



Threat and Error Management

Aim: To develop strategies to mitigate against Threats and Errors that may lead to unsafe flight outcomes.

Considerations:

Threats

External • adverse weather; weight and balance; density altitude; runway length & condition; other traffic; ATC/unattended airfield, high terrain or obstacles; condition of the aircraft.

Internal • fatigue; complacency; over or under confidence; lack of flight discipline; hazardous behaviour; impulsiveness; machoism; invulnerability; resignation; anti-authority or lack of currency and proficiency.

Pilots need good **situational awareness** to anticipate and recognise threats as they occur.

Errors• lead to a deviation from pilot intentions or expectations; reduce safety margins; and increase the probability of adverse operational events.

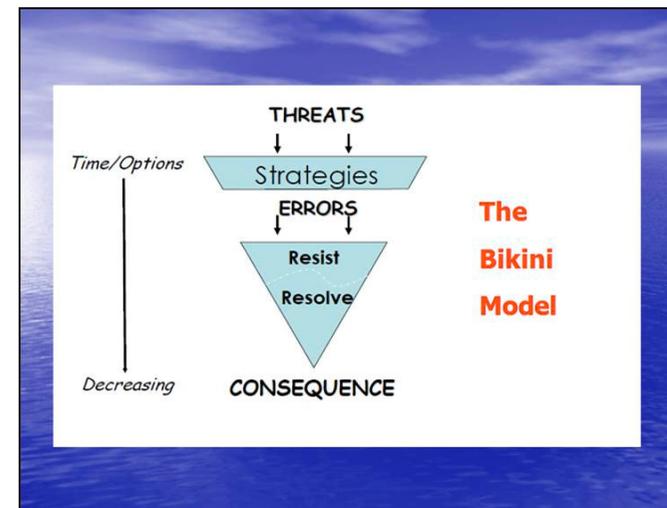
- incorrect performance calculations; inaccurate flight planning; non-standard communications; aircraft mis-handling; incorrect systems operation or management; or checklist errors.

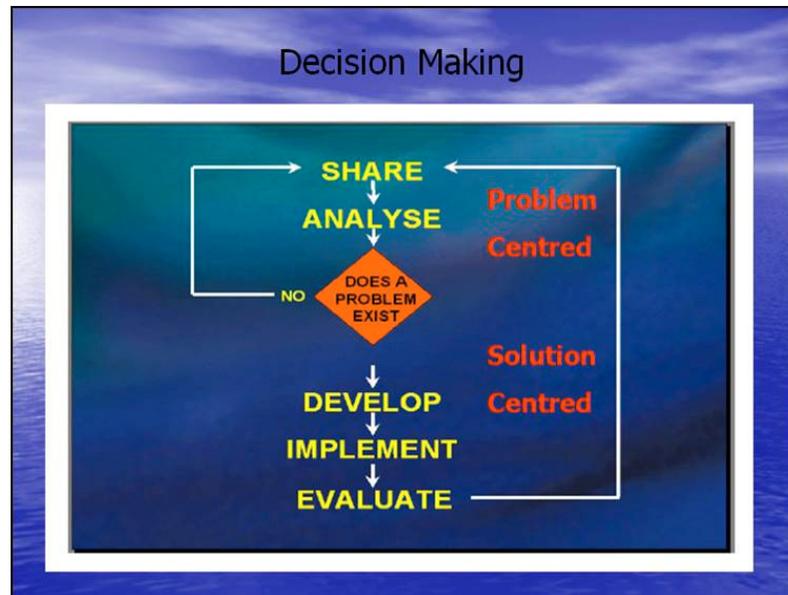
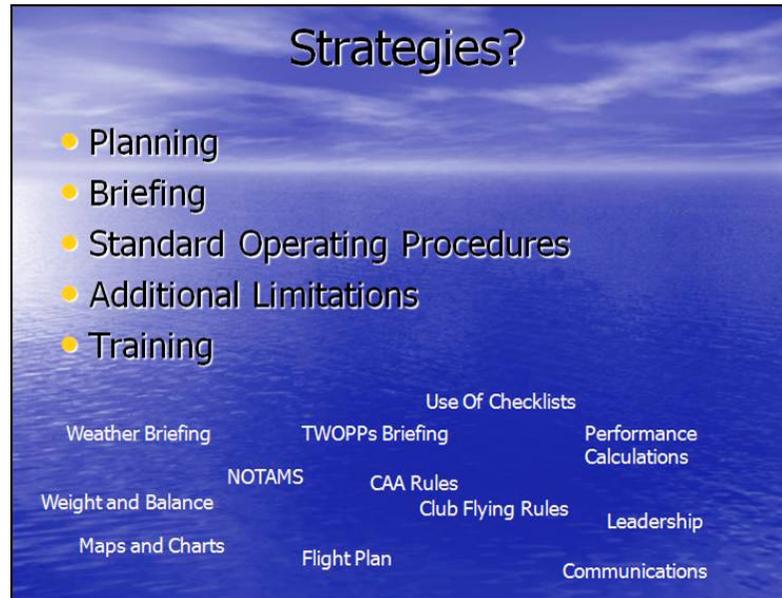
TWOPPs

