

# Aeronautical Decision-Making and Judgement

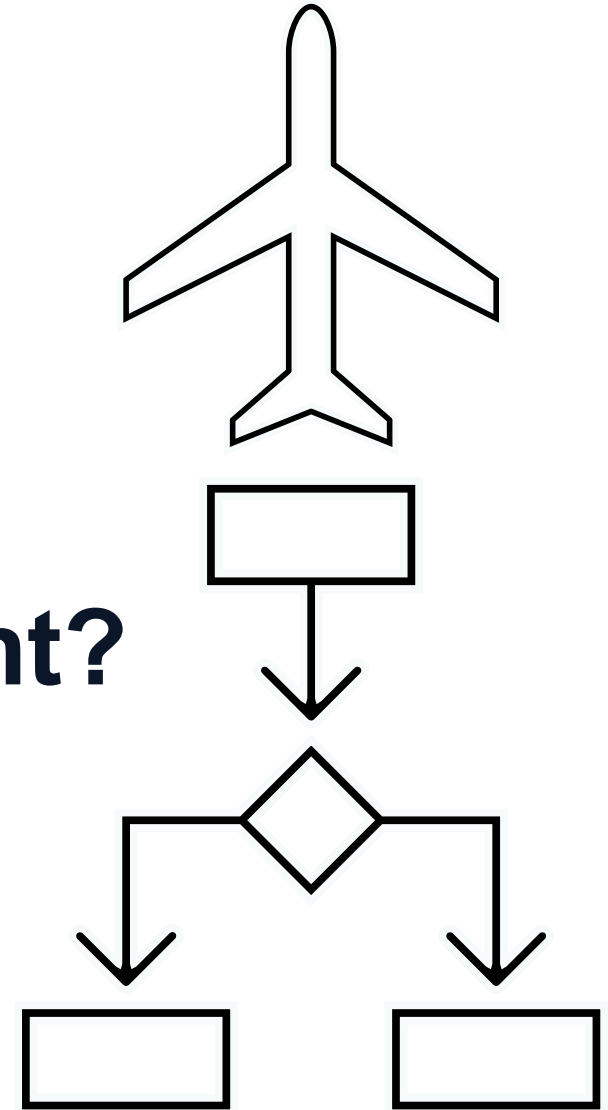
## MUAS Remote Pilot Course

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# Aim

**Decision making in the aviation world.**

**Can making decisions be taught?**



# Why is this important for me?

Able to operate MUAS safely.

# Agenda

**1** Introduction

**2** History

**3** Decision-Making Steps

**4** Crew & Single-Pilot  
Resource Management

**5** Hazard and Risk

**6** Risk Management

**7** Decision-Making  
Process

**8** Operation Pitfalls

**9** Stress Management

**10** Situational Awareness

**11** Questions

# Reading Material

## **Chapter 10: Aeronautical Decision-Making and Judgment**

*Remote Pilot – Small Unmanned Aircraft Systems Study Guide*

[https://www.faa.gov/regulations\\_policies/handbooks\\_manuals/aviation/media/remote\\_pilot\\_study\\_guide.pdf](https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/media/remote_pilot_study_guide.pdf)

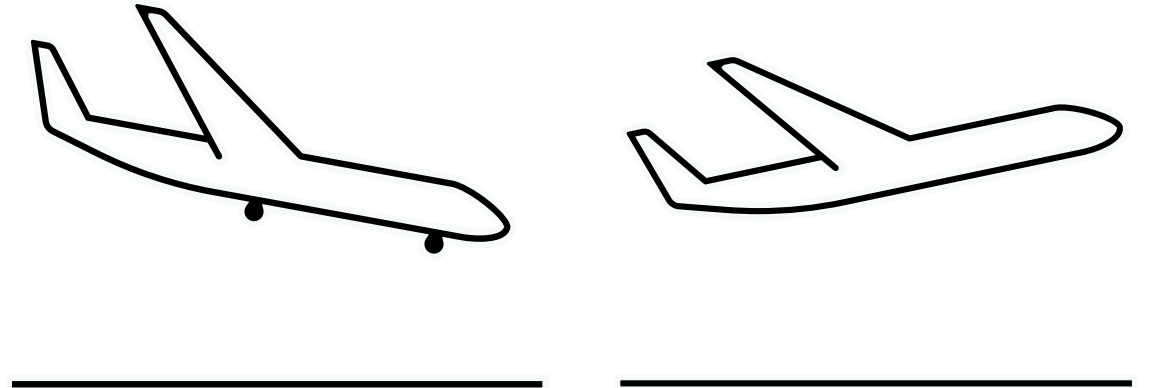
## **Chapter 2 Aeronautical Decision-Making**

