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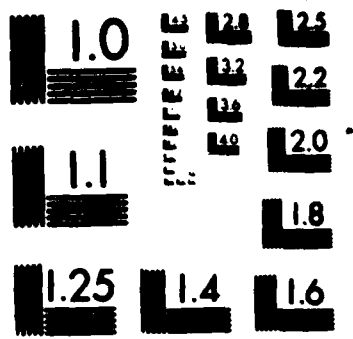UNCLASSIFIED   DTFA01-80-C-10080   F/G 1/2   NL

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AERONAUTICAL DECISION MAKING FOR INSTRUCTOR 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 flight instruction activities, the underlying behavioral causes of typical accidents, and the effects of stress on pilot decision making. This instructor manual explains the unique aspects of teaching judgment concepts in contrast with the imparting of knowledge and the development of airmanship skills in conventional flight training. It also provides detailed explanations of pre-flight and in-flight stress management techniques. The assumption is that CFI's receiving this training will develop a positive attitude toward safety and the ability to effectively manage stress 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. Keywords:

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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.

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FOREWORD

This aeronautical decision-making training manual is a result of ten years of research, development, testing and evaluation of the effectiveness of judgment and decision making. This manual is a revision of the prototype publication "Judgment Training Manual for Instructor Pilots," which was developed by 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.
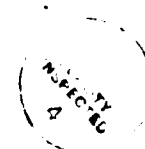
This manual contains the necessary background material to help prepare you to effectively teach the subject material contained in the companion publication entitled "Aeronautical Decision Making for Private Pilots." Similar training materials have been developed for commercial and instrument pilots and for those 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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AERONAUTICAL DECISION MAKING
FOR INSTRUCTOR PILOTS

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1. INTRODUCTION

This INSTRUCTOR MANUAL contains directions for administering the decision-making training program described in the publication "Aeronautical Decision Making for Student and Private Pilots." This manual supplements the private pilot manual and is not designed to be used on its own.

Learn the private manual! The material contained in the private manual constitutes about 80 percent of this training course. This manual outlines the private manual, explains how to present the material to your students, and provides guidance on how to resolve student difficulties.

This manual will not teach you the material that students must learn from the private manual. You must study and complete all of the lessons contained in the private manual. This material is critical to the success of the training program.

Note that the private manual requires a minimum of study and memorization. By reading the various chapters and completing the exercises, you, as well as your students, will learn most or all of the material.

Use the "situations" to full advantage. The private manual contains numerous examples and "situations" taken from reports of accidents and incidents. Some have been slightly altered to fit the requirements of each section. Use these scenarios in two ways:

First, emphasize to the student the reality of the situations. Stress that these situations continually occur in accidents and incidents. Second, discuss the scenarios and the accompanying exercises with your students. If possible, enrich these discussions with examples from your own experiences. This is encouraged because discussion of actual incidents and personal experiences may improve the student's judgment and decision making.

The flight training is entirely up to you. This instructor manual contains two sets of training activities not in the private manual which should be presented to the student during flight training. Although these lessons require student-instructor interaction, no learning of new material is necessary. This allows the student to apply what has been learned to actual flight situations.

Knowing the principles upon which this training program is founded will help you present the material more positively to your students. Indeed, it is important that your students perceive your attitude toward this training as positive. Although a discussion of each principle listed below is presented within the body of the instructor manual, this summary may help you to understand each segment of the program more clearly.

Principles of Decision-Making Training

o The private manual is simple and repetitive for two reasons: 1) the simplicity provides frequent positive reinforcement; 2) the repetition builds good judgment habits and refreshes memory so that information can be readily recalled in a variety of circumstances, even when under stress.

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o The scenarios in the private manual should stimulate the student's interest and appreciation of the need for good pilot judgment and decision making. Discussions of these stories and similar ones from your repertoire of personal experiences are more important for developing the student's judgment and decision-making skills.

o The instructor, you, profoundly affects the student as a role model and as an opinion shaper. Instructor attitudes toward safe flying and toward this material may influence the student much more than actual flight training. Furthermore, instruction is greatly improved when the instructor acts as coach and consistently uses effective educational principles.

o Use of the decision-making concepts to guide conversations with the student focuses the instruction on judgment-related training and increases the student's ability to provide self-generated feedback upon which good judgment depends.

o Knowing how to recognize and respond to hazardous attitudes and high stress is very important to exercising good pilot judgment. The instructor should encourage the student to develop these skills, but in doing so should never attempt to analyze or modify the student's personality.

o The student learns concepts and behavioral techniques, then repeatedly applies this learning to relevant flight situations during ground and flight training. Through repeated reinforcement and continued student involvement, this program builds new intellectual and behavioral habits. Spaced practice which includes repetition, feedback, and positive reinforcement is essential to the success of this training program.

The Instructor's Role in Training

Although this curriculum is designed to help pilots overcome a variety of circumstances which may result in poor pilot judgment, you, the flight instructor, are the key element of this program. Your attitude and your approach to flying may often influence your students more than any specific lesson. By always setting a good example and by giving students support and encouragement throughout this program, you help them develop good judgment and sound flying practices.

To help prepare yourself for this role, think about the difference between the instructor as evaluator and the instructor as coach. The evaluator sees his or her role as one of telling the student what to do then monitoring the student's performance. Most of the time is spent making assignments, watching performance, answering questions, measuring performance and making positive or negative evaluation. The amount of learning actually accomplished is up to the student.

In contrast, think of the instructor in a slightly different perspective, as "coach," as someone who actively stimulates learning. The instructor not only makes assignments and observes the results, he or she also helps the student learn through demonstration and personalized instruction. The instructor-coach does more than just answer questions and point out errors, he or she also asks pertinent questions to stimulate the student's thought processes and encourages correct ways of doing things by helping the student analyze mistakes.

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How do you instruct as a coach? First, be actively involved with your students as individuals. A student learns more when he/she realizes that his/her instructor respects him as a unique individual. Show the student that you know and care about him or her and can respond to day-to-day changes in the student. One day a student may be alert and ready to learn; another day the student, for whatever reason, may be unresponsive. Students may often find it difficult to tell you what is on their minds. Listen and respond constructively to help a student learn to be more open.

Use Sound Educational Principles

A good coach uses sound educational methods based on principles of psychology. In general, it is best to deal only with the actual behavior of the student. Make no attempt to guess motives, change ideas, or develop willpower. Focus your attention completely on what the student actually says or does. When they relate directly to specific observable actions or statements, your responses are the most effective.

The basic educational principles which follow are simple, but application does take some practice. When you first try to apply them you may feel somewhat awkward, but eventually you will become more comfortable with them. After a few months the use of these principles will become automatic.

BASIC EDUCATIONAL PRINCIPLES

1. The first principle is:

BEHAVIOR POSITIVELY REINFORCED WILL CONTINUE

Simply put, reinforcement is anything desirable that follows a specific behavior. This may consist of such ordinary things as a smile, a word of praise, or simply letting the student know he or she has done something correctly.

2. The second principle is:

BEHAVIOR FOLLOWED BY PUNISHMENT MAY DECREASE

Generally, punishment is not an effective way to correct erroneous or undesirable behavior. True, potent punishment will reduce the likelihood of repeating undesirable behavior, but it does not teach the student to substitute the correct response. The student would be just as likely to substitute a different mistake as he or she would be to learn the correct response. Yet, mild punishment may be equally ineffective in achieving the desired response. The student may associate the attention received with an error and may actually be more inclined to repeat the mistake.

In addition, any type of punishment may have many undesirable side effects which could range from discomfort to active anger to actual hostility directed toward the flight instructor.

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How to Apply These Principles

BE VERY CLEAR ABOUT LEARNING OBJECTIVES. Exactly what do you want the student to learn? This training program spells out many specific objectives, for example, the four subject areas.

IN THE BEGINNING REINFORCE GENEROUSLY, since the entire course of learning is influenced by its early stages. In the first part of any sequence, look for responses that can be rewarded, then proceed slowly, reinforcing or rewarding as frequently as possible. After a firm beginning, later stages can be handled more quickly and simply.

SHIFT SLOWLY FROM CONTINUOUS TO OCCASIONAL REWARD. At first all correct responses should be rewarded, but as time passes and responses become automatic, you should gradually decrease the frequency of your praise or attention. If continuous reward persists, the student performs only for the reward without actually experiencing any learning. However, if the student comes to expect continuous rewards that suddenly cease, there is a good chance that the established pattern will break down and that learning too will cease. The ideal sequence is where reinforcement gradually becomes less and less frequent, and behavior will more easily come under control of the student's own satisfaction or competence.

SHAPE EXISTING BEHAVIOR INTO DESIRED BEHAVIOR. You cannot wait for the desired behavior to occur and then reinforce it. Rather, it is necessary to shape current behavior into the required form.

For example, in learning to taxi an airplane, students cannot transfer automobile driving experiences to the aircraft where feet and hands are used quite differently. Shape the desired behavior by reinforcing first the behavior nearest the desired performance, then gradually increase the performance requirements until the desired behavior is reached.

Remember, though, that to be successful in shaping this desired behavior, critique and correct the behavior, not the person. Tell the student specifically what needs to be changed to meet the objective, and do not make general statements of disapproval or correction.

Summary

o Behavior positively reinforced will continue.

o Behavior followed by punishment may decrease. Punishment also does not help the student substitute the correct behavior for the error.

o Be very specific about learning objectives.

o Reinforce generously in the early stages of learning.

o Shift slowly from continuous to occasional reinforcement.

o Shape existing behavior into desired behavior.

2. DECISION-MAKING CONCEPTS IN THE PRIVATE MANUAL

Objectives

Note: At this time, you should read and complete the entire private manual before proceeding further.

Traditional pilot training emphasizes the pilot's knowledge about the aircraft and the flight environment. Aeronautical decision-making training focuses on the pilot's additional need for accurate and complete self-knowledge. The success of this training course greatly depends upon teaching the student to think more carefully and thoroughly about his or her attitudes and behaviors.

The terms and concepts introduced in Chapter 2 of the private pilot manual have been especially designed to help you guide the student toward patterns of thinking that produce safe flight outcomes. It is essential that you know this new terminology before initiating any instruction, since it provides the most concise, objective means possible of discussing pilot behavior in judgment-related situations.

Students should learn the terms and concepts by carefully studying the private pilot manual. Although Chapter 2 does not contain exercises, and memorization is not required, the exercises which follow are intended to reinforce the concepts and will be used throughout the flight training portion of this program.

After your students have completed Chapter 2, you may wish to give them a brief oral quiz to be certain that they understand the material. Be prepared to discuss any problems and clear up any confusion. If a student does not clearly understand, review as necessary.

Completion Schedule

The material in Chapter 2 should be completed early in the standard ground school training curriculum.

Key Points From Chapter 2 of the Private Manual

Five Subject Areas

Chapter 2 introduces the five subject areas relevant to pilot judgment and decision making: Pilot(P), Aircraft (A), Environment (E), Operation (O) and Situation (S). Conventional flight generally focuses on subject areas A and E. This training deals with the pilot's need to know more about area P and how it interacts with the aircraft (P/A), flight environment (P/E), or both (P/A/E), and time (P/A/E/O).

