5. Operations

5.4 - Aeronautical Decision Making

Structure & Formatting Reminder

This presentation is provided as a reference to help you prepare for the your exam. It seeks to go beyond memorization and provide explanation and rationale.

While this reference considers many of the points covered in the exam, given the bredth it is in no way exhaustive. It is suggested to consult a variety of resources when preparing for the exam.

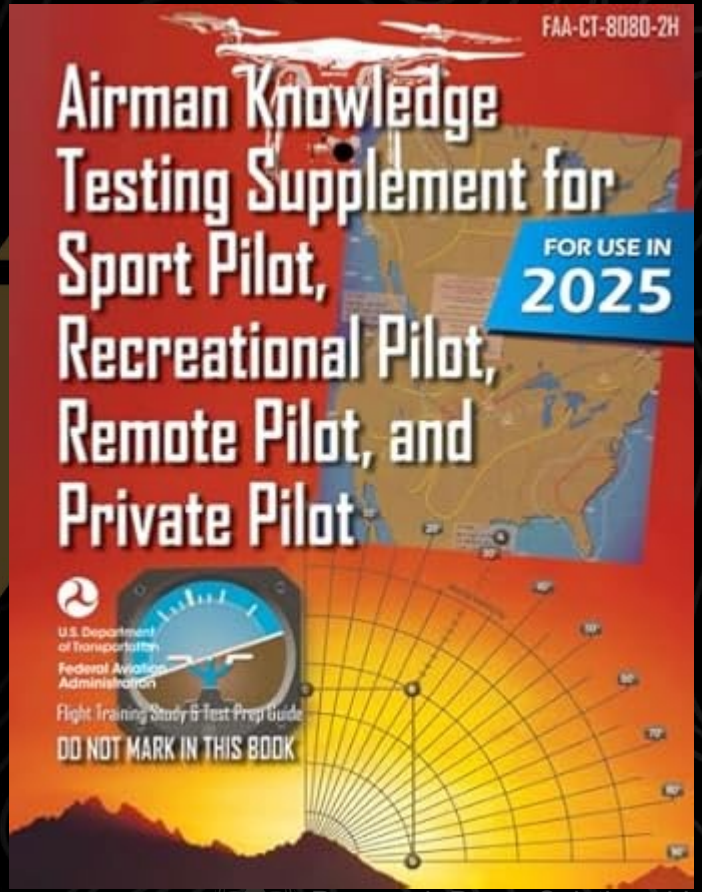
Text that is marked in YELLOW has a high probability of being referenced directly in one of the exam's nearly 400 possible questions.

Take the quiz at the end to gauge your understanding.

Airman Knowledge Testing Supplement

Many of the points covered in the slideshow and quiz reference images and concepts found in the “Airman Knowledge Testing Supplement”.

