



**AERONAUTICAL DECISION  
MAKING**

**SINGLE-PLOT RESOURCE  
MANAGEMENT**

**THREAT&ERROR MANAGEMENT**

Call it what you want...

it's all the same stuff.....

# MANAGING RISK

"BLUE SKIES"

"TAIL WINDS"

"FLY SAFE"

"SMOOTH LANDINGS"

"SAFE FLIGHT"



"KEEP THE GREASY SIDE DOWN"



"FLY SAFE"

What is "safe"?

Lack of risk

There is risk in everything

Cookie Monster

slipping

eating

cholesterol

table saws

falling

driving

electricity

ladders

black ice

trees/branches

blizzards

chainsaws

choking

blood pressure

fire

knives

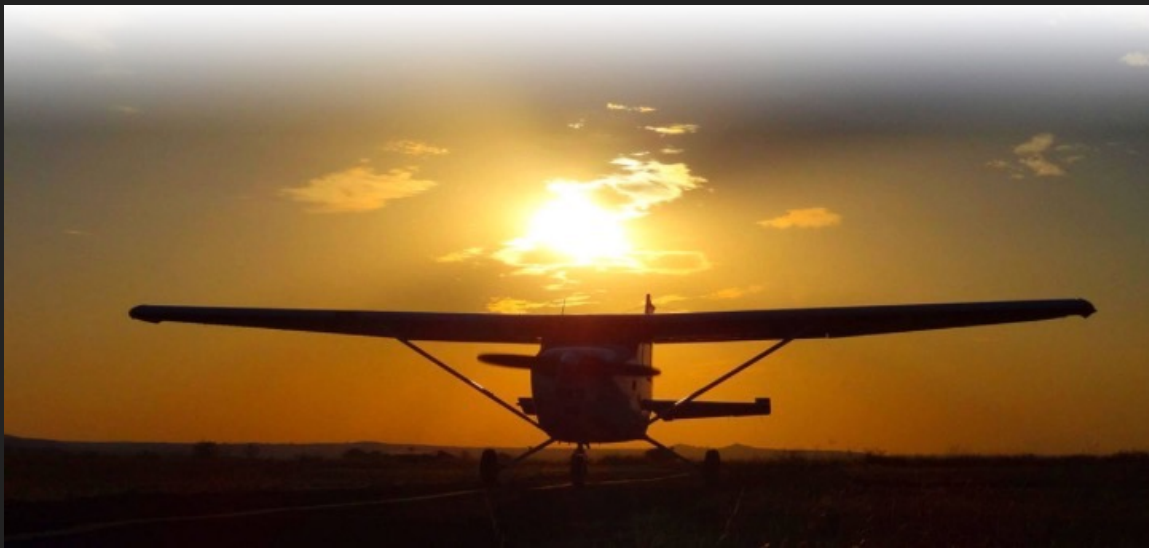
lawn mowers

hurricanes

banana peels

When do we EVER have ZERO risk?

Never!







How 'bout those winds?



Risk is not binary - black/white.....it's usually grey

Risk is always present at some level.

**Accept risks consciously.**

Can you sufficiently mitigate?

Can you balance the risk vs. benefit?

**Take no *unnecessary* risk**

# FAA and Risk Management

## ...an evolution

**"FIRST, FLY THE PLANE"**

**"AVIATE, NAVIGATE, COMMUNICATE"**

# FAA - Personal Minimums Checklist

## P<sub>ilot</sub>

\*Experience, recency, familiarity, physical condition

## A<sub>ircraft</sub>

\*Fuel, performance, equipment

## En<sub>V</sub>ironment

\*Wind, weather, VFR/IFR, night, terrain

## E<sub>xternal pressures</sub>

\*Time for trip planning, "get-there-itis", alternate plans, pride, "running late", extra costs, commitments

