THREAT & ERROR MANAGEMENT
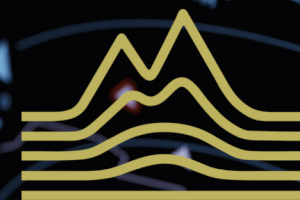
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THREATS & ERRORS

Todays CRM courses use Threat and Error Management (TEM) as a foundation.

Threat and Error Management is the practice of thinking ahead in order to predict and avoid errors and threats.

TEM requires the recognition of threats and errors but also the need to **react,** should they occur.

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"A superior pilot uses their superior judgement to avoid situations that would require their superior skills."

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A [leader/guide/instructor] uses their superior judgement to avoid situations that would require their superior skills."

ACCEPTANCE

Threat and Error Management is based on the work of James Reason in 1990. Providing additional theory to the previous quote.

The key assumption in TEM is that Treats and Errors will occur or be made.

TEM is not an attempt to eliminate but to manage them.

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THREE ELEMENTS

The three elements of TEM and Reason's work that are relevant to us are:

1. Threats
2. Errors
3. Undesired States

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THREATS

Can be **expected**: e.g.

- Complex terrain with significant avalanche exposure

- A deteriorating weather forecast during the day

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THREATS

Can be **unexpected**: e.g.

- An emergency which requires intervention

- Other parties climbing or skiing above

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THREATS

Can be **latent**: e.g.

- Organisational culture

- Fatigue, stress etc

Latent Threats: Might not be directly obvious, usually only uncovered by safety analysis.

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ERRORS

Errors are often internal to our groups, and maybe due to **action** or **inaction** e.g.

- Ending up on an aspect/slope with higher avalanche hazard than anticipated e.g. navigational error

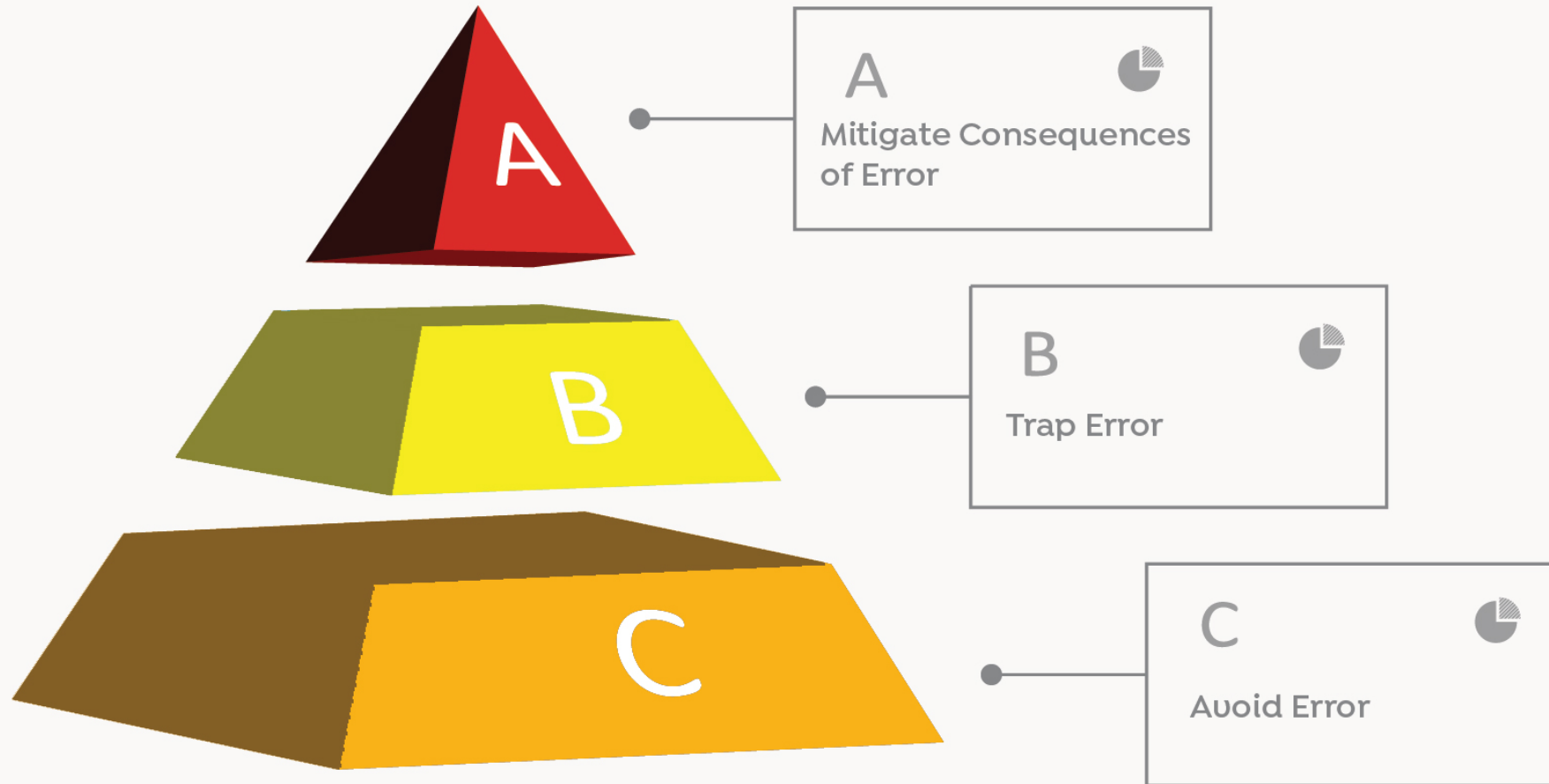- Choosing an inadequate mode of travel, e.g. moving as a group rather than well spaced

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UNDESIRED STATES

Undesired states could be due to a threat, error or both.

In our environments an undesired state could be any situation where our margin of safety is eroded, or we are exposed to hazards beyond those we consider acceptable.

CRM behaviours act as a counter measure to threats and errors.

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A — Mitigate Consequences of Error

B — Trap Error

C — Avoid Error

The error troika, from Helmreich et al, 1999

TEM MANTRA

The TEM mantra is to Avoid – Trap – Mitigate

How do we do that?

- Use TEM as an ongoing process e.g. before, during, after
- Counter measures e.g. action in case of visibility change

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TEM IN PRACTICE

Ongoing process at all times of the day:

- Pre–activity: Time spend before anticipating threats means you can plan and develop counter measures. (e.g. action for weather change)

- Pre–activity: Briefing, what's the plan (can be self, colleagues, group)

- During–activity: Brief at significant phases of the day

- During–activity: Prioritise tasks and manage workload

- Post–activity: Review and reflect

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SUMMARY

- Accepting that threats and errors exist is fundamental

- Optimum situation is to identify threats and errors before they occur

- Recognise threats and errors and trap them. Be bothered.

- Pre-day, during day, post day

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