

Safety Enhancements in the Aviation Sector

Focusing on Air Navigation Services.

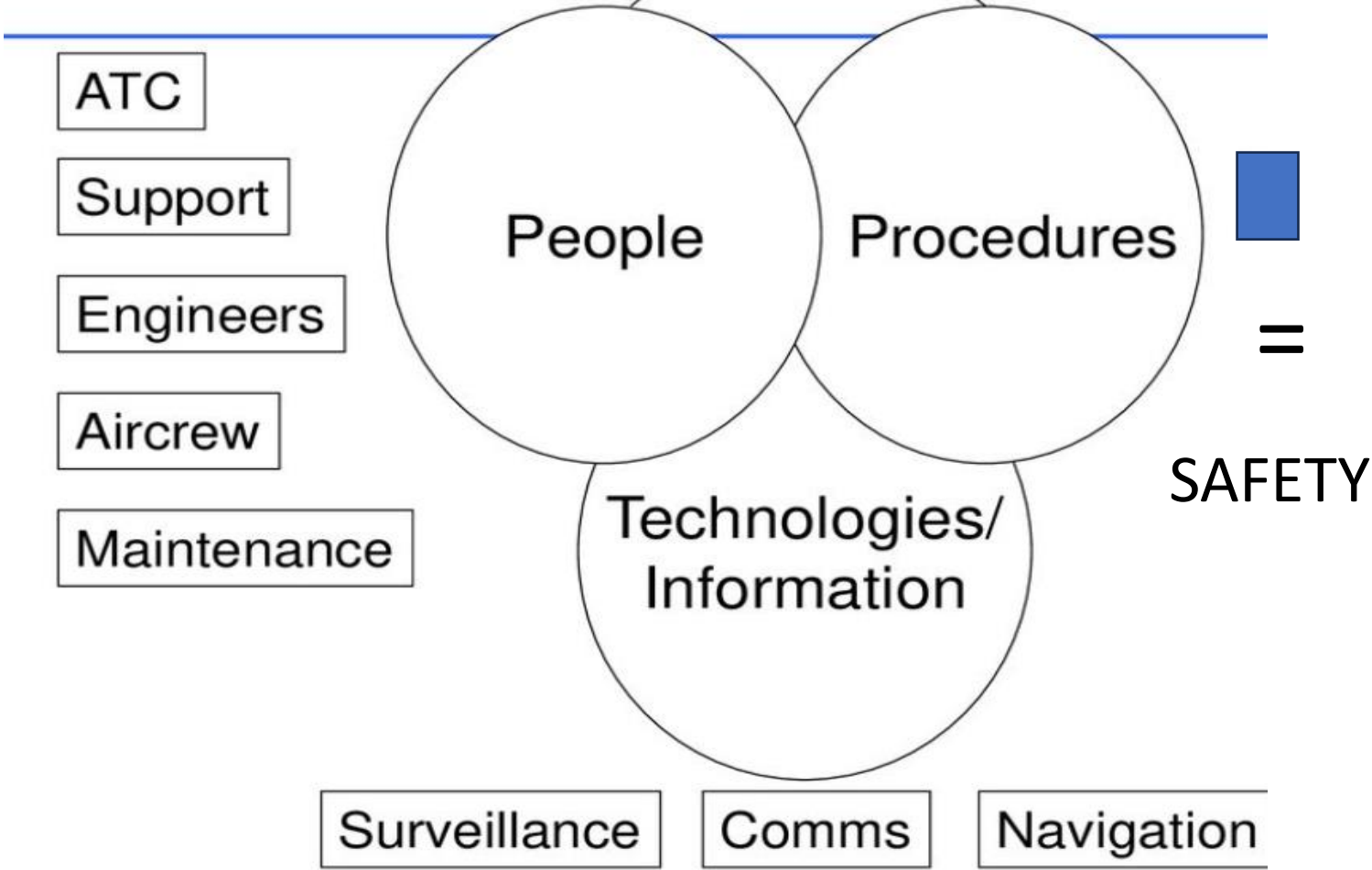
12/1/2023

Safety Enhancements in the Aviation Sector focusing on Air
Navigation Services



ATM System

Air Traffic Management System



Threat & Error Management in ATC.

1. **Threat** are “Events or conditions which occur beyond the influence of the air traffic controller, increase operational complexity and which must be managed to maintain the margins of safety.
2. **Errors** are defined as "actions or inactions by the air traffic controller that lead to deviations from organizational or air traffic controller intentions or expectations“
3. **Undesired States:** operational conditions where an unintended traffic situation results in a reduction in margins of safety.

"Ideal shift" versus "Real world shift"