The Aeronautical Decision-Making (ADM) Process

Conventional training programs tend to focus on skills and prodecures (how to manipulate controls, performing the specific procedures for operating installed equipmant, 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 improve decision making (headwork) and information management skills.
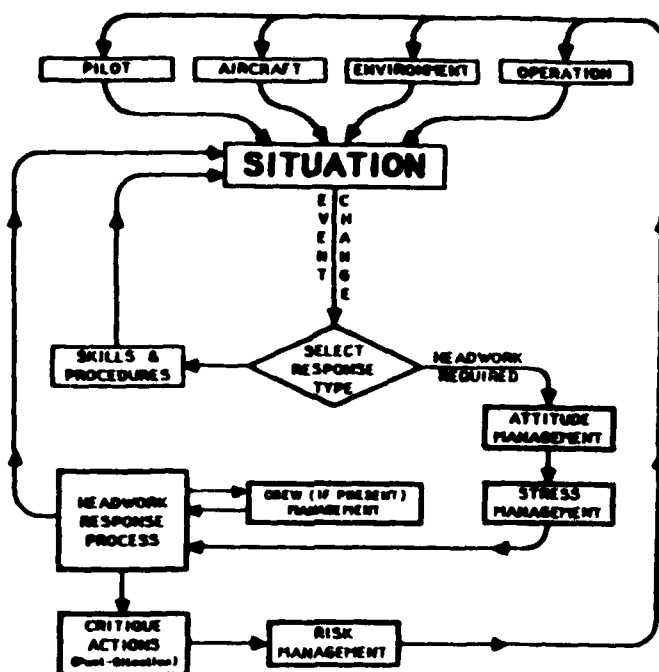
Aeronautical Decision-Making Process.

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 abailable 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.

3. TEACHING THE BEHAVIORAL ASPECTS OF DECISION MAKING

Objectives

Three approaches are presented in the private manual to improve the pilot's judgment and decision-making skills. The first approach presents an analytical method for making decisions and evaluating risk (Chapters 2 & 3). The second approach (Chapters 4, 5 & 6) addresses the pilot's hazardous attitudes and substituting ones which promote good judgment. The third approach (Chapter 7) deals with overcoming of high stress which reduces judgment and decision-making abilities.

Completion Schedule

Students must be exposed to this material early on in their pilot training-ideally during the first quarter of the student's standard private pilot training course. There is no material in this unit which requires advance knowledge from the ground school training curriculum or from flight experience, but the sooner the students know this foundation material, the sooner the knowledge can be put to use in regular flight training.

DESCRIPTION OF MATERIAL IN THE PRIVATE MANUAL

Chapter 3

"Balancing Risk While Flying" introduces five risk elements as areas for evaluating risk before and during flight. Accident data is presented to increase pilot awareness regarding the phase of operation and conditions in which accidents occur, e.g., takeoff, landing, night, etc. A method for evaluating risk is also presented.

Student pilots usually do not have the ability to evaluate all the risks associated with flying until gaining experience. The instructor should emphasize those areas where students should assess risk and explain the interactions between the pilot, aircraft, environment, time and situation.

Risk assessment should be a continuous process during flight. Risk must be constantly evaluated and controlled, if necessary, to assure a safe flight outcome. The instructor should demonstrate the analysis of a developing situation and the possible actions which may be implemented to control risk. The instructor may also recall personal experiences in which to demonstrate the risk assessment process.

Chapter 4

Chapter 4, entitled "Self-Assessment of Hazardous Attitudes," contains a brief self-assessment inventory to help the student identify the relative degree to which each hazardous attitude affects their thinking. If you have not as yet done so, please complete and score your own inventory before continuing. You will find the experience helpful in understanding the program and in assisting your students.

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The inventory is scored by the student, and the score remains confidential. It provides an indication of the relative strength of each hazardous attitude for that person at that time, and it helps to personalize the program by suggesting which thoughts are most likely for each individual. Under no circumstances should it be used to label a student. The instructor should be prepared, however, to answer any question the student might have about how to complete the inventory.

So that your students will feel free to answer the items truthfully, reassure them that they will not be asked to reveal their scores to you or anyone else. Yet, be sure each student realizes the seriousness of the task. Completion of this inventory by the student is critical in redirecting the student's awareness toward a greater concern for the "Pilot" subject areas. Help students see that while the tendency to use these attitudes is commonplace, it is a habit to be broken, not an insurmountable fault. It is important that the instructor guide students without condemning them for having hazardous attitudes. Indeed, we all may experience each of the five hazardous attitudes at one time or another. You are not to analyze how students think or try to "cure" them of hazardous thinking. This chapter's only purpose is to make the student pilot aware that various hazardous attitudes exist which are likely to affect safe flying and that the student can move away from such hazardous attitudes.

Chapter 5

Chapter 5 teaches students to identify and understand the five hazardous attitudes. This chapter uses an educational concept known as "programmed text learning," allowing each student to proceed at his or her own pace. The programmed text calls for a student response to each paragraph. The student selects one of the alternatives given and is then directed to turn to the appropriate response list. If the correct alternative has been chosen, the student will be directed to proceed to the next paragraph or situation. If not, the student is told that the answer is incorrect, given the reason why, and directed to return to the same situation to select another alternative. The process is repeated until the correct alternative is chosen. Students who select the correct alternative on their first try will go through the lesson very rapidly, and may obtain further practice if needed. If you have not completed Chapter 5, do so at this time. (Although anyone who reads and follows the directions carefully should be able to work through the material, some students may have difficulty with the format and will require assistance.)

Chapter 6

Chapter 6, entitled "Antidotes for Hazardous Attitudes," is important because it specifies substitute attitudes, called "antidotes," for the five hazardous attitudes. The tendency to act on hazardous attitudes can be reduced once the pilot is aware of them, but, first, the student must have a viable alternative to the hazardous attitude.

STUDENTS MUST MEMORIZE THE HAZARDOUS ATTITUDE ANTIDOTES.

Merely being familiar with them is not enough: They must be memorized word for word. Help your students understand that memorization is absolutely necessary so they can quickly and automatically substitute the good attitude when appropriate.

After the antidotes have been memorized, assign "Exercise 2-Antidote Identification," part of Chapter 6. The student will read a description of a pilot's thoughts and actions in a particular situation. The student identifies actions representing a hazardous attitude and writes the name of that hazardous attitude and its antidote on the right side of the page. Be sure that the student completes this exercise in its entirety, because repetition aids learning. Only with repeated practice will the student reach a point in learning where, the instant a hazardous attitude comes to mind, the antidote will also come to mind. Explain this to the student, and keep him working. The private manual includes a "key" for the student to use in grading the exercise.

When discussing the answers with the student, bear in mind that there is some room for differences of opinion. Thus, the student may attribute some action to a hazardous attitude which the key has not identified. Because he or she has identified a hazardous attitude that the key has not does not mean the student is entirely incorrect. If, through your discussion, the two of you decide it is acceptable, the student's choice may show a deeper understanding of the hazardous attitudes and their antidotes.

Although the student may find some extra instances of hazardous attitudes, he should not continue if any are left out. Also, the correct antidote must be supplied word-for-word in each case. Review the student's work to be certain these requirements have been met before assigning Exercise 3 of Chapter 6.

Exercise 3, "Recognizing and Replacing Hazardous Attitudes," reinforces the student's knowledge about replacing hazardous attitudes with antidotes. Situations are presented where the pilot must make and implement a decision. From the description of the pilot's thinking, the student identifies the hazardous attitude, indicates the appropriate antidote, and writes a brief description of a good attitude for the same situation.

It was previously mentioned that discussion with an experienced teacher helps improve a student's judgment. The effectiveness of this material, therefore, greatly depends on your discussion of the answers with the student. There are no absolutely right answers, and no answer key is provided. As you reason with the student in discussing the answers, you should be convincing and should eliminate any confusion or uncertainty on the part of the student. Use your judgment to decide if the student needs practice beyond Exercise 3.

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Chapter 7

Chapter 7, entitled "Identifying and Reducing Stress," deals with the causes of stress, stress-related problems, and coping techniques. Physical, physiologicial, and behavioral symptoms of stress are identified, and the pilot shown how the destructive aspects of stress can reduce one's judgment-making abilities. Inadequate coping with stress actually creates additional stress which intensifies as the inadequate coping continues-ultimately incapacitating one's decision-making process. Chapter 7 examines stress and coping in three time-related contexts: 1) long-term stresses which often involve issues such as life style, domestic and job-related stress, 2) techniques for the pre-flight adjustment of one's mental condition, and 3) methods for dealing with inflight stress.

Progress Check

After the initial training material has been completed, administer a "progress check," using at least two of the postcheck exercises contained on pages 52-57 of this manual, to determine if the student understands the material. This postcheck form contains six scenarios like those the student is already familiar with. Have the student work in a quiet place and assign at least two of these postcheck exercises. Allow the student as much time as needed. Score the form using the keys at the rear of this manual (pages 58-63).

The postcheck is successful if the student:

1) has not omitted more than three of the keyed responses for any two exercises, and

2) has responded at least once to each of the five hazardous attitudes, correctly producing the proper antidotes.

If both of these grading criteria are not met, tell the student that he or she will be checked again at a later date. Suggest that the student review the appropriate materials and remind the person of the seriousness of the training. Use your own judgment when grading the postcheck. Extra responses should not be penalized unless they are clearly incorrect.

If a recheck is needed, assign other postcheck exercises. Keep in mind that this postcheck material is to be presented as an additional learning experience, not just an evaluation. Help the student learn all the material in a particular chapter before allowing him or her to move on.

Remember that your utmost concern as a flight instructor is the safety of your students. The material in the private manual has been carefully designed to make students aware of some thoughts that could endanger them and to help them deal with stressful situations. The success of this part of their training experience will depend largely on your own attitudes, for your students take their cues from you. Through your support and assistance, they will make the greatest gains possible.

4. TEACHING THE APPLICATION EXERCISES

Objectives

The material contained in Chapter 8 of the private manual, entitled "Applying the Decision-Making Concepts," relates the academic concepts discussed earlier in the private manual with actual real world flight situations. No new concepts are presented. Rather, this material is intended to reinforce the student's understanding and appreciation of the importance of judgment training by integrating its concepts with real-life examples.

The scenarios used in the private manual are based upon official reports of actual occurrences but have been modified to fit the needs of this training program. Stress to your students that the scenarios provide opportunities to learn from the mistakes of others, and relate some of your own or other student experiences to appropriate scenarios in the private manual.

Completion Schedule

The material contained in Chapter 8 of the private manual should be integrated where appropriate into the topics of the conventional ground training syllabus. The following list of topics is representative:

1. The aircraft – Components and types, aerodynamics and basic performance

2. Aircraft systems – Flight control systems, flight instruments, the reciprocating engine, fuel systems, and electrical systems

3. Airports and communications – Runways, lighting, radio communications, and air traffic control

4. Weight and balance theory and calculations

5. Weather theory, weather reports, and forecasts

6. Aviation regulations

7. The Airman's Information Manual (In Canada-Airman's Information Publication, AIP)

8. The flight computer

9. Basic navigation – Aeronautical charts (sectional and world aeronautical charts), airspace utilization, plotter and wind triangles

10. Radio navigation – VOR navigation, DME and area navigation, ADF and radar, and transponders

11. Medical factors of flight – Oxygen and altitude, vertigo, vision, alcohol and drugs.

12. Cross-country flying - flight planning, pilotage, dead reckoning navigation, flying a VFR trip, and night operations.

It is suggested that this material in Chapter 8 be integrated into the conventional ground school syllabus as follows:

The section on "Preflight and Aircraft Systems" after aircraft and aircraft systems.

The section on "Weight/Balance and Performance" after performance and weight and balance.

The section on "Official Procedures and Communications" after airports and communications, aviation regulations, and the Airman's Information Manual (In Canada-AIP).

The section on "Cross-Country Flying" after basic navigation and radio navigation.

The section on "Physiological Factors and Night Flying" after medical factors and cross-country flying.

