly without difficulty. They have a good laugh over the incident, telling one another that it is another great adventure in their flying careers. Tom tells George, "You know, if the power company has any sense, they would bury all those power lines. If they would do that, pilots like us would have an easier time of flying safely."

Invulnerability: "It could happen to me."

Resignation: "I'm not helpless. I can make a difference."

Now, go on to Situation 3.

Situation 3

Antidote

On a night landing, Bill discovers the runway lights are not on. He thinks, "I didn't think about the possibility that the airport might be closed. I should have telephoned ahead." Then he becomes angry with the airport management, thinking, "They could leave the lights on at night. Who are they to control how late I can land? The next time I see the manager I will tell him a thing or two about how to run an airport."

Determined to land, Bill declares, "I'm landing here tonight, lights or no lights. I'll just have to rely on myself and show these guys how a top-notch pilot can do whatever needs doing." Bill chooses the runway which parallels the highway adjacent to the airport and uses street-lights as reference. Unsure of his height above the runway, he flares too quickly and begins to float. He immediately forces the airplane onto the runway rather than going around or extending his landing.

After landing hard, the aircraft swerves off the runway and into a fence. Bill is unhurt, but the airplane is substantially damaged. To himself, Bill says, "If the lights were on, this would not have happened."

A few minutes later some people arrive to see what has happened. Bill starts telling them how the accident is the fault of the local airport management. Someone asks Bill why he decided to land without airport lights. He answers, "Look, I'm an experienced pilot. Having no lights is not a serious problem. There should be more rules about how to run an airport and less about how a guy like me is supposed to fly his airplane."

Check your answers to this situation with the key on page 71.

KEY TO SITUATION 3

On a night landing, Bill discovers the runway lights are not on. He thinks, "I didn't think about the possibility that the airport might be closed. I should have telephoned ahead." Then he becomes angry with the airport management, thinking, "They could leave the lights on at night. Who are they to control how late I can land? The next time I see the manager I will tell him a thing or two about how to run an airport."

Anit-Authority: "Follow the rules: They are usually right."

Determined to land, Bill declares, "I'm landing here tonight, lights or no lights. I'll just have to rely on myself and show these guys how a top-notch pilot can do whatever needs doing." Bill chooses the runway which parallels the highway adjacent to the airport and uses streetlights as reference. Unsure of his height above the runway, he flares too quickly and begins to float. He immediately forces the airplane onto the runway rather than going around or extending his landing.

Macho: "Taking chances is foolish."

Impulsivity: "Not so fast. Think first."

After landing hard, the aircraft swerves off the runway and into a fence. Bill is unhurt, but the airplane is substantially damages. To himself, Bill says, "If the lights were on, this would not have happened."

Resignation: "I'm not helpless. I can make a difference."

A few minutes later some people arrive to see what has happened. Bill starts telling them how the accident is the fault of the local airport management. Someone asks Bill why he decided to land without airport lights. He answers, "Look, I'm an experienced pilot. Having no lights is not a serious problem. There should be more rules about how to run an airport and less about how a guy like me is supposed to fly his airplane!"

Resignation: "I'm not helpless. I can make a difference."

Macho: "Taking chances is foolish.
Anti-Authority: "Follow the rules: They are usually right."

DID YOU GET ALL ANSWERS CORRECT? GOOD! YOU HAVE FINISHED THIS EXERCISE. GO ON TO EXERCISE 3 ON PAGE 72.

EXERCISE 3: RECOGNIZING AND REPLACING HAZARDOUS ATTITUDES

You have now learned the meaning of the five hazardous attitudes and the antidotes to substitute for them. But, for judgment training to benefit you, the mental process of recognizing a hazardous attitude, substituting the correct antidote, and then supplying good attitudes must become automatic.

In this exercise, you will practice recognizing potential hazardous attitudes in various flight situations, recalling the correct antidote, and thinking of a good attitude for the same situation.

Instructions:

1. Read each situation and the description of the pilot's thinking.

2. In the blanks beneath each situation, fill in the hazardous attitude, the antidote, and a brief description of a good attitude for the same situation. (You do not need to write complete sentences.)

3. Ask your flight instructor to review your answers when you have completed the first five situations.

EXAMPLE

Situation:

The pilot leaves his non-pilot spouse at the aircraft's controls while he goes outside to see why the engine will not start. The pilot concludes that the battery is dead.

Pilot's Thinking:

No sense delaying any more. I'll just hand-prop the engine, and get the battery checked when we land again. My wife is pretty good with machinery. She will understand what to do until I get back into the cabin.

Hazardous Attitude:

Invulnerability

Antidote:

It could happen to me.

Good Attitude:

Pilot delays flight while he gets a mechanic to charge or replace the battery.

SITUATIONS 1-5

Situation 1:

The pilot did not allow for strong headwinds when calculating fuel consumption. With 45 minutes of fuel left, she can land at an alternate airport just below or continue to the destination airport which she thinks is only 30 minutes away.

Pilot's Thinking:

I will fly on to my destination. I can be there in 30 minutes. I can make it if I just keep going.

Hazardous Attitude:

Antidote:

Good Attitude:

Situation 2:

The pilot is preparing to taxi when he feels a sharp pain in his chest. He thinks it might be indigestion but is undecided if he should mention anything to his passengers or possibly delay takeoff.

There is nothing I can say to the passengers that would help. I will continue the flight. It is just my rotten luck that I had bad food for lunch.

Hazardous Attitude:

Antidote:

Good Attitude:

Situation 3:

The pilot is on a pleasure flight with a friend to scout some nearby ski slopes. Weather conditions for the area include snow showers and gusty winds.

Pilots Thinking:

I am sure I'll be able to land without permission at that private airstrip near the lodge if the weather gets too bad.

Hazardous Attitude:

Antidote:

Good Attitude:

Situation 4:

A passenger appears to be suffering from a sudden illness, and it is still two hours to the intended destination. The passenger says he is all right, but his wife is very concerned that he may need medical aid. The nearest airport is unmanned, and it is 35 miles from a hospital.

Pilot's Thinking:

This man is sick, and his wife is really upset. I can't deal with this in the airplane. I better get this thing down--fast. Landing at the nearest (suitable) airport probably wouldn't be so bad.

Hazardous Attitude:

Antidote:

Good Attitude:

Situation 5:

It is after dark, and the pilot arrives at the airport with two friends after leaving a picnic dinner. The pilot intends to take his friends on a local VFR trip along the lakeshore. Weather is officially reported as clear at the airport, but fog has begun to form over the lake 10 miles away.

Pilot's Thinking:

The beers I had this afternoon certainly will not affect my flying skills now. Besides, the weather looks good, and my friends will be impressed when I fly them over the lake at night.

