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Transportation
**Federal Aviation
Administration**

Advisory Circular

Subject: **AERONAUTICAL DECISION MAKING**

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1. PURPOSE. This Advisory Circular (AC) provides introductory material, background information, and reference material on Aeronautical Decision Making (ADM). The material in this AC provides a systematic approach to risk assessment and stress management in aviation, illustrates how personal attitudes can influence decision making and how those attitudes can be modified to enhance safety in the cockpit. This AC also provides instructors with methods for teaching ADM techniques and skills in conjunction with conventional flight instruction. However, this AC is not intended to replace the complete body of knowledge contained in the ADM related reference materials listed in paragraph 4, but rather to support them and to serve as a catalyst for further study.

2. APPLICATION. The material contained in this AC is applicable to pilots who operate airplanes or helicopters under Federal Aviation Regulations (FAR) Parts 61, 91, 121, 125, 133, 135, and 141.

3. FOCUS. This AC is designed to explain the risks associated with aviation activities to pilots. Underlying behavioral causes of typical accidents and the effects of stress on ADM are emphasized. These materials provide a means for an individual to develop an "Attitude Profile" through a self-assessment inventory and provide detailed explanations of preflight and in-flight stress management techniques. The assumption is that persons exposed to these behavioral techniques will develop a positive attitude toward

safety and learn ways to manage stress while recognizing and avoiding unnecessary risk. This AC is a learning tool that will help enable a person to make an intelligent determination as to the risk involved before beginning a flight. It is intended that the reader recognize risk factors such as weather, weight and balance, recency of experience, environment, and cockpit stress management so as to deal effectively with them.

4. RELATED REFERENCE MATERIAL.

Twelve years of ADM research, development, and testing culminated in 1987 with the publication of six manuals oriented to the decision making needs of variously rated pilots. These manuals provide multifaceted materials designed to reduce the number of decision related accidents (the type of accidents which account for 52 percent of fatal general aviation pilot error accidents). The effectiveness of these materials has been validated in six independent studies where student pilots received such training in conjunction with the standard flying curriculum. When tested, the pilots who had received ADM training made fewer in-flight errors than those who had not received ADM training. The differences were statistically significant and ranged from about 10 to 50 percent fewer judgment errors. In the operational environment, an operator flying about 400,000 hours annually demonstrated a 54 percent reduction in accident rate after using these materials for recurrency training. For detailed information regarding exposure to risk assessment, stress management, interpersonal

crew coordination and communication, and other ADM techniques, the reader is directed to one or more of the manuals which may be obtained from National Technical Information Service.

a. **Published Documents.** (Price of individual documents is subject to change without notice.)

<u>Report Number</u>	<u>Title</u>
DOT/FAA/PM-86/41	Aeronautical Decision Making for Student and Private Pilots. NTIS identification number ADA182549, price \$23.00.
DOT/FAA/PM-86/42	Aeronautical Decision Making for Commercial Pilots. NTIS identification number ADA198772, price \$17.00.
DOT/FAA/PM-86/43	Aeronautical Decision Making for Instrument Pilots. NTIS identification number N8724880, price \$17.00.
DOT/FAA/PM-86/44	Aeronautical Decision Making for Instructor Pilots (how to teach ADM). NTIS identification number ADA182611, price \$17.00.
DOT/FAA/PM-86/45	Aeronautical Decision Making for Helicopter Pilots. NTIS identification number ADA180325, price \$23.00.

<u>Report Number</u>	<u>Title</u>
DOT/FAA/PM-86/46	Aeronautical Decision Making - Cockpit Resource Management. NTIS identification number ADA205115, price \$23.00.

b. **Any of the series** of ADM training manuals may be obtained by writing or calling:

Mailing Address: National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

Telephone: (703) 487-4650 (orders)
(800) 336-4700 (rush orders only)
(703) 478-4780 (title identification branch)

5. DEFINITIONS.

a. **ADM** is a systematic approach to the mental process used by aircraft pilots to consistently determine the best course of action in response to a given set of circumstances.

b. **Attitude** is a personal motivational predisposition to respond to persons, situations, or events in a given manner that can, nevertheless, be changed or modified through training. A sort of *mental shortcut* to decision making.

c. **Attitude Management** is the ability to recognize hazardous attitudes in oneself and the willingness to modify them as necessary through the application of an appropriate antidote thought.

d. **Cockpit Resource Management, (CRM)**, in multiperson crew configurations, is the effective use of all personnel and material

assets available to a flight crew. CRM emphasizes good communication and other interpersonal relationship skills.