Ideal

Its a beautiful day

The Ideal Shift Overstaffed

All aircraft on ADS B

All systems operational

Beautiful VFR Weather

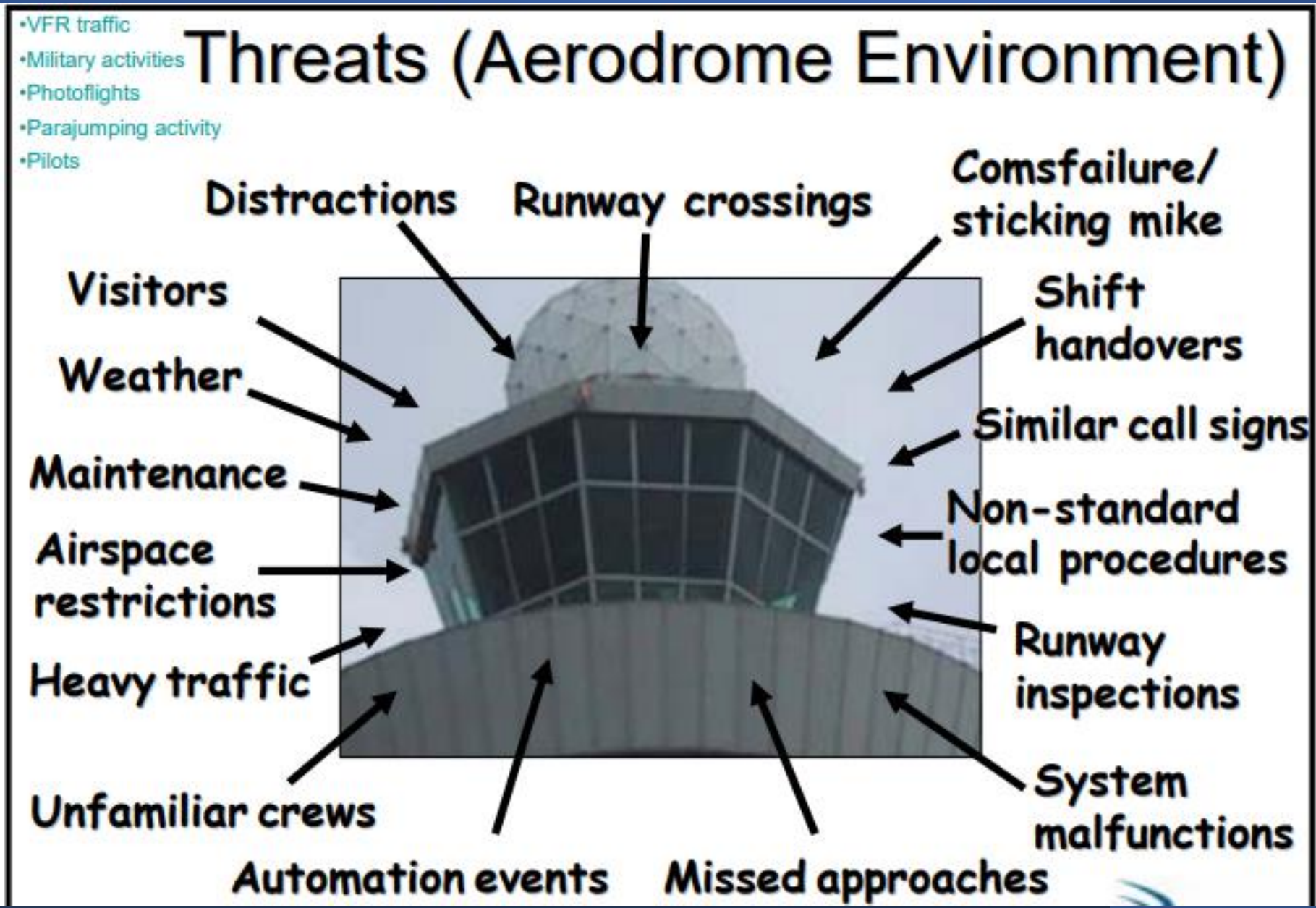
Happy, supportive supervisor

Pilots are attentive and responsive

Co-workers are pleasant and supportive

Real world

- Its a beautiful day
- A More Typical Shift Short staffed
- Non-ADS B aircraft
- Maintenance on critical systems
- IFR / Marginal VFR Weather
- Not-so-supportive supervisor
- Pilots - slow to respond to instructions
- Co-workers - demanding and create workload



Threats in ATC can be grouped into four broad categories:

ATSP Internal	ATSP External	Airborne	Environmental
Equipment	Airport Layout	Pilots	Weather
Workplace Factors	Navigational Aids	Aircraft Performance	Geographical environment
Procedures	Airspace Infrastructure/Design	R/T Communications	
Other Controllers	Adjacent Units	Traffic	Distractions

Managing Threats and Errors

1. The process of detecting and responding to **threats** with countermeasures to maintain safety margins.
2. The process of detecting and responding to **errors** with countermeasures that mitigate the probability and / or severity of further errors or undesired states.

***We cannot PREVENT or AVOID all errors
BUT we can MANAGE errors to maintain safety margins.***

Threat and error countermeasures for ATC:

Team Climate	
COUNTERMEASURE	DESCRIPTION
Communication Environment	Environment for open communication is established and maintained
Leadership	Supervisor shows leadership and coordinated the team/sector/unit activities
Overall Team Performance	Overall, team performs well as risk managers
Planning	
COUNTERMEASURE	DESCRIPTION
Briefing	An interactive and operationally thorough briefing is provided
Plans Stated	Operational plans and decisions are communicated and acknowledged
Contingency Management	Team members develop effective strategies to manage threats to safety
Execution	
COUNTERMEASURE	DESCRIPTION
Monitor/Cross-check	Team members actively monitor and cross-check other team members
Workload Management	Operational tasks are prioritised and properly managed to handle primary ATC duties
Automation Management	Automation is properly managed to balance operational and/or workload requirements
Flight Strip Management	Flight strips are properly organized and updated to keep track of traffic developments
Review/Modify	
COUNTERMEASURE	DESCRIPTION
Evaluation of Plans	Existing plans are reviewed and modified when necessary
Inquiry	Team members are not afraid to ask questions to investigate and/or clarify current plans of action