Hazardous Attitude:

Antidote:

Good Attitude:

ASK YOUR FLIGHT INSTRUCTOR TO REVIEW WITH YOU YOUR ANSWERS TO THE FIRST FIVE SITUATIONS. IF YOU HAVE DONE WELL, MOVE ON TO THE NEXT SECTION. IF YOU NEED MORE PRACTICE WITH THE ANTIDOTES, YOU MAY BE ASSIGNED TO DO SITUATIONS 6 THROUGH 10. (If so, be sure to discuss your answers for Situations 6-10 with your instructor.)

NOTE: DO NOT BECOME DISCOURAGED WITH DOING EXERCISES THAT SEEM REPETITIVE. JUST AS REPEATED TOUCH-AND-GO LANDINGS TEACH YOU GOOD LANDING TECHNIQUES, THESE EXERCISES TEACH YOU GOOD JUDGMENT TECHNIQUES BY HELPING YOU FORM NEW HABITS.

SITUATIONS 6-10

Situation 6:

The pilot checks twice by phone for weather in the area of his proposed VFR trip. On both occasions, he receives warnings of severe or extreme turbulence. He takes off as planned, despite suggestions from experienced pilots that such a flight is very risky.

Pilot's Thinking:

I have to get there by 10 o'clock. It can't be that bad, and I've handled weather like this before without an accident. Nothing will happen to me.

Hazardous Attitude:

Antidote:

Good Attitude:

Situation 7:

The pilot decides to do some night flying. He calls up two buddies and tells them that he will pick them up at 8:00 p.m., but he does not check the weather. When he gets to the airport the ceiling is 300 feet with three miles visibility.

Pilot's Thinking:

I can't let those guys think that I'm afraid of a few little clouds. I'd never hear the end of it. Anyway, I promised them we would go, and I know I can handle the plane even when the going gets rough.

Hazardous Attitude:

Antidote:

Good Attitude:

Situation 8:

A second aircraft is following a small trainer on final at an uncontrolled airport. The second aircraft is quickly overtaking the trainer. The trainer lands, then does a touch-and-go. The second aircraft makes a go-around directly over the runway. On climb-out, both aircraft nearly collide.

Pilot's Thinking:

The pilot of the second aircraft thinks the requirement to deviate to the right when overtaking another aircraft is a silly rule.

Hazardous Attitude:

Antidote:

Good Attitude:

Situation 9:

The pilot decides to take a friend flying. They fly low over a swamp to look for alligators. Flying at 50 feet, the pilot thinks he sees birds which are taking off in front of the aircraft's flight path. The pilot pulls back hard on the controls and starts a climbing turn but stalls and crashes into trees.

Pilot's Thinking:

Those birds might come right through the windshield! I'd better not take any chances, I'll do a zoom-climb and turn and get away from them as fast as I can.

Hazardous Attitude:

Antidote:

Good Attitude:

Situation 10:

The student pilot takes off in good weather for a local training flight. Upon return two hours later she finds the airport in the midst of local heavy rain. The pilot is low on fuel because she stayed in the practice area longer than she intended.

Pilot's Thinking:

Gee, my practice went so well. What rotten luck to be low on gas now. I guess I'll just keep flying around out here and hope the airport goes back to VFR so I can land.

Hazardous Attitude:

Antidote:

Good Attitude:

7. IDENTIFYING AND REDUCING STRESS

What is Stress?

Stress can be defined as the body's response to any demand made upon it by physical, physiological, or psychological factors known as stressors. Any internal or external stimulus that is perceived as a threat to the body's equilibrium causes a reaction as the body marshals its resources to cope with it. These reactions include the release of chemical hormones (such as adrenalin) into the blood and speeding of the metabolism to provide energy to the muscles. Blood is shunted away from the stomach and digestive tract to supply the muscles in the arms and legs with more oxygen. Blood sugar is increased. Heart rate, respiration, blood pressure, and perspiration all increase. Other hormones improve the blood's ability to clot. The result prepares the body to "fight or flee," a primordial physiological response to threat.

What are Stressors?

As mentioned in Chapter 3, stressors can be either physical physiological, or psychological.

Physical stressors include conditions associated with the environment, such as temperature and humidity extremes, noise, vibration, and lack of oxygen. You have probably already encountered some or all of these in flight.

Physiological stressors include fatigue, lack of physical fitness, sleep loss, missed meals (leading to low blood sugar levels), and disease.

Psychological stressors are related to social or emotional factors such as a death in the family, a divorce, a sick child, a demotion, etc. Or they may be related to mental workload such as analyzing a problem, navigating an aircraft, or making decisions.

When you need to consider only one thing at a time to reach a decision, you usually have no problem in making a decision. In flight, however, you frequently have to deal with many situations simultaneously and make numerous, inter-related decisions--often based on incomplete information and within a short span of time.

For instance, on a cross-country flight you realize you are much lower on fuel than you expected. The clouds ahead appear to be building. Static is interfering with your radio. You are off course and can't locate your current position on the sectional chart--all of a sudden a great deal to think about! On top of all this, you are tired, hungry, and have a full bladder. The cabin heater isn't working, and you have to contend with turbulence. You begin to worry about arriving at your destination on time and missing an important appointment. You are afraid of violating nearby restricted airspace, thus getting into trouble with the government and having to file a report--maybe even having enforcement action taken against you. You contemplate a forced landing and begin to worry about damaging your aircraft. What if your insurance won't cover it? Can you afford the deductible? What about injury to yourself or your passengers? Your palms are sweating, your mouth is dry, and your heart is pounding!

At this point, you feel a growing sense of urgency and tension. Your thinking becomes confused, unfocused. You may give too much attention to "what if" questions which should be ignored. You are reaching (or have reached) a state of stress overload. You begin to use poor judgment that results in a series of bad decisions: pressing on into deteriorating weather, overflying good landing areas, and so on until you are almost out of fuel. The stage is set for panic and disaster.

As you can see, there can be plenty of stressors to cope with in the flight environment itself without the added burden of "life stressors" in the form of financial problems, job pressures, or family troubles; these can also be self-generated--a desire to obtain a promotion or to achieve recognition from peers. Moreover, stress effects are cumulative, eventually adding up to an intolerable burden unless adequately coped with.

Even those things in life you find pleasurable can be stressors since they represent changes in your environment with which you must deal. Everyone is stressed to some degree all the time. Indeed, it is a well-known fact that some people seek stress to make life more interesting, and a certain amount of stress is good for you. It keeps you on your toes and prevents complacency from setting in. Some stress helps prevent accidents.

Stress and Performance

It was just noted that the effects of stress were cumulative; furthermore, that some amount of stress was desirable, but that higher stress levels, particularly over long periods of time, can adversely affect performance. Thus, performance will generally increase with the onset of stress but will peak and then begin to fall off rapidly as stress levels exceed your ability to cope.

At the lower stress levels, we will see boredom--followed by optimal performance at the moderate stress levels, followed ultimately by overload and panic at the highest stress levels. See Figure 7.1.