Description of Material

Each section of Chapter 8 presents exercises which test the student's judgment and decision-making knowledge in the previously mentioned topic areas. These exercises require the student to use the terms and concepts learned in all previous lessons. Encourage the students to review earlier material as necessary.

After the student has completed each section, discuss the answers. No answer key is provided, and bear in mind that, although responses to most of the questions may be relatively obvious, there are no absolutely right or wrong answers.

These exercises are intended to stimulate learning in two ways. First, having the student look for the subject areas in "real life" flight situations reinforces knowledge of these concepts and their relevance to the judgment and decision-making process. Second, your interaction with the student should improve student awareness of this process in all flight situations. Use these exercises to teach your students that there is not always a clearly defined right or wrong answer to every problem encountered while flying, but the use of the judgment training concepts will allow the pilot to arrive at the best answer possible.

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5. INFLIGHT INSTRUCTION: THE LESSON PLANS

How does a flight instructor combine educational principles with the concepts in this manual to improve a student's judgment and decision making? By giving the student a series of practical, "hands-on" lessons in which you observe performance and response to specific behavior. Do not comment on intentions or motivations. Use rewards (praise) frequently, and avoid criticism (punishment) as much as possible. Errors, or "misjudgments," by the student should be viewed as opportunities for learning, not as occasions for criticism.

Introducing the Lessons

In this unit, while on routine training flights you will give your students "activities" designed to further develop their appreciation for the decision making concepts based upon an actual preflight or inflight "hands-on" experience. Each activity is designed to focus on one of these processes but may include elements of the others. After observing the student's response to your instructions, use the subject area and ADM process concepts in giving positive reinforcement. When pointing out an error, consider which of the five subject areas is involved. When the student neglects to observe change and evaluate the five risk elements, point out how this relates to the ADM process. Continued reference to these terms and concepts will keep your instruction focused on judgment and decision making in addition to other flight skills.

Take 15 minutes or so for your own preparation the first few times you work with each lesson. As with any new activity, you should allow yourse'f two or three trials with each lesson before it becomes established as a solid part of your instructional technique. After that, you will feel much more comfortable teaching these lessons, and you will need less preparation time. Remember that your style of delivery and your professional approach is critical.

When to Begin

Start the lessons when the student has the ability to control the aircraft confidently during the most basic maneuvers. Use your own judgment, but a suggested starting point is about three flight lessons before you expect the student to solo. The student must have completed at least Chapter 2 of the private manual before beginning work on this unit.

Using the Lesson Plans

At least three lessons are needed to teach automatic reaction, problem resolving and repeated reviewing, for a total of nine lessons. Each lesson should take no more than five minutes and should be integrated into the normal one to two hour flight training period. Do only one lesson per training flight. However, one of these lessons and one training scenario from Chapter 6 of this manual may be covered on the same flight.

At the end of this chapter, you are provided with 18 lesson plans for inflight teaching of these mental processes. These lesson plans are designed to help you and your student structure each lesson. As part of your lesson preparation, you may wish to copy the essential information from the lesson plans onto a separate sheet of paper for possible later reference in the cockpit. However, we discourage extensive paperwork or note taking in the cockpit, as this may be intimidating to the student.

The 18 sample lessons do not include every valid way to accomplish this unit's training objective. You may wish to modify or substitute parts of these sample lessons or develop your own lesson plans to suit your student and your own style of teaching. This is perfectly acceptable, as long as you meet the objectives of this unit. Blank forms are provided in the back of this manual for you to develop your own lessons. Regardless of which approach you take, be sure to observe the principles of lesson delivery listed below.

Principles of Lesson Delivery

o Assign an activity to develop a specific decision-making concept: This is the
lesson's focus, not the flight activity.

o Monitor the student's behavior in terms of the objective: Does the observed behavior indicate success in using the decision-making concept being developed?

o Praise correct behavior (reinforcement).

o Coach the student to correct errors, relying on the five subject areas and the ADM process concepts. At the same time occasionally offer some sort of reward (not punishment).

o Encourage the student to maintain his or her self-awareness of hazardous attitudes and high stress levels.

Individual Lesson Content

Before meeting your student for the flight, select the lesson plan you want to use. Review it carefully as follows:

o Objective. Know which ADM concept you are going to present.

o Activity. Where will this activity best fit into the rest of the flight? You may want to handle the decision-making concepts early in the lesson so that you can work with the student later in the lesson if additional practice is needed.

o Observable Behavior Sought. Be sure you know exactly what you expect the student to do when he or she is correctly demonstrating the selected concept. Evaluate other flight skills as well during this time as long as you make sure to reinforce the student for demonstrating the desired behavior.

o Reinforcement. Be prepared to give the student positive reinforcement, using the five subject areas as a focus for finding a reason to give the student positive feedback. Although the sample lessons provide reinforcements for each subject area, you do not need to give the student two or three reinforcements for each activity. Sincerity and appropriateness are the most important factors for choosing reinforcements: quality not quantity. Also if the student's stress level appears high, call attention to the stress reduction techniques.

o Making Corrections. If the student's performance is unsatisfactory in some way, describe it in relation to the five subject areas and relate how the behavior could lead to an unsafe outcome.

o Student Debriefing. After the flight lesson, discuss the overall performance with the student to determine whether he or she was aware of any hazardous attitudes during the exercises. Do not try to figure out why a hazardous attitude may have occurred. Simply make the student more aware of the need to monitor and control his or her own behavior by the self-awareness of hazardous attitudes.

Lesson Plan #1

I. Objective:

II. Activity: Use of trim control.

III. Observable Behavior Sought: The student consistently makes immediate and appropriate corrections to the trim to maintain a constant airspeed and rate of descent when the flaps are moved to the various settings.

IV. Positive Reinforcements: (Focusing on the five subject areas)

1. Pilot: You showed that you can handle the aircraft properly while your attention was directed to the flap operations.

2. Aircraft: You are handling the aircraft well as the flaps change. Your airspeed control is excellent.

3. Environment: You did a good job of watching for other traffic in the area as you were doing this.

Lesson Plan #2

I. Objective:

II. Activity: Stall entry recognition, and recovery.

III. Observable Behavior Sought: The student can identify the cues of a stall and recover from a full stall.

IV. Positive Reinforcements: (Focusing on the five subject areas)

1. Pilot: You realized that not only a nose-high attitude can lead you into a stall. You were not afraid of the aircraft.

2. Aircraft: You maintained directional control with rudder instead of doing your usual aileron "trick."

3. Environment: You flew well clear of the airport traffic area before commencing stall practice. You also maintained an excellent collision avoidance scan.

Lesson Plan #3

I. Objective:

II. Activity: Simulated power loss at altitude.

III. Observable Behavior Sought: The student immediately lowers the nose and sets up best power-off gliding speed.

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IV. Positive Reinforcements: (Focusing on the five subject areas)

1. Pilot: You remembered to lower the nose to pevent a stall.

2. Aircraft: You quickly recalled the power-off best gliding speed.

3. Environment: You immediately looked for a suitable landing area.

Lesson Plan #4

I. Objective:

II. Activity: Transition from cruise to level flight at minimum controllable airspeed using various flap settings.

III. Observable Behavior Sought: The student automatically coordinates pitch and power for various slow flight configurations to maintain level flight.

IV. Positive Reinforcements: (Focusing on the five subject areas)

1. Pilot: I believe you understand the pitch-power relationship.

2. Aircraft: You remembered to adjust power before pulling back the yoke and entering slow flight. The airplane did not stall.

3. Environment: You cleared the area for traffic while setting up for slow flight.

Lesson Plan #5

I. Objective:

II. Activity: Control the aircraft's pitch attitude in level flight by using the available pitch instruments.

III. Observable Behavior Sought: The student properly interprets the trend indicated by the instruments and immediately corrects for deviations.

IV. Positive Reinforcements: (Focusing on the five subject areas)

1. Pilot: You seem to understand that "Aircraft pitch control and power control equals aircraft performance."

2. Aircraft: You made smooth adjustments and did not over-control.

3. Environment: You showed me a good scan between instrument references and external visual cues.

Lesson Plan #6

I. Objective:

II. Activity: Control the aircraft bank angle by using only one of the available bank instruments. (Repeat using a second instrument if time allows.)

III. Observable Behavior Sought: The student properly interprets the trend indicated by the instrument and immediately corrects when the aircraft strays from the desired bank angle.

IV. Positive Reinforcements: (Focusing on the five subject areas)

1. Pilot: You have shown me that you thoroughly understand the information available from this instrument.

2. Aircraft: You made positive corrections for each instrument and its trends.

3. Environment: You kept a good scan for traffic while practicing turns.

Lesson Plan #7

I. Objective:

II. Activity: Electrical system failure simulation. (Pull circuit breakers or fuses, as appropriate.)

III. Observable Behavior Sought: The student continues to fly the aircraft in straight-and-level flight, maintaining attention to safe operations, while he or she searches for the cause of the electrical problem and resolves it.

IV. Positive Reinforcements: (Focusing on the five subject areas)

1. Pilot: You did not get rattled when you realized you had electrical problems, and you did a fine job of locating the cause.

2. Aircraft: You noticed the pulled circuit breaker or fuse and compensated for it.

3. Environment: You did well by avoiding any situation that required the use of failed system(s).

Lesson Plan #8

I. Objective:

II. Activity: The student will experience a simulated total loss of communications equipment.

III. Observable Behavior Sought: Student demonstrates correct procedures to find the source of failure and takes proper actions to determine the extent of the failure.

IV. Positive Reinforcements: (Focusing on the five subject areas)

1. Pilot: You quickly and accurately recognized the equipment failures and proceeded to check it out and confirm the extent of the problem.

2. Aircraft: You landed the aircraft and then notified ATC of the problem.

3. Environment: You interpreted the light gun signals correctly and maneuvered the aircraft accordingly.

Lesson Plan #9

I. Objective:

II. Activity: VOR orientation and tracking.

III. Observable Behavior Sought: The student quickly orients himself without being distracted from flying the aircraft. He or she intercepts the desired radial smoothly and tracks within acceptable limits.

IV. Positive Reinforcements: (Focusing on the five subject areas)

1. Pilot: By remembering your procedures, you were able to fly the airplane to your intended destination.

2. Aircraft: You started your turn to roll out on the desired radial and did not fly through the course.

3. Environment: You avoided obstructions, clouds, traific, etc., when you needed to and still flew the proper course.

Lesson Plan #10

I. Objective:

II. Activity: Wake turbulence avoidance.

III. Observable Behavior Sought: The student demonstrates an awareness of the presence of wake turbulence and alters his flight path to avoid it.

IV. Positive Reinforcements: (Focusing on the five subject areas)

1. Pilot: You told me about the other aircraft's wake turbulence and then avoided it. That was excellent!

2. Aircraft: You landed on another runway to avoid the jet's vortices. Nice job!

3. Environment: It was a good idea to land on an adjacent runway.

Lesson Plan #11

I. Objective:

II. Activity: Transition through various pitch-power combinations without the use of trim.

III. Observable Behavior Sought: The student correctly and consistently transitions from one flight attitude to another and maintains the new flight attitude, despite resistance of the aircraft.

IV. Positive Reinforcements: (Focusing on the five subject areas)

1. Pilot: You seem more confident of yourself in controlling the aircraft without using trim.

2. Aircraft: You made the aircraft do what you wanted it to.

3. Environment: You remained aware of the outside environment even though you were having a difficult time flying the airplane.

Lesson Plan #12

I. Objective:

II. Activity: The student will experience a simulated communication failure.

III. Observable Behavior Sought: The student quickly and accurately completes a process to confirm that radio communication has been lost while maintaining safe control of the aircraft.

