Safety Risk Management

Do we really know what good looks like?

Do we have clear safety goals?

Understanding safety from all sources (not just data)
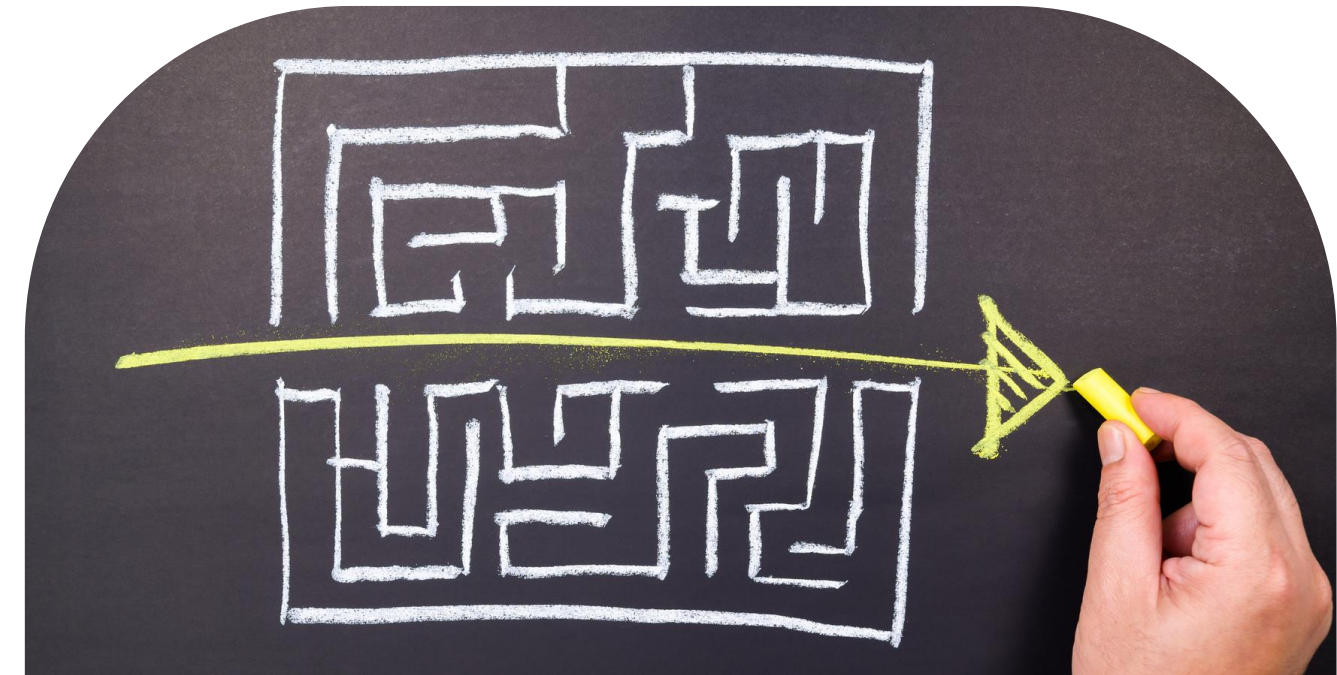# Taking action to mitigate the top risks

Back to Basics - In a Complicated World

Aviate-Navigate-Communicate

Taking stock of where the industry is now and what needs to be done to chart the course it takes going forward.

"Doing" Safety is not always easy

With the challenge to be "compliant" while battling the theory of Safety I, Safety II, Safety Differently

EASA
European Union Aviation Safety Agency

The Safety Map

Purpose — Safety as the ability to create and maintain the conditions for safe and effective operations - as organisations, leaders/ managers and individuals.

Be Ready

Stay Safe

Mindset

Defining and living by the values that creates the trust needed to support positive safety conversations.

Compliance

Encouraging people to do things right by following the relevant rules, procedures and practices.

People

Having enough competent people who are operationally ready so they can perform to the best of their abilities

Risks

Effectively identifying and mitigating risks effectively as part of a resilient management system.