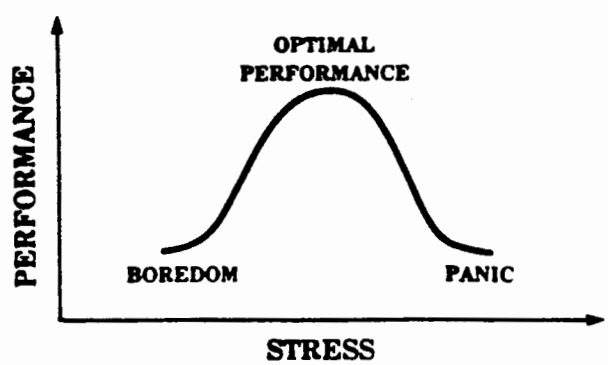


Figure 7.1
Relationship of Stress and Performance.

Task Requirements and Pilot Capabilities

Accidents often occur when flying task requirements exceed pilot capabilities. Pilot capabilities can be adversely affected by a variety of stresses, such as fatigue, alcohol, emotional problems, etc. The difference between pilot capabilities and task requirements as shown in Figure 7.2 is called the "margin of safety." Note that in this idealized example, the margin of safety is minimal during the approach. Had any emergency or distraction occurred, or anything else further degraded pilot capabilities, an accident may have occurred.

Health Effects of High Stress Levels

Whether you perceive life's many changes as good or bad, they still impose stress. Remember, stress is cumulative, and if it exceeds your ability to cope, you may become ill or accident-prone. As your body is continually assaulted by stressors, it tries to adjust, leaving you in a constant state of "fight or flee." In most stressful situations in today's modern society, you can't fight back or run away, and the changes in your body may actually be harmful. The chemicals in your bloodstream, when not allowed to do the job they were meant to do, can lead to a deterioration of your body's physiological defense mechanisms, causing heat attacks, arthritis, ulcers, high blood pressure, and diseases of the respiratory system, among others.

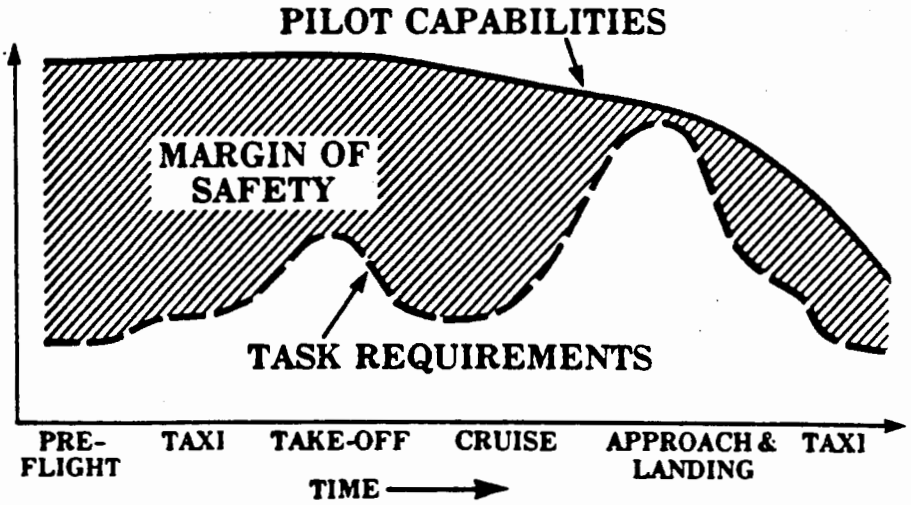


Figure 7.2
Task Requirement versus Pilot Capabilities.

Coping With Stress

As you mature and adapt to life's many stressors, you learn to cope. There is a limit, however, to the amount of stress you can handle, and this varies from individual to individual and within the same individual over a lifetime--or even in just a few hours. As you grow in experience, you may be able to handle more stress, but if you continue to accumulate stress beyond your ability to cope, you will eventually reach a state of exhaustion and become ill.

As we said before, stress handling techniques vary considerably. An individual's personal strategies for dealing with stress may be healthy and adequate in coping with various life problems, or they may be inappropriate and lead to an increased burden through self-imposed stress.

Inadequate Stress-Coping Strategies

The inadequate strategies employed by most people in trying to cope with stress often impose more stress. When this happens, people can develop anxieties and become frustrated. Frustration, in turn, often leads to anger and aggression. That anger may be directed at other people or turned inward, showing up as self-destructive behavior and lead to suicide. More often, such behavior takes a more subtle form in ways that may have the same result without the individual's conscious awareness of self-destructive tendencies: overeating (leading to obesity), smoking too much, alcoholism, and drug abuse, or it may take the form of risk-taking and accidents. When the individual directs anger toward others, the resulting problems with interpersonal relationships lead to loss of friends, trouble with the boss, marital problems, divorce, child abuse, assault, and even homicide. Aggression directed at inanimate objects can lead to damage and injury that show up as accidents.

Symptoms to Look For

Individuals who are overstressed (not coping adequately) often show symptoms in three ways: emotional, physical, and behavioral. These symptoms differ depending upon whether aggression is focused inward or outward. Those individuals who typically turn their aggressive feelings inward often demonstrate the emotional symptoms of depression, preoccupation, sadness, and withdrawal. Physical symptoms may show up as headaches, insomnia, appetite changes, weight gain or loss, indigestion, nausea, vomiting, diarrhea, and constipation. Behavioral symptoms include a morbid preoccupation with illness (hypochondria), self-medication, a reluctance to accept responsibility, tardiness, absenteeism, and poor personal appearance and hygiene.

The individual who typically takes out frustration on other people or objects will, on the other hand, show few physical symptoms. Emotional symptoms may show up as overcompensation, denial, suspicion, paranoia, agitation, restlessness, defensiveness, excess sensitivity to criticism, argumentativeness, arrogance, and hostility. Behavioral symptoms include episodes of desperate "acting out" or temper tantrums (a disguised cry for attention). These individuals also tend to abuse alcohol and drugs, but, in addition, they get into fights, incur numerous traffic tickets, gamble, fall into indebtedness, and may even become child or spouse abusers. They also tend to be accident-prone.

Techniques for Stress Coping

You need to be able to recognize the symptoms of stress overload in yourself and to learn how to manage your stress. We will explore three areas of stress management: 1) how to manage long-range life stresses and keep them from accumulating; 2) making go/no-go decisions before flight; and 3) managing stress in the cockpit to prevent overload and panic.

Life Stress Management

There are several techniques which can be applied to help prevent the accumulation of life stresses. The first involves a program of physical fitness. Exercise provides the body with an outlet for the energy provided the muscles for "fight or flee," reducing stress effects such as high blood pressure, accelerated pulse, and excess cholesterol. It also has the added result of reducing weight, itself a stressor. However, some sports can also be stress-producing for people who are themselves highly competitive. Aggressive, highly motivated people who must win all the time will experience severe frustration when their performance is not up to their expectations. If you find this happening to you, then noncompetitive exercise might be the answer. Jogging, swimming, or biking three to four times a week, at least half an hour each time, is ideal.