IV. Positive Reinforcements: (Focusing on the five subject areas)

1. Pilot: You seemed confident in taking the proper action.

2. Aircraft: You knew which switches and fuses to check to try and solve the problem.

3. Environment: You were alert for other aircraft. You took the proper actions to inform the tower of your problem prior to landing; i.e., you made a low approach and rocked your wings.

Lesson Plan #13

I. Objective:

II. Activity: Control of aircraft in gusty crosswind conditions.

III. Observable Behavior Sought: Student should correct for wind while maintaining the proper ground track.

IV. Positive Reinforcements: (Focusing on the five subject areas)

1. Pilot: You did a good job of adjusting for the effects of wind.

2. Aircraft: You knew how to control the aircraft to establish the proper track over the ground.

3. Environment: You knew how to check the wind direction and how to tell if you were making the proper corrections.

Lesson Plan #14

I. Objective:

II. Activity: Traffic pattern entry and landing at a controlled airport.

III. Observable Behavior Sought: Constant checking of the aircraft's track for conformance to the pattern. Regular observation of traffic and areas of potential traffic conflict. Continual attention to radio transmissions.

IV. Positive Reinforcements: (Focusing on the five subject areas)

1. Pilot: You did a nice job in keeping ahead of the aircraft.

2. Aircraft: You managed your approach and descent very well.

3. Environment: You were very observant of other traffic in the pattern, and you responded well to instructions from the controller.

Lesson Plan #15

I. Objective:

II. Activity: Identification of all traffic in the immediate vicinity.

III. Observable Behavior Sought: The student scans for aircraft in his immediate vicinity and takes the necessary evasive action when required.

IV. Positive Reinforcements: (Focusing on the five subject areas)

1. Pilot: You were more observant of the traffic today.

2. Aircraft: You were aware of your aircraft's blind spots. You turned away from one aircraft that you felt was on a collision course.

3. Environment: You looked for traffic entering and departing the pattern before turning downwind.

Lesson Plan #16

I. Objective:

II. Activity: You (or ATC) will provide suggested headings to the student, and the student must remain in VFR conditions.

III. Observable Behavior Sought: The student will make proper diversions from clouds and rising terrain to remain VFR.

IV. Positive Reinforcements: (Focusing on the five subject areas)

1. Pilot: You were confident in the actions required to remain in VFR conditions. You exercised your prerogatives as pilot-in-command, and requested a heading change when necessary to keep us out of weather.

2. Aircraft: You began your "roll-out" sufficiently before reaching the assigned heading.

3. Environment: You saw that the weather was deteriorating and started back to the airport.

Lesson Plan #17

I. Objective:

II. Activity: Practice ground reference maneuvers.

III. Observable Behavior Sought: The student selects a field that will permit a safe landing, if necessary. The student continually scans the area and the aircraft for hazardous conditions while performing the maneuver.

IV. Positive Reinforcements: (Focusing on the five subject areas)

1. Pilot: You have learned how to transfer ground reference practice to the traffic pattern.

2. Aircraft: Your scanning between visual and instrument references was good.

3. Environment: I liked the field you chose.

Lesson Plan #18

I. Objective:

II. Activity: The student will taxi the aircraft, positioning ailerons and elevators for existing wind conditions.

III. Observable Behavior Sought: The student correctly positions the control yoke into a quartering headwind or away from a quartering tailwind while taxiing.

IV. Positive Reinforcements: (Focusing on the five subject areas)

1. Pilot: You remembered to correct for wind while taxiing.

2. Aircraft: You correctly positioned the yoke while turning to compensate for a new wind vector.

3. Environment: While taxiing, you were aware of the wind direction and speed and properly adjusted the ailerons and elevators.

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6. INFLIGHT INSTRUCTION: THE TRAINING SCENARIOS

The purpose of this chapter is to further encourage the student to use judgment and decision-making skills. Your role is to encourage the student's self-reliance by again providing coached practice. This material has appropriate practical situation for your use, which you may modify or replace as you desire. Just be certain that what you do meets the section's objectives.

Your duties are two-fold. First, you must set up the situation to stimulate the student's decision-making process. Second, you must respond to the student's behavior in a manner that encourages safe judgments and decisions.

Practice situations, provided at the end of this section, create circumstances that may actually encourage the student to make an unsafe judgment or decision. Why? Because it is important for the student to become skilled at recognizing and replacing hazardous attitudes and unsafe tendencies with good judgment behavior. It does little good to teach students about the principles and importance of good judgment. Rather, good judgment must become a habit, and habits are formed ONLY by practicing the desired behavior in realistic situations.

CAUTION

This instruction like other types of flight training may involve "tampering" with an aircraft to teach a point. However, great care must be exercised to ensure the aircraft is not inadvertently operated in an unairworthy condition.

Setting Up the Situations

When to Begin

This phase of training should be introduced when the student has established his or her ability to act as pilot-in-command to your satisfaction and feels confident about his or her knowledge and understanding of pilot operations. A good starting point may be after the student has flown solo three or four times. Also, material through Chapter 7 of the private manual must be completed before you work with the student on this unit.

What to do First

Advise the student that, after one briefing session, you will be introducing practice behavioral situations during training. There will be no further notice, and the practice situations will be interjected randomly. This will keep the student alert for learning situations without further prompting.

It is very important that: 1) the student be given only one notice about the practice situation; 2) the situations be presented randomly; and 3) the student understands you will not allow him or her to become endangered at any time. Inform the student that you will sometimes lead him or her into a situation, but arrange a clear signal to end the evaluation so he or she understands that the practice situation is completed and will relinquish control of the aircraft to you as necessary.

Introducing the Sessions

Read over the situation you are planning to use, keeping the following in mind:

- o What materials do I need?

- o How must I act to make the student believe that the situation is "for real"? (The better you prepare and the better actor you are, the better your chances of success.)

- o How might the student react?

- o At what point do I end the practice and review it with the student?

Establish the situations in a realistic manner. In some cases, you may wish to prepare the aircraft as well before the student arrives but not "sabotage" it. For example, check the oil in an aircraft after returning from a flight. If you find it is low, leave it alone for your next student to discover during the preflight. Or, if your operation has several aircraft at its disposal, you may wish to assign the student first to an aircraft that is awaiting maintenance for an obvious discrepancy, such as a flat tire.

Many of the behavioral situations will benefit by your making the student cope with typical distractions and pressures (i.e., stressors), so it is important that you continually occupy the student's attention with customary flight training activities. For example, by giving the student cause to hurry the preflight or changing your mind about what heading you want the student to fly, you will force the student to handle both the usual and unusual in the scenarios you present. In general, try not to deviate too much from your normal personality when doing these lessons but challenge the student to think by making him or her feel your control and guidance is somewhat inadequate or misleading. Occasionally tell the student to act as if you are just a passenger.

RESPONDING TO THE STUDENT

Why Response Is Important

Generally, a fledgling pilot's first feedback comes from an outside observer-the instructor. Thus, your response to the student pilot is important for two reasons: First, you are teaching the student to recognize the difference between safe and unsafe judgment, and second, you are setting a standard for the student to copy when providing his or her own feedback. The material in this section not only furnishes practice for the student, but it also challenges you to influence the student's judgment and decision-making process favorably by providing the best possible feedback.

When to Respond

Stop the practice session and begin giving feedback immediately at one of these two points:

1. The student has recognized the situation as one which may result in an unsafe outcome and has objected to following your suggestions or to continuing the situation.

Praise the student for recognizing the practice situation. Discuss it briefly, using the ADM concepts. Point out the "worst possible case" that could have resulted for a pilot in a similar situation.

You do not have to reveal the practice situation immediately when the student first challenges you. Force the student to continue pressing the issue, especially when he or she is certain that the situation may not be safe. Part of the desired response is to be assertive, when appropriate, against the suggestions of others-even authority figures such as flight instructors.

For example, you meet the student and convince him/her you are in a hurry and suggest a preflight inspection would take considerable time. If the student concurs and begins to board the airplane you should remind him/her that you were only evaluating his response. The student should never be talked out of an important safety function such as the preflight. Of course, if the student objects to skipping the preflight, you compliment his/her good behavior.

Explain to the student that you will be evaluating his/her judgment at other times in the future by making requests similar to those often made by passengers, pilots, controllers, and others, and at that it is up to him or her as pilot-in-command, to make safe decisions. Such instructor suggestions are not meant to be viewed as tricks, but rather training for real world situations that the student will encounter later.

2. The student does not recognize a potentially hazardous situation which could lead to an unsafe outcome. Allowing the student to continue will present no further opportunity for judgments related to the situation or will possibly allow the student to get into a dangerous or unauthorized circumstance.

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First, ask why he or she has made the decision or is taking the action. Try to give the student the opportunity to explain his or her reasoning based on general pilot knowledge. If the student is having difficulty explaining his or her response, announce that this was a practice situation and point out how the student should have responded. Follow with a discussion of the student's judgment based on the concepts, the possibility of hazardous thinking, and the influence of high stress levels. Also, suggest solutions to specific problems.

How to Respond

Your responses should use the educational principles presented earlier to provide the best feedback. Remember, punishment does not help-positive reinforcement does. You are correcting specific actions in order to shape existing behavior into desired behavior. Do not generally criticize the student's abilities, and do not indicate disappointment in the student's flying skill and aviation knowledge. You are acting as a coach to reinforce the necessity and importance of the student providing self-generated feedback.

At some point, the student may question legitimate suggestions that you make even when you are not involved in judgment training. When this happens you will have an excellent opportunity for a short discussion of why the student feels this way. This is a valuable learning aid and indicates the student's judgment and decision-making process is beginning to operate independently of yours.

Always try to include some sort of positive reinforcement in your responses to student questions about a real or perceived judgment situation. Remind the student that improved decision making comes through practice, and some errors are to be expected during practice sessions. That is what practice is for!

Completion Schedule

The practice situations which follow are divided according to the phase of flight. Also, choose situations which match the student's level of experience.

Schedule the situations so that you finish as many as possible during the student's training. Use of twelve or more of the situations are preferable, and you can usually accomplish this by doing one or two per session. Develop and record a tentative schedule for introducing each situation. Keep in mind that you may need to change your schedule based upon each student's rate of progress. Remember, too, these situations should be distributed evenly over the student's flight training and yet presented randomly.

If the student has trouble identifying or understanding the situations, schedule more of them until he or she reacts properly. It is much better to have a student question too much than too little. At this stage in the training, it is important to keep the student aware of the judgment process and talk about it as much as possible. Your reinforcement is essential.

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The Training Scenarios

     The following materials contain a series of candidate decision-making training scenarios. Each scenario contains the applicable phase of flight for the situation, a brief description, and the observable behavior(s) which indicate the proper response. Use your own imagination and creativity to lead the student astray, to make it likely for him to overlook proper procedures, and to ignore previous training.

     If you wish to make up your own situations, refer to page 50 for blank master copies of this form.

CAUTION: Do not permit any violation of airspace, air traffic control instructions, or good operating practices during execution of the following scenarios.

Training Scenario #1

Phase: Entire Flight

I. Title: Use of Checklists

II. Situation: Checklist use. Distractions are introduced at points where use of the checklist is required.

III. Critical Actions (Behaviors): Use the checklist throughout the flight.

Training Scenario #2

Phase: Flight Planning

I. Title: Flight Planning, including getting a good weather and NOTAM briefing.

II. Situation: Cross-country without flight planning. "Reasons" are given to distract the student from the need to plan, including getting a good weather briefing. Selection of a destination airport with NOTAM hazards is encouraged.

III. Critical Actions (Behaviors): Complete required flight planning. Complete required weather and NOTAM briefing. If a flight plan is filed, ensure that the flight plan is closed upon landing at the destination airport.