*Pilot's Handbook of Aeronautical Knowledge*

[https://www.faa.gov/regulations\\_policies/handbooks\\_manuals/aviation/phak/media/04\\_phak\\_ch2.pdf](https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/phak/media/04_phak_ch2.pdf)

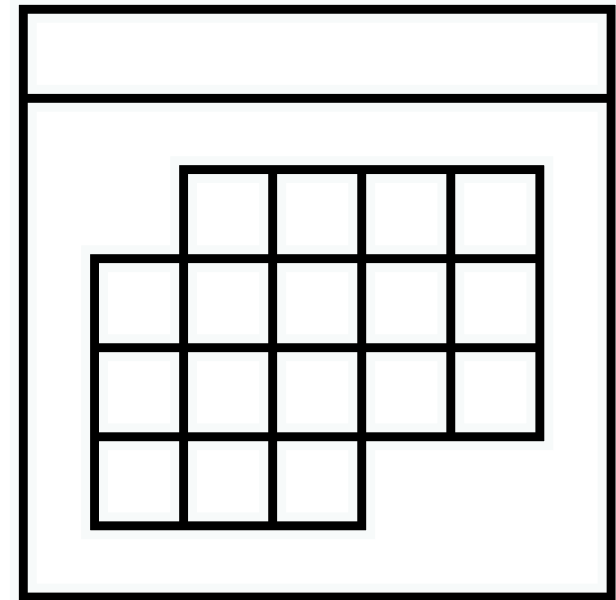
# Introduction

- PIC Decision Making
- Accidents
  - 80% Human Error
  - 24.1 % landing
  - 23% takeoff
- ADM
  - Risk assessment
  - Stress Management
- Personal Attitude



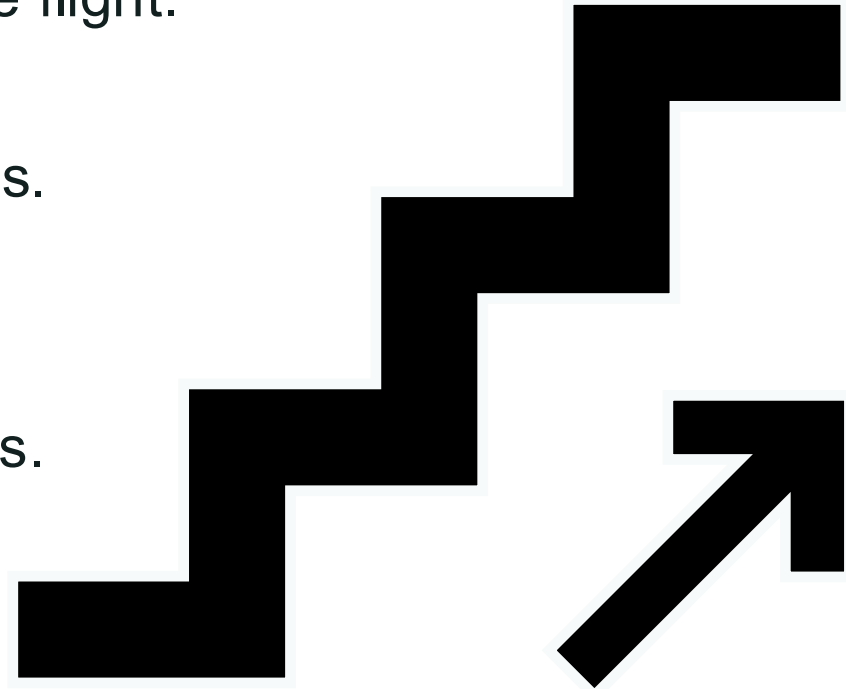
# History

- 25 years
- Reduce accident by human factor.
- Improve decision making
- 10-50% fewer judgement error



# Steps for Good Decision-Making

- Identifying personal attitudes hazardous to safe flight.
- Learning behavior modification techniques.
- Learning how to recognize and cope with stress.
- Developing risk assessment skills.
- Using all resources.
- Evaluating the effectiveness of one's ADM skills.