# A.I.M. Self-assessment

Illness

Medication

Stress

Alcohol

Fatigue

Emotion

# FAA and Risk Management

...an evolution

**Commercial Pilot – Airplane  
Airman Certification Standards**

**June 2017**

**Instrument Rating – Airplane  
Airman Certification Standards**

**June 2017**



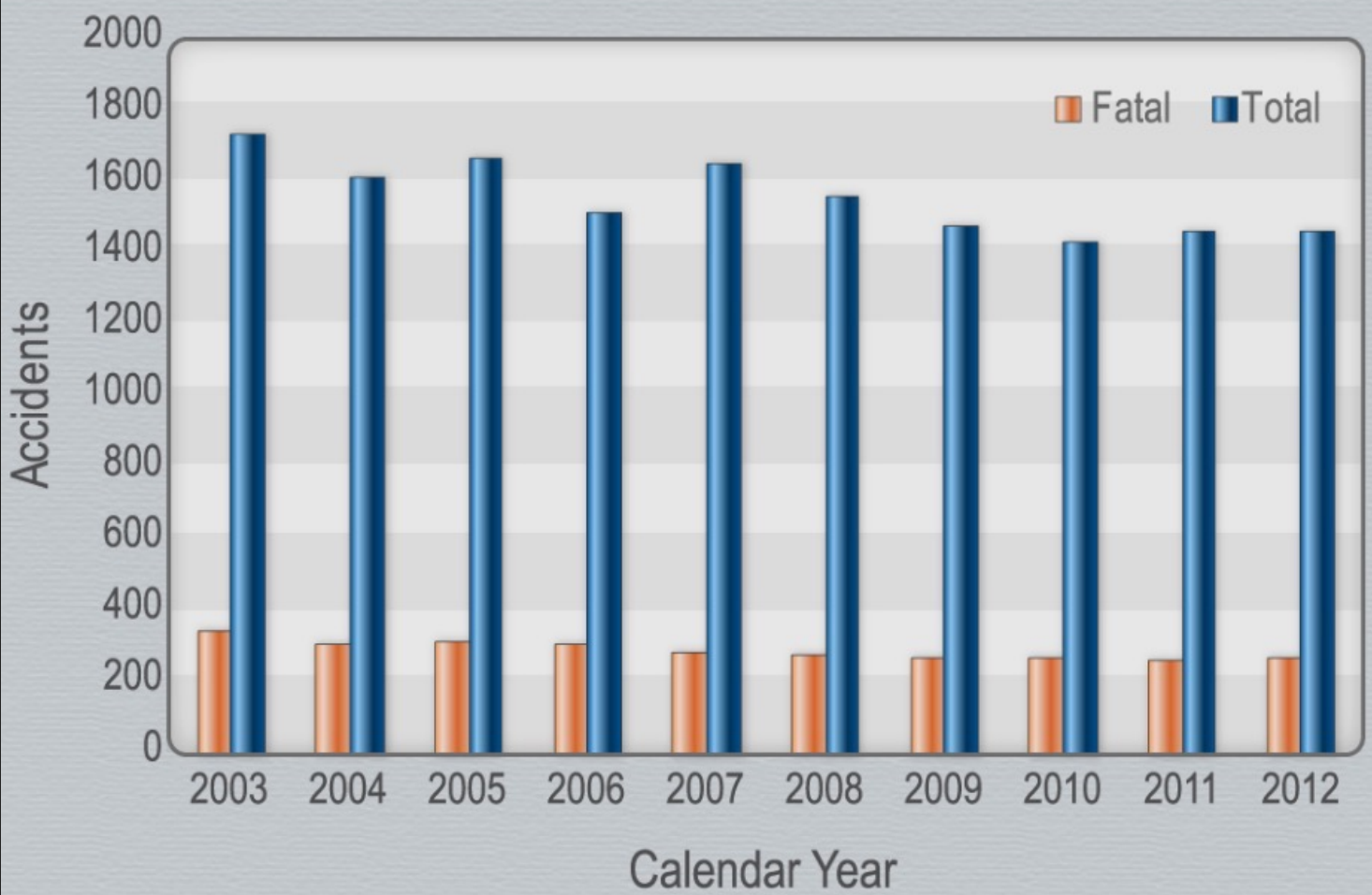
**Private Pilot – Airplane  
Airman Certification Standards**

**June 2017**

Risk management .....the logical process of weighing the potential costs of risks against the possible benefits .....

