Aeronautical Decision Making

Module 1

Ground Lesson 6

Lesson Objective

- The student shall gain basic knowledge of aeronautical decision-making (ADM):
  - Risk management
    - Basic risk management process
    - Four fundamentals of risk management
  - Crew resource management (CRM) vs single pilot resource management (SRM)
  - Decision-making process

Why does ADM matter?

- In crewed aviation, approximately 80% of accidents are related to human factors
- Skydio customers experience ~3 incidents per month due to User Error
- Good judgement can be taught and it can reduce judgement errors by 10-50% in FAA tests

Discussion: NTSB Accident #CEN21LA224

Risk Management

Concepts

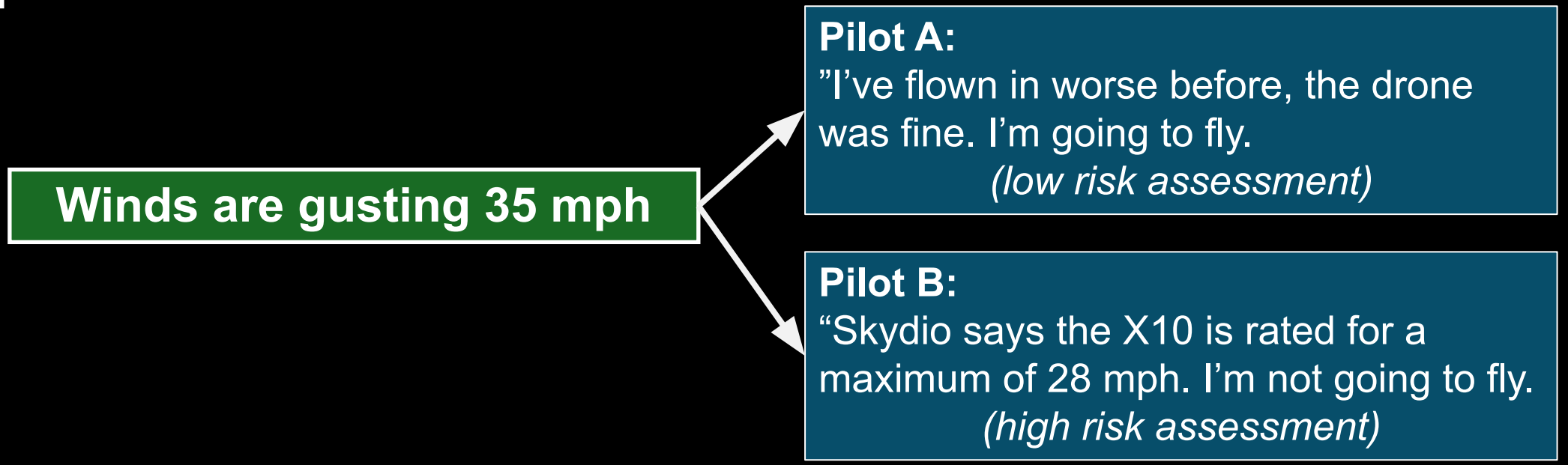
What are hazards and risks?