e. **Headwork** is required to accomplish a conscious, rational thought process when making decisions. Good decision making involves risk identification and assessment, information processing, and problem solving.

f. **Judgment** is the mental process of recognizing and analyzing all pertinent information in a particular situation, a rational evaluation of alternative actions in response to it, and a timely decision on which action to take.

g. **Personality** is the embodiment of personal traits and characteristics of an individual that are set at a very early age and extremely resistant to change.

h. **Poor Judgment (PJ) Chain** is a series of mistakes that may lead to an accident or incident. Two basic principles generally associated with the creation of a PJ chain are: (1) one bad decision often leads to another; and (2) as a string of bad decisions grows, it reduces the number of subsequent alternatives for continued safe flight. ADM is intended to break the PJ chain before it can cause an accident or incident.

i. **Risk Management** is the part of the decision making process which relies on situational awareness, problem recognition, and good judgment to reduce risks associated with each flight.

j. **Risk Elements** in ADM take into consideration the four fundamental risk elements: the pilot, the aircraft, the environment, and the

type of operation that comprise any given aviation situation.

k. **Situational Awareness** is the accurate perception and understanding of all the factors and conditions within the four fundamental risk elements that affect safety before, during, and after the flight.

l. **Skills and Procedures** are the procedural, psychomotor, and perceptual skills used to control a specific aircraft or its systems. They are the *stick and rudder* or *airmanship* abilities that are gained through conventional training, are perfected, and become almost automatic through experience.

m. **Stress Management** is the personal analysis of the kinds of stress experienced while flying, the application of appropriate stress assessment tools, and other coping mechanisms.

n. **VOR** is a very high frequency omnidirectional range station.

6. **COMMENTS INVITED.** Comments regarding this publication should be directed to:

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Flight Standards National Field Office,
AFS-500 (Advisory Circular Staff)
P.O. Box 20034, Gateway Building
Dulles International Airport
Washington, DC 20041-2034

Every comment will not necessarily generate a direct acknowledgement to the commenter. Comments received will be considered in the development of upcoming revisions to AC's or other related technical material.



Thomas C. Accardi
Director, Flight Standards Service

CONTENTS

	<u>Page No.</u>
CHAPTER 1. INTRODUCTION	1
1. General	1
2. ADM Process	1
3. Conventional Decision Making	2
4. Operational Pitfalls	3
CHAPTER 2. HAZARDOUS ATTITUDE INVENTORY	5
5. Attitude Assessment Test	5
6. Self-Assessment Hazardous Attitude Inventory Test	5
7. Instructions for Taking the Self-Assessment Hazardous Attitude Inventory Test	5
8. Scoring Instructions	7
9. Attitude Profile	7
10. Sample Situations for Advanced Rated Pilots	7
11. Profile Explanation	8
12. Summary	9
CHAPTER 3. DEALING WITH HAZARDOUS ATTITUDES	11
13. Hazardous Attitudes	11
14. Antidotes for Hazardous Attitudes	11
15. Antidote Recall Exercise	11
16. The Importance of Reinforcement Exercises	12
17. Instructions for Using Reinforcement Exercises	12
CHAPTER 4. STRESS AND FLYING	17
18. What Is Stress	17
19. How Much Stress Is in Your Life?	17
20. Is Stress Bad	17
21. Handling Stress In Flying	17
CHAPTER 5. RISK MANAGEMENT	21
22. Assessing Risk	21
23. The Decide Model	21

CONTENTS (Continued)

	<u>Page No.</u>
CHAPTER 6. IDENTIFYING THE ENEMY	23
24. General	23
25. Personal Checklist	23
26. How To Be A Safe Pilot	24
27. Development of Good Decision Making Skills	24
28. Successful Decision Making	25
CHAPTER 7. TEACHING ADM	27
29. Purpose	27
30. Background	27
31. The Flight Instructor's Role in ADM Training	27
32. Principles of ADM Training	27
33. Teaching the Behavioral Aspects of ADM	28
34. Teaching the Application Exercises	28
35. In-Flight Instruction: The Lesson Plans	29
36. In-Flight Instruction: The Training Scenario	29
37. Typical Training Scenarios	29
38. Management of ADM Training	29
APPENDIX 1. SAMPLE ATTITUDE INVENTORY ANSWER SHEET	(1 Page)
APPENDIX 2. SCORING FORM	(1 Page)
APPENDIX 3. ATTITUDE PROFILE	(1 Page)
APPENDIX 4. ANTIDOTE RECALL EXERCISE	(1 Page)
APPENDIX 5. LIFE EVENTS STRESS TEST	(1 Page)

CHAPTER 1. INTRODUCTION

1. **GENERAL.** Contrary to popular opinion, good judgment can be taught. Heretofore it was supposed to be gained only as a natural by-product of experience. As pilots continued to log accident-free flight hours, a corresponding increase of good judgment was also assumed.

