

Teaching ADM/SRM



INSTILLING A CULTURE OF AERONAUTICAL DECISION MAKING IN INSTRUCTORS AND THEIR STUDENTS

BY

ROB RHODES-HOUGHTON
MANAGER: TESTING STANDARDS

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INTRODUCTION

- Describe a scenario during your flying career when things did not go quite as you had expected or planned.
- What did you do and what was the eventual outcome?
- What could you have done differently?
- How could you have been better prepared to handle the situation?

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- Answer the following questions concerning the scenario (quickly and honestly):
 - 1. Did you have any **I**llness symptoms?
 - 2. Had you taken and **M**edication before the flight?
 - 3. Were you under any form of **S**tress around about that time?
 - 4. Did you have any **A**lcohol in the 24 hours prior to the flight?
 - 5. Were you in any way **F**atigued or tired on the day?
 - 6. Had you **E**aten properly prior to the flight?
- What do the letters in **red** spell out?
 - **I'M SAFE**

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Aim (what?):

To suggest ways and models for flight instructors to inculcate a systematic approach in their students to assess, analyse and mitigate potential risks in their flying activities

In the hope that (why?):

Students will develop good habits which may improve their situational awareness, encourage them to make better decisions and take more effective actions, manage all the resources at their disposal and, where necessary, modify any hazardous attitudes thus reducing the number of accidents and incidents.

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NUMBER OF ACCIDENTS AND FATALITIES PER MONTH 2009 - 2011													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOT
2009	7	12	11	10	16	10	11	7	6	8	17	12	127
FATAL- ITIES	1	2	4	0	1	0	1	4	0	2	5	8	28
2010	11	20	11	6	9	8	17	12	12	17	15	9	147
FATAL- ITIES	0	3	1	2	3	0	4	7	1	0	3	0	24
2011	5	14	12	12	6	8	10	10	9	6	?	?	92
FATAL- ITIES	2	10	0	1	2	4	2	13	0	0	?	?	34

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Some definitions:

Aeronautical Decision Making (ADM)

A systematic approach to the mental process used by pilots to consistently determine the best course of action in response to a given set of circumstances

Single-pilot Resource Management (SRM)

The art/science of managing all the resources (both onboard the aircraft and from outside sources) available to a single pilot (prior to and during flight) to ensure that the successful outcome of the flight is never in doubt

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Risk elements in ADM

The four fundamental risk elements: the pilot, the aircraft, the environment, and external pressures

Risk management

The part of the decision-making process which relies on situational awareness, problem recognition, and good judgment to reduce risks associated with each flight

Situational awareness

The accurate perception and understanding of all the factors and conditions within the four fundamental risk elements that affect safety before, during, and after the flight.

Some typical models and good habits:

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1. Well before a flight, pilots should assess their fitness, just as they evaluate the aircraft's airworthiness:

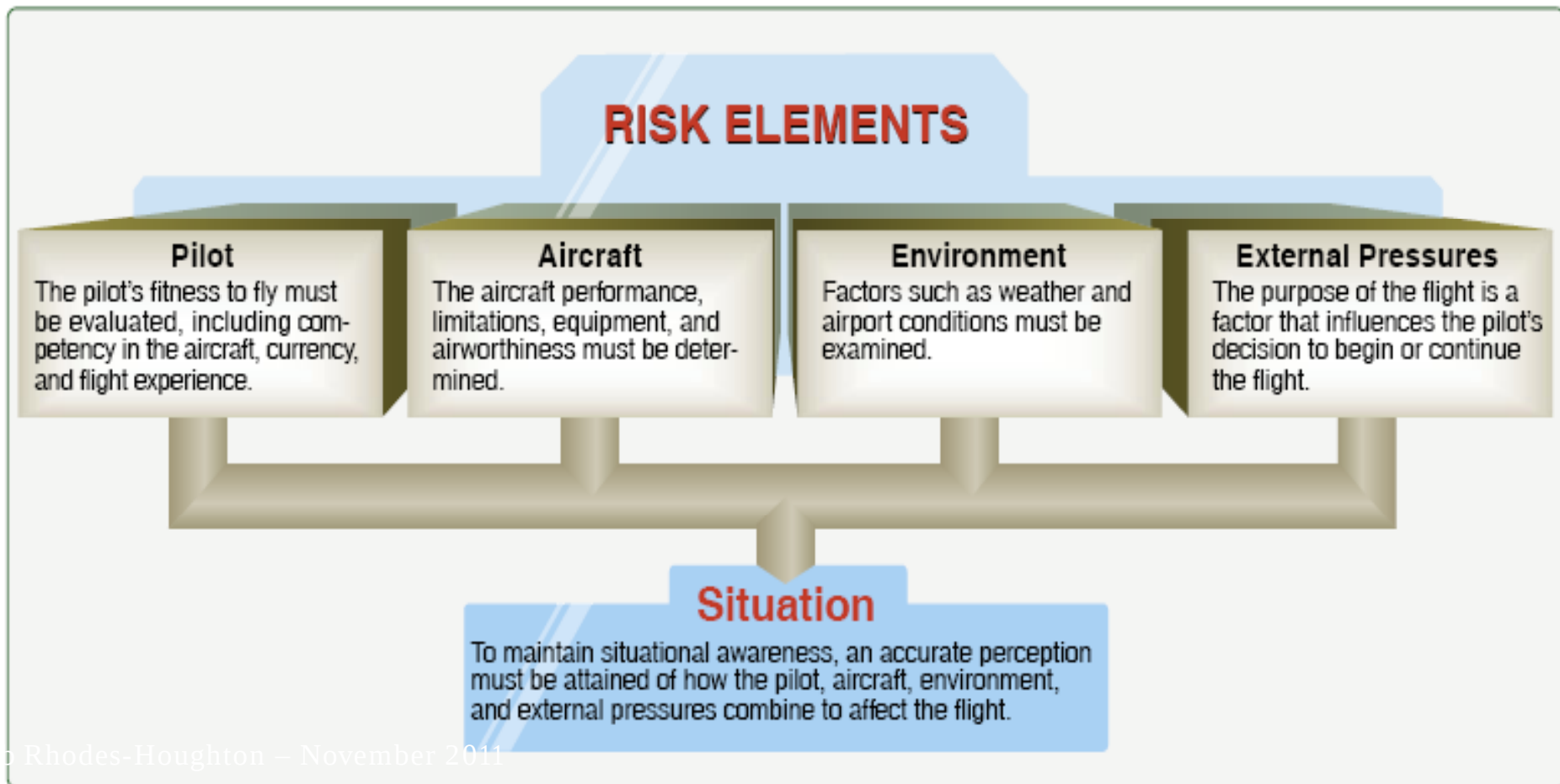


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2. Prior to every flight, assess the “bigger picture”:

PAVE MODEL



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3. Before lining up for take-off, always carry out a threat and error management (TEM) analysis:

Threats EXIST:

Weather: Cross-wind, windshear, cloud, rain, thunderstorms, fog, mist, etc.

Airport: high ground, obstacles, runway length, width and slope, traffic volume (solo flights!), wake turbulence, etc.

Errors OCCUR:

Incorrect flap settings, incorrect speeds, incorrect climb angle, incorrect take-off technique for prevailing conditions, aircraft incorrectly loaded, etc.

Manage the situation by considering the threats and *always* carry out a thorough before take-off briefing.

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4. In flight, maintain good situational awareness and if something unexpected occurs:

DECIDE MODEL

Detect the fact that a change has occurred.

Estimate the need to counter or react to the change.

Choose a desirable outcome for the success of the flight.

Identify actions which could successfully control the change.

Do the necessary action to adapt the change.