Training Scenario #3

Phase: Flight Planning

I. Title: Use of Outdated Charts

II. Situation: Out-of-date sectional. Have the student "borrow" an outdated chart from you or a third party. (Ideally, select either a NAVAID or destination airport that has undergone some significant change since the last revision of the chart).

III. Critical Actions (Behaviors): Replace the sectional. Also check other information sources for current NOTAMS.

Training Scenario #4

Phase: Flight Planning

I. Title: Weather Check Immediately Prior to Takeoff

II. Situation: At the destination airport, the weather is deteriorating and is worse than forecast. You provide "reasons" or circumstances that discourage the student from checking the weather.

III. Critical Actions (Behavior): Check weather.

Training Scenario #5

Phase: Preflight

I. Title: Aircraft Inspection

II. Situation: During a flight training session you intentionally select an aircraft due for a 100-hour inspection. On your way to the aircraft explain how to determine when an airplane is due for an inspection. See if the student follows your suggestions before you cancel the flight.

III. Critical Actions (Behaviors): Student states, "The aircraft needs an inspection." Terminate flight.

Training Scenario #6

Phase: Preflight

I. Title: Use of Shoulder Harness

II. Situation: As flight instructor, make up a variety of excuses so as to avoid having to wear your shoulder harness.

III. The student notes the appropriate regulations, and requests that you wear your shoulder harness for all takeoffs and landings.

Training Scenario #7

Phase: Preflight

I. Title: Weight and Balance

II. Situation: The aircraft is loaded with fuel. Wait until the last minute to notify the student that passengers, cargo or both will be carried.

III. Critical Actions (Behaviors): Student suggests and performs weight and balance calculations.

Training Scenario #8

Phase: Preflight

I. Title: Unsecured Object in Passenger Compartment

II. Situation: Instructor, upon boarding airplane, places a heavy, unsecured object in an inappropriate location, i.e., a thermos bottle on the baggage shelf.

III. Critical Actions (Behaviors): The student recognizes the danger and requests that the object be removed or secured.

Training Scenario #9

Phase: Preflight

I. Title: First Post-Refueling Check

II. Situation: Have the aircraft refueled after the preflight. Let the student decide if and when he should recheck the fuel sumps.

III. Critical Actions (Behaviors): A pilot should always check the fuel sumps after each refueling.
(Note--it may take several minutes or longer for water or other contaminants to separate from the fuel).

Training Scenario #10

Phase: Preflight

I. Title: Second Post-Refueling Check

II. Situation: Aircraft has to be refueled after the student has performed the exterior preflight. The student must decide whether or not to check the fuel caps a second time. Distract somehow.

III. Critical Actions (Behaviors): Student checks each fuel tank after refueling and reconfirms that caps are secured.

Training Scenario #11

Phase: Preflight

I. Title: Extra Bolts on Ground Under Airplane

II. Situation: The instructor places several extra bolts underneath airplane.

III. Critical Actions (Behaviors): Student should notice these bolts and recognize the possible safety implications.

Training Scenario #12

Phase: Preflight

I. Title: Loose Items

II. Situation: Loose articles in the cabin. Empty soda cans, paper, books, etc., spread about the cabin. Provide "reasons" for the student to hurry the preflight.

III. Critical Actions (Behaviors): Remove or secure such loose items.

Training Scenario #13

Phase: Preflight

I. Title: Required Aircraft Documents Missing

II. Situation: Temporarily remove one or more requested aircraft documents from the airplane. Do this one after the student has become quite familiar with the preflight routine.

III. Critical Actions (Behaviors): Point out missing documents. Replace them prior to flight.

Training Scenario #14

Phase: Preflight

I. Title: Thorough Preflight Inspection

II. Situation: The aircraft is being preflighted by the student. Distract by talking about unrelated things or asking questions that require detailed answers.

III. Critical Actions (Behaviors): Conduct thorough preflight, with knowledge of oil and fuel levels, inspections due, etc., (in response to questions by instructor).

Training Scenario #15

Phase: Preflight

I. Title: Low Tire or Oleo Pressure

II. Situation: Select a trainer with low tire or oleo pressure and observe whether the student detects this during preflight.

III. Critical Actions (Behaviors): Add air as required.

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Training Scenario #16

Phase: Preflight

I. Title: Object in Engine Compartment

II. Situation: Use an empty aluminum soda pop can and place in engine compartment.

III. Critical Actions (Behaviors): REMOVE BEFORE FLIGHT. Exr ain that other common objects, such as bird's nests or wrenches are sometimes found here during preflight.

Training Scenario #17

Phase: Preflight

I. Title: Simulated Hydraulic Leak

II. Situation: Hydraulic fluid on ground or brake assembly. Pour fluid on ground in an appropriate area to provide "evidence" of a suspected leak.

III. Critical Actions (Behaviors): Inspect for obvious leaks. Suggest having a mechanic check the brake system for leaks and proper operation.

Training Scenario #18

Phase: Preflight

I. Title: Oil Leak

II. Situation: Oil on engine cowling and ramp. Smear oil on an appropriate spot to simulate "evidence" of a leak.

III. Critical Actions (Behaviors): Inspect the engine compartment for oil leaks. Inspect the oil filler cap area for signs of oil spill. Check the engine oil level. Student states, "Indications point to an engine oil leak—have a mechanic check it prior to flight."

Training Scenario #19

Phase: Preflight

I. Title: Low Oil

II. Situation: Low Oil - Engine oil quantity is marginal or low for normal operations. The student is assigned an aircraft already known to be low on oil.

III. Critical Actions (Behaviors): Check oil. Add oil as required.

Training Scenario #20

Phase: Taxi

I. Title: Position of flight controls for existing wind conditions during taxi.

II. Situation: The student is taxiing the aircraft in windy conditions (above 10 knots). Distract the student with conversation about other subjects.

III. Critical Actions (Behaviors): Student places aircraft controls as needed for the prevailing wind.

Training Scenario #21

Phase: Taxi

I. Title: Taxi Across Active Runway

II. Situation: The instructor draws the student's attention to something inside the cockpit immediately prior to crossing an active runway.

III. Critical Actions (Behaviors): Student must look outside the aircraft and down the runway to check for traffic, prior to crossing. Additionally, all runway crossings at controlled airports must be done in accordance with ATC instructions.

Training Scenario #22

Phase: Takeoff

I. Title: Aircraft Separation

II. Situation: Suggest a takeoff from a busy, uncontrolled field right behind another airplane.

III. Critical Actions (Behaviors): Student insists on maintenance of adequate aircraft separation. A delay off the runway may be required, especially in the case of touch-and-go landings.

Training Scenario #23

Phase: Takeoff

I. Title: Intersection Takeoff

II. Situation: A departure from a runway intersection is suggested by the instructor. The runway remaining would make a safe takeoff marginal.

III. Critical Actions (Behaviors): The student decides to use the full length of the runway.

Training Scenario #24

Phase: Takeoff

I. Title: Simulated Loss of Power

II. Situation: Do not actually pull power on takeoff; suggest doing a 180 degree turn back to the airport. Select an altitude above the ground where a prudent pilot's only choice would be to land straight ahead.

III. Critical Actions (Behaviors): Student responds and says he would land straight ahead.

Training Scenario #25

Phase: En Route

I. Title: Low-Speed Turns

II. Situation: The aircraft is set up at low altitude (500-800 feet) and low airspeed (1.5 Vso). The need for a steep turn is simulated.

III. Critical Actions (Behaviors): The student adjusts the aircraft bank angle to avoid a stall.

Training Scenario #26

Phase: En Route

I. Title: VFR Altitude

II. Situation: Improper VFR altitude. Using an appropriate reason (staying clear of clouds, smooth air, etc.), mention you would like to change altitude to one not correct for the heading.

III. Critical Actions (Behaviors): Student pilot questions the incorrect altitude assignment.

Training Scenario #27

Phase: En Route

I. Title: Over Water Operation

II. Situation: Over water operations without floatation equipment. During practice, start to take the aircraft out over a large body of water.

III. Critical Actions (Behaviors): Student does not fly farther than power-of gliding range of land.

Training Scenario #28

Phase: En Route

I. Title: Cloud Clearance

II. Situation: Select a cloudy day and suggest a VFR cruising altitude which will violate cloud clearance regulations.

III. Critical Actions (Behaviors): The student points out that he can not maintain legal VFR at that altitude.

Training Scenario #29

Phase: En Route

I. Title: Simulated Loss of Power

II. Situation: Loss of engine power is simulated at a safe altitude. Only an expeditious turn towards an open field will produce a safe landing.

III. Critical Actions (Behaviors): Turning the aircraft towards the field and establishing the best glide speed before attempting a restart. Attempt a simulated engine restart only if altitude permits.

Training Scenario #30

Phase: En Route

I. Title: Staying Position Oriented

II. Situation: The flight is being conducted in the local practice area. Distract the student with numerous heading changes or activities that are not related to staying position oriented.

III. Critical Actions (Behaviors): Constant awareness of the aircraft's location (in response to questions by the instructor).

Training Scenario #31

Phase: En Route

I. Title: Communications Versus Maintaining VFR

II. Situation: The aircraft is headed towards cloud formations at the time contact should be made with air traffic control.

III. Critical Actions (Behaviors): The student controls the aircraft to avoid the clouds before contacting the controller.

Training Scenario #32

Phase: En Route

I. Title: Clearing Turns

II. Situation: Student begins various flight maneuvers in the practice area. Instructor does not mention clearing turns.

III. Critical Actions (Behaviors): Execute clearing turns prior to certain flight maneuvers.

Training Scenario #33

Phase: En Route

I. Title: Suggest Stalls at Low Altitudes

II. Situation: Suggest commencing stalls at low altitude-less than 1,500 feet AGL.

III. Critical Actions (Behaviors): The student recognizes the conflict and climbs to higher altitude before initiating stall practice.

Training Scenario #34

Phase: En Route

I. Title: Suggest Maneuvers Over A Congested Area

II. Situation: Suggest ground reference maneuvers over a congested area. Note such maneuvers are generally done at 800 ft. AGL while regulations require that an aircraft must maintain at least 1,000 ft. AGL over congested areas.

III. Critical Actions (Behaviors): The student recognizes the conflict and performs ground reference maneuvers over non-congested areas.

Training Scenario #35

Phase: En Route

I. Title: Traffic Avoidance

II. Situation: Traffic avoidance vigilance is not emphasized by the instructor during the flight. Try to make the student feel that today's flight is a leisurely, unstructured one for general practice.

III. Critical Actions (Behaviors): Maintain a continuous traffic avoidance scan.

Training Scenario #36

Phase: En Route

I. Title: Pilotage

II. Situation: VFR checkpoints are being followed to navigate (pilotage). Use conversation to keep the student "inside" the cockpit.

III. Critical Actions (Behaviors): Constant ability to pinpoint location of aircraft using charts, even between checkpoints.

Training Scenario #37

Phase: En Route

I. Title: Communications within TCA

II. Situation: The route of flight passes through a Terminal Control Area (TCA). To distract from the need to communicate, suggest repeated course changes at the edge of the TCA.

III. Critical Actions (Behaviors): Communication is established with ATC for approval to enter TCA.

Training Scenario #38

Phase: En Route

I. Title: Aircraft Endurance

II. Situation: A local training flight. Begin the flight without giving the student an idea of how long the lesson will last.

III. Critical Actions (Behaviors): Constant awareness of aircraft endurance based in amount of fuel on board at time of takeoff (in response to questions by the instructor).

Training Scenario #39

Phase: Descent

I. Title: Vfe Limitation

II. Situation: The instructor directs the flight so as to require a descent over a short distance. He tells the student to lower the flaps and suggests a descent at a rate that would cause Vfe to be exceeded.