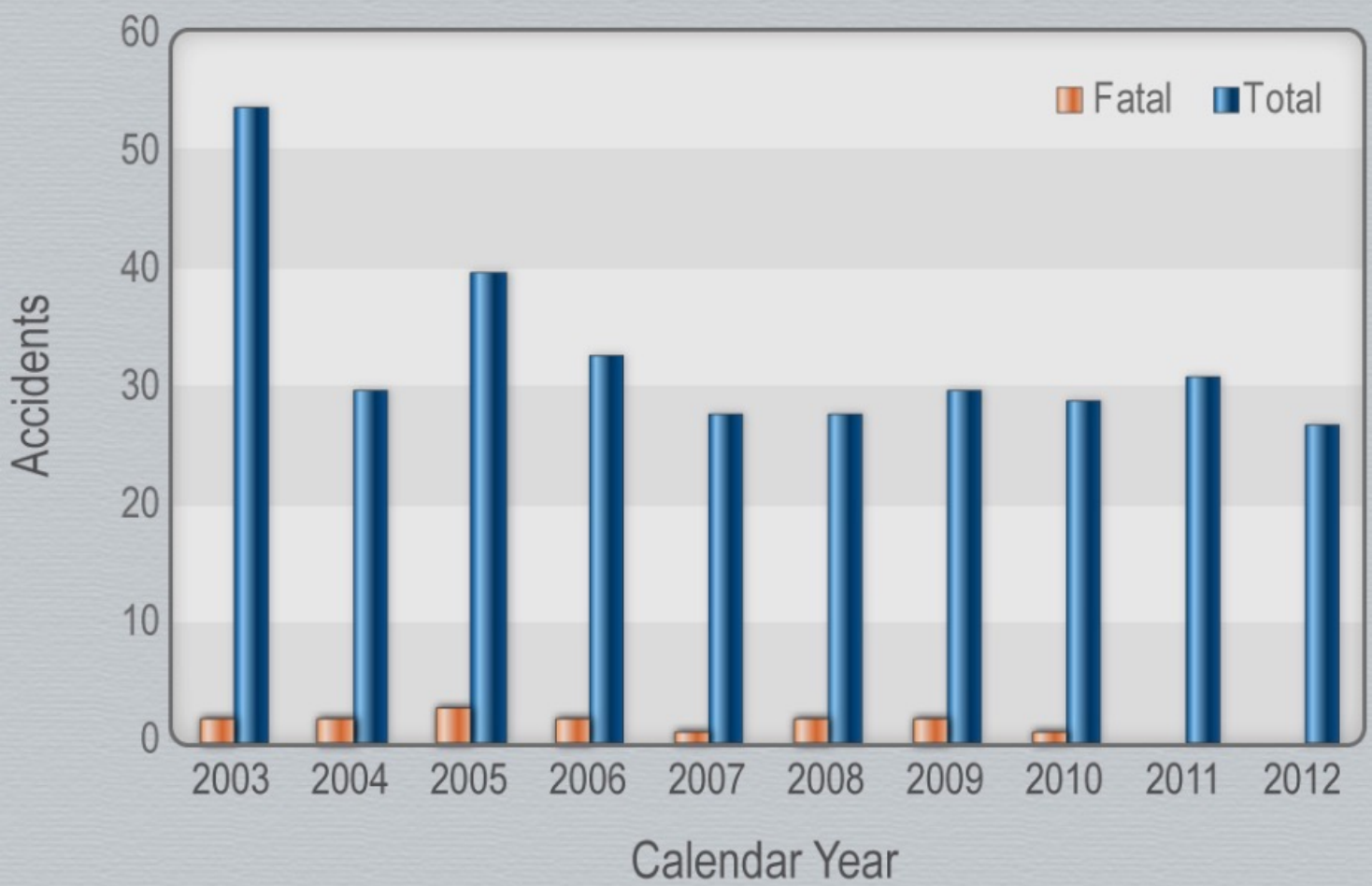


## General Aviation Accidents 2003-2012





## Part 121 Accidents 2003-2012



## How do they do it?

- Dispatchers/Mechanics
- SOPs
- Checklists
- Recurrent Training
- Repetition/Frequency
- Rest - Fatigue mitigation
- Crew of two/three/four pilots
- Crew Resource Management
- Threat and Error Management