Second, learn to recognize and avoid the heavy pressures imposed by getting behind schedule and not meeting deadlines. In allotting your time, think about your life goals--what you plan for yourself and your family--and order them by priority. Separate your tasks into three categories of action: things that must be done, those that can be delayed, and those that you can forget about. Plan your schedule to accomplish those tasks that are important and necessary, and don't worry about those that are not. Allow yourself time for relaxation in your schedule, a chance to slack off on the pressure a bit, to be with your family or friends.

Third, take a realistic assessment of yourself. What are your capabilities and limitations? Strengths and weaknesses? Set your goals accordingly. Learn to recognize your limitations and work competently within them without selling yourself short. Establish realistic life goals. What do you want out of life? Success in your job? Professionalism? A reasonable level of autonomy? Promotion? Retirement? The "good life" for you and your family? Health and happiness? If your behavior or activities don't contribute to such goals, it's best to change them rather than continue frustrating yourself.

Fourth, whenever possible, avoid stressful situations and encounters. If driving in traffic raises your blood pressure, join a car pool or ride the bus. If crowds add to your frustration, avoid them when possible. If you have relatives or acquaintances with whom you don't get along, stay away from them as much as possible. Don't volunteer to take on stressful jobs when you are already overburdened.

Finally, be aware of other, more specialized techniques that can help you cope with stress. Most are designed to evoke what psychologists call the relaxation response--a condition of your body that is opposite to "fight or flee." These techniques have been used successfully by athletes, businessmen, and others in high tension professions to maximize performance and minimize the effects of stress. The relaxation response brings a profound rest, much deeper than sleep. Oxygen consumption and heart rate drop markedly, and blood lactates--products of fatigue--are no longer produced and are cleansed from the body, giving it more time to restore normal function, which, in turn, improves your ability to cope with ensuing stress.

"Biofeedback" is one relaxation technique in which your own body uses physiological "signals" to tell you what's happening to it. Through biofeedback you learn to gain voluntary control over your body to achieve the relaxation response.

In autogenic training, you learn to shut down many bodily functions to achieve the relaxation response on your own body by using calming words (such as warm, soft, etc.), without the need for return "signals," as in biofeedback. Starting with the extremities and moving inward, you learn to relax each part of your body progressively.

Another readily available technique that can be used at home or whenever you can find a quiet spot is meditation. Meditation techniques can produce the relaxation response through passive concentration, cleansing, the mind of anxiety-producing thoughts. This is usually done through the repetitive subvocalization of a single "nonsense" syllable that does not stimulate a conscious train of thought. While sitting upright in a straightbacked chair in a quiet, darkened room, shoes removed, in loose clothing, repeat your nonsense syllable to yourself in order to quiet your mind and stop the flow of thoughts. Don't try to fight your thoughts and mental images, however. Above all, relax. Meditation is best repeated twice a day, preferably for 20 minutes before breakfast and again before the evening meal. (It's easy to fall asleep on a full stomach, which you want to avoid.) Information on these and other more formalized techniques is available in your library or from your physician.

Remember, the above stress-coping techniques are not usually practical in flight. Rather, you must condition yourself to relax and think rationally when stress appears.

Making Go/No-Go Decisions Before Flight

Most pilots give their aircraft a thorough preflight, yet many forget to preflight themselves. We suggest you use the "I'M SAFE" checklist before you decide to fly.

Some specific suggestions: Before you make a long flight stay away from excess liquids, especially caffeine--it acts as a diuretic. Never fly when you are angry or emotionally upset. Never get into a situation where you must get to your destination at all costs. If you can't afford the time or money to wait on the ground until weather conditions improve, your hangover goes away, or your aircraft is fixed, don't go. Also, don't

allow passengers to dictate when it comes to safety matters, such as the amount of baggage, or where and when to go. You alone are pilot-in-command; you alone must make the go/no-go decision.

Cockpit Stress Management

When you are carrying passengers make sure that they are calm, informed, and prepared. If you should encounter an emergency, keep them informed if you can find the time. Avoid family squabbles in flight. Assign an adult to control small children and look after their needs. Above all, avoid situations that distract you from flying the aircraft.

If you feel tension mounting, you might loosen your collar, stretch your arms and legs, open air vents. Don't hesitate to ask controllers to help, for instance, to speak more slowly or to give you a position fix. Experienced passengers can be asked to look for landmarks and traffic, or even to assist in radio communications. The point is--reduce your workload to reduce stress levels--provide yourself with the proper environment in which to make sound judgments.

And, if an emergency does occur, BE CALM--think for a moment, weigh the alternatives, then act. Remember that fear and panic are your greatest enemies during an inflight emergency. Also, don't hesitate to declare an emergency when necessary or let other people including passengers know about your situation. Don't delay until it is too late!

Your greatest tool for combating fear and panic is to familiarize yourself thoroughly with your aircraft, its systems, and emergency procedures, along with the navigation/communications frequencies along your route of flight. Above all, maintain proficiency in your aircraft, for proficiency builds confidence. Know and respect your own personal limits. Give yourself plenty of leeway for an "out" when needed. Always have a "plan" and an "alternate plan"--leave yourself an out! Plan stops to allow adequate time for rest, for meals, and to stretch your legs. A good rule of thumb is to stop at least every four hours to meet your physiological needs, especially if you are in an aircraft where you can't stand up and walk around in flight.

Another situation that may generate stress involves letting little mistakes bother you until they build into a "big thing." If you make a mistake which you detect and correct, the most sensible thing to do is to forget about it and return your entire attention to flying. Don't keep thinking, "Why did I do it?" "How could I have been so stupid?" "Where did I go wrong?" "What happens if I do it again?" If you do this, your mental energies and attention will be distracted from the job of flying. Wait until after you land, then "debrief" and analyze past actions.

Finally, if flying is adding to your stress, then you had better quit. But if it helps you to cope with your life by providing an enjoyable means of earning a living or as a hobby to take your mind off everyday cares, then relax and enjoy! Learning to handle your stress will enable you to have a happier, more productive life.

And Remember...

"A superior pilot uses superior judgment to avoid stressful situations which might call for the use of superior skills."

Anon

ARE YOU FIT TO FLY?
The "I'M SAFE" Checklist

Illness?	Do I have any symptoms?
Medication?	Have I been taking prescription or over-the-counter drugs?
Stress?	Am I under psychological pressure from the job? Worried about financial matters, health problems, or family discord?
Alcohol?	Have I been drinking within eight hours? Within 24 hours?
Fatigue?	Am I tired and not adequately rested?
Eating?	Am I adequately nourished?

