


Situation Awareness in General Aviation

A small blue propeller plane with the registration 'N8RF' is flying from left to right in the foreground. In the background, an air traffic control tower stands prominently. The scene is set during dusk or dawn, with a soft, hazy light in the sky and silhouettes of trees and hills in the distance.

Keeping the big picture

AOPA Safety Seminar

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Luxembourg



Topics

- Introduction
- Definition
- Mental Models
- 3 Steps of good SA
- Monitoring Skills



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How long are you in the possession of your licence?

How long are you in the possession of your licence?

- 1-5 years
- 5-10 years
- 10-15 years
- above



Have any of you had
already a critical
situation during a flight?



Was it easy to keep a high level
of Situation Awareness?

How can you improve your SA?

Definition

„...Situation Awareness is the **perception** of the elements in the environment within a volume of time and space, the **comprehension** of their meaning, and the **projection** of their status in the near future.“

Mica Endsley, 1995

Mental Models



Mental Models



What do you hear?

Mental Models



Mental models are influenced by

- your knowledge,
- skills,
- experience and
- expectations.

If new information is coming in, your brain is checking if you have already a corresponding mental model.

Mental Models



What are the advantages and disadvantages of Mental Models ?

Mental Models



Advantages

- Mental models derive from other people's experience or be composed from different mental models which are stored already
- Allow us to deal easily with a high amount of information coming in
- Mental models allow us to react fast

Disadvantages

- If you do not have the complete picture, it is hard to generate a correct mental model
- Difficult to keep a good SA if you are not fit

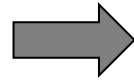
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Situation Awareness

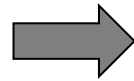
perception



The perception of what is happening



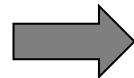
comprehension



The understanding of what has been perceived



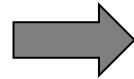
projection



The use of what is understood to think ahead.

Situation Awareness

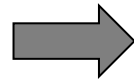
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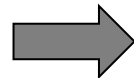
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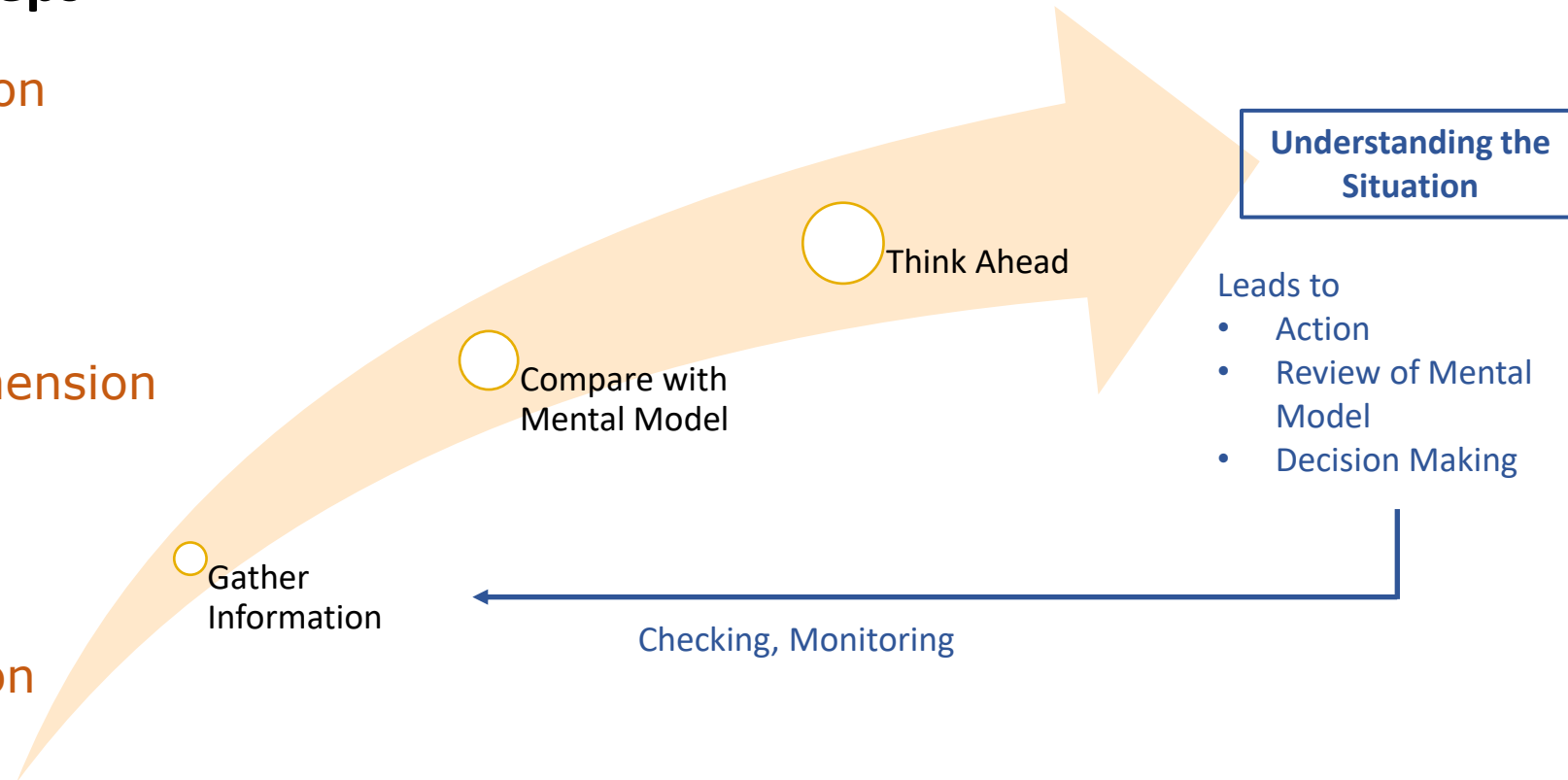
Situation Awareness