Hazard

- Real or perceived condition, event, or circumstance that a pilot encounters

Risk

- A pilot's assessment of a hazard

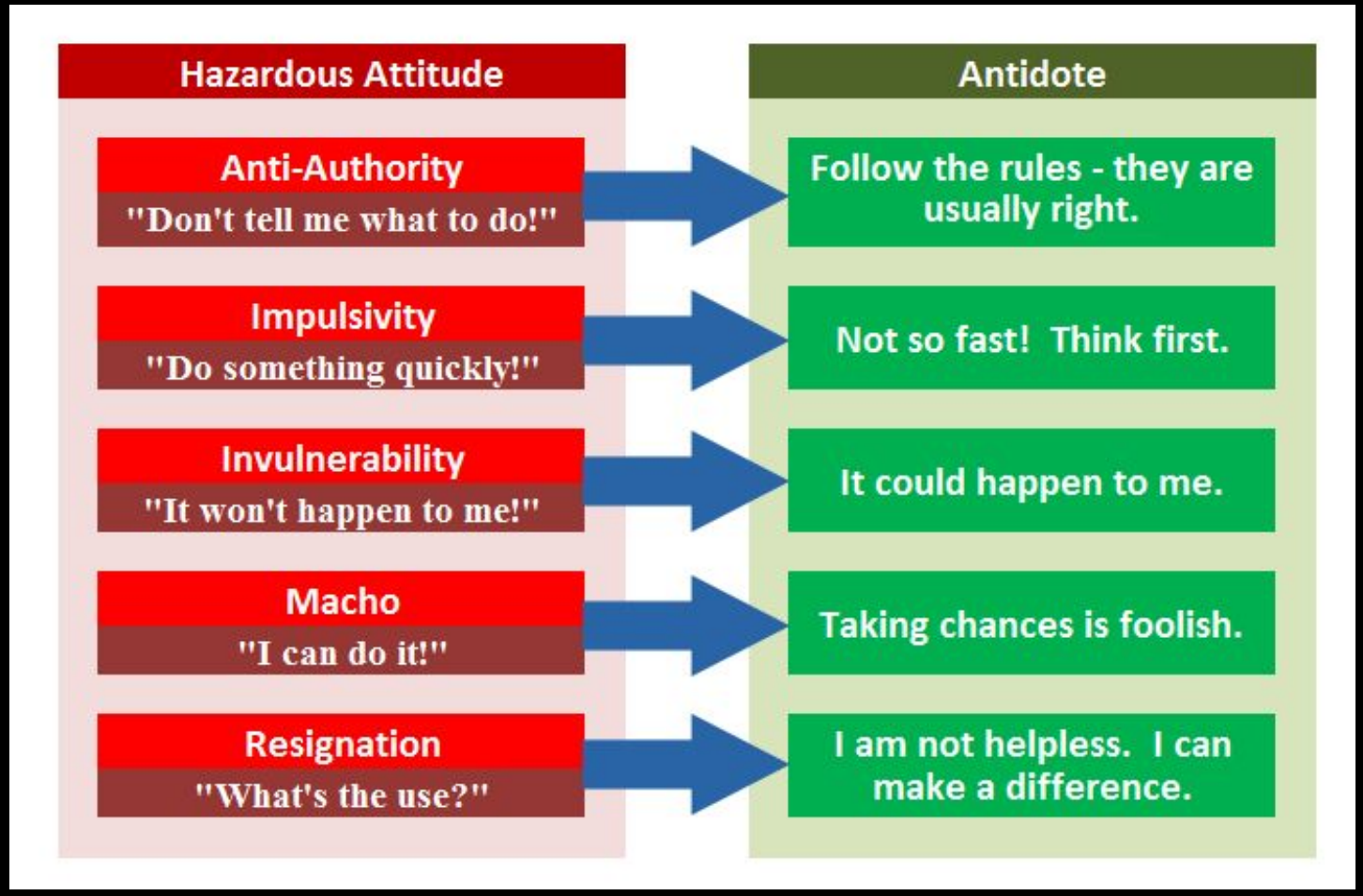


Risk Management

- The goal of risk management is to proactively identify safety-related hazards and mitigate the associated risks.

Hazardous Attitudes

- A predisposition o respond to situations or events in a given manner.
- These interfere with an operator's ability to make sound decisions



Four Fundamental Principles

1. **Accept no unnecessary risk.**
2. **Make risk decisions at the appropriate level.**
3. **Accept risk when benefits outweigh dangers (or cost).**
4. **Integrate risk management into planning at all levels.**

CRM and SRM

CRM Overview

Crew resource management (CRM) is a management system used for improving crew performance. It encompasses a broad skill set which includes communication, leadership, teamwork, situational awareness, problem solving, and decision making.