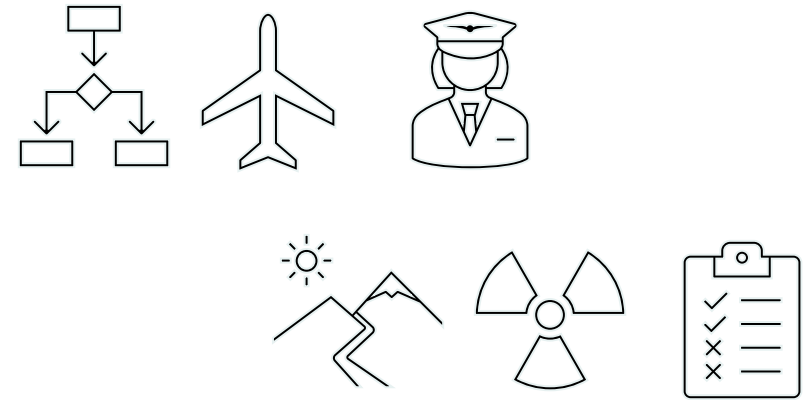
# Crew Resource Management (CRM) and Single-Pilot Resource Management

## CRM

- Crew environments

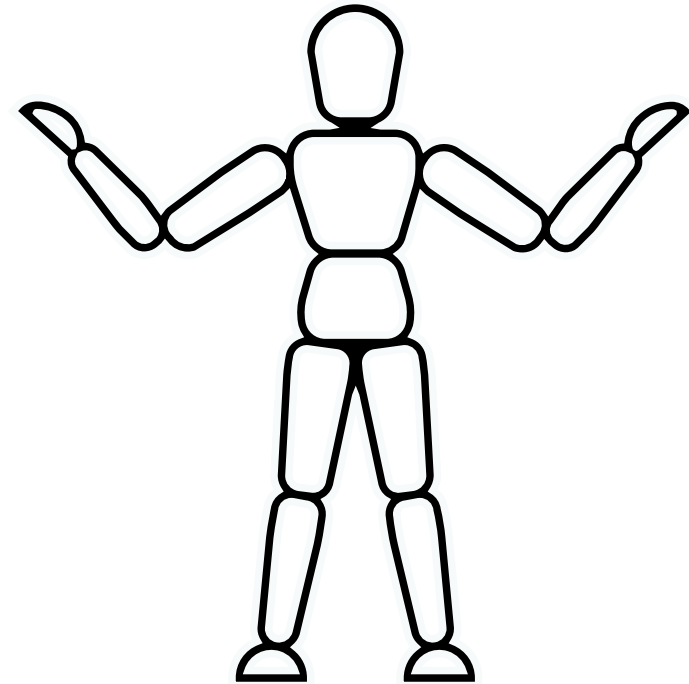
## SRM

- ADM,
- risk management (RM),
- task management (TM),
- automation management (AM),
- controlled flight into terrain (CFIT) awareness,
- situational awareness (SA)