Three Steps

perception

comprehension

projection





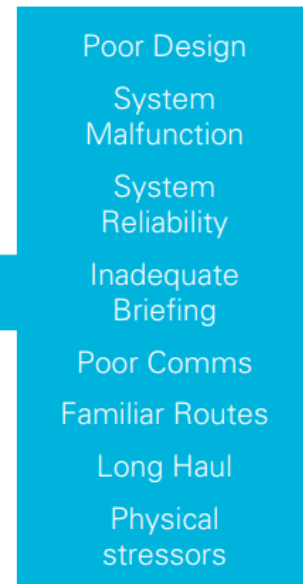
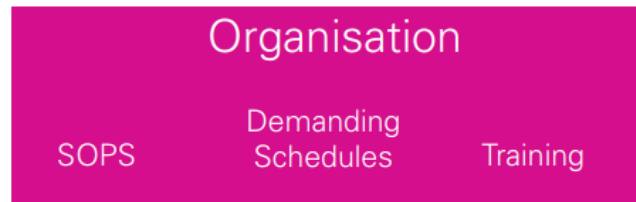
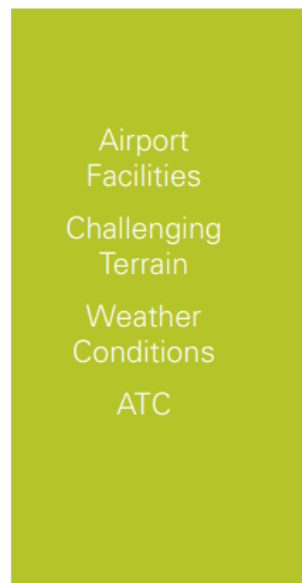
What is monitoring?