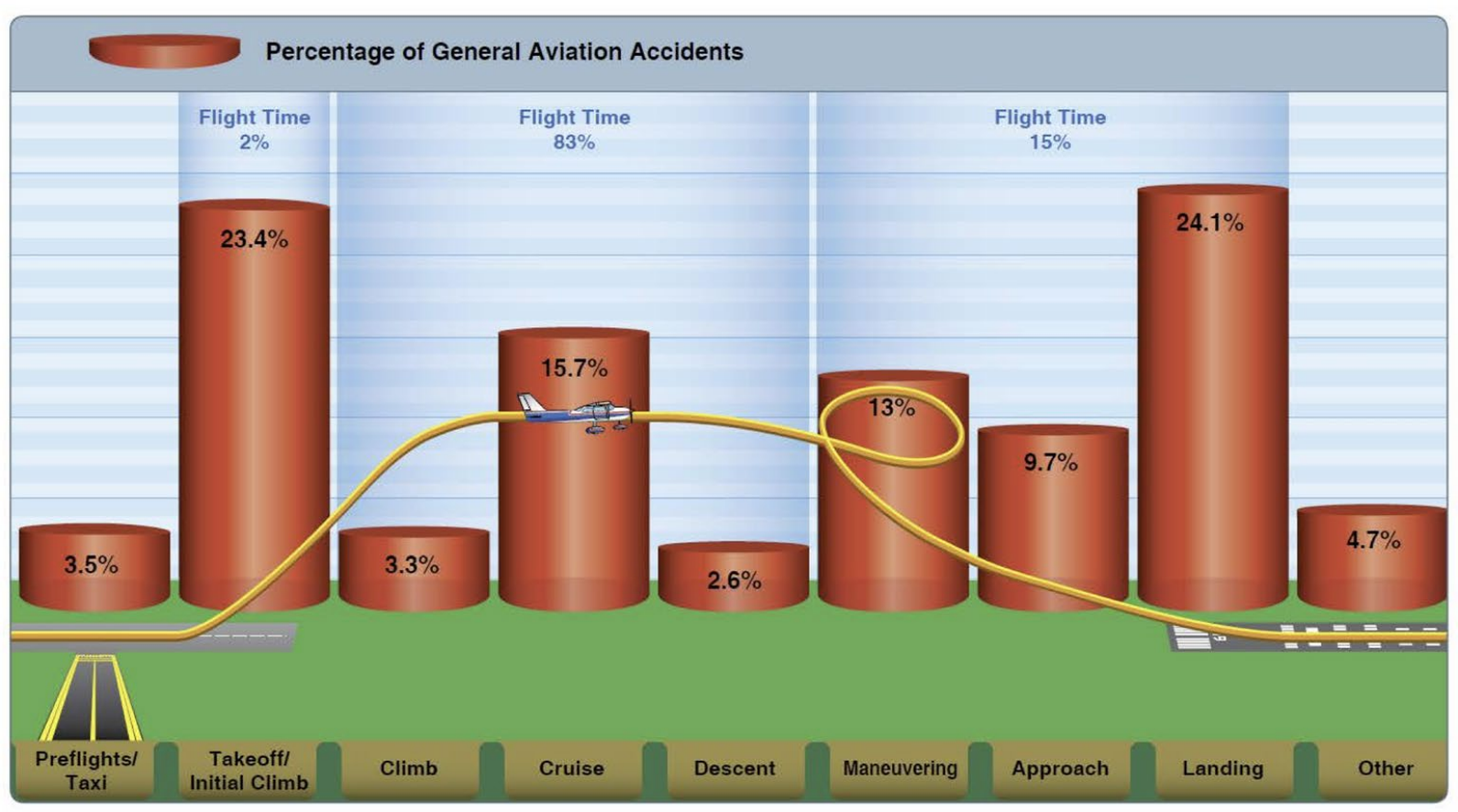
You can download the document from the FAA here. Alternatively, a hard copy can be purchased online for around $10.



5.4a - Principles of Risk Management

- Accept no unnecessary risk.
- Make risk decisions at the appropriate level.
- Accept risk when benefits outweigh danger (cost).
- Integrate risk management into planning at all levels.

5.4a - Principles of Risk Management



Why do you think the majority of accidents take place during takeoff and landing?

5.4 - Aeronautical Decision Making (ADM) Overview

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What is ADM?

- ADM is a systematic approach to the mental side of light.
- If used, ADM will help pilots consistently determine the best course of action.

ADM = Risk Management

5.4 - Aeronautical Decision Making (ADM) Overview

ADM is a Continuous Process that doesn't have a defined start and end. It happens in all aspects of flight but can be categorized into three main groups.

- Preflight
- In-Flight
- Post Flight

5.4 - 3P Model (Perceive, Process, Perform)

- *Perceive (PAVE Checklist)*
  - Gather all relevant info pertaining to your flight.
- *Process (CARE Checklist)*
  - Evaluate the impact on flight safety, determine your best course of action.
- *Perform (TEAM Checklist)*
  - Implement the best course of action. Performance results become information to be perceived and analyzed.

5.4 - 3P Model (Perceive, Process, Perform)

PAVE

- **P -** Use the IMSAFE checklist to make sure the pilot is prepared.
- **A** - Make sure the aircraft is familiar, fueled, loaded properly, and functioning.
- **V** - Ensure the enVironment is safe (weather, terrain, airport, airspace, nighttime).
- **E** - External Pressures should not overwhelm safety.

5.4 - 3P Model (Perceive, Process, Perform)

Perceive - IMSAFE

A pilot's self-assessment tool used as a quick check.

5.4 - 3P Model (Perceive, Process, Perform)

Process - CARE

- **Consequences** - departing after a full workday creates fatigue and pressure.
- **Alternatives** - Delay until morning; reschedule meeting; drive.
- **Reality** - dangers and distractions of fatigue could lead to an accident.
- **External Pressures** - business meeting at designation might influence decisions.

5.4 - 3P Model (Perceive, Process, Perform)

Perform - TEAM

- **Transfer** - should the risk decision be transferred to someone else?
- **Eliminate** - is there a way to eliminate the hazard?
- **Accept** - Do the benefits of accepting risk outweigh the costs?
- **Mitigate** - What can you do to mitigate the risk?