2. ADM PROCESS.

a. *ADM builds upon the foundation of conventional decision making (figure 1), but enhances the process to decrease the probability of pilot error. ADM provides a structured, systematic approach to analyzing changes that occur during a flight and how these changes might affect a flight's safe outcome. The ADM process addresses all aspects of decision making in the cockpit and identifies the steps involved in good decision making.*

Steps for good decision making are:

- (1) Identifying personal attitudes hazardous to safe flight.
- (2) Learning behavior modification techniques.
- (3) Learning how to recognize and cope with stress.
- (4) Developing risk assessment skills.
- (5) Using all resources in a multicrew situation.
- (6) Evaluating the effectiveness of one's ADM skills.

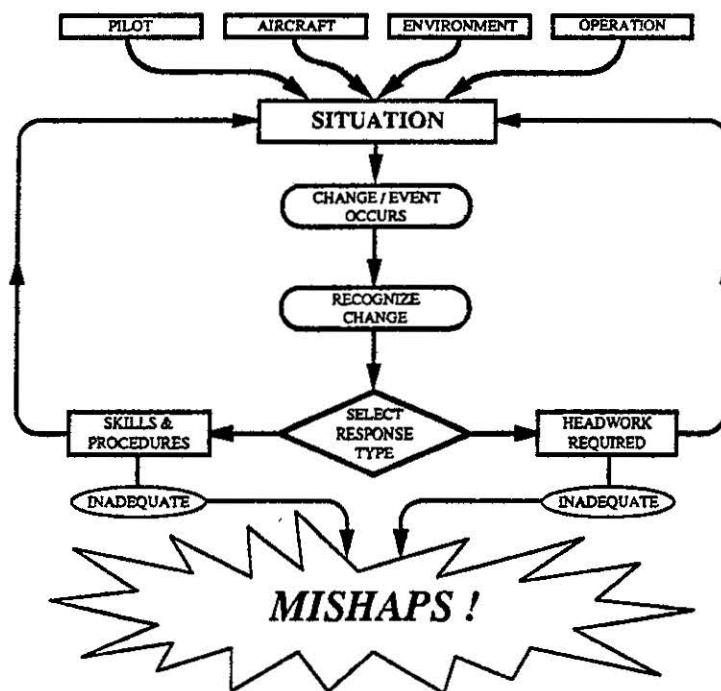


FIGURE 1. CONVENTIONAL DECISION MAKING PROCESS

3. CONVENTIONAL DECISION MAKING.

a. *In conventional decision making*, the need for a decision is triggered by recognition that something has changed or an expected change did not occur. Recognition of the change, or non-change, in the situation is a vital step in any decision making process. Not noticing the change in the situation can lead directly to a mishap (figure 1). The change indicates that an appropriate response or action is necessary in order to modify the situation (or, at least, one of the elements that comprise it) and bring about a desired new situation. Therefore, situational awareness is the key to successful and safe decision making. At

this point in the process, the pilot is faced with a need to evaluate the entire range of possible responses to the detected change and to determine the best course of action.

b. *Figure 2 illustrates the ADM process*, how this process expands conventional decision making, and shows the interactions of the ADM steps and how these steps can produce a safe outcome. Starting with the recognition of change, and following with an assessment of alternatives, a decision to act or not act is made, and the results are monitored. ADM enhances the conventional decision making process with an awareness of the importance of attitudes in decision making, a

