

Gliding Australia Training Manual

Pilot Guide



Unit 25

Threat and Error Management

Unit 25 - Threat and Error Management

WHAT THIS UNIT IS ABOUT

To develop the skills and knowledge required to:

- recognise and minimise the impact of threats; and
- manage any subsequent errors in an aircraft in order to prevent these leading to an undesired aircraft state.

This unit develops non-technical skills and knowledge that underpins all GPC units and aviation activity.

WHAT ARE THE PRE-REQUISITES FOR THIS UNIT?

- Nil

COMPLEMENTARY UNITS

This unit should be read in conjunction with:

GPC Unit 24 Human Factors and Pilot limitations

KEY MESSAGES

- Threats come at you, while errors come from you.
- Our aim is for Pristine Flights - any variation to a straightforward pristine flight is a threat.
- Threats can lead to errors;
- Errors can lead to Undesired Aircraft States (UAS);
- An UAS can lead to an aircraft incident or accident;
- Pilots must use TEM strategies to mitigate against Threats and Errors.

PILOT GUIDE FOR THIS UNIT

Definitions

Pristine Flight

- Flight carried out entirely in a normal manner from pre-flight initiation to post-flight completion.

Threats

- Any variation to a straightforward pristine flight is a threat.
- Every threat increases the likelihood of an error being committed.
- Every threat requires a positive strategy to manage it and prevent errors.

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Errors

- **Slips**
 - Observable externally
 - Inadvertent Fall to a lower level
- **Lapses**
 - Observable internally only
 - e.g. Lapse of memory
- **Mistakes**
 - Rule or knowledge-based error
- **Violations**
 - Deliberate avoidance of rules/Standard Operating Procedures (SOPs)
 - e.g. Minimum distance from other aircraft, thermalling rules, checks.

Uncorrected errors can lead to an:

- **Undesired Aircraft State (UAS)**
 - Pilot induced aircraft position or speed deviations, misapplication of flight controls, or incorrect systems configuration, associated with a reduction in margins of safety,
 - e.g. wheels up, stall, spin, Airprox (near miss), in-flight break-up, fuel exhaustion.
 - A UAS can lead to an aircraft incident or accident, which could have been prevented if the original threat or the resulting error had been handled better.

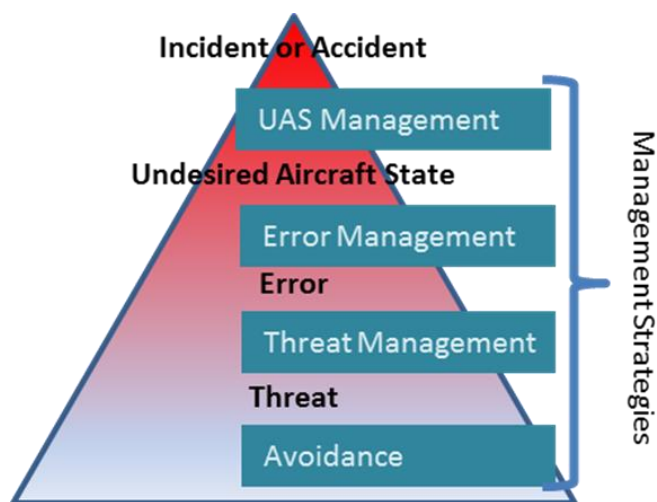
Threats come at you, while errors come from you

- Every glider flight, whether local, cross-country or competition, involves some threats, and all pilots must ensure they recognise these and have a strategy to manage the threats and prevent errors, and/or have a process to catch errors that may have occurred.
- Remember we ALL make some errors on every flight,
 - the important thing is to ensure they are not critical ones, or that they are captured before they lead to an UAS.