5.4 - 3P Model (Perceive, Process, Perform)

The DECIDE Model

Detect that a change has occurred.

Estimate the need to counter or react.

Choose the desired outcome.

Identify actions to control the change.

Do (perform) the action.

Evaluate the success of the action.

Why is ADM important in sUAS operations?

Why is ADM important in sUAS operations?

It helps remote pilots assess risks, make safe choices, and respond effectively to unexpected situations. Good ADM reduces the chance of accidents by promoting sound judgment before and during flight.

5.4 - 3P Model (Perceive, Process, Perform)

ADM enhances the decision-making process because it:

- 1. Increases awareness and importance of attitude in decision-making.
- 2. Teaches the ability to search for and establish the relevance of information.
- 3. Increases their motivation to choose and execute actions that ensure safety in the situational time frame.

5.4 - 3P Model (Perceive, Process, Perform)

- *Perceive*
  - *PAVE*
  - *IMSAFE*
- *Process*
  - *CARE*
- *Perform*
  - *TEAM*
  - *DECIDE*

5.4 - Effective Team Communication

5.4 - Effective Team Communication - Task Management

Remote Pilot in Command (RPIC)

- 107 Pilot - responsible for operation and safety. Final authority.

Person Manipulating the Controls

- Controlling the flight of the sUAS under the supervision of the remote pilot in command.

Visual Observer (VO)

- Designated by the RPIC to assist with “see and avoid” process regarding other air traffic or objects aloft.

Panther Newspaper

5.4 - Effective Team Communication - Crew Resource Management

- CRM manages all resources available to pilot.
- CRM includes ADM, risk management, task management, automation management, controlled flight into terrain awareness, and situational awareness.
- Use CRM in all phases of flight operations.

Nevada Business Aviation Association

5.4 - Effective Team Communication - Crew Resource Management

CRM requires good communication between all involved parties.

- Person-to-Person - (RPIC-VO)
  - Avoid misunderstandings, take actions to reduce risk.
- Good Communication Between GCS and Drone
  - Make sure connections between control station, drone, and other outside signals (GPS/WiFi, etc) is strong enough.
- Good communication with the FAA
  - Listed to the FAA about how to safely operate your drone.

5.4 - Situational Awareness

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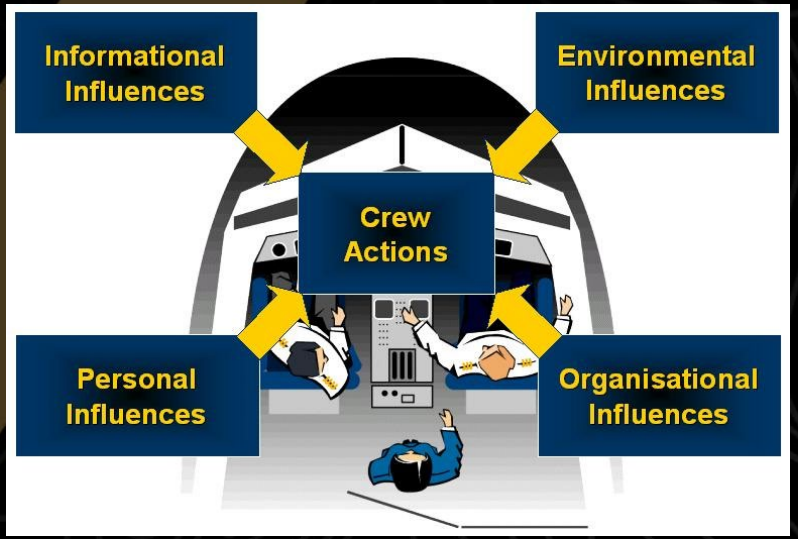
Situational awareness allows the pilot to plan for what will happen next and to stay ahead of the aircraft. A forward-looking plan also provides for early detection of any deviation from expectations.

Be aware of the following

- Aircraft position
- Flight path
- Status of other aircraft in the area
- Status of the environment
- Human factors in play



5.4 - Hazardous Attitudes

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Anti-authority - “Don’t tell me”

- Resentful of having someone tell them what to do.

ANTIDOTE: Follow the rules, they help prevent accidents.