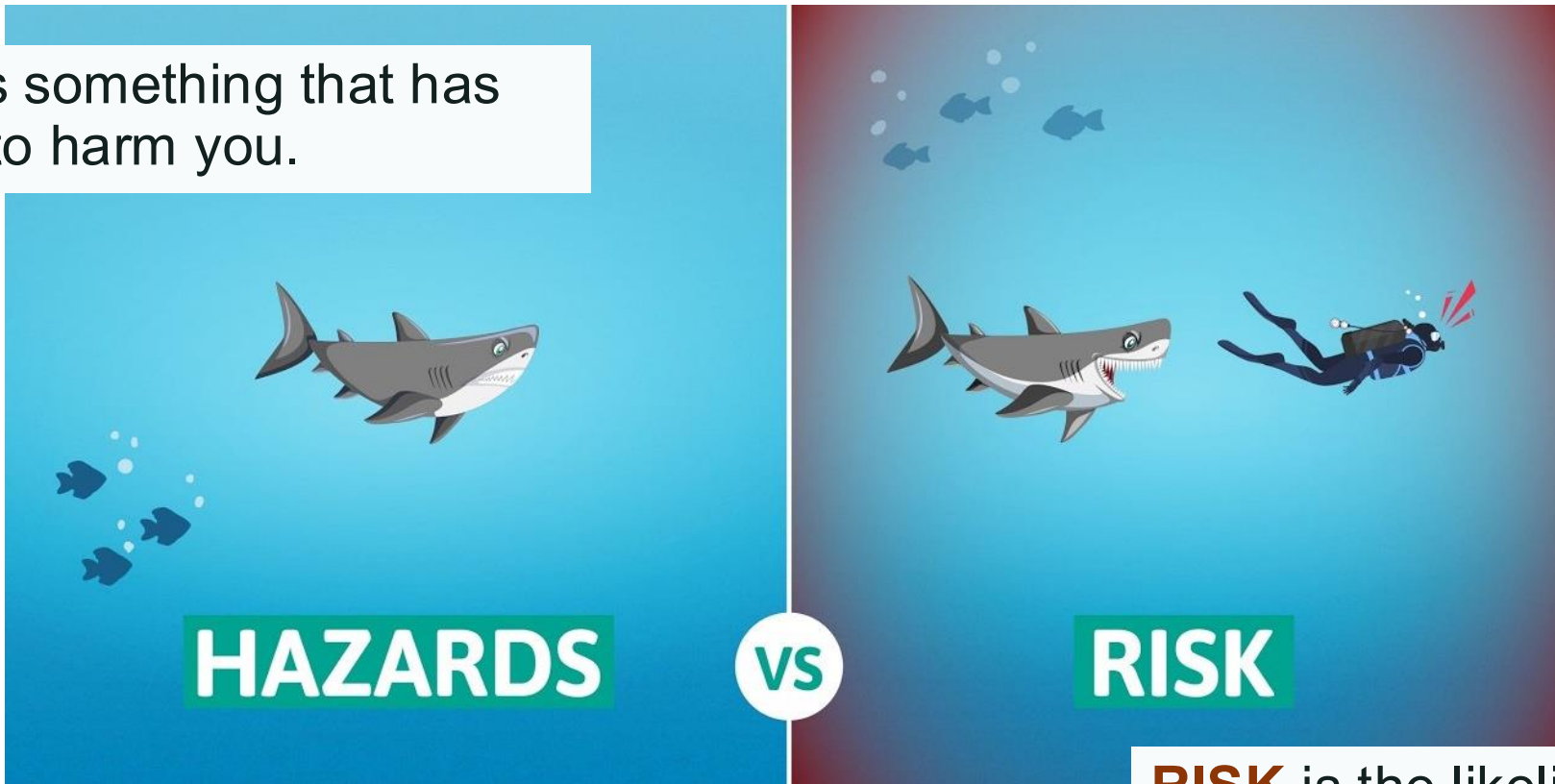
# Decision-Making Process

- ADM and SRM
- Risk Management and Risk Intervention



# Hazard and Risk

A **HAZARD** is something that has the potential to harm you.



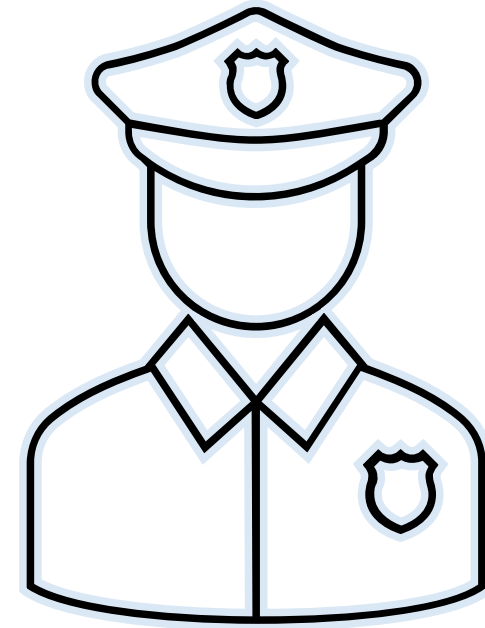
**RISK** is the likelihood of a hazard causing harm.

# Hazardous Attitudes and Antidotes

## Anti-Authority

- *"Don't tell me."*
- *Those who do not like anyone telling them what to do.*

***Follow the rules. They are usually right.***



# Hazardous Attitudes and Antidotes

## Impulsivity

- *"Do it quickly."*
- Those who feel the need to do something, anything and immediately.

***Not so fast. Think first.***



# Hazardous Attitudes and Antidotes

## Invulnerability

- *“It won't happen to me”*
- Those who feel that accidents happen to others.

*It could happen to me.*

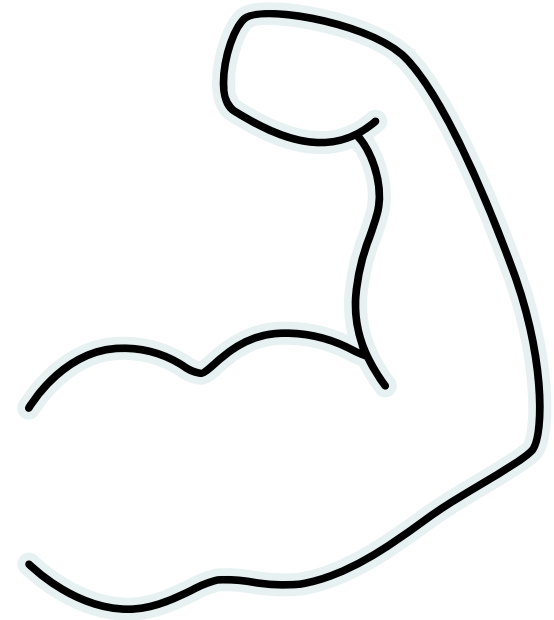


# Hazardous Attitudes and Antidotes

## Macho

- *"I can do it"*
- Those who are trying to prove that they are better than anyone else. "Watch this!"