It is equally important for each crew member, regardless of role. It is an opportunity for individuals to examine their behavior and identify what can be improved to ensure safe and efficient flight operations.

Introduction

CRM is *not*:

- Only for select cases
- A prescription to mend relationships
- A quick fix
- A psychological assessment

CRM is for everyone - flight crew, mission commander, engineers, customers, ground crew, air traffic controllers, visual observers.

SRM Overview

Single pilot resource management (SRM) is all about helping pilots learn how to gather information, analyze it, and make decisions. It is managing all the resources available to a single pilot (prior to and during flight) to ensure the successful outcome of the flight.

SRM includes:

- ADM
- Risk management
- Task management
- Automation management
- Controlled flight into terrain (CFIT) awareness
- Situational awareness

The Decision-Making Process

The Decision-Making Process

While some situations require immediate pilot response…

There is usually time to make a decision!

There are many models for the decision-making process.

When there is no time...

Automatic Decision-Making

A reflexive type of decision-making anchored in training and experience

- Scenario-based training is crucial for developing this skill!

Consider these operational pitfalls

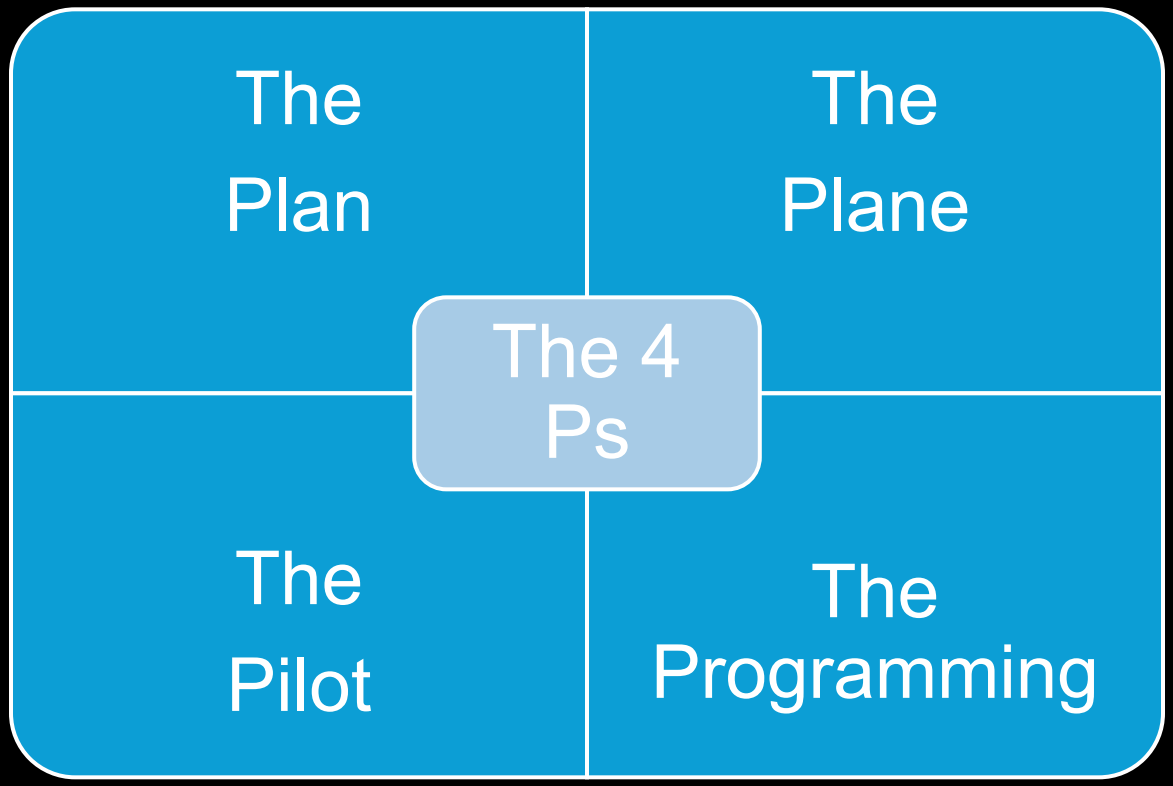
- Peer Pressure
- Mindset
- Get-the-mission-done-itis
- Loss of situational awareness
- Flying outside the OEM envelope / limitations
- Neglect of flight planning, preflight inspection
- Not using a checklist

When there is time...

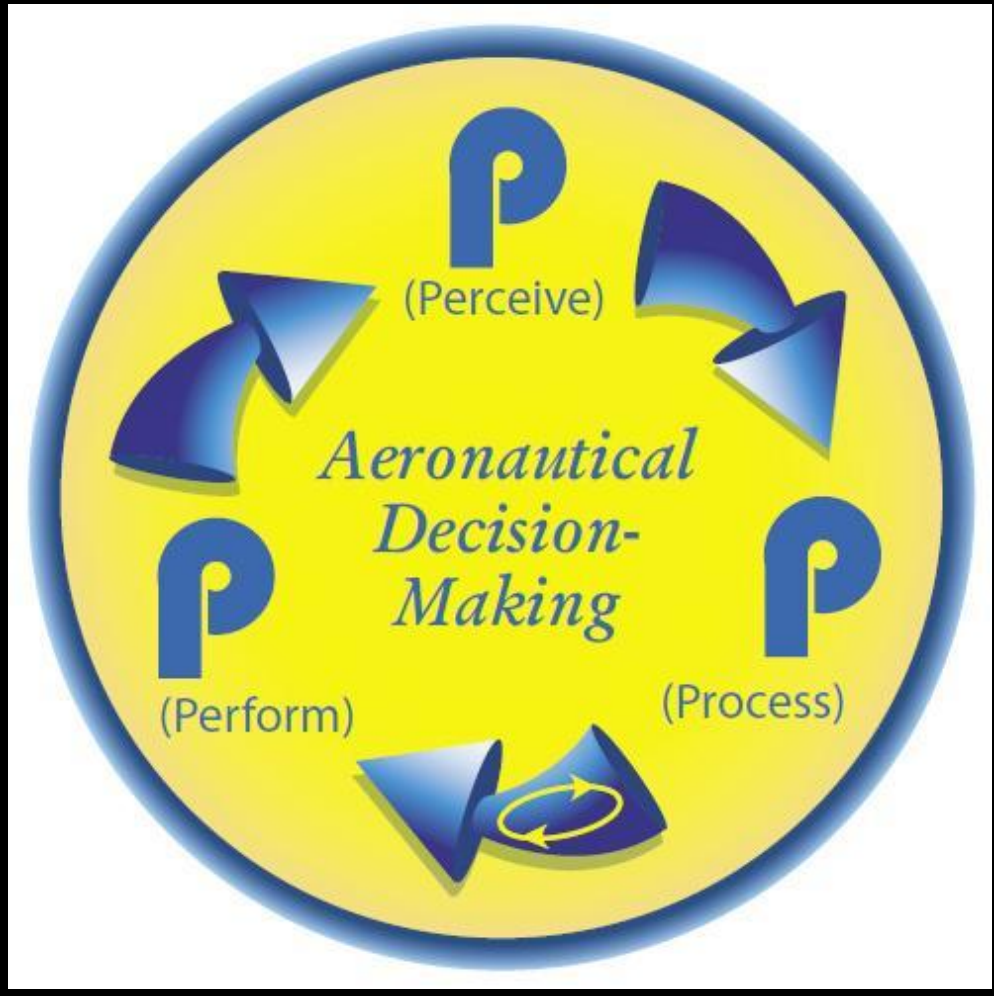
- The Four Ps Check [especially good for SRM]
- The 3P Model
- The DECIDE Model

Single Pilot Resource Management Model

The “Four Ps” Check



Decision-Making Models: The 3P Model



Decision-Making Models: DECIDE