8. APPLYING THE JUDGMENT AND DECISION-MAKING CONCEPTS

This chapter will not present any new information, rather, it will reinforce your understanding and appreciation of the material you have studied up to now.

The following exercises require you to apply your newly acquired knowledge about judgment and decision-making. The examples and scenarios used in these exercises are based on actual pilot experiences.

If you do not clearly remember the five subject areas, and the ADM process, you should now go back and review them before continuing.

The following exercises are to be completed under the supervision of your flight instructor. Upon completion you are encouraged to review each exercise with your instructor in order to gain further insight into the decision-making process.

PREFLIGHT AND AIRCRAFT SYSTEMS

Introduction

Once an aircraft is airborne, any mechanical problem is a very serious and dangerous matter. Aircraft manufacturers, maintenance personnel, and government regulatory agencies work hard to keep each aircraft as safe as possible. However, things can go wrong, and maintenance personnel do make mistakes. It is the pilot who must make the final judgment regarding the airworthiness of the aircraft before each flight.

Here are examples where poor judgment was exercised regarding preflight actions and aircraft systems:

- Assuming maintenance work was done correctly
- Failing to do part or all of the standard preflight inspection
- Carelessness during the preflight check; for example, leaving gas or oil caps loose or off
- Incomplete checking of flight controls for freedom of operation
- Not adequately checking aircraft systems prior to takeoff
- Not acknowledging the importance of each system; for example, taking off with an inoperative carburetor heating system
- Improper use of aircraft systems
- Inadequate understanding of aircraft systems

SITUATION ANALYSIS EXERCISE

Directions:

Read the following report by a pilot who got into trouble because he did not conduct a thorough preflight inspection. When you finish, answer the questions following the scenario. Circle the correct answer. The sentences in this and the following exercises have been numbered for your convenience.

Pilot's Report:

(1) I taxied out of the loading area about 15 minutes later than I had planned. (2) When I got about 1,000 feet down the taxiway, the tower called me. (3) They said they thought they saw smoke coming from the left wheel. (4) I did not want to stop and check the problem because I was determined to get to Remotesville on time to impress my boss. (5) I figured I should do something right away to get the tower off my back, so I decided to speed up. (6) I thought maybe the rush of air would blow away the smoke that had attracted the tower's attention.

(7) Then, the left wheel starting binding a little. (8) The airplane was moving pretty fast, and I was having a hard time steering it in a straight line. (9) The taxiway--hidden by high grass--did not help matters. (10) Before I really knew what was happening, the left wheel went off the taxiway and onto the grass. (11) I closed the throttle and tried to stop as fast as I safely could, but the brakes were not working on the left side. (12) By then I figured there was nothing I could do to overcome this, so I just let the plane come to a stop on its own. (13) I was so busy cursing my bad luck that I did not notice the underground fuel system box until it was too late. (14) I hit the box at only about five miles per hour, but that was fast enough to do substantial damage to the landing gear. (15) It really makes me mad to think that the whole thing was due to a hydraulic fluid leak in the brake system. (16) I probably would have noticed it if I had not rushed my preflight inspection.

Questions:

1. In sentence 4, the pilot's attitude was probably the hazardous one we call:

a. Impulsivity

b. Invulnerability

c. Macho

d. Resignation

2. In sentence 5, the pilot's attitude was probably the hazardous one we call:

a. Anti-Authority

b. Impulsivity

c. Macho

d. Resignation

3. What subject area was the pilot making a judgment about in sentence 6?

a. Pilot

b. Aircraft

c. Environment

d. Aircraft/Environment

4. What hazardous attitude could the pilot be using in sentence 12?

a. Anti-Authority

b. Impulsivity

c. Invulnerability

d. Resignation

5. What is the antidote for the hazardous attitude displayed in sentence 12?

6. What subject area was the pilot's attention being directed to in sentence 12?

a. Pilot

b. Aircraft

c. Environment

d. Pilot/Aircraft

7. Earlier in this manual you were taught that an important step in the ADM process was to recognize change and to evaluate the effects of that change on the safe outcome of the flight. Which sentence indicates the pilot is taking this step?

a. Sentence 4

b. Sentence 11

c. Sentence 12

d. Sentence 16

WEIGHT/BALANCE AND PERFORMANCE

Introduction

Engineers design an aircraft to fly safely and efficiently. One design factor that is very important to an aircraft's safe operation, as well as its operating efficiency, is the weight and balance criteria. Flying an aircraft loaded beyond its weight and balance limitations may create dangerous changes in control and performance characteristics that can cause or contribute to serious accidents.

Of course, performance is dependent on factors in addition to weight and balance. For instance, density altitude and runway surface conditions are very important considerations.

Here are examples of pilots who did not accurately assess weight and balance and aircraft performance:

- Estimating passenger and cargo weights instead of making exact calculations
- Knowingly exceeding weight and balance limitations to accommodate the desires or demands of supervisors, customers, friends, etc.
- Loading the aircraft as one would a car with no regard to total weight or distribution of the load
- Failing to secure cargo to prevent it from shifting while in flight or in case of an accident
- Forgetting or ignoring density altitude, runway surface conditions, or other factors that affect aircraft performance
- Trying to make a short field takeoff when other than standard conditions exist

SITUATION ANALYSIS EXERCISE

Directions:

Read the following report of a pilot who got into trouble because of poor weight and balance decision-making and the resulting effects on performance. When you finish, answer the questions following the scenario.

Pilot's Report:

(1) When I took off from Tombstone, I knew the aircraft was only 20-pounds under maximum gross weight. (2) What I had failed to realize was that the new cargo had moved the CG to slightly behind the aft limits. (3) At departure, the temperature was 93°F, and the density altitude was 6,200 feet.

(4) Because weight and balance had never created any problems for me, I did not bother to calculate takeoff distance. (5) I did try to estimate it, however, by remembering my figures from earlier in the morning at Tucson. (6) At maximum gross weight and at the Tucson density altitude of 5,000 feet, the aircraft performance chart had called for a 1,600 foot takeoff roll. (7) Since the runway at Tombstone was 4,200 feet, I was sure there would be no problem.

(8) The prevailing wind was from 260° at seven knots, so I departed runway 24. (9) During the takeoff roll, the airplane accelerated very slowly. (10) About halfway down the runway, I thought about aborting, but the speed gradually continued to increase. (11) I finally rotated after using about two-thirds of the runway, figuring it would either fly or not.

(12) Then my real problems began. (13) As I attempted to establish best rate-of-climb, I found the nose wanted to pitch up to a higher than normal angle of attack. (14) Next, I noticed I was not gaining enough altitude in relation to the ridge, which was just a little over a mile ahead. (15) Worried, I felt I had to do something right then, so I pulled the nose up higher to try and get the best-angle-of-climb airspeed. (16) The airplane became difficult to control.