Resources

Ensuring safe aircraft products that are supported by the right tools, equipment and infrastructure

Learning

Talk openly about safety and have a positive approach to learning and solving problems.

SAFE360 2025 – Risk Management

Neil Richardson

We are all different, yet also the same.

- Our fallible selves

- Our different perspectives

- What about how others make sense of the world?

- Can we ever know everything?

- Embracing discomfort over familiarity

About me...

- Great to be here and share my thoughts

- 35 years Aviation experience

- Aircraft Maintenance and Continuing Airworthiness

- 20 Years of Safety Management 'discovery'

- Current Safety Manager

On one hand…

- SMS maturity

- Purpose, purpose, purpose!

- Risk acceptability

- Legacy beliefs and bias remain strong

- Ownership

- Humans & systems, systems and humans

On the other…

- Our amazing people

- Hunger for change

- THEY are our leaders, THEY are our followers

- THEY have something to say

- THEY are the power behind change

- THEY will determine success or failure

- Our choices today will affect those made tomorrow: Resilient and Performing systems or 'Paper Safe'

Comfortable with the uncomfortable?

- Comfort blankets

- Cues that provide insight to cultural identity

- "Language is the roadmap of culture - It tells you where its people come from and where they are going"

- The search for certainty can fuel a damaging motive.

- True learning is embracing our own fallibility
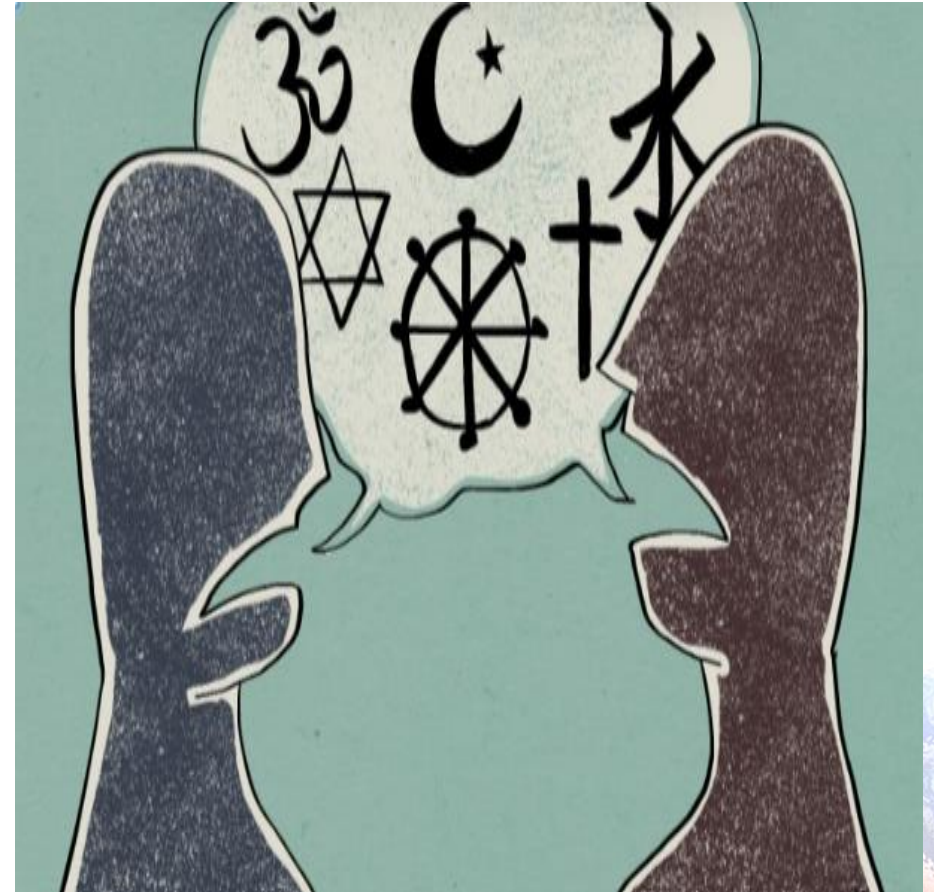
Who has the answers?