Undesired Aircraft State Threats and errors that are not detected and managed correctly can lead to an undesired aircraft state, e.g. a deviation from flight path, or an aircraft configuration that reduces normal safety margins.

e.g. • Pilot induced aircraft position or speed deviations, misapplication of flight controls or incorrect systems configuration. Can still be recovered to normal flight but, if not managed appropriately, may lead to an outcome such as an accident or incident.

Examples • loss of directional control during a stall (error) resulting in an unusual attitude (state); inappropriate or ineffective scan of aircraft instruments (error) resulting in flight below VY(best rate of climb speed).





Departure Briefing

Threats; identified and managed. (Traffic, birds, sun, etc)

Weather; (wind, turbulence, cloud, visibility etc.)

Operational; (aircraft defects, windscreen, EFATO, Fuel)

Pilot; (I'm Safe)

Performance; (runway distance, altitude, climb above/turn away from terrain)

Arrival Briefing

Threats identified and managed. (Traffic, birds, sun, etc)

Weather; (wind, turbulence, cloud, visibility etc.)

Operational; (a/c defects, windscreen, Fuel)

Pilot; (I'm Safe)

Performance; (landing distance, surface. obstacles on approach.)

Departure Briefing

Threats; identified and managed. (Traffic, birds, sun, etc)

Weather; (wind, turbulence, cloud, visibility etc.)

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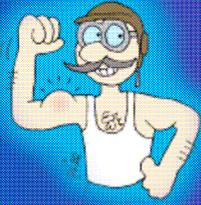
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Am I fit to fly?

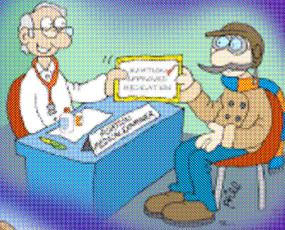
Illness

Free of symptoms.



Medication

Aviation-approved medications only.



Stress

Managing stress well.



Alcohol or Drugs

Alcohol in moderation and not less than 12 hours before flight. NO drugs!



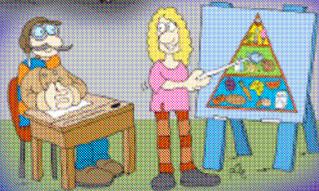
Fatigue

Good sleep management.



Eating

A balanced diet.



...Yes, I'M SAFE to fly. 

Definitions

Airmanship: The consistent use of good judgement and well developed knowledge, skills and attitudes to accomplish flight objectives (International Civil Aviation Organization (ICAO)).

Error: Flight crew actions or inactions that:

- lead to a deviation from crew or organisational intentions or expectations;
- reduce safety margins; and
- increase the probability of adverse operational events on the ground and during flight.

Flight environment: The environment, internal and external to the aircraft that may affect the outcome of the flight. The aircraft's internal environment may include, but is not limited to, aircraft attitude and performance, instruments, observations, flight controls, equipment, warning and alerting devices, trainee members, procedures, publications, checklists and automation.

The external environment may include, but is not limited to, airspace, meteorological conditions, terrain, obstacles, the regulatory framework, other stakeholders and operating culture.

Formative assessment: Formative evaluation monitors learning progress during instruction and provides continuous feedback to both trainee and instructor concerning learning success and failures.

Human factors: Optimising the relationship within systems between people, activities and equipment.

Non-technical skills: Specific human factors competencies, sometimes referred to as 'soft skills', such as lookout, situation awareness, decision making, task management and communications.

Situation awareness: Knowing what is going on around you and being able to predict what could happen.

Summative assessment: A summative evaluation is conducted at the end of a course of training and determines if the instructional objectives (competency standards) have been achieved.

Threat (*University of Texas/GAPAN definition for multicrew/LOSA operations*):

Events or errors that:

- occur outside the influence of the flight crew;
- increase the operational complexity of the flight; and
- require crew attention and management if safety margins are to be maintained.

Threat and Error Management (TEM): The process of detecting and responding to threats and errors to ensure that the ensuing outcome is inconsequential, i.e. the outcome is not an error, further error or undesired state.

Undesired aircraft state: Pilot induced aircraft position or speed deviations, misapplication of flight controls, or incorrect systems configuration, associated with a reduced margin of safety.