



Using Threat and Error Management for UPRT

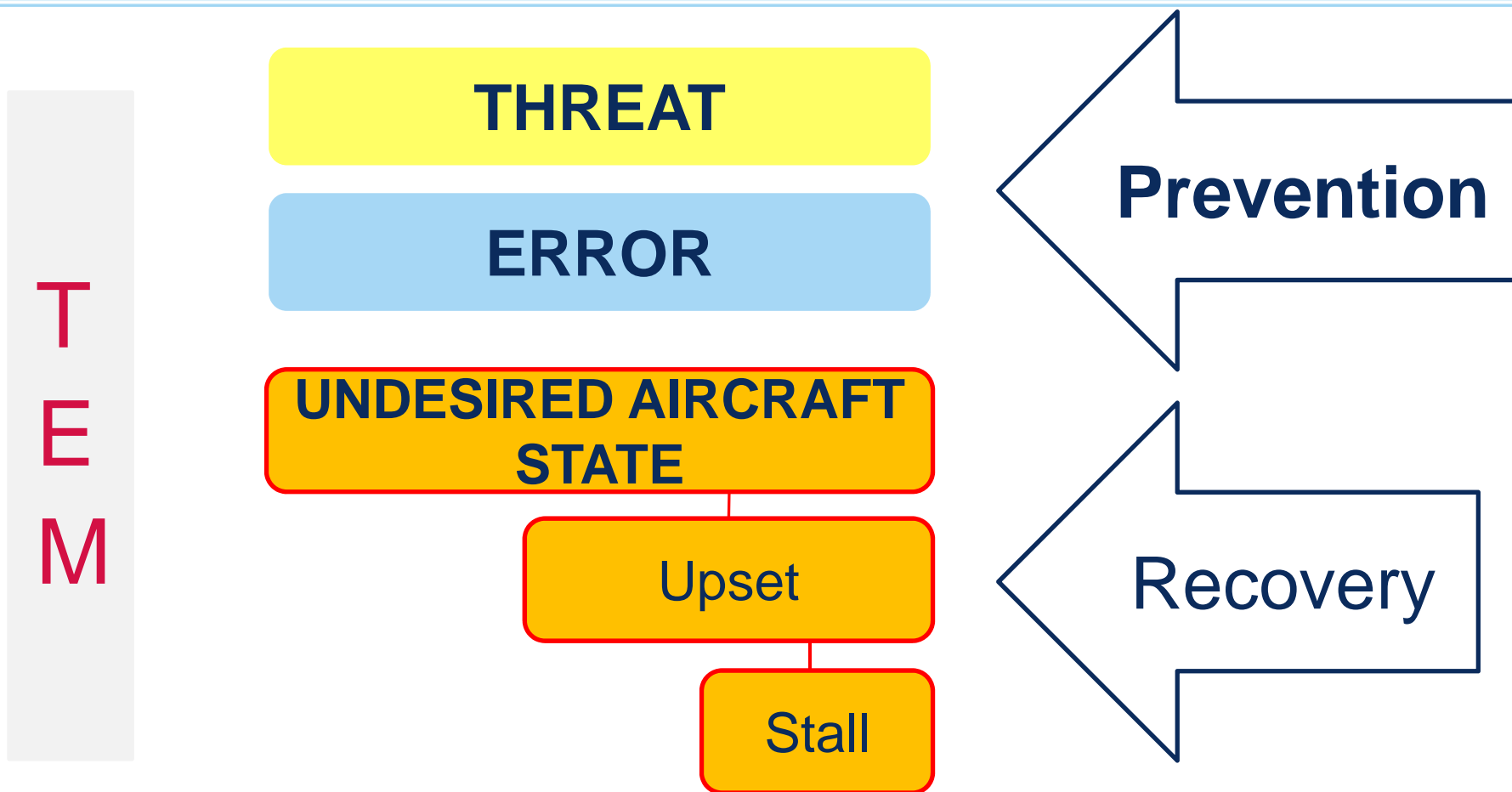
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Content