(17) As the ridge grew closer, altitude above the ground got lower and lower. (18) With the crest of the ridge now less than a mile away, I concluded the airplane would not climb fast enough to clear it. (19) A half a mile away my height above the terrain had dipped below 300 feet, and I decided that my only hope was to turn back to the airport. (20) To say the least, the turn was very unnerving. (21) At one point in the turn the wheels were less than 20 feet off the ground. (22) But, it was my only way out. (23) I was flying just above stall speed, and aircraft control was unstable because of the improper loading. (24) Somehow, though, I succeeded in getting back to the airport.

Questions:

1. Which sentence indicates the pilot did not do something he should have done?

a. Number 1

b. Number 4

c. Number 6

d. Number 8

2. The pilot's attitude at the decision point referred to in question 1 was probably the hazardous one called:

a. Impulsivity

b. Invulnerability

c. Resignation

d. Anti-Authority

3. Which sentence suggests the pilot did something too late?

a. Number 7

b. Number 8

c. Number 9

d. Number 10

4. The pilot's attitude at the decision point referred to by sentence 11 was probably the hazardous one called:

a. Impulsivity

b. Invulnerability

c. Macho

d. Resignation

5. The pilot's attitude at the decision point referred to in sentence 15 could be the hazardous one called:

a. Impulsivity

b. Invulnerability

c. Macho

d. Anti-Authority

6. The correct antidote for the hazardous attitude referred to in question 5 could be expected to call the pilot's attention to:

a. The rule about loading the heaviest passengers to the front of the aircraft.

b. The real possibility that being overloaded might cause the airplane to crash.

c. A sudden change in attitude might stall the aircraft.

d. The pilot, not "Lady Luck," needs to do something quickly.

8. One principle of the ADM process states that, "As time progresses, the alternatives available to control change may decrease, and the option to select the remaining alternatives may be lost." Which sentence best illustrates this principle?

a. Number 11

b. Number 13

c. Number 17

d. Number 19

e. Number 23

9. Do you think the pilot fully evaluated his aircraft during this series of events?

a. Yes

b. No

c. Why?

10. Do you think the pilot fully evaluated his environment during this series of events?

a. Yes

b. No

c. Why?

OFFICIAL PROCEDURES AND COMMUNICATIONS

Introduction

There are numerous rules, procedures, and regulations that control aircraft operations. In the United States, the Federal Aviation Regulations (FARs), the Airman's Information Manual (AIM), and the various Advisory Circulars (ACs) contain information that every pilot should know and use correctly at all times. In Canada, the Air Regulation and Air Navigation Orders, and the Airmans Information Publication (AIP), should be reviewed periodically. Airport procedures, radio communications, and navigation aids are all designed to make flying safer by having every pilot conform to standard systems and procedures.

There are a number of ways pilots can endanger themselves and others due to a lack of knowledge of or by ignoring official rules and procedures. Here are some examples:

- Failing to learn regulations and procedures correctly
- Failing to review regulations and procedures that have become unclear or have been forgotten over time
- Not keeping current on changes and additions to official information
- Ignoring the rules and procedures
- Failing to get further explanation when something seems confusing or illogical
- Failing to be assertive and to challenge apparent mistakes when an official source of information, such as a controller or a government publication, seems to be in error

SITUATION ANALYSIS EXERCISE

Directions:

Making judgments about received information is a very important part of a pilot's workload. Sometimes even official information can be confusing or incorrect. The following is a scenario regarding a pilot who was led astray by such information. When you finish, answer the questions following the scenario.

Pilot's Report:

(1) I got up early and watched the television weather. (2) Conditions looked good for my route of flight, except for a squall line due to move in from the northwest during the afternoon. (3) At the airport the FBO was not open, and I couldn't find a pay phone. (4) I, therefore, did not get a complete weather briefing. (5) Since I expected a routine flight, I decided not to file a VFR flight plan. (6) Once in my aircraft, I tuned in the ATIS broadcast which reported the local weather to be VFR, wind out of 090° at 10 knots, altimeter setting 30.29 inches.

(7) I took off on runway 6L, and I switched my radio to departure control. (8) The controller said, "Left 360, climb to 3,000, follow river." (9) I read back, "Roger, a left 360, climb to 3,000." (10) The departure controller responded, "Follow traffic at 10 o'clock, 4 miles." (11) I replied, "Doing a left 360 and looking for traffic." (12) I thought that a 360° turn just after takeoff was very unusual, but I trusted the controller and did it anyway. (13) About half way around, the controller said, "What are you doing? You were supposed to roll out on a heading of 360°." (14) I immediately turned back to 360° and departed the airport traffic area without further incident.

(15) As I headed west at 5,500 feet, I could see convective activity in the distance off to my right. (16) About an hour later, I feared I would soon be flying into IFR conditions. (17) I got out my sectional chart to look for an alternate airport. (18) Fortunately, I was close to Lakeville, an airport where I had landed a few times in years past. (19) I headed there right away. (20) I arrived near the field about 10 minutes later, and I began descending from 5,500 feet to 2,000 feet to circle the field, look for traffic, and determine the active runway.

(21) All of a sudden, I saw an aircraft at my altitude (2,000 feet indicated) on a direct collision course from my 2 o'clock position. (22) Since I was there first, I decided to continue on my course, and the other aircraft quickly passed under my wing. (23) I then tried to establish radio contact on what I thought was the UNICOM frequency for Lakeville. (24) Another pilot answered my call, and advised me to contact Lakeville tower on 120.7. (25) I thanked him and took a second look at my sectional chart: It was over 10 months old!

(26) The tower told me to enter a downwind for runway 12 at pattern altitude, and they gave me an altimeter setting of 30.31. (27) As I moved to reset my altimeter, I was surprised to find it was set at 29.29. (28) I must have erred when I set it from the ATIS broadcast at my departure airport! (29) That explained the near midair collision--I was already at pattern altitude, not 1,000 feet above it!'

Questions:

1. Which sentence illustrates the beginning of the ADM process?

a. Number 2

b. Number 3

c. Number 4

d. Number 5

2. Which antidote is appropriate for the hazardous attitude that may be present in sentence 5?

a. "Not so fast. Think first."

b. "Follow the rules. They are usually right."

c. "I'm not helpless. I can make a difference."

d. "It could happen to me."

3. Which hazardous attitude is shown by what the pilot says in sentence 12?

a. Anti-Authority

b. Resignation

c. Macho

d. Impulsivity

4. Which combination of subject areas is of greatest concern to the pilot in sentence 21?

a. Pilot Environment

b. Pilot/Aircraft

c. Environment/Aircraft

d. Pilot/Aircraft/Environment

5. What hazardous attitude might the pilot have had in ignoring the right-of-way regulations in sentence 22?

a. Anti-Authority

b. Macho

c. Invulnerability

d. Resignation

6. In sentence 28 the pilot noticed he had misunderstood information from the ATIS. To which subject area or areas would a pilot have to pay careful attention in order to notice such an error?

a. Pilot

b. Environment

c. Pilot/Environment

d. Aircraft/Environment

CROSS COUNTRY FLYING

Introduction

For many pilots, cross country flying can be exciting, but as anticipation builds, a pilot may view his or her abilities in an unrealistic, overconfident manner. Another pilot may tend to view cross country flights as routine and become complacent. In either case, failure to evaluate risk before and during the flight can lead to unsafe outcomes.