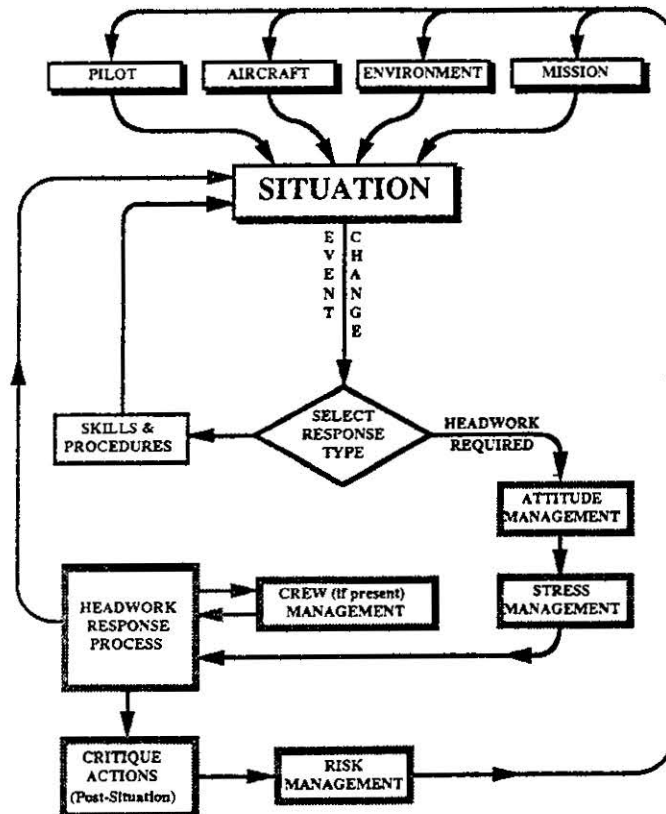


FIGURE 2. AERONAUTICAL DECISION MAKING PROCESS

learned ability to search for and establish the relevance of all information, and the motivation to choose and execute the actions which assure safety in a timeframe permitted by the situation. These elements of ADM are discussed in depth as they relate to the specific discipline in each of the training manuals.

4. OPERATIONAL PITFALLS. There are a number of classic behavioral traps into which pilots have been known to fall. Pilots, particularly those with considerable experience, as a rule always try to complete a flight as planned, please passengers, meet schedules, and generally demonstrate that they have the "right stuff." This much-talked-about "right stuff" is a fragile image. The basic drive to demonstrate the "right stuff" can have an adverse effect on safety and can impose an unrealistic assessment of piloting skills under stressful conditions. These tendencies ultimately may lead to practices that are dangerous and often illegal, and may lead to a mishap. All experienced pilots have fallen prey to, or have been tempted by, one or more of these tendencies in their flying careers. These dangerous tendencies or behavior patterns, which must be identified and eliminated, include:

a. **Peer Pressure.** Poor decision making based upon emotional response to peers rather than evaluating a situation objectively.

b. **Mind Set.** The inability to recognize and cope with changes in the situation different from those anticipated or planned.

c. **Get-There-Itis.** This tendency, common among pilots, clouds the vision and impairs judgment by causing a fixation on the original goal or destination combined with a total disregard for any alternative course of action.

d. **Duck-Under Syndrome.** The tendency to *sneak a peek* by descending below minimums during an approach. Based on a belief that there is always a built-in "fudge" factor that can be used or on an unwillingness to admit defeat and shoot a missed approach.

e. **Scud Running.** Pushing the capabilities of the pilot and the aircraft to the limits by trying to maintain visual contact with the terrain while trying to avoid physical contact with it. This attitude is characterized by the old pilot's joke: "If it's too bad to go IFR, we'll go VFR."

f. **Continuing visual flight rules (VFR)** into instrument conditions often leads to spatial disorientation or collision with ground/obstacles. It is even more dangerous if the pilot is not instrument qualified or current.

g. **Getting Behind the Aircraft.** Allowing events or the situation to control your actions rather than the other way around. Characterized by a constant state of surprise at what happens next.

h. **Loss of Positional or Situation Awareness.** Another case of getting behind the aircraft which results in not knowing where you are, an inability to recognize deteriorating circumstances, and/or the misjudgment of the rate of deterioration.

i. **Operating Without Adequate Fuel Reserves.** Ignoring minimum fuel reserve requirements, either VFR or Instrument Flight Rules (IFR), is generally the result of overconfidence, lack of flight planning, or ignoring the regulations.

j. **Descent Below the Minimum Enroute Altitude.** The duck-under syndrome (mentioned above) manifesting itself during the en route portion of an IFR flight.

k. **Flying Outside the Envelope.** Unjustified reliance on the (usually mistaken) belief that the aircraft's high performance capability meets the demands imposed by the pilot's (usually overestimated) flying skills.

l. **Neglect of Flight Planning, Preflight Inspections, Checklists, Etc.** Unjustified reliance on the pilot's short and long term memory, regular flying skills, repetitive and familiar routes, etc.