Definition

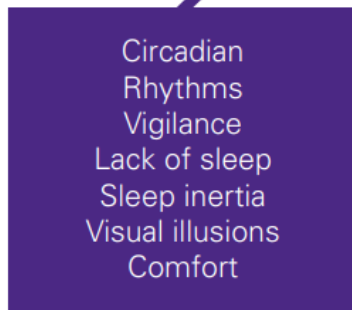
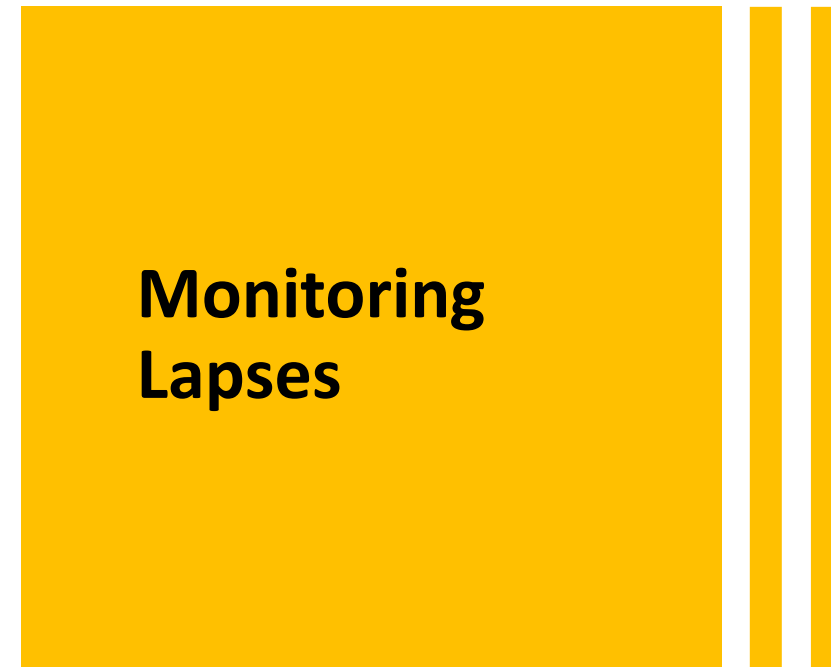
Monitoring describes the observation and interpretation of the flight path data, configuration status, automation modes and on-board systems appropriate to the phase of flight. It involves a cognitive comparison against the expected values, modes and procedures.

CAA, 2013

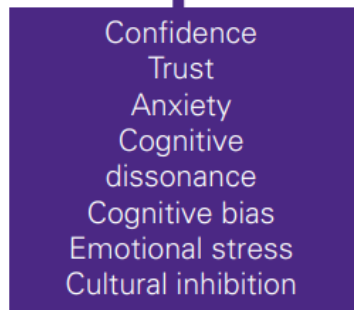
External Environment



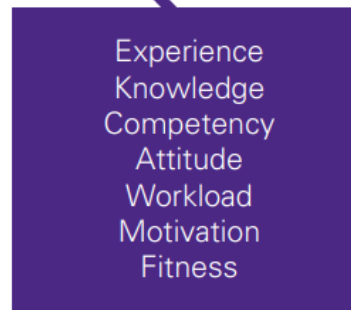
Aircraft



Physiological



Psychological



Personal

Human Performance Shaping Factors



What influences
good monitoring
attributes?

Good monitoring attributes



- Good monitoring relies upon effective task management
- Knowledge is provided through training
- Experience is the application of the knowledge
- Skill is the product of both knowledge and experience
- Attitude is a personal trait that can be shaped and developed
- Communication is fundamental to monitoring