***Taking chances is foolish.***

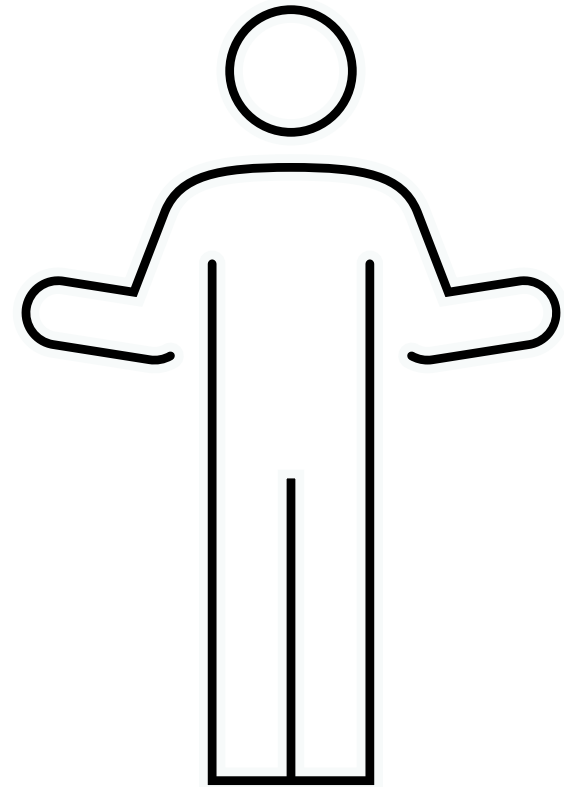


# Hazardous Attitudes and Antidotes

## Resignation

- *"What's the use"*
- Those who do not see themselves making a difference

*I am not hopeless. I can make a difference.*





# Hazardous Attitudes and Antidotes

	<b>Example</b>	<b>Definition</b>	<b>Antidote</b>
<b>Anti-authority</b>	"Don't tell me."	Those who do not like anyone telling them what to do	Follow the rules. They are usually right.
<b>Impulsivity</b>	"Do it quickly."	Those who feel the need to do something, anything and immediately.	Not so fast. Think first.
<b>Invulnerability</b>	"It won't happen to me"	Those who believe that accidents happen to others.	It could happen to me.
<b>Macho</b>	"I can do it "	Those who are trying to prove that they are better than anyone else. "Watch this!"	Taking chances is foolish.
<b>Resignation</b>	"What's the use"	Those who do not see themselves making a difference	I am not hopeless. I can make a difference.

# Risk Management

**Risk Identification:** Consider technology, resource operation, environment, regulation; use SME to identify risk.



**Risk Assessment:** Likelihood and impact of the Risk. Risk Rating may be Qualitative / Quantitative.



**Risk Monitoring:** Change in technology, Operation environment or regulation may have introduced new risk



**Risk Control:** Mitigation, Transference, Avoidance, Acceptance.

# Risk Assessment

	<b>Severity</b>			
<b>Likelihood</b>	Catastrophic	Critical	Marginal	Negligible
Probable	High	High	Serious	Medium
Occasional	High	Serious	Medium	Low
Remote	Serious	Medium	Medium	Low
Improbable	Medium	Medium	Medium	Low