III. Critical Actions (Behaviors): The student points out the conflict and does not exceed Vfe.

Training Scenario #40

Phase: Landing

I. Title: Collision Avoidance

II. Situation: On base leg, the instructor directs the student's attention to the runway threshold.

III. Critical Actions (Behaviors): The student should direct his visual attention to the extended runway centerline to check for conflicting traffic.

Training Scenario #41

Phase: Landing

I. Title: Non-Standard Approach Path

II. Situation: Following a slip demonstration, the instructor lets the aircraft fly to the right or left of the runway centerline to a position which would make an attempted landing possible but dangerous. He gives control of the aircraft to the student.

III. Critical Actions (Behaviors): Go-around.

Training Scenario #42

Phase: Landing

I. Title: Checklist Versus Communications

II. Situation: After landing at an uncontrolled airport the instructor tells the student to call unicom prior to completing the after-landing checklist.

III. Critical Actions (Behaviors): The student completes the after-landing checklist prior to calling unicom.

Training Scenario #43

Phase: Landing

I. Title: Traffic on Runway

II. Situation: An aircraft pulls out onto the runway (simulated).

III. Critical Actions (Behaviors): Go-around.

Training Scenario #44

Phase: Landing

I. Title: High Approach

II. Situation: While demonstrating a situation (your choice) in the pattern, the instructor sets the aircraft up on an approach that is way too high, then turns the aircraft over to the student.

III. Critical Actions (Behaviors): Go-around.

Training Scenario #45

Phase: Landing

I. Title: Extraneous conversation while in the airport traffic area.

II. Situation: Distract the student with irrelevant conversation.

III. Critical Actions (Behaviors): Student to request holding irrelevant conversation to a minimum.

Training Scenario #46

Phase: Landing

I. Title: Traffic Pattern Entry

II. Situation: Improper traffic pattern entry. At an uncontrolled airport, student enters pattern too high or in a non-standard manner.

III. Critical Actions (Behaviors): Enter the pattern at the proper location and at the correct traffic pattern altitude.

Training Scenario #47

Phase: Landing

I. Title: Objects on Instrument Panel Glareshield

II. Situation: During descent instructor places maps, manuals, etc., on glareshield, limiting forward vision.

III. Critical Actions (Behaviors): Student requests objects be removed.

Training Scenario #48

Phase: Landing

I. Title: Aircraft Separation

II. Situation: An approach to a runway is made with another aircraft ahead. The separation between the aircraft is continuously decreasing.

III. Critical Actions (Behaviors): Corrective action should be taken, such as decreasing airspeed, "S"-turns on final, or a go-around.

Training Scenario #49

Phase: Landing

I. Title: Crosswind Landings at a Busy Airport

II. Situation: A suggestion is made by the instructor to conduct landings
on a crosswind runway at a busy, uncontrolled airport.

III. Critical Actions (Behaviors): The student suggests that the landings be made on the runway being used by all other aircraft for safety reasons.

Training Scenario #50

Phase: Landing

I. Title: Gusty Wind Conditions

II. Situation: An approach is made in gusty wind conditions. The student is given minimum time to plan the approach.

III. Critical Actions (Behaviors): Partial flap extension and a higher than normal approach speed may be required.

7. TYPICAL TRAINING SESSION

The following is a narrative of a typical judgment training session. You might find it useful in formulating your own ideas for conducting your own judgment training flights. As mentioned earlier, all necessary preparation should be completed before the student's expected arrival time.

The Lesson Plan to be administered:

Title: Transition from cruise to level flight at minimum controllable airspeed using various flap settings. (Lesson Plan #4, page 17)

Training Scenarios to be administered:

Title: Extra Bolts on Ground under Airplane (Training Scenario #11, page 30).
Title: Use of Shoulder Harness (Training Scenario #6, page 29).

Instructor Preparation:

Place a few extra bolts under the aircraft. Stow shoulder harness.

Narrative

The instructor tells the student they will meet at 2:00 p.m. for training. The student is told to have the aircraft ready to fly. At the appointed time the instructor arrives and verifies that the student has the aircraft ready to fly. Intentionally, the instructor makes no attempt to release the stowed shoulder harness.

Extra Bolts on Ground Under Airplane

During preflight, the student advises the instructor that he has discovered a few bolts on the ground under the aircraft. The instructor offers positive reinforcement for the student's act of good judgment since he noticed the extra bolts and checked to see if they had come from the aircraft: "You were very alert. Good work."

Use of Shoulder Harness

As a flight instructor, make up a variety of excuses so as to avoid having to wear your shoulder harness. During reading of the pre-takeoff checklist, the student notices that you are not using your harness. The student should say, "Are you aware of the regulations concerning use of shoulder harnesses?" As instructor, you should say "Don't let my poor judgment influence you. You must always make your own judgments." They both then fasten their shoulder harnesses and continue with takeoff preparations.

Transition Using Flaps

Next, the lesson transitioning from cruise to minimum controllable airspeed using various flap settings is conducted. Emphasis is placed on developing automatic reaction. The instructor provides positive reinforcement when appropriate, and when an error occurs, points out the subject areas in question.

The student is told to establish slow flight at minimum controllable airspeed (MCA), which he does by reducing power and extending flaps, adding power as MCA is neared to avoid a stall. The instructor queries the student, "Are you sure we are clear of other traffic in the area"? The student replies, "No, I should have made clearing turns while I was setting up the aircraft." The instructor reinforces this, "You should have been more aware of your environment. What you are doing well, however, is understanding and controlling the pitch-power relationship." The student replies, "Yes, I feel I am doing pretty well with that." The instructor then says, "Very good. Now retract the flaps, maintaining your present airspeed and altitude." The student retracts the flaps and reduces power as he increases the aircraft's pitch attitude. Pointing to the altimeter, which reads 100 feet below target altitude, the instructor comments,"You should have raised your pitch a little more. Not a bad job though!" Recovery from slow flight is then initiated, and the airwork continues.

Debriefing

On the ground the instructor and the student review the flight. The instructor begins by saying, "You did pretty well today. I planned three judgment training activities for you, and you handled them correctly for the most part. You did fail to make proper use of the shoulder harness."

The instructor continues the discussion with the student about how a similar situation could develop into an unsafe outcome.

At the end of the discussion, the instructor asks, "Do you remember having any hazardous attitudes during the flight"? The student says "No." The instructor then asks, "How about your stress level? Did it ever increase to where you felt uneasy or distracted"?

The student says, "Most of the flight I was calm and doing fine. I did get a bit rattled when I realized I had lost some altitude when recovering from slow flight, but it didn't last very long. I did think to myself to relax and to deal with the situation at hand." The instructor positively affirms the student's self awareness of a change in stress level, and they make arrangements for the next training session.

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8. THE MANAGEMENT OF AERONAUTICAL DECISION-MAKING TRAINING

This training program is more than just a collection of related facts and ideas for students to learn. It is a carefully designed educational system. Using this integrated system produces an overall result greater than that attainable by random presentation of the individual parts. To achieve the maximum benefits of this system, you must manage the instruction carefully.

The materials listed below are designed to aid both the individual instructor and the training supervisor for a group of flight instructors, e.g., the chief pilot engaged in decision-making training activities.

Aeronautical Decision-Making Training Materials

SCHEDULE OF STUDENT WORK
GROUND TRAINING

TRAINING SEGMENT	NUMBER OF IN-FLIGHT LESSON	WHEN TO SCHEDULE	EXERCISES/REVIEW
Chapters 1-3 of the Private Manual		During student's early work on the standard ground school training curriculum.	None required; oral quizzing suggested
Chapters 4-7 of the		During student's work on the first 25 percent of the standard ground school training curriculum.	Chapter 6
Chapter 8 of the Priavte Manual		At the time student is working on similar materials in standard ground school training	Chapter 8

FLIGHT TRAINING

Chapter 5 of the Instructor Manual	9 lessons total (one per regularly scheduled flight training period)	Randomly during flight training. Suggested starting point is about three lessons before the student is expected to solo. PREREQUISITE:	Additional lessons as necessary
Chapter 6 of the Instructor Manual	12 or more lessons total (1 or 2 per flight training period)	Randomly during flight training. Suggested starting point is after the student has flown solo 3 to 4 times. PREREQUISITE: Student Manual chapters 1-7.	Additional lessons as necessary

SET OF MASTER COPIES

Immediately following this page are the master copies of every form you will need to present this judgment training program. BE VERY CAREFUL NOT TO MARK ON THESE MASTER COPIES! You will probably want to remove the pages listed below and file them for safekeeping and easy access when you need to make more copies. It would be wise to remove them now and make copies to insert in the manual in place of the originals.

	ITEM	QUANTITY NEEDED
1	Progress Record: Private Manual	One Each Per Student
2	Progress Record: Inflight Training	One each Per Student
3	Lesson Plan: (Blank Form)	One Each Lesson Plan You Develop Yourself
4	Training Scenario: (Blank Form)	One for Each Training Scenario You Develop Yourself
5	Postcheck Excercises: For use after completion of the Private Manual (Note: Answer keys for these postcheck exercises appear beginning on page 58).	One Complete Set Per Student

AERONAUTICAL DECISION-MAKING TRAINING
PROGRESS RECORD - PRIVATE MANUAL

Student

Instructor

Chapter	Assignments	Date Assigned	Date Completed
1	Read.		
2-3	Read.		
4	Read. Do Assessment Inventory and Profile Graph.		
5	Read. Do Situation Exercises.		
6	Do Exercises. Memorize antidotes.		
7	Read.		
8	Do Situation Exercises. Discuss.		

AERONAUTICAL DECISION-MAKING TRAINING
PROGRESS RECORD - INFLIGHT TRAINING

Instructor Name _____

Pilots Name _____

Lesson Plans

Lesson Number	Performance Pass	Fail	Date				
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							

Training Scenarios

Phase	Number/Title	Performance Pass	Fail	Date			

Lesson Plan #

I. Objective:

Automatic Reaction

Problem Resolving

Repeated Reviewing

II. Activity:

III. Observable Behavior Sought:

IV. Positive Reinforcements:

(Focusing on the five subject areas)

1. Pilot:

2. Aircraft:

3. Environment:

Lesson Plan #

I. Objective:

Automatic Reaction

Problem Resolving

Repeated Reviewing

II. Activity:

III. Observable Behavior Sought:

IV. Positive Reinforcements:

   (Focusing on the five subject areas)

1. Pilot:

2. Aircraft:

3. Environment:

TRAINING SCENARIO #   TRAINING SCENARIO #

PHASE: PHASE:

I. TITLE   I. TITLE:

II. SITUATION: II. SITUATION:

III. CRITICAL ACTIONS (BEHAVIORS):   III. CRITICAL ACTIONS (BEHAVIORS):

TRAINING SCENARIO #   TRAINING SCENARIO #

PHASE: PHASE:

I. TITLE   I. TITLE:

II. SITUATION: II. SITUATION:

III. CRITICAL ACTIONS (BEHAVIORS):   III. CRITICAL ACTIONS (BEHAVIORS):

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POSTCHECK EXERCISES FOR USE AFTER
COMPLETION OF THE PRIVATE MANUAL

Student Name   Date

INTRODUCTION

The following postcheck exercises have two purposes: to reinforce
your decision making training; and to help you identify and remedy
problems you may have with mastering any part of the material presented in
the private manual.

INSTRUCTIONS

You will recognize the form of the following six scenarios from
Chapter 6 of your earlier training. For all scenarios underline the
hazardous attitudes. Write its name and the correct antidote to the right.
There will be several hazardous attitudes in each. This is not a timed
test, but it is important that you identify all of the hazardous
attitudes. So check your responses after you have finished, then return
the postcheck to your flight instructor for evaluation.