Monitoring Strategies for Single Pilot Operation

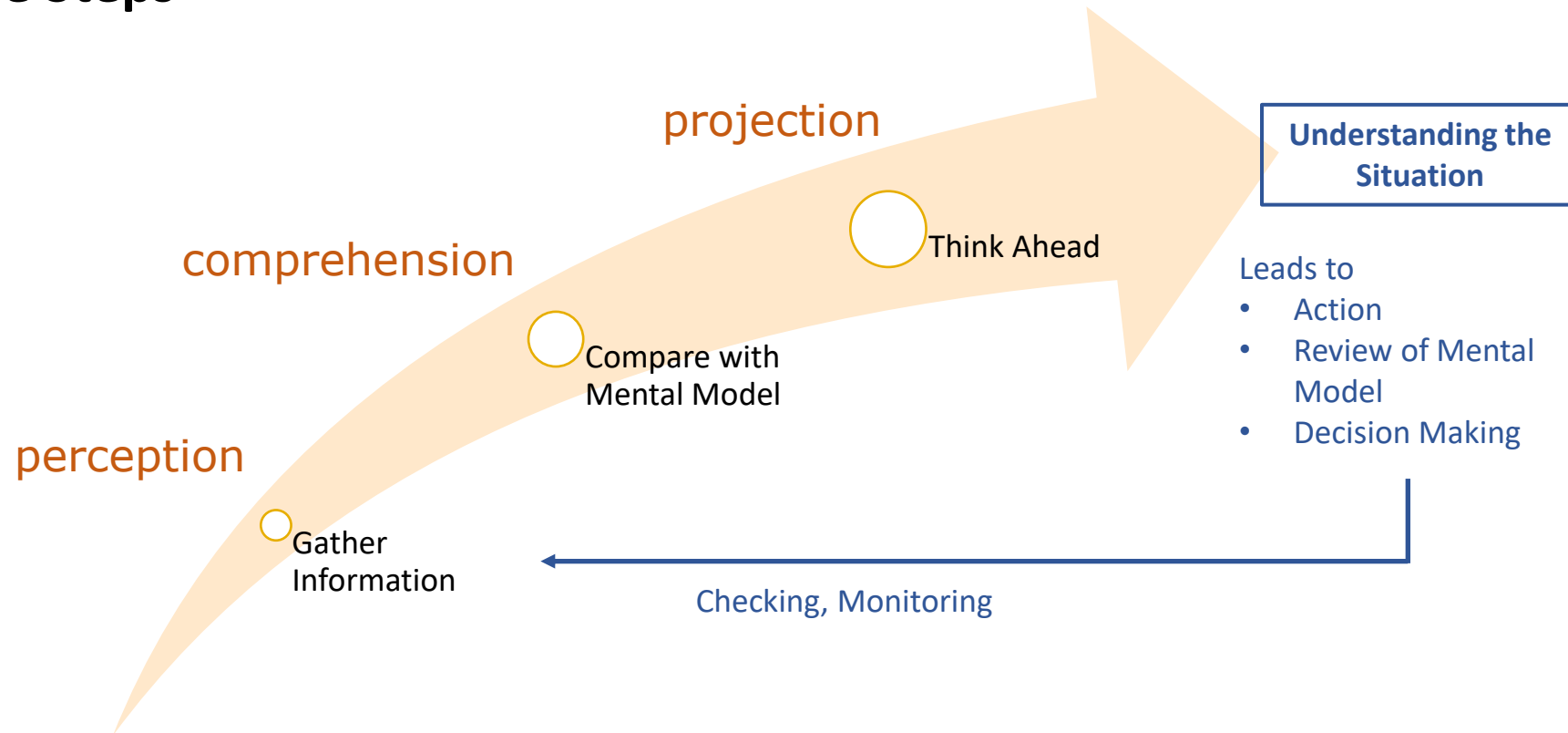
1. Resist the temptation to take short cuts and avoid repeating the well-known checklists from memory
 - Saying a drill out loud will re-enforce the actions and ensure nothing is missed
 - Departure and approach briefings or reviews are an essential element of safe operations
2. Emergency briefings become a self-disciplined action
 - Completing a briefing (to yourself) re-enforces the thought process – ‘Have I thought of everything’
 - Have a ‘what if plan’. Consider, any airfield restrictions, surrounding terrain, weather, temperature, aircraft weight and payload. What are you going to do if the engine fails?

Monitoring Strategies for Single Pilot Operation

3. Review the engine failure or major emergency actions by self-briefing and accomplishing a touch drill of all the relevant switches and levers
 - The touch drill improves the memory for actions required under stress
4. Ensure that emergency checklists are accessible and can be executed whilst still flying the aircraft
5. In most emergencies, the best strategy is to land as soon as possible. Therefore, have a plan
6. Self monitoring, to detect lapses becomes important. In a single pilot situation taking a break is not an option so ensure that you are well rested and fit to fly.

Situation Awareness

Three Steps





Summary

- Prudent pre-flight choices can avoid difficult in-flight decisions
- The need to recognize potential hazards and taking timely action to avoid them is crucial
- Once in the air, you should enter a continuous situation awareness cycle

→ **Good situation awareness is about avoiding the circumstances that lead to really tough decisions**

**Thank you for
your attention!**