# Risk Mitigation

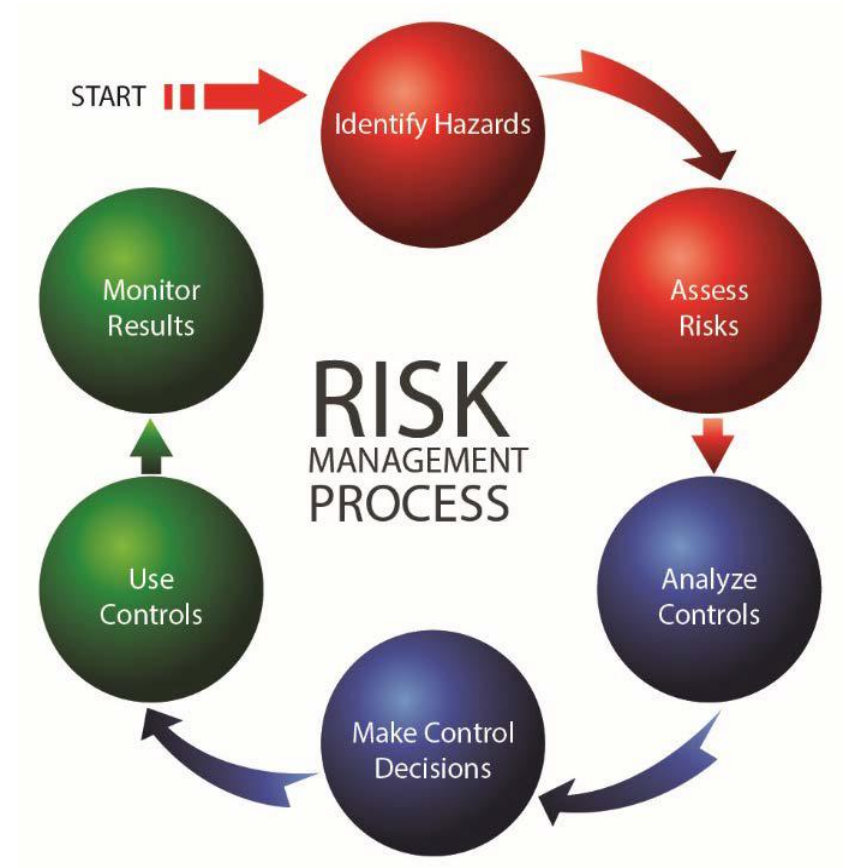
## I'M SAFE

- **Illness:** Am I sick?
- **Medication:** Avoid medicine that affect judgement or make you drowsy.
- **Stress:** Psychological pressure? Money, health, family problems?
- **Alcohol:** Am I under the influence?
- **Fatigue:** Tired or not well rested?
- **Emotion:** Emotionally upset?

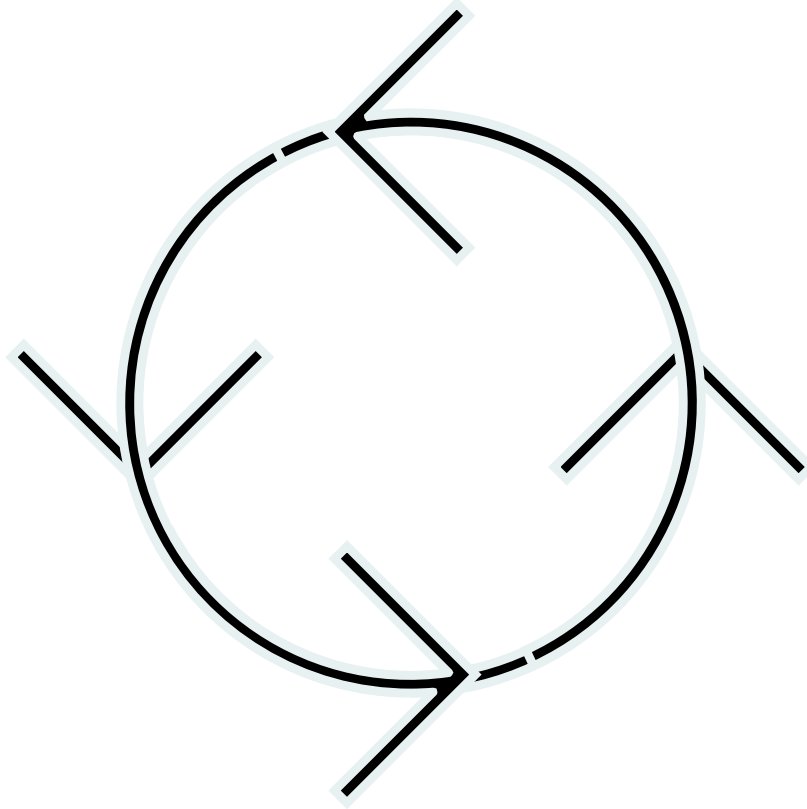


# Risk Management

- Identify the hazard
- Assess Risk
- Analyze Control
- Make control Decisions
- Use controls
- Monitor Results