CHAPTER 2. HAZARDOUS ATTITUDE INVENTORY

5. ATTITUDE ASSESSMENT TEST. In each ADM manual, a chapter addresses five hazardous attitudes that can affect a pilot's judgment, and how these hazardous attitudes can have an impact on safe flying. Subsequent chapters in each of the ADM manuals provide methods of modifying these hazardous attitudes.

6. SELF-ASSESSMENT HAZARDOUS ATTITUDE INVENTORY TEST. Each ADM student should take the Self-Assessment Hazardous Attitude Inventory Test in order to gain a realistic perspective on his/her attitudes toward flying. The inventory test requires the pilot to provide a response which most accurately reflects the reasoning behind his/her decision. The pilot must choose one of the five given reasons for making that decision, even though the pilot may not consider any of the five choices acceptable. The inventory test presents extreme cases of incorrect pilot decision making in an effort to introduce the five types of hazardous attitudes described in Chapter 3 of this AC.

7. INSTRUCTIONS FOR TAKING THE SELF-ASSESSMENT HAZARDOUS ATTITUDE INVENTORY TEST.

a. *Read over each* of the six situations and the five choices contained in the inventory test. Keep in mind that there are no correct answers.

b. *Decide which one of the five choices* is the most likely reason for the decision made. Using a copy of the Attitude Inventory Answer Sheet (appendix 1), place the number 5 in the space provided.

c. *Continue by ranking in declining order* the remaining four probable reasons from 4 (next most likely) to 3, 2, and 1 (least likely) until all five blanks have been filled. (Figure 3 provides an example of how the alternatives might be ranked.)

Situation 1 (Example)

- a. 1 (your least likely reason)
- b. 3
- c. 5 (your most likely reason)
- d. 2
- e. 4

FIGURE 3. SAMPLE SET OF RANK ORDERED ANSWERS

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, and 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. You 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. 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. I have made it this far. What is the use in turning back now?
- b. The panic of the passenger makes you think it will not happen to me - I have encountered ice before and nothing happened.
- c. Why is he panicking? I can handle this situation just like I have done before.
- d. FAA regulations exaggerate the dangers of icing. I can handle this situation.
- e. I have got to do something. Descend! That will make everyone realize that I am in control.

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 40 minutes late for a trip in a small airplane. 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.

8. SAMPLE SITUATIONS FOR ADVANCED RATED PILOTS.

a. *Paragraph 7 presented examples of six situations from the student/private pilot ADM manual. For pilots with advanced ratings, the remaining ADM manuals provide similar situations and self-assessment tests. The following are example situations taken from these texts.*

Situation 7. Instrument Pilot ADM Situation. You plan an important business flight under instrument conditions in an aircraft with no deicing equipment through an area in which light to moderate rime or mixed icing in clouds, and precipitation above the freezing level has been forecast. You decide to make the trip, thinking:

_____a. You believe your skills are good enough to handle ice accumulation on the aircraft.

_____b. You have been in this situation many times and nothing has happened.

_____c. You must get to the business meeting in 2 hours and cannot wait.

_____d. You don't allow an icing forecast to stop you; weather briefers are usually overly cautious.

_____e. There is nothing you can do about atmospheric conditions.

Situation 8. Commercial Pilot ADM Situation. Your passengers have shown up almost an hour late. You are going to an airport that requires a reservation. Which of the following alternatives best illustrates your reaction?

_____a. You think to yourself, if I hurry, maybe I can still make it.

_____b. Nothing will happen if I miss this reservation.

_____c. I'm smart enough to talk our way in when we arrive.

_____d. I can't help it if my passengers were late. I don't control them.

_____e. The Feds wouldn't dare keep me out.

Situation 9. Helicopter Pilot ADM Situation. You are to fly a helicopter which you know is old and has been poorly maintained. A higher than normal turbine outlet temperature on startup is indicated, and you suspect the fuel control. Two fellow company pilots, travelling as passengers, do not want to be delayed. After 5 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 over-emphasize safety in this kind of situation.

_____c. You think that the fuel control will certainly last for just one more flight.

____d. You feel that your opinion may be wrong since the two other pilots are willing to take the risk.

____e. The thought of changing arrangements is annoying, so you jump at the suggestion of the other pilots.

Situation 10. Instructor Pilot ADM Situation.