- A recent engagement

- "Hear me"

- WE & the by products of silence

- A conversation with a fallible person requires us to suspend our agenda, submit control and pay attention to the other [Dr Nippin Anand]

- Togetherness – one conversation at a time

I hope we all took something away.

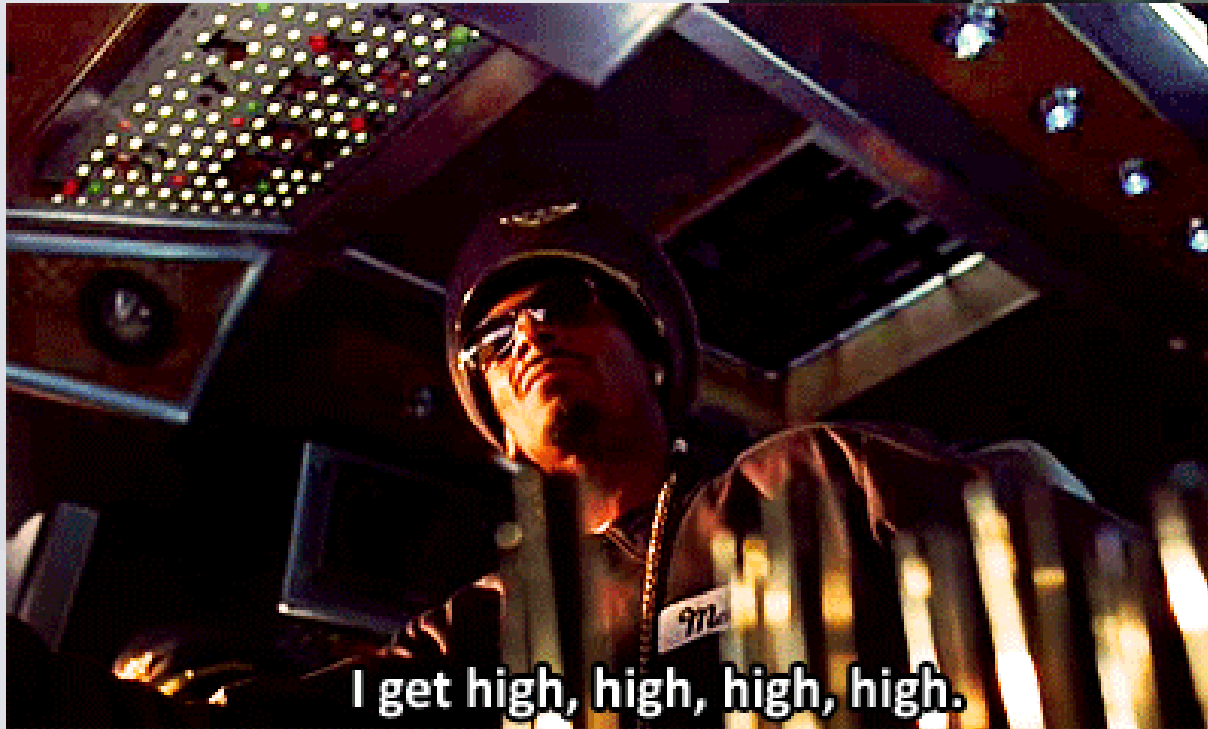Thank you and let's talk.

Owning risks in Business Aviation

SAFE360

Cologne, September 30, 2025

Senior Capt. Mr. He/Him. Sir. Lord. Ing. Dr. Pr. HRH. Maxime Wauters
AKA "MiniMax"

I get high, high, high, high.

EBAA

VS

COMMERCIAL PRESSURE	FATIGUE & TIREDNESS	HEAVY TRAINING REQUIREMENTS
FUEL MANAGEMENT	FLIGHTS TO/FROM/OVER CONFLICT ZONES	
HIRING & RETAINING TALENT	COMPLEXITY OF INTERNATIONAL OPERATTIONS	
MENTAL HEALTH	REGULATORY COMPLEXITY	

WHAT YOU SEE...