5.4 - Hazardous Attitudes

Impulsivity - “Do it quickly”

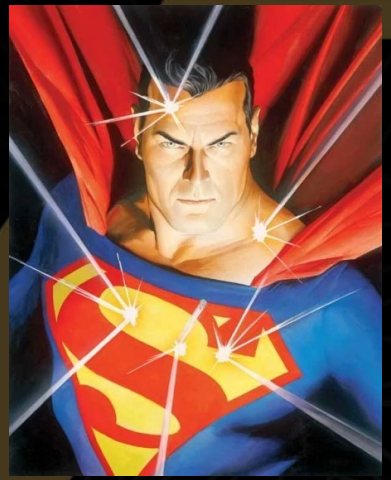
- People who don’t stop to think about what they are about to do. Always do the first thing that may come to mind.

ANTIDOTE: Not so fast, think first.

5.4f - Hazardous Attitudes

Invulnerability - “It won’t happen to me”

- Someone who thinks that they will not be personally involved in an issue. More likely to take chances.



ANTIDOTE: It could happen to me.

5.4f - Hazardous Attitudes

Macho - “I can do it”

- Always trying to prove they are better. More willing to take risks in order to impress others.

Redbubble

ANTIDOTE: Taking chances is foolish.

5.4f - Hazardous Attitudes

Resignation - “What’s the use?”

- People who think they won’t be able to make a difference in what happens to them. Always believe that someone is out to get them or always have bad luck.

Disney

ANTIDOTE: I’m not helpless, I can make a difference.

Why are hazardous attitudes so dangerous?

Why are hazardous attitudes so dangerous?

They lead to poor judgment and risky decisions that can compromise the safety of a flight. If not recognized and managed, these attitudes can cause pilots to ignore rules, take unnecessary risks, or react emotionally instead of rationally.

What are some steps you can take to avoid hazardous attitudes or address them if they occur?

What are some steps you can take to avoid hazardous attitudes or address them if they occur?

- Recognize the attitude when it arises.
- Apply the antidote thought or corrective action.
- Practice self-awareness and regularly reflect on your decision-making process.
- Use checklists and SOPs to stay grounded in objective procedures.
- Seek input from crew or observers if available to help maintain perspective.