Postcheck Exercise One

On a pleasure flight with two passengers, the pilot was told
that one of the passengers, who was a diabetic, had become very
ill, apparently in shock. Unable to stand the pressure of the
decision, the pilot asked the other passenger what to do. Should
he continue the flight in the hope that the passenger would
recover, or should he return home for medical attention? The
other passenger became angry and said,"That is not for me to
decide. Don't you have any regulations that tell you what to do
in this situation? Call air traffic control for instructions."
Since he was not sure what to do and since the passenger was so
demanding, the pilot thought, "Yeah, I better call for
instructions. No sense getting that guy more upset than he is."

He called air traffic control, and it was suggested he return
to his departure point where an ambulance would be waiting to
take the sick man to the hospital. He said to the other
passenger, "I hate to inconvenience you this way. It's not my
decision. I'm only doing what I'm told to do."

The passenger seemed surprised at this statement and became
further irritated saying,"You're really some pilot! I'd hate to
have my life in your hands if I got sick"!

The pilot became angry and said to himself,"Look, I'm the
boss here, and what I say goes. The lives of everyone on board
are in my hands now, and I'm the one who is handling this
situation. Just because someone feels sick is no reason to change
a flight plan. I don't care what ATC says. Those bureaucrats are
forever making rules. Who are they to tell me when to turn back
or continue"?

As he calmed down, however, he thought to himself, "Maybe the
man is really sick; perhaps I'd better get him help immediately."

He returned to the departure airport and the sick passenger,
who had lapsed into a coma, was rushed to the hospital.

The pilot was deeply disturbed by his near mistake and
immediately decided never to fly again.

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Postcheck Exercise Two

George and Jack are on a pleasure flight late in the afternoon. George, the pilot, has been flying for almost six months and he is feeling quite proud of his flying ability. He brags to Jack that he is one of the best pilots at the local airport and that he knows more about flying than a lot of the old timers who seem to be following the rules. He says, "Flying by the book is unnecessary. All of those regulations are devised by some petty bureaucrats who probably have never been in an airplane."

Jack has heard this from George before and is irritated by it. He feels that George brags too much, so he reminds him that he is not so great since he does not have much night time and is not instrument rated.

George is annoyed by this. He tells Jack that he has never had an accident and that he is sure that he never will. He decides to fly to another airport, two hours away, thinking, "I'll show him that I can handle night flying." He tells Jack that it would be better to fly on since the new destination has more "action" in its area than the airport they were originally headed for. Jack does seem to mind, though, and remarks that this will mean flying in darkness for a half hour. George says, "Don't worry; nothing bad can happen to us." They both have a laugh, and the decision does not bother Jack.

As they fly into darkness, George becomes a bit nervous since he cannot locate any checkpoints and thinks, "Why don't they provide better lighting in these areas so a pilot can see." He does not let Jack know his apprehension but continues to boast about how well he is flying his aircraft.

Finally, George sees an airport ahead and makes his approach, but he is so nervous that he hardly listens to his landing instructions. He lands without a problem and feels quite relieved. Jack apologizes to George, saying that he had underestimated his abilities.

As they taxi the airplane to the parking area, George realizes that he has landed at the wrong airport. Embarrassed and disgusted, he thinks, "You would think they'd identify airports better so pilots would not be misled."

Postcheck Exercise Three

The pilot and a companion had been drinking for two hours
before their flight from a local airport. As they walked toward
their airplane the pilot said, "I can drink with the best of them
and still fly." Once airborne, she continued by telling her
friend that there is less chance of having an aircraft accident
than there is for car accident. "After all," she said, "there's
nothing up here but fresh air. Who is going to run into us at
this height"?

As the flight began, the pilot flew somewhat erratically, but
neither one noticed it. So, they had a few more drinks and
thoroughly enjoyed them. Then, the companion suggested the pilot
do a few loops, just to keep the flight interesting. The pilot
remarked, "Loops? I don't think I know how to do them. Ah, let's
try a few anyway. After all, the only thing that could go wrong
is for us to get dizzy."

She then started a loop without checking her altitude, which
was quite low. The companion noticed this and screamed, "You're
too low for this. You want to get us killed?" The pilot was very
annoyed and answered, "Who is in charge of this airplane, you or
me? I know what I'm doing. Now you just relax and watch me put
the airplane through some action. If things go wrong, it's not
our doing. It's in the cards if your time is up, but don't worry,
Lady Luck is going to be with us."

Witnesses later reported they had seen the aircraft making
repeated loops at low altitude. During the last loop, the pilot
exceeded the design limitations of the airplane and both wings
separated from the aircraft. Both women were killed, and
autopsies showed both had elevated blood alcohol levels.

Postcheck Exercise Four

On a flight from Baltimore to Hartford, the pilot neglected
to get the most recent weather forecast. In fact, he left
Baltimore in such a hurry that he did not take the time to do a
proper preflight inspection of the engine. He wanted to arrive at
Hartford before 4 p.m. so that he would not miss an important
engagement. He dispensed with the preflight check and the weather
briefing.

En route to Hartford, the weather became progressively worse;
snow was beginning to fall, and ice was beginning to form on the
aircraft's wings. This frightened the pilot, and he quickly
descended to a lower altitude, hoping that this would help the
icing problem, but ice continued to form. He was now flying at
only 800 feet above the terrain.

He was not sure what to do. In fact, he was so frightened, he
was almost unable to do anything. He thought, "Perhaps I should
radio for help; no, I won't radio for assistance. What would they
think of me if they knew the problem I got myself into. Better to
let sleeping dogs lie."

"But what if my carburetor starts to ice? I'm not even sure
what procedure I should use in that situation. I better fly close
to the ground so I can be sure of where I'm going." He descended
even further, knowing that this violated regulations and
jeopardized his safety even further. Now even more confused, he
was still not certain what to do.

At one point, he narrowly missed a small mountain ridge. This
panicked him further, so he decided to make an emergency landing.
He began his approach even though he had not decided where to
·land.

Finally, at an altitude of 200 feet, he spotted a paved road.
Without checking for car traffic, he made an emergency landing.
Two cars on the road had to swerve to avoid colliding with the
oncoming airplane. The pilot managed to stop the plane and left
it on the road, cursing the bad weather that caused his problems.

Postcheck Exercise Five

   While on a flight over hilly terrain, the pilot notices that
his fuel gauge is not operating. He calculates that it will take
approximately two hours to reach his destination, a small airport
in western Pennsylvania, but because he neglected to refuel at
the last airport, he is not certain of the amount of fuel in the
tanks. Also, he has neglected to monitor the operation of the
fuel gauge during the flight.

   He thinks, "I should have topped off the tanks at the last
stop. That would have given me plenty of fuel to make the trip,
but who has time to follow all those procedures that are written
for people who don't know anything about flying and make dumb
mistakes. Besides, nothing has ever happened to me, even in
situations worse than this."

   He decides to keep flying, thinking that "If something goes
wrong, well, that's life." Then, it suddenly occurs to him that
he may be nearly out of fuel: "Maybe I have a fuel leak, and the
fuel tanks are already empty"! He starts to make an emergency
landing.

   His descent is into a hilly and forested area, and he tells
his passengers, "We're practically out of fuel, so I'm heading
for that small clearing before the engines quit. Fasten your
seatbelts and shoulder harnesses tightly and hold on, because
it's going to be a very hard landing."

   The left wing and the tail section is damaged on landing, but
no one is injured. After he secures the airplane and gets out, he
checks the fuel tanks and finds them half-full. He says to
himself, "Dumb mechanics, if they did their job right, my gauge
would not have broken, and this wouldn't have happened."

Postcheck Exercise Six

The pilot and his friend were flying a single-engine airplane 1,200 miles on a VFR cross-country flight to Toronto. Halfway to Toronto, the pilot noticed that the weather was deteriorating. He was concerned because he wanted to reach his destination that day. His fuel reserve calculations indicated that he had just enough fuel to make it, so he decided not to make a planned refueling stop. "What can go wrong?" He reasoned, "I should make it with time to spare. I'd rather get to Toronto right away than be stuck at some small airport waiting for weather to improve."

Nearing the Toronto area, he realized that the weather was much worse than he had anticipated, and strong headwinds had caused the airplane to use far more fuel than he had allowed for. He thought, "This crummy weather is really botching up my flight." Then his passenger remarked that he should have refueled. He answered, "Once I make up my mind that I have made the right decision, nobody is going to tell me differently.,"

As he made his approach to Toronto, he could not see the runway clearly. Instead of executing a go-around, he landed anyway. The aircraft was not aligned with the runway, and it ran off the hard surface into the grass. The pilot blamed the landing mishap on the bad weather and the distraction of arguing with this friend.

On a pleasure flight with two passengers,
the pilot was told that one of the passengers,
who was a diabetic, had become very ill,
apparently in shock. Unable to stand the
pressure of the decision, <u>the pilot asked the</u>
<u>other passenger what to do.</u> Should he continue
the flight in the hope that the passenger would
recover, or should he return home for medical
attention? The other passenger became angry and
said, "That is not for me to decide. Don't you
have any regulations that tell you what to do in
this situation? Call air traffic control for
instructions." Since he was not sure what to do
and since the passenger was so demanding, the pilot
thought. <u>"Yeah, I better call for instructions,</u>
<u>no sense getting that guy more upset than he is."</u>

IMPULSIVITY:
"Not so fast.
Think first."

RESIGNATION:
"I am not helpless.
I can make a
difference."

He called air traffic control, and it was
suggested he return to his departure point where
an ambulance would be waiting to take the sick
man to the hospital. He said to the other passenger,
"I hate to inconvenience you this way. <u>It's not</u>
<u>my decision. I'm doing what I'm told to do."</u>

RESIGNATION

The passenger seemed surprised at this state-
ment and became further irritated saying , "You're
really some pilot! I'd hate to have my life in your
hands if I got sick"!

The pilot became angry and said to himself,
<u>"Look, I'm the boss here, and what I say goes.</u> The
lives of everyone on board are in my hands now, and
I'm the one who is handling this situation. Just
because someone feels sick is no reason to change a
flight plan. <u>I don't care what ATC says. Those</u>
<u>bureaucrats are forever making rules. Who are they</u>
<u>to tell me when to turn back or continue</u>"?

MACHO: "Taking
chances is foolish."

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

As he calmed down, however, he thought to
himself, "Maybethe man is really sick; perhaps I'd
better get him help immediately."

He returned to the departure airport and the
sick passenger, who had lapsed into a coma, was
rushed to the hospital.

<u>The pilot was deeply disturbed by his near</u>
<u>mistake and immediately decided never to fly again.</u>

IMPULSIVITY:
"Not so fast."
"Think first."

58

George and Jack are on a pleasure flight late
in the afternoon. George, the pilot, has bee
flying for almost six months and he is feeling
quite proud of his flying ability. He brags to
Jack that he is one of the best pilots at the local
airport and that he knows more about flying than a
lot of the old timers who seem to be following the
rules. He says, "Flying by the book is unnecessary.
All of those regulations are devised by some petty
bureaucrats who probably have never been in an
airplane."

MACHO: "Taking chances
is foolish."

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

Jack has heard this from George before and is
irritated by it. He feels that George brags too much,
so he reminds him that he is not so great since he does
have much night time and is not instrument rated.

George is annoyed by this. He tells Jack that he
has never had an accident and that he is sure that he
never will. He decides to fly to another airport,
two hours away, thinking, "I'll show him that I
can handle night flying." He tells Jack that it
would be better to fly on since the new destination
has more "action" in its area than the airport
they were originally headed for. Jack does seem
to mind, though, and remarks that this will mean
flying in darkness for a half hour. George says,
"Don't worry; nothing bad can happen to us."
They both have a laugh, and the decision does not
bother Jack.