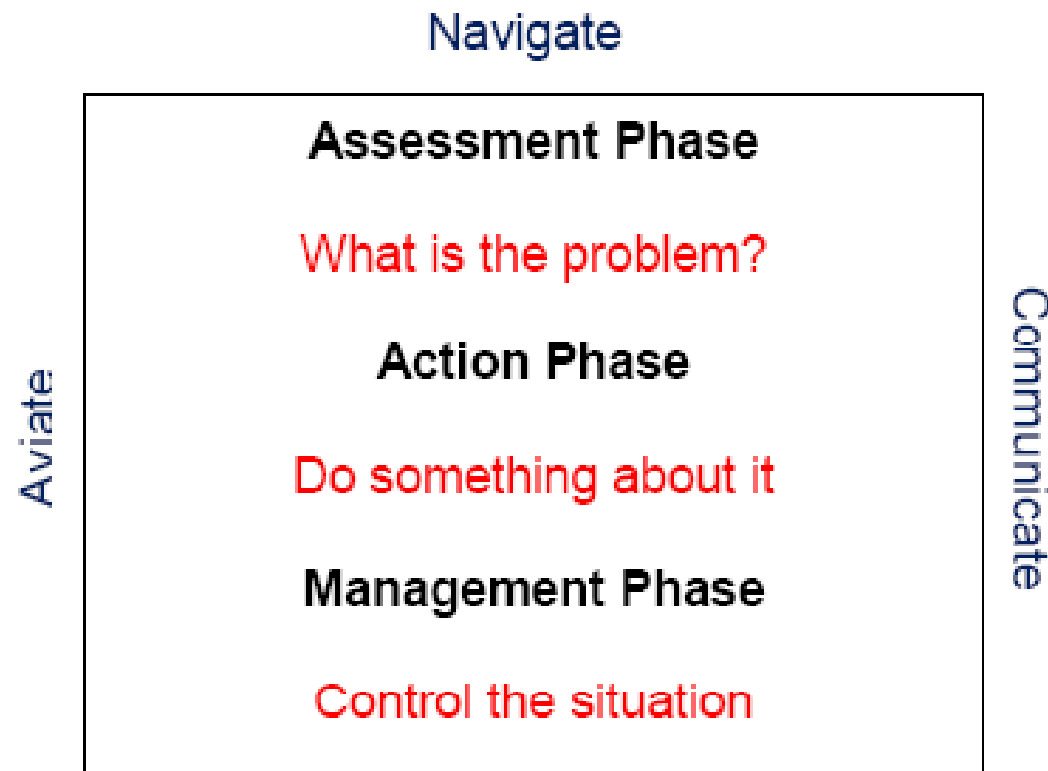
Evaluate the effect of the action.

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Or, a typical (simple) airline model:

RISK MANAGEMENT MODEL



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Which works as follows:

- **Assessment phase (diagnose):**
 - Check circuit breakers and switches
 - Diagnose the problem
 - Choose a course of action
 -
- **Action phase (rectify/contain):**
 - Implement the course of action
 - Re-assess and take additional action if required
 -
- **Management phase (control):**
 - Evaluate success of action(s)
 - Check for further problems (lights, CBs, switches, instrument indications)
 - Make use of all available resources (ATC, ATIS, nearby aircraft, GPS, etc.)

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The role of the instructor:

1. Introduce the models to the student
2. Insist that the appropriate models are **meaningfully** applied with every flight and talk the student through them until they become habit
3. Regularly introduce judgement training scenarios with prior notice at first but with no warning as the student progresses and apply the models to resolve the situation
4. Enforce and regularly practise a “go-around” philosophy
5. Discuss and analyse student’s decisions and actions after every flight.
6. Be aware of typical operational pitfalls and potential hazardous attitudes of the student.

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Some suggested ADM scenarios:

CAUTION!! The use of ADM scenarios could pose a **Safety Risk** if not carefully managed by the flight instructor.

The scenario must be terminated as soon as

- a) the student identifies the threat, or
- b) The student fails to recognise the threat or demonstrates poor judgement.

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1. Remove one or two documents required to be on board before the pre-flight
2. Place a couple of cowling screws, bolts or nuts in strategic positions below the aircraft before the pre-flight
3. Pull a circuit breaker before the pre-flight or before take-off or landing
4. Attempt to rush the student during the pre-flight or before take-off checks
5. Suggest attempting to take-off in front of an aircraft on final approach

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6. Distract the student just before levelling off in either a climb or a descent
7. Drop a pen or pencil during flight and ask the student to retrieve it
8. Suggest practising stalling or spin awareness below 2 000 ft AGL.
9. Suggest turning back to the runway after a simulated engine failure at 500 ft AGL
10. Adjust the DI when the student is distracted during a navigation exercise or returning to the aerodrome

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Operational Pitfalls

Peer Pressure

Poor decision-making may be based upon an emotional response to peers, rather than evaluating a situation objectively.

Mind Set

A pilot displays mind set through an inability to recognize and cope with changes in a given situation.

Get-There-Itis

This disposition impairs pilot judgment through a fixation on the original goal or destination, combined with a disregard for any alternative course of action.

Duck-Under Syndrome

A pilot may be tempted to make it into an airport by descending below minimums during an approach. There may be a belief that there is a built-in margin of error in every approach procedure, or a pilot may want to admit that the landing cannot be completed and a missed approach must be initiated.