Some examples of not evaluating the five risk elements related to cross country flight are:

- Carelessness when obtaining a weather briefing
- Lack of familiarity with the aircraft
- Poor planning of route, fuel requirements, etc.
- Inadequate use of navigational aids, check points, along with constant position "awareness"
- Over extension of skills especially in weather conditions
- Failing to ask for help when a problem occurs

SITUATION ANALYSIS EXERCISE

Directions:

The following is a report by a pilot who did not assess risk when planning and flying a cross-country trip. This story is an excellent example of how failure to evaluate the five risk elements during preflight and inflight can lead to an unsafe outcome.

Pilot's Report:

(1) I was going to fly two friends from Pelltown to Astorville to look at a new boat and then return to Pelltown with just one friend. (2) During my preflight weather briefing, I was told that the visibility at Pelltown was forecast to be marginal VFR, maybe even IFR, upon my

return. (3) Enroute to Astorville I updated my weather briefing and learned that the weather was probably not going to improve and that icing conditions prevailed. (4) I was becoming somewhat concerned since I did not have an instrument rating and the aircraft was not deicing equipped.

(5) At Astorville, I debated about refueling for the return trip. (6) I figured I had enough fuel to get back to Pelltown with about a 25-minute reserve. (7) I expected to get back about sunset, and decided that I would not really need the 45-minute reserve required for night VFR. (8) So I decided against topping off the tanks. (9) I had made this trip probably 50 times, and I was sure I could do it--bad weather or not. (10) Besides, I was in a hurry to get going before the weather got even worse.

(11) So, I left the Astorville area with my passenger. (12) He asked me if I thought the weather was going to be a problem. (13) I remember telling him, "No, there's nothing to flying in this stuff." (14) At the time I really meant it.

(15) About 20 miles out from Pelltown, the weather had become really nasty with steady snow flurries and gusty winds. (16) Pelltown approach control informed me that the airport was barely VFR and their Visual Approach Slope Indicator (VASI) lights were inoperative. (17) I checked the fuel and realized there was only about 15 minutes left. (18) This was not enough to get to another airport nor was I sure it was enough for a second landing attempt.

(19) With the VASI inoperative, I knew I would have to fly a very precise approach. (20) Not wanting to alarm my friend, I simply told him, "We'll be landing as quickly as possible. (21) Let's have no conversation until we get on the ground." (22) His reply of "okay" came with a flat voice and a concerned look on his face.

(23) I did not see the runway as soon as expected, so I decided to dip a bit below the recommended minimum altitude. (24) The controller then said, "Below altitude."

(25) I thought, "Don't worry, the guy who assigns these altitudes always makes them a little higher than necessary," (26) I did not adjust the descent. (27) Soon after that the aircraft struck the tree tops on the ridge a few hundred yards from the airport boundary.

Questions:

1. What subject area combinations concern the pilot in sentence 4?

a. Pilot/Aircraft

b. Pilot/Environment

c. Aircraft/Environment

d. Pilot/Aircraft/Environment

2. Which hazardous attitude would you associate with the pilot's comment in sentence 9?

a. Anti-Authority

b. Impulsivity

c. Invulnerability

d. Macho

3. Which hazardous attitude would you suspect the pilot of using by what is said in sentence 13?

a. Anti-Authority

b. Impulsivity

c. Macho

d. Resignation

4. What is the subject area being considered in sentence 18?

a. Pilot

b. Aircraft

c. Environment

d. Aircraft/Environment

5. Which antidote would you suggest for the hazardous attitude that may be present in sentence 20?

a. "Follow the rules. They are usually right."

b. "I'm not helpless. I can make a difference."

c. "Not so fast. Think first."

d. "Taking chances is foolish."

6. Which hazardous attitude is shown by what the pilot says in sentence 25?

a. Anti-Authority

b. Impulsivity

c. Macho

d. Resignation

7. One step in the ADM process requires the pilot to constantly evaluate conditions in flight and determine if the flight can be safely completed. Which sentence in the scenario best illustrates the pilot's failure to conduct this evaluation?

a. Number 4

b. Number 7

c. Number 13

d. Number 23

PHYSIOLOGICAL FACTORS AND NIGHT FLYING

Introduction

Night VFR poses additional difficulties to flying. The pilot who flies with a physiological impairment such as illness, fatigue, or intoxication faces obvious dangers. Yet, many accidents occur because pilots do not adequately assess their ability to fly safely in spite of night conditions or physiological limitations.

Here are some common examples:

- Flying while under the influence of alcohol
- Flying after taking certain medications
- Flying with a known illness
- Flying when extremely fatigued
- Flying when emotionally upset
- Flying when hungry
- Flying into conditions which are likely to cause vertigo
- Flying VFR at night without sufficient experience at recognizing landmarks
- Understanding the factors which can cause disorientation at night

SITUATION ANALYSIS EXERCISE

Directions:

The following is a report by a pilot who nearly got into trouble because his poor decision making led to physical impairment. When you finish, answer the questions following the scenario.

Pilot's Report:

(1) I had been flying at 13,500 feet for about an hour and a half before I began my descent. (2) I guess I was pushing my luck since I had no oxygen. (3) I did not think anything would happen to me because I had done this before and had always come out okay. (4) My altitude had dropped to below 12,000 feet for about 25-30 minutes before I began my landing approach.

(5) When I got over the runway threshold, I was a little "foggy" about how to land the airplane. (6) I guess "confused" is a better word. (7) Well, because of my slow and fuzzy thinking, the airplane got ahead of me. (8) I tried to land anyway, wanting to get on the ground and out of the airplane as soon as possible.

(9) The next thing I knew, I was porpoising down the runway. (10) The first jolt scared the stuffings out of me. (11) But, surprisingly enough, it also made me more alert. (12) I got the airplane airborne again, and called the tower for a closed pattern (full circuit). (13) My second landing attempt was a little better but again rough because I was still feeling fuzzy in the head. (14) I guess I was lucky I made it around the second time.

(15) Right away I went to see my doctor. (16) He asked me what I had eaten before the flight. (17) When I told him my last meal was almost twelve hours before the trip and had consisted of a candy bar, he was obviously annoyed. (18) He said, "Your story sounds like a case of hypoxia (oxygen starvation) or of hypoglycemia (low blood sugar)--or both. (19) I suspect both because you continued to feel confused at the lower altitudes. (20) Also, your symptoms cleared rapidly after your reaction to your first landing attempt. (21) A surge of adrenalin in such a situation will produce very rapid increase in blood sugar level. (22) However, the hypoxia may have made the blood sugar problem more severe."