You perform a slip demonstration during an approach to landing and fly the aircraft to the left of the runway centerline to a position which would make an attempted landing possible but dangerous. You return control of the aircraft to the student and instruct him to "execute proper landing procedures." Which of the following best characterizes your attitude about putting the student and yourself in this situation?

____a. I can always handle this even if he can't.

____b. Whatever happens, it's up to him now.

____c. I've never had a problem doing this in the past.

____d. The quicker we get through this, the better.

____e. These aircraft can take a lot worse landings than the manuals suggest.

9. SCORING INSTRUCTIONS. After completing the inventory test, transfer the responses for each alternative from the completed Attitude Inventory Answer Sheet (appendix 1) to the appropriate section of the Scoring Form (appendix 2). Total the ranking scores for each scale and enter the total in the space provided at the bottom of each column. The total score for each situation must be 15, while the total for situations 1 through 6 must be 90. If the totals are not 15 and 90, review for possible errors in the transfer of scores and check addition. These totals are then marked on the Attitude Profile (appendix 3) where indicated for situations 1 through 6.

10. ATTITUDE PROFILE. Using the total scores for each Scale I-V from appendix 2, place an "X" on the corresponding scale profile in appendix 3. Notice that the score values run from bottom to top, so that the highest value should be at the highest point on the profile sheet. Straight lines should be drawn from the score in each scale to the score in the next scale (connect the "X's") so that the profile resembles a graph. Note the hazardous attitude shown at the bottom of each scale on appendix 3.

11. PROFILE EXPLANATION. The profile graph indicates the comparative tendency for each of the five hazardous attitudes. The higher the relative rank (first, second, third, etc.), the greater the propensity to respond with that hazardous attitude. The pilot should keep in mind his/her results while reviewing the explanation. An explanation of the pilot's profile starts with the description of an all-too-common flight situation.

a. *A pilot of a single-engine aircraft* checks the weather and notes that there is a possibility of a thunderstorm at the destination airport. The pilot has never operated an aircraft in bad weather and knows that a flight instructor would advise against flying. Despite this knowledge, the pilot takes off, crashes in poor weather, and is seriously injured.

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

12. SUMMARY.

a. *The pilot should use the profile* to determine which hazardous attitudes dominated his/her responses. The profile will illustrate which hazardous thought patterns have a greater tendency to influence a pilot's judgment. The inventory test may indicate the actual tendency of the pilot; however, exhibiting attitudes similar to those described are common and normal. As a pilot's flying career

progresses, the ability to identify these hazardous attitudes will help the pilot counteract his/her hazardous thoughts. The goal of this exercise is to balance all thoughts against possible outcomes so that actions are nonhazardous. A critical part of ADM training is learning to examine the thinking process and control hazardous attitudes. Flying will become safer if a pilot is able to identify and act upon hazardous attitudes.

b. *In reviewing* the five hazardous attitudes in Chapter 3, a pilot should pay particular attention to hazardous attitudes that may characterize his/her own tendencies. Hazardous attitudes occur to every pilot to some degree at some time. Problems arise when these hazardous attitudes occur regularly and/or to an extreme. Therefore, a pilot should learn to recognize these hazardous attitudes in order to take corrective action.

CHAPTER 3. DEALING WITH HAZARDOUS ATTITUDES

13. HAZARDOUS ATTITUDES. ADM addresses the following five hazardous attitudes.

a. *Antiauthority (don't tell me!).* This attitude is found in people who do not like anyone telling them what to do. In a sense they are saying no one can tell me what to do. They may be resentful of having someone tell them what to do or may 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.

b. *Impulsivity (do something quickly!)* is the attitude 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, and they do the first thing that comes to mind.

c. *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. They never really feel or believe that they will be personally involved. Pilots who think this way are more likely to take chances and increase risk.

d. *Macho (I can do it).* Pilots who are always trying to prove that they are better than anyone else are thinking I can do it - I'll show them. Pilots with this type of attitude will try to prove themselves by taking risks in order to impress others. While this pattern is thought to be a male characteristic, women are equally susceptible.

e. *Resignation (what's the use?).* Pilots who think what's the use? do not see themselves

as being able to make a great deal of difference in what happens to them. When things go well, the pilot is apt to think that's good luck. When things go badly, the pilot may feel that someone is out to get me, or attribute it to bad luck. The pilot will leave the action to others, for better or worse. Sometimes, such pilots will even go along with unreasonable requests just to be a "nice guy."