Scud Running

This occurs when a pilot tries to maintain visual contact with the terrain at low altitudes while instrument conditions exist.

Continuing Visual Flight Rules (VFR) into Instrument Conditions

Spatial disorientation or collision with ground/obstacles may occur when a pilot continues VFR into instrument conditions. This can be even more dangerous if the pilot is not instrument rated or current.

Getting Behind the Aircraft

This pitfall can be caused by allowing events or the situation to control pilot actions. A constant state of surprise at what happens next may be exhibited when the pilot is getting behind the aircraft.

Loss of Positional or Situational Awareness

In extreme cases, when a pilot gets behind the aircraft, a loss of positional or situational awareness may result. The pilot may not know the aircraft's geographical location or may be unable to recognize deteriorating circumstances.

Operating Without Adequate Fuel Reserves

Ignoring minimum fuel reserve requirements is generally the result of overconfidence, lack of flight planning, or disregarding applicable regulations.

Descent Below the Minimum En Route Altitude

The duck-under syndrome, as mentioned above, can also occur during the en route portion of an IFR flight.

Flying Outside the Envelope

The assumed high-performance capability of a particular aircraft may cause a mistaken belief that it can meet the demands imposed by a pilot's overestimated flying skills.

Neglect of Flight Planning, Preflight Inspections, and Checklists

A pilot may rely on short- and long-term memory, regular flying skills, and familiar routes instead of established procedures and published checklists. This can be particularly true of experienced pilots.

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The Five Hazardous Attitudes

Anti-authority: “Don’t tell me.”

This attitude is found in people who do not like anyone telling them what to do. In a sense, they are saying, “No one can tell me what to do.” They may be resentful of having someone tell them what to do, or may regard rules, regulations, and procedures as silly or unnecessary. However, it is always pilot prerogative to question authority if it seems to be in error.

Impulsivity: “Do it quickly.”

This is the attitude of people who frequently feel the need to do something—anything—immediately. They do not stop to think about what they are about to do; they do not select the best alternative, and they do the first thing that comes to mind.

Invulnerability: “It won’t happen to me.”

Many people believe that accidents happen to others, but never to them. They know accidents can happen, and they know that anyone can be affected. They never really feel or believe that they will be personally involved. Pilots who think this way are more likely to take chances and increase risk.

Macho: “I can do it.”

Pilots who are always trying to prove that they are better than anyone else are thinking, “I can do it, I’ll show them.” Pilots with this type of attitude will try to prove themselves by taking risks in order to impress others. While this pattern is thought to be a male characteristic, women are equally susceptible.

Resignation: “What’s the use?”

Pilots who think, “What’s the use?” do not see themselves as being able to make a great deal of difference in what happens to them. When things go well, the pilot is apt to think that it is good luck. When things go badly, the pilot may feel that “someone is out to get me,” or attribute it to bad luck. The pilot will leave the action to others, for better or worse. Sometimes, such pilots will even go along with unreasonable requests just to be a “nice guy.”

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Hazardous Attitude	Antidotes
Macho Steve often brags to his friends about his skills as a pilot and how close to the ground he flies. During a local pleasure flight in his single-engine airplane, he decides to buzz some friends barbecuing at a nearby park.	Taking chances is foolish.
Anti-authority Although he knows that flying so low to the ground is prohibited by the regulations, he feels that the regulations are too restrictive in some circumstances.	Follow the rules. They are usually right.
Invulnerability Steve is not worried about an accident since he has flown this low many times before and he has not had any problems.	It could happen to me.
Impulsivity As he is buzzing the park, the airplane does not climb as well as Steve had anticipated and, without thinking, he pulls back hard on the yoke. The airspeed drops and the airplane is close to stalling as the wing brushes a power line.	Not so fast. Think first.
Resignation Although Steve manages to recover, the wing sustains minor damage. Steve thinks to himself, "It doesn't really matter how much effort I put in—the end result is the same whether I really try or not."	I'm not helpless. I can make a difference.

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Personal minimums checklist:

Encourage students to develop their own checklists appropriate to their qualifications and comfort zones.

Remember, the law stipulates absolute minima – you are perfectly entitled, and encouraged, to set higher ones for yourself, for example: the law says remain at least 500 ft clear of cloud, but I always stay at least 1 000 ft clear!

SAFE FLYING!