(23) I left his office a grateful and wiser pilot. (24) I assured him that before flying I would eat a proper meal to maintain an adequate blood sugar level. (25) I also promised myself to get a supplemental oxygen system before trying another long flight at high altitude.

Questions:

1. The hazardous attitude best describing the pilot's thinking in sentence 3 is?

a. Anti-Authority

b. Impulsivity

c. Invulnerability

d. Resignation

2. The subject area mentioned in sentence 5 is?

a. Pilot

b. Aircraft

c. Environment

d. Aircraft/Environment

3. Which sentence suggests the hazardous attitude of impulsivity?

a. Number 7

b. Number 8

c. Number 9

d. Number 10

4. Which antidote would you suggest for what the pilot is saying in sentence 14?

a. "It could happen to me.

b. "Not so fast. Think first."

c. "Taking chances is foolish."

d. "I'm not helpless. I can make a difference."

5. What combination of subject areas does sentence 18 suggest?

a. Pilot/Aircraft

b. Pilot/Environment

c. Aircraft/Environment

d. Pilot/Aircraft/Environment

6. What does sentence 19 suggest to you about the doctor?

a. He knows his patient very well.

b. He does not know anything about airplanes.

c. He knows something about psychiatry and psychology.

d. He understands flight physiology and its effect on pilot judgment.

7. For which subject area has the pilot gained a greater respect, as indicated by sentence 24?

a. Pilot

b. Aircraft

c. Environmental

d. Pilot/Aircraft

8. Effective risk management requires a pilot to constantly evaluate risk in flight, otherwise, the chances for a safe outcome are reduced. Which sentence is an example of the pilot's lack of risk assessment/management?

a. Number 1

b. Number 2

c. Number 3

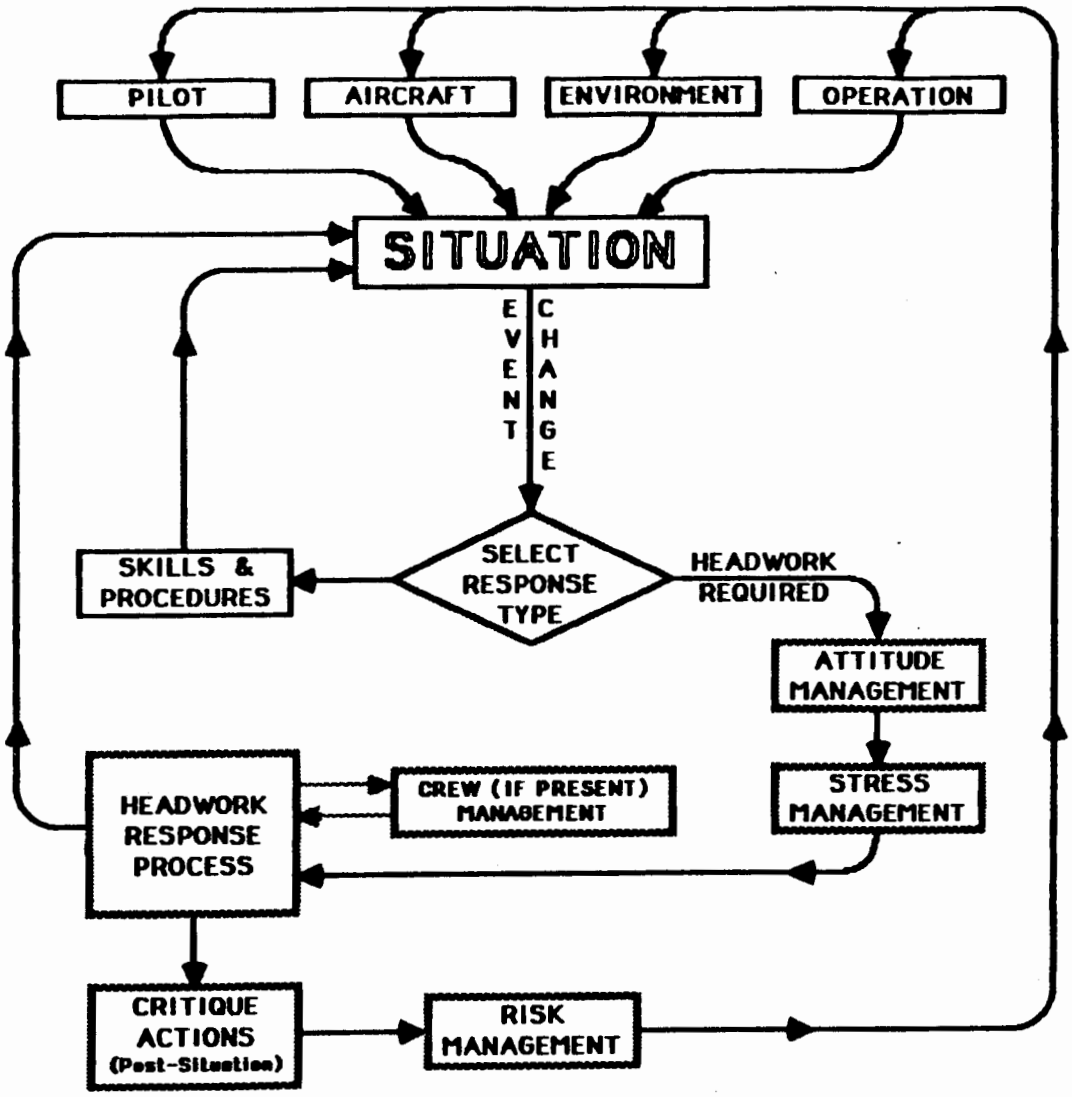
d. Number 5

9. SUMMARY

You have just completed the first aeronautical decision-making training program designed for student and private pilots. However, completion of this written material is only the beginning. You now must put these newly learned concepts into practice under the supervision of a flight instructor. Your instructor is prepared with a series of mini-preflight and in-flight lesson plans designed specifically to reinforce the basic concepts presented in this manual. Knowledge, skills, experiences--all tied together with good judgment is the basis for safe flying.

Good luck and good flying!

THE FIVE ANTIDOTES

Hazardous Attitude	Antidote
ANTI-AUTHORITY: "Don't tell me"	"Follow the rules. They are usually right."
IMPULSIVITY: "Do something - quickly!"	"Not so fast. Think first."
INVULNERABILITY: "It won't happen to me."	"It **could** happen to me."
MACHO: "I can do it."	"Taking chances is foolish."
RESIGNATION: "What's the use?"	"I'm not helpless. I **can** make a difference."

AERONAUTICAL DECISION MAKING PROCESS