INVULNERABILITY:
"It could happen
to me."

INVULNERABILITY

As they fly into darkness, George becomes a bit
nervous since he cannot locate any checkpoints and
thinks, "Why don't they provide better lighting in
these areas so a pilot can see," He does not let Jack
know his apprehension but continues to boast about
how well he is flying his aircraft.

RESIGNATION: "I'm
not helpless. I
can make a dif-
ference."
MACHO: "Taking chances
is foolish."

Finally, George sees an airport ahead and make
his approach, but"he is so nervous that he hardly
listens to his landing instructions. He lands
without a problem and feels quite relieved.
Jack apologizes to George, saying that he had
underestimated his abilities.

As they taxi the airplane to the parking area,
George realizes that he has landed at the wrong
airport. Embarrassed and disgusted, he thinks,
"You would think they'd identify airports
better so pilots would not be misled."

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

Postcheck Exercise Three

The pilot and a companion had been drinking
for two hours before their flight from a local
airport. As they walked their airplane the pilot
said, "I can drink with the best of them and still
fly." Once "airborne, she continued by telling
her friend that there is less chance of having an
aircraft accident than there is for a car accident.
"After all," she said, "there's nothing up here
but fresh air. Who is going to run into us at
this height?"

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

MACHO: "Taking chances
is foolish."

As the flight began, the pilot flew somewhat
erratically, but neither one noticed it. So,
they had a few more drinks and thoroughly enjoyed
them. Then, the companion suggested the pilot
do a few loops, just to keep the flight interest-
ing. The pilot remarked, "Loops? I don't think I
know how to do them. Ah, let's try a few anyway.
After all, the only thing that could go wrong is
for us to get dizzy."

INVULNERABILITY:
"It could happen to
me."

ANTI-AUTHORITY

INVULNERABILITY

She then started a loop without checking
her altitude, which   was quite low. The
companion noticed this and screamed, "You're
too low for this. You want to get us killed"?
The pilot was very annoyed and answered, "Who
is in charge of this airplane, you or me? I
know what I'm doing. Now you just relax and
watch me put the airplane through some action.
If things go wrong, it's not our doing. It's in
the cards if your time is up, but don't worry,
Lady Luck is going to be with us."

MACHO

RESIGNATION: "I'm not
helpless. I can make
difference."

Witnesses later reported they had seen the
aircraft making repeated loops at low altitude.
During the last loop, the pilot exceeded the
design limitations of the airplane and both wings
separated from the aircraft. Both women were
killed, and autopsies showed both had elevated
blood alcohol levels.

Postcheck Exercise Four

On a flight from Baltimore to Hartford, <u>the
pilot neglectedto get the most recent weather
forecast. In fact, he left Baltimore in such a
hurry that he did not take the time to do a proper
preflight inspection of the engine.</u> He wanted to
arrive at Hartford before 4 p.m. so that he would
not miss an important engagement. <u>He dispensed
with the preflight check and the weather briefing.</u>

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

IMPULSIVITY:
"Not so fast. Think
first."

En route to Hartford, the weather became
progressively worse, snow was beginning to fall,
and ice was beginning to form on the aircraft's
wings. This frightened the pilot, and he <u>quick-
ly descended to a lower altitude,</u> hoping that
this would help the icing problem, but ice
continued to form. He was now flying at only
800 feet above the terrain.

IMPULSIVITY

He was not sure what to do. In fact, he
was so frightened, he was almost unable to do
anything. He thought, <u>"Perhaps I should radio for
help; no, I won't radio for assistance. What
would they think of me if they knew the problem
I got myself into. Better to let sleeping dogs
lie."</u>

MACHO: "Taking chances
is foolish."

"But what if my carburetor starts to ice?
I'm not even sure what procedure I should use
in that situation. <u>I better fly close to the
ground so I can be sure of where I'm going."</u>
He descended even further, <u>knowing that this
violated regulations</u> and jeopardized his safety
even further. Now even more confused, he was still
not certain what to do.

ANTI-AUTHORITY

At one point, he narrowly missed a small
mountain ridge. This panicked him further, so
he decided to make an emergency landing. <u>He
began his approach even though he had not
decided where to land.</u>

IMPULSIVITY

Finally, at an altitude of 200 feet, he
spotted a paved road. <u>Without checking for
car traffic,</u> he made an emergency landing. Two
cars on the road had to swerve to avoid
colliding with the oncoming airplane. The pilot
managed to stop the plane and left it on the
road, <u>cursing the bad weather</u> that caused his
problems.

IMPULSIVITY

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

Postcheck Exercise Five

While on a flight over hilly terrain, the
pilot notices that his fuel gauge is not
operating. He calculates that it will take ap-
proximately two hours to reach his destination,
a small airport in western Pennsylvania, but
because he neglected to refuel at the last airport,   ANTI-AUTHORITY: "Follow
he is not certain of the amount of fuel in the   the rules. They are
tanks. Also, he has neglected to monitor the   usually right."
operation of the fuel gauge during the flight.

He thinks, "I should have topped off the tanks
at the last stop. That would have given me plenty
of fuel to make the trip, but who has time to follow   ANTI-AUTHORITY
all those procedures that are written for people who
don't know anything about flying and make dumb
mistakes. Besides, nothing has ever happened to me,   INVULNERABILITY: "It
even insituations worse than this."   could happen to me."

He decides to keep flying, thinking that "If   INVULNERABILITY
something goes wrong, well, that's life." Then, it
suddenly occurs to him that he may be nearly out of
fuel: "Maybe I have a fuel leak, and the fuel tanks
are already empty!" He starts to make an emergency   IMPULSIVITY: "Not so fast.
landing.   Think first."

His descent is into a hilly and forested
rea, and he tells his passengers, "We're practically
out of fuel, so I'm heading for that small clearing
before the engines quit. Fasten your seatbelts and
shoulder harnesses tightly and hold on, because it's
going to be a very hard landing."

The left wing and the tail section is damaged on
landing, but no one is injured. After he secures the
airplane and gets out, he checks the fuel tanks and
finds them half-full. He says to himself, "Dumb
mechanics, if they did their job right, my gauge   RESIGNATION: "I am
would not have broken, and this wouldn't have happened." helpless. I can make a
                                                        difference."

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The pilot and his friend were flying a single-
engine airplane 1,200 miles on a VFR cross-country
flight to Toronto. Halfway to Toronto, the pilot
noticed that the weather was deteriorating. He was
concerned because he wanted to reach his destination
that day. His fuel reserve calculations indicated
that he had just enough fuel to make it, so he
decided not to make a planned refueling stop. "What
can go wrong?" He reasoned, "I should make it with
time to spare. I'd rather get to Toronto right
away than be stuck at some small airport waiting for
weather to improve."

ANTI-AUTHORITY: "Follow
the rules. They are usually
right."
INVULNERABILITY: "It
could happen to me."

Nearing the Toronto area, he realized that
the weather was much worse than he had anticipated,
and strong headwinds had caused the airplane to use
far more fuel than he had allowed for. He thought,
"This crummy weather is really botching up my
flight." Then his passenger remarked that he should
have refueled. He answered, "Once I make up my mind
that I have made the right decision, nobody is going
to tell me differently."

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

MACHO: "Taking charge is
foolish."

As he made his approach to Toronto, he could
not see the runway clearly. Instead of executing
a go-around, he landed anyway. The aircraft was
not aligned with the runway, and it ran off the
hard surface into the grass. The pilot blamed the
landing mishap on the bad weather and the distraction
of arguing with his friend.

ANTI-AUTHORITY

RESIGNATION

THE FIVE ANTIDOTES

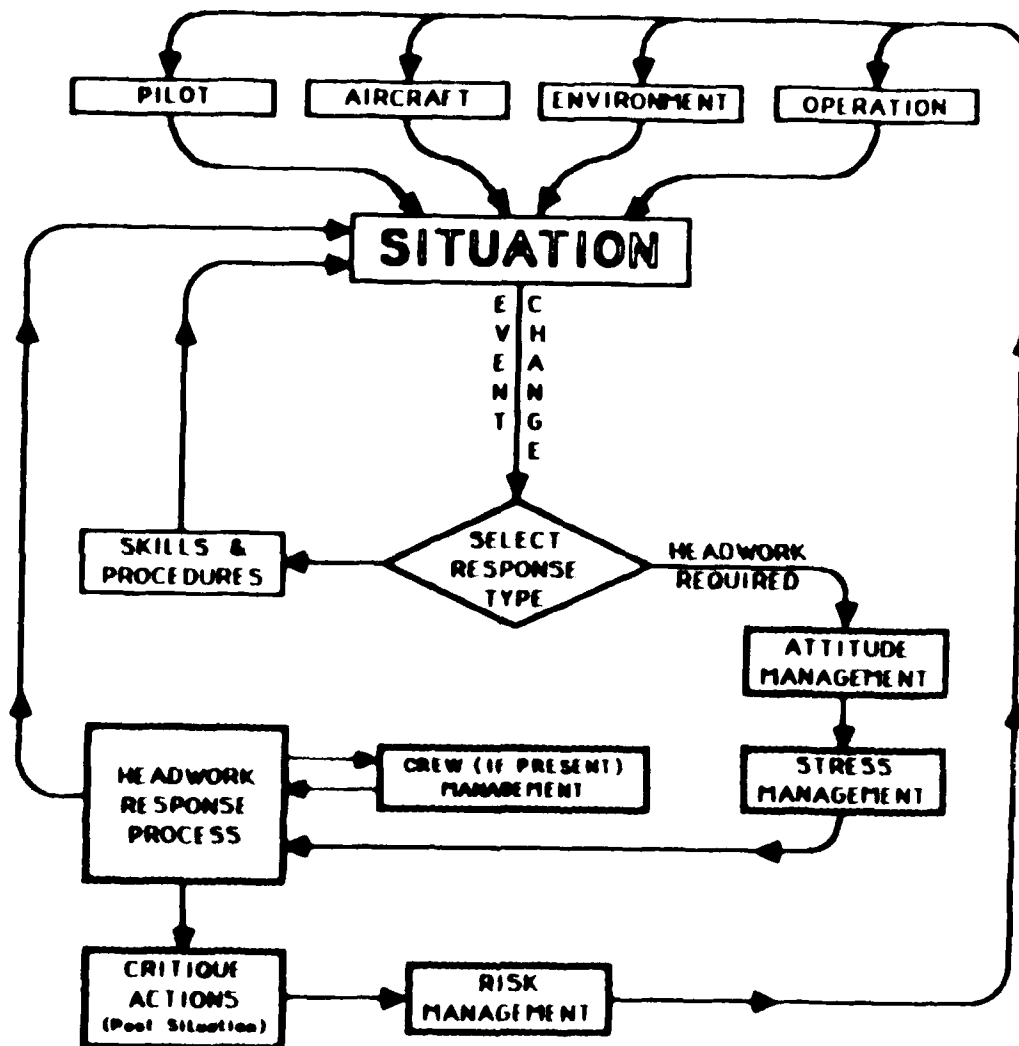| Hazardous Attitude	Antidote
ANTI-AUTHORITY: "Don t tell me"	"Follow the rules They are usually right "
IMPULSIVITY: Do something - quickly!"	"Not so fast Think first "
INVULNERABILITY: it won t happen to me "	"it could happen to me "
MACHO: "i can do it "	"Taking chances is foolish "
RESIGNATION: "what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

AERONAUTICAL DECISION MAKING PROCESS

END

8-87

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