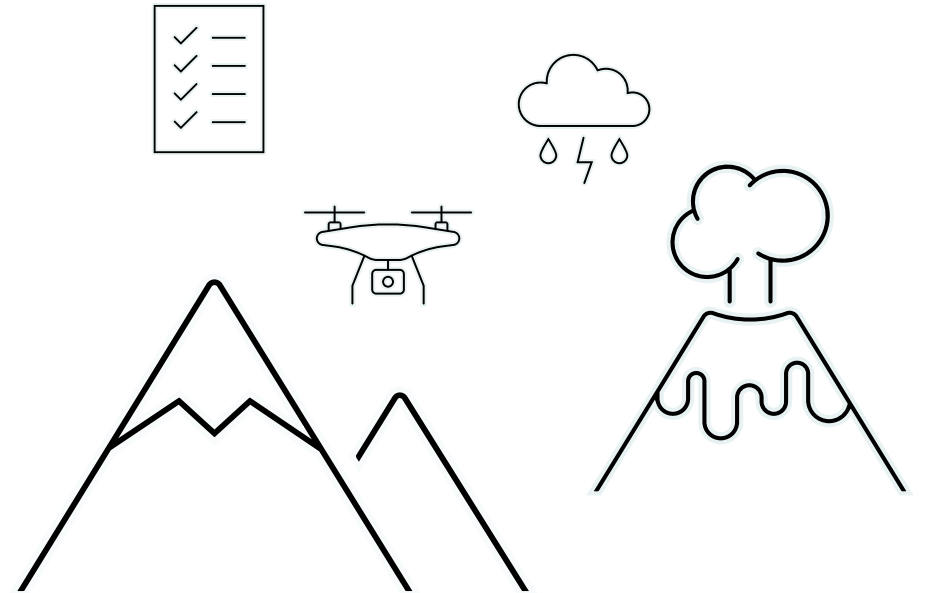
# Risk Management



- Accept no unnecessary risk
- Make risk decisions at the appropriate level
- Accept risk when benefits outweigh dangers
- Integrate risk management into planning

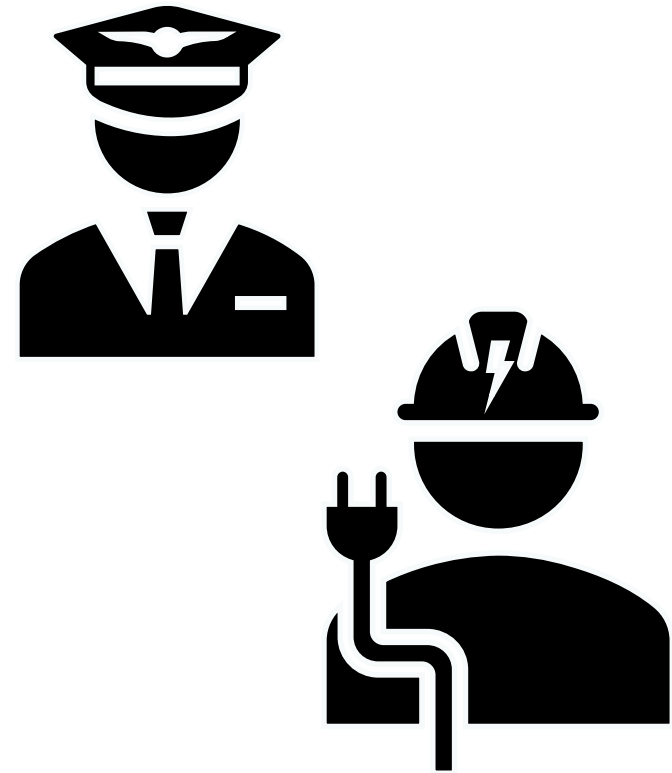
# The PAVE Checklist

- **Pilot-in-command:** use the IMSAFE Checklist to determine that you are fit to operate.
- **Aircraft:** Ensure you are familiar with the aircraft and its limitations.
- **enVironment:** weather, terrain and airspace (powerlines trees airspace)
- **External Pressures:** Hazardous attitudes and operational pitfalls.



# Human Factors

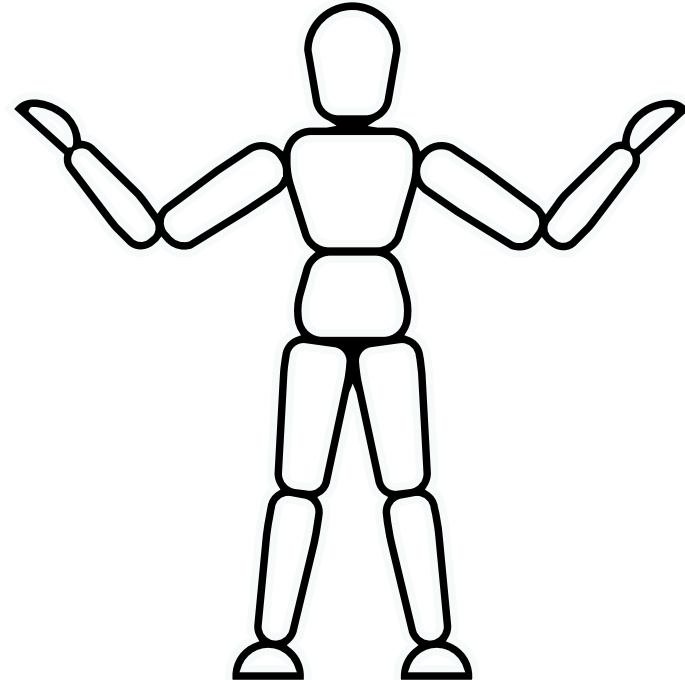
- Fatigue, complacency and stress
- 70 % of aircraft accident.
- Multidisciplinary field.
- Properties of human capability.
- Flight, maintenance, stress levels, knowledge