Useful Strategies:

- The following are just a few examples of TEM strategies that should become automatic to be a skilled and safe pilot:

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- Prepare for flight:
 - Daily self-assessment (IMSAFE)
 - What's the weather?
 - What are the NOTAMed Threats?
 - What task should be achievable?
 - What other threats are there? (e.g. Airspace, Bush fire risk, Landable terrain)
- Take advice from other pilots, especially experienced glider pilots.
- Use SOPs / Procedures/ Checks diligently.
- Maintain sterile environments when necessary.
- Don't succumb to time or other pressures (get-home-itis, more people to fly, aircraft unserviceability).
- Plan the flight, fly the plan.
- Always fly the glider first – and always be thinking ahead of the aircraft - anticipating not reacting.
- Maintain effective nutrition, hydration and waste management.
- Recognise the potential for fatigue and if fatigued be more careful and conscientious.
- After interruptions, say "Where was I?"
- Always carry out a Situation Awareness review after a period of high workload.
- Set limits and stick to them
 - particularly with respect to landing decision making
 - transitioning from "Soaring" Pilot to "Landing" Pilot.
- Don't "see what you expect to see" – look for threats and errors.
- Listen to "that little voice" that questions what you are doing.
- Always evaluate after flight:
 - What threats were mitigated?

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- What errors were exhibited but managed?
 - What was learned?
 - What can be improved on in future flights?
- Check your personal ATTITUDE
 - safety above all else;
 - it is after all a sport and should never become a life-or-death situation.
- Acknowledging your vulnerability to errors is actually a sign of strength.
- In flying, you never stop learning.
- Every flight, whether you have 50 hours, 500 hours, or 15,000 hours, presents you with the threats that must be recognised and managed.
- On every single flight you need to ask:
 - What are my threats today?
 - How will I manage and mitigate these?

*It is safer to be on the ground wishing you were in the air
than in the air wishing you were on the ground.*

Have fun out there – but be safe!

FLIGHT EXERCISES FOR THIS UNIT

Instructor to:

- Demonstrate how to prepare a day's briefing using TEM strategies,
- Identify during flight operations when TEM is used.

Student to:

- Demonstrate how to prepare a day's briefing using TEM strategies,
- Identify during flight operations when TEM is used.

Post Flight:

- Debrief to identify all threats – which were expected, which were not.
- Did these lead to errors and how were these handled?
- Did any errors progress to a UAS?

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THINGS YOU MIGHT HAVE DIFFICULTY WITH

COMMON PROBLEMS

- Interpreting Notam and Meteorological information and terms
 - Lack of Experience to be able to fully recognise threats

HOW DO YOU DEMONSTRATE COMPETENCE?

- Define:
 - Pristine flights,
 - Threats,
 - Errors and
 - Undesired Aircraft States (UAS)
- Prepare a briefing for flight using TEM strategies:
 - Daily self-assessment (IMSAFE);
 - Assessment of the weather;
 - Identifies if there are any NOTAMed Threats;
 - Assesses what tasks are achievable;
 - Identifies any other threats (eg Airspace, bush fire risk, landable terrain, known traffic etc.)
- Demonstrate awareness of threats and errors that can occur during Pre-boarding and pre-flight Checks.
- Demonstrate monitoring and positive strategies to identify and manage in-flight threats and aircraft handling, procedural. communication or committed errors before an UAS occurs;
- Diligently demonstrate the use of Standard Operating Practices (SOPs) / Procedures / Checks;
- Does not succumb to time or other perceived pressure;
- Describe how biological functions create threats and their mitigation through effective nutrition, hydration and waste management strategies;
- Describe how to recognise and mitigate fatigue;
- Demonstrate conducting a Situation Awareness review after a period of high workload or interruption;
- Demonstrate personal limits
 - particularly with respect to transition from Soaring Pilot to Landing Pilot or ;
 - in cross wind conditions or:
 - when feeling fatigued.
- Perform a post-flight evaluation and describe:
 - What threats were mitigated?

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- What errors were exhibited but managed?
- What was learned?
- What can be improved on in future flights?

RESOURCES & REFERENCES

- Knowledge Centre: Bureau of Meteorology Website.
- Gliding – Threat and Error Management: Arthur Gatland; Soaring: June, August, October 2010.
- Human Error; James Reason; Cambridge University Press: 1990.
- Human Factors for Pilots; Package; CASA: 2012
- Threat and Error Management in Flight Operations: SKYbrary webpage: Flight Safety Foundation.

SELF-CHECK QUESTIONS

Use these questions to test your knowledge of the unit.

- What is the definition of a pristine flight?
- What is the difference between a threat and an error?
- What is a SOP?
- What is an UAS? Give three examples of an UAS.
- What are the four levels of management in TEM?
- What are five common threats to every flight?
- How could each of the threats in the above question be managed?
- What are the four categories of error?
- List the items you should cover in a post flight TEM evaluation.