14. ANTIDOTES FOR HAZARDOUS ATTITUDES.

a. *Hazardous attitudes which contribute* to poor pilot judgment can be effectively counteracted by redirecting that hazardous attitude so that appropriate action can be taken. Recognition of hazardous thoughts is the first step in neutralizing them in the ADM process. This chapter is designed to familiarize the pilot with a means of counteracting hazardous attitudes with an appropriate *antidote thought*.

b. *When a pilot recognizes* a thought as hazardous, the pilot should label that thought as hazardous, then correct that thought by stating the corresponding antidote. Antidotes should be memorized for each of the hazardous attitudes so that they automatically come to mind when needed.

15. ANTIDOTE RECALL EXERCISE. The hazardous attitude antidotes (figure 4) should be learned thoroughly and practiced. Make a copy of the Antidote Recall Exercise form (appendix 4) and, without referring to the text, write the characteristic thought for each hazardous attitude and its appropriate antidote. Check the statements and continue if they are correct. If not, continued study of the antidotes is recommended until they are memorized.

16. THE IMPORTANCE OF REINFORCEMENT EXERCISES. The basic definitions, the self-assessment test, the hazardous attitudes, and the antidotes represent the foundation for understanding the factors of good ADM. However, they represent only about 10 percent of the important process of learning and putting ADM into practice. The other 90 percent can be achieved only through completion of all of the situation exercises in the appropriate manual (i.e., Student/Private, Instrument, Commercial, etc.) and applying the principles learned to each and every flight. Some examples of the reinforcement exercises from each of the manuals follow. These are presented as examples of the types of decision errors which have contributed to accidents in the past.

HAZARDOUS ATTITUDE	ANTIDOTE
Antiauthority: 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.

FIGURE 4. THE FIVE ANTIDOTES

17. INSTRUCTIONS FOR USING REINFORCEMENT EXERCISES. Read each of the following situations. At the end of each situation, an alternative should be selected which best illustrates the reactions of a pilot who is thinking a particular hazardous attitude. After the most appropriate alternative is selected, refer to the explanation of alternatives page for the proper response. This page will provide the correct answer. If the selection is accurate, proceed to the next situation. If an incorrect alternative was selected, the reader should review the situation again and select another alternative. Repeat the exercise until the correct alternative is selected.

a. *The Impulsivity Hazardous Attitude.*

(1) *Situation:* As you enter the landing pattern, 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 down, you realize that you forgot to extend the flaps. Which of the following alternatives best illustrates the impulsivity reaction?

(i) You feel that nothing is going to happen because you have made intentional no-flap landings before.

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

(iii) You think that using a checklist is a stupid requirement.

(iv) You immediately grab the flap handle and add full flaps.

(v) You think that it all depends on whether you get an updraft or downdraft now.

(2) *Explanation of Alternatives:*

(i) Feeling that nothing bad can happen suggests the invulnerability hazardous attitude (it won't happen to me). Go back to the situation and select another alternative.

(ii) 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 the situation and select another alternative.

(iii) Thinking that checklists are stupid suggests that you feel that aircraft designers, the Government, and your instructor, all of whom urge the use of checklists, are wrong. This suggests the antiauthority hazardous attitude (don't tell me). Go back to the situation and select another alternative.

(iv) 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 the next situation.

(v) If you are convinced that it is up to the wind, this implies the hazardous attitude of resignation (what's the use). Go back to the situation and select another alternative.

(3) *A Good Attitude.* Distractions can be dangerous--always use your checklist.

b. The Antiauthority Hazardous Attitude.

(1) *Situation:* You approach the VOR and the controller asks if you want to execute the entire VOR procedure or will you accept a right turn of more than 90° to intercept the final approach course. You state that you will make the turn directly onto final at 2,000 feet although this will press you to get properly established on final. Which of the following alternatives best illustrates the antiauthority reaction?

(i) It was not your idea to make the approach like this.

(ii) A controller is not going to influence the way I fly.

(iii) You do not need the full approach; you know you are a good instrument pilot.

(iv) You are in a hurry and do not wish to bother with the full approach.

(v) You know the controllers will be impressed with this approach.

(2) Explanation of Alternatives.

(i) By assuming someone else has responsibility for your approach, you exhibit the resignation attitude (what's the use?). Go back to the situation and select another alternative.

(ii) Right! The regulations are for someone else attitude assumes controllers are interfering with your business. You are thinking in an antiauthority manner. Go on to the next situation.

(iii) Here you are taking the invulnerability stand (it won't happen to me). You think of yourself as invulnerable. Go back to the situation and select another alternative.