1. TEM – Upset Prevention and Recovery
2. TEM - as a Training tool
3. The Evolution of TEM / ICAO Docs

4. Summary



**Nothing
to do?**



70-100% of crew activities

➤ Recognize and manage
Threats/Errors/Undesired a/c States

➤ **Plan and deploy Countermeasures**





Training:
Shift to
the
application
of TEM-
countermeasures

LESSON PLAN / GRADE SHEET		FLT NO XY 405		
Training Objective: HYD G+B RES LO LVL				
TEM briefing Discuss <u>expected</u> threats, errors, undesirable a/c states, <u>plan</u> effective countermeasures.				
Assessment	Grades			
Application of Procedures				
Communication				
Aircraft Flight Path Management, automation				
Aircraft Flight Path Management, manual control				
Leadership and Teamwork				
Problem Solving and Decision Making				
Situation Awareness				
Workload Management				
TEM debriefing Review and analyze <u>actually encountered</u> threats, errors and undesirable a/c states. Analyze the effectiveness of applied countermeasures.				

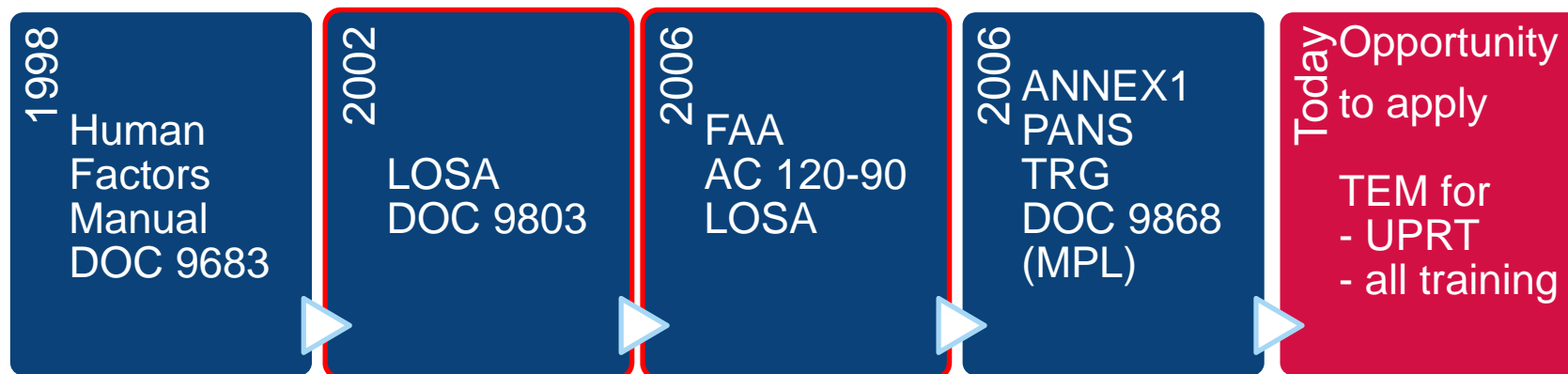
Countermeasures

Measuring Crew-Performance

Measuring the application of countermeasures.

LESSON PLAN / GRADE SHEET		FLT NO XY 405			
Training Objective: HYD G+B RES LO LVL					
TEM briefing Discuss expected threats, errors, undesirable a/c states, plan effective countermeasures.					
Assessment		Grades			
Application of Procedures	✗				
Communication				✗	
Aircraft Flight Path Management, automation			✗		
Aircraft Flight Path Management, manual control				✗	
Leadership and Teamwork			✗		
Problem Solving and Decision Making				✗	
Situation Awareness			✗		
Workload Management		✗			
TEM debriefing Review and analyze <u>actually encountered</u> threats, errors and undesirable a/c states. Analyze the effectiveness of applied countermeasures.					

Evolution of TEM





Summary

- TEM is an ideal tool for UPRT
- Effective management of threats, errors and undesired aircraft states requires to focus on **countermeasures**
- Application of countermeasures enables crews to Prevent and Recover UAS, even to handle the „unforeseeable“
- ICAO and the industry should harmonize the terminology used in Annex 1 + PANS TRG documents and develop a consistent set of TEM countermeasures/competencies.



Thank you!

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