5.4 - Hazard Identification and Risk Assessment

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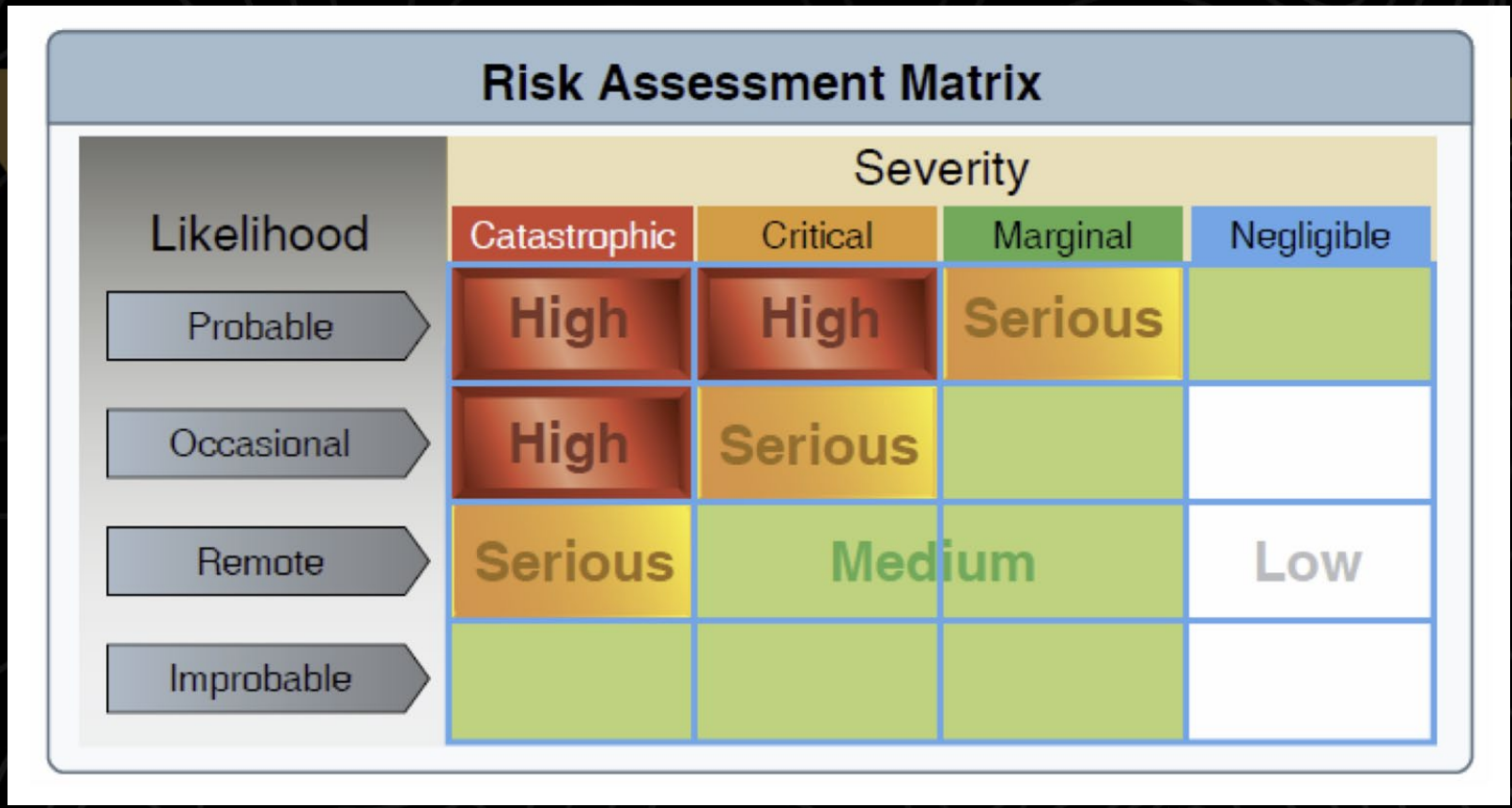
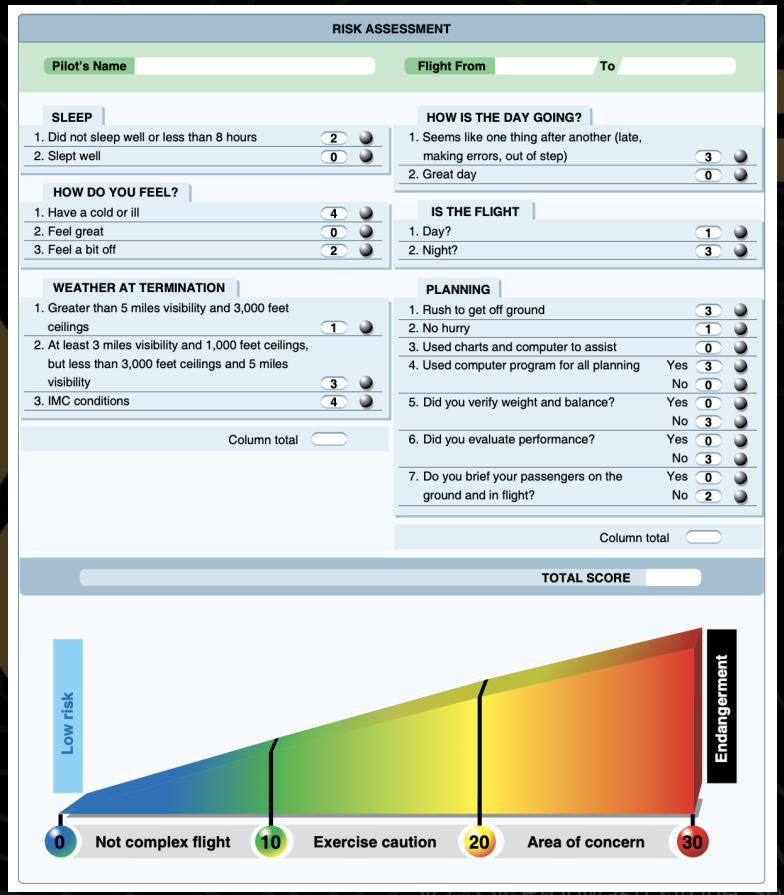


5.4 - Hazard Identification and Risk Assessment

Flight Risk Assessment Tool (FRAT)

FRATs assign a numerical value with a type of hazard and the significance.

The user selects the hazards and derives a score that can fall in a low, intermediate, or high risk.



Why is using a FRAT (Flight Risk Assessment Tool) essential?

Why is using a FRAT (Flight Risk Assessment Tool) essential?

- It helps identify potential hazards before a flight and assess their severity. This allows remote pilots to make informed, proactive decisions to reduce risk and increase the safety of sUAS operations.

Unit 5 Operations – 5.4 Review Quiz

- 5.4 - Aeronautical Decision Making – QUIZ
- This quiz contains 18 questions.
  - You may take it as many times as you like.
  - The order of questions are randomized each time.
  - The large majority of the questions are worded exactly as they appear on the exam.