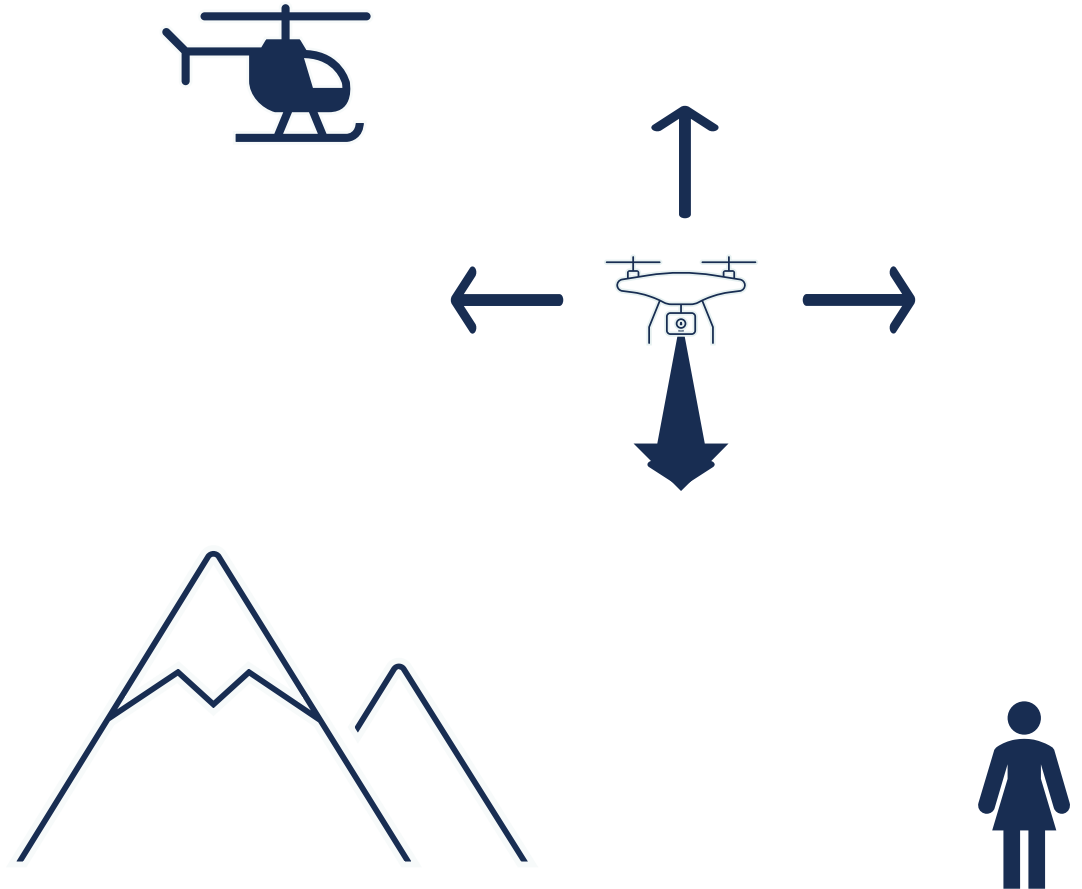
# Decision-Making Process

- 5P
  - Plan
  - Plane (Drone)
  - Pilot
  - (Passengers) VO
  - programming
- 3P + Pave
- DECIDE



# DECIDE

- **D**etect the fact that a change has occurred
- **E**stimate the need to counter or react.
- **C**hoose a desirable outcome for the flight.
- **I**dentify actions that can control the change.
- **D**o take the necessary action.
- **E**valuate the effect of your action.



# Automatic Decision-Making

- Good habits
- Scenario Based Training
- This is referred to as "naturalistic" and "automatic decision making".

# Operation Pitfalls

- Peer Pressure
- Mindset
- Scud Running
- Continuing VFR into instrument condition
- Getting behind the aircraft
- Loss of situational awareness
- Operations without adequate battery level
- Flying outside the envelope
- Neglect Flight planning, preflight and checklists

# Stress Management

## Effect is cumulative

- Acute: short term
- Chronic: see a doctor

## Tips

- Relaxation
- Physical fitness
- Time management

# Situation Awareness

Surrounding + entire operation  
have a VO

Fatigue, stress, work overload

Distraction

# Questions? The End

**United  
Nations****UNITED NATIONS**  
*C4ISR ACADEMY FOR  
PEACE OPERATIONS*