You CAN teach an old dog new tricks

Old Dog



# Single-Pilot Resource Management

## Internal resources

### ★ You, the Pilot

- Create quiet time - collect thoughts, visualize the plan
- Your knowledge of the machine and the POH
- Your knowledge of the GPS - programming and data extraction

### ★ Verbal communication

- even when alone - talking/verbalizes reinforces,
- 121.5 = 911

### ★ Passenger

- traffic, checklist, unusual smell or sound, gear down, altimeter
- Safety briefing

### ★ Navigational Equipment

### ★ iPad - weather, traffic, position, situational awareness

### ★ Checklists make life easier

### ★ Automation

# ~~CREW~~ Single-Pilot Resource Management

## External resources

### ★ATC

- Closest airport?
- Traffic
- Declaring emergency
- Lost
- Airspace

### ★Other aircraft

- Transmissions
- Ride reports

### ★Looking out the window

- Cloud formations, waves, windsock, terrain, obstacles
- Lighting - RWY, approach, PAPI/VASI

# Threat and Error Management

aka..... CRM, SRM, ADM, Risk Management

## Threats:

Anything that has an adverse effect on the flight

- ★ Weather
- ★ Terrain, birds, other aircraft
- ★ Procedures
- ★ Unfamiliar
- ★ Mechanical
- ★ Fatigue, Stress

## Errors:

Pilot action or inaction leading to deviation from the desired state

- ★ Altitude
- ★ Course
- ★ Airspeed
- ★ Automation
- ★ Communication
- ★ Decision

# Threat and Error Management

aka..... CRM, SRM, ADM, Risk Management

## Threat Management

- ★ Monitor,
- ★ Coordinate, verbalize
- ★ Anticipate, recognize, act
- ★ Evaluate
- ★ Create a decision point

## Error Management

- ★ Threats can cause errors - back to the top
- ★ Resist and resolve
  - Counter-measures
- ★ Communicate, verbalize
- ★ SOPs, checklists, sterile cockpit

# Threat and Error Management

aka..... CRM, SRM, ADM, Risk Management

GA fly-in pancake breakfast. What are our threats and mitigations?



"It will be very busy as we approach the airport so I will listen to CTAF early, keep my ADS-B traffic displayed and zoomed in, fly a standard pattern entry and ask everyone onboard to keep their eyes out for traffic. We should clear the runway to the left and park in the grass. Should we be in conflict with any traffic, I will just follow standard procedures and re-enter the pattern or go around and fly a standard pattern. - any questions? OK - please, no more idle chit-chat and heads-up everyone."



# Threat and Error Management

aka..... CRM, SRM, ADM, Risk Management

What's Plan B? We know what Plan A is - to fly to our destination. Do you have a Plan B?  
- especially when things are marginal.



Consider and discuss alternatives - IN ADVANCE. Plan B could be a solid - familiar alternate airport. It could also be a rental car or a commercial airline ticket. Don't be a mission-hacker; don't worry about getting the BSAA plane back on Schedule Master. Just focus on a logical balance of the risks.

# Threat and Error Management

aka..... CRM, SRM, ADM, Risk Management

Short field approach and landing



"This is a relatively short runway so I will make sure I am on speed and properly configured by 1000'. I did a runway analysis before takeoff and we have enough runway. There are no obstacles so, I'm aiming for the numbers but if I haven't touched down in the first 1/4 of the runway I'll go around. Likewise if I get unstabilized. On the go around [mental review], I will fly the pitch and airspeed, clean up, straight ahead till xxx feet. - any questions?"

# Threat and Error Management

aka..... CRM, SRM, ADM, Risk Management

Review,  
Debrief  
Self-critique



# Threat and Error Management

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How did I do?

What went well?

What went poorly?

What was so-so?

How can I improve?

What was my "Plan B"?

Talk to others...

- Pilots, CFI, online forum



### **§ 91.103 Preflight action.**

Each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight.

# Threat and Error Management

aka..... CRM, SRM, ADM, Risk Management

"If the FAA invites you to a BBQ, don't be the pig"

I can't believe  
he just said that.

UMM, CAN I POLL THE  
AUDIENCE?

PHONE A FRIEND?

THIS POOR GUY  
IS TOAST!



Confucius say: "When in deep shit, keep your mouth shut."

THE END