(iv) This is the impulsivity hazardous attitude (I must act now, there's no time). Go back to the situation and select another alternative.

(v) The desire to impress another influences your decision. This is the macho attitude (I'll show you - I can do it). Go back to the situation and select another alternative.

(3) *A Good Attitude.* Make as much time available on an approach as possible. You may need it.

c. The Macho Hazardous Attitude.

(1) *Situation:* On a trip to the west coast, you make an en route refueling stop at an airport in the Rockies. After refueling, the density altitude prior to your departure is reported as 10,500 feet. You are at maximum takeoff weight when you depart. At the present rate of climb, you will just barely clear the minimum crossing altitude (MCA) at the next intersection on your flight route. Which of the following alternatives best illustrates the macho reaction?

(i) There is really nothing you can do about it; it is up to air traffic control (ATC) to make sure you clear.

(ii) The MCA's have plenty of leeway for clearance. So what if you are a little low.

(iii) You are a good pilot and will make it.

(iv) When you see that you cannot climb enough, you immediately inform ATC of your situation without determining your intentions.

(v) Mountain flying is not any different from any other flying and you have never run into any problems before. Nothing will happen.

(2) *Explanation of Alternatives.*

(i) Assuming someone else is responsible for you is the resignation hazardous attitude. Go back to the situation and select another alternative.

(ii) This is the antiauthority hazardous attitude (don't tell me). Go back to the situation and select another alternative.

(iii) Right! Thinking I'll show you - I can do it, is the macho hazardous attitude.

(iv) Acting before thinking, this is the impulsivity hazardous attitude (do something quickly). Go back to the situation and select another alternative.

(v) This is the invulnerability hazardous attitude (it won't happen to me). Go back to the situation and select another alternative.

(3) *A Good Attitude.* Be aware of your limitations and don't exceed them.

d. *The Invulnerability Hazardous Attitude.*

(1) *Situation:* While preflighting the pressurization system, you discover that the rate adjustment control is inoperative. Knowing that you can manually control the cabin pressure, you opt to disregard this discrepancy and depart on your trip. You will have to handle the system yourself. Which of the following alternatives best illustrates the **invulnerability** reaction?

(i) It's too late to fix it now.

(ii) You can handle a little problem like this.

(iii) What's the worst that could happen?

(iv) I certainly didn't break it. It's not my fault.

(v) You barely need the pressurization at the filed altitude anyway.

(2) *Explanation of Alternatives.*

(i) This is the impulsivity hazardous attitude (there's no time - I must do something quickly). Go back to the situation and select another alternative.

(ii) This is the macho hazardous attitude showing through (I can do it). Go back to the situation and select another alternative.

(iii) Right! Nothing bad is going to happen to you because of your invulnerability. Go on to the next situation.

(iv) This is the resignation hazardous attitude - what's the use? - where someone else is responsible. Go back to the situation and select another alternative.

(v) This type of thinking is characteristic of the antiauthority attitude (rules and regulations are made to be broken). Go back to the situation and select another alternative.

(3) *A Good Attitude.* Settle for nothing less than full operating systems.

e. *The Resignation Hazardous Attitude.*

(1) *Situation:* Your copilot shows up for duty and you notice that the copilot's behavior is

somewhat out of the ordinary. You know your copilot has had a cold. When questioned, the copilot said maybe it was the antihistamine that he/she took the night before. Although your aircraft requires a crew of two, you decide to ignore your copilot's drowsiness and inattention. Which of the following alternatives best illustrates the resignation reaction?

(i) You could fly this jet by yourself anyway.

(ii) You two have flown together many times, and everything has always worked out fine.

(iii) What else can you do? He was assigned this flight too.

(iv) He/she might not be within the regulations, but he/she says he/she's okay and that's what counts.

(v) There is really no time to call another copilot now.

(2) *Explanation of Alternatives.*

(i) This is a trait of the macho hazardous attitude (I can do it). Go back to the situation and select another alternative.

(ii) This is the invulnerability attitude (it won't happen to me). Go back to the situation and select another alternative.

(iii) Right! When you feel as if it is out of your control, you are exhibiting the resignation hazardous attitude.

(iv) This is the antiauthority hazardous attitude (the rules and regulations don't apply to me). Go back to the situation and select another alternative.

(v) This is the impulsivity hazardous attitude (do something quickly). Go back to the situation and select another alternative.

(3) *A Good Attitude.* Don't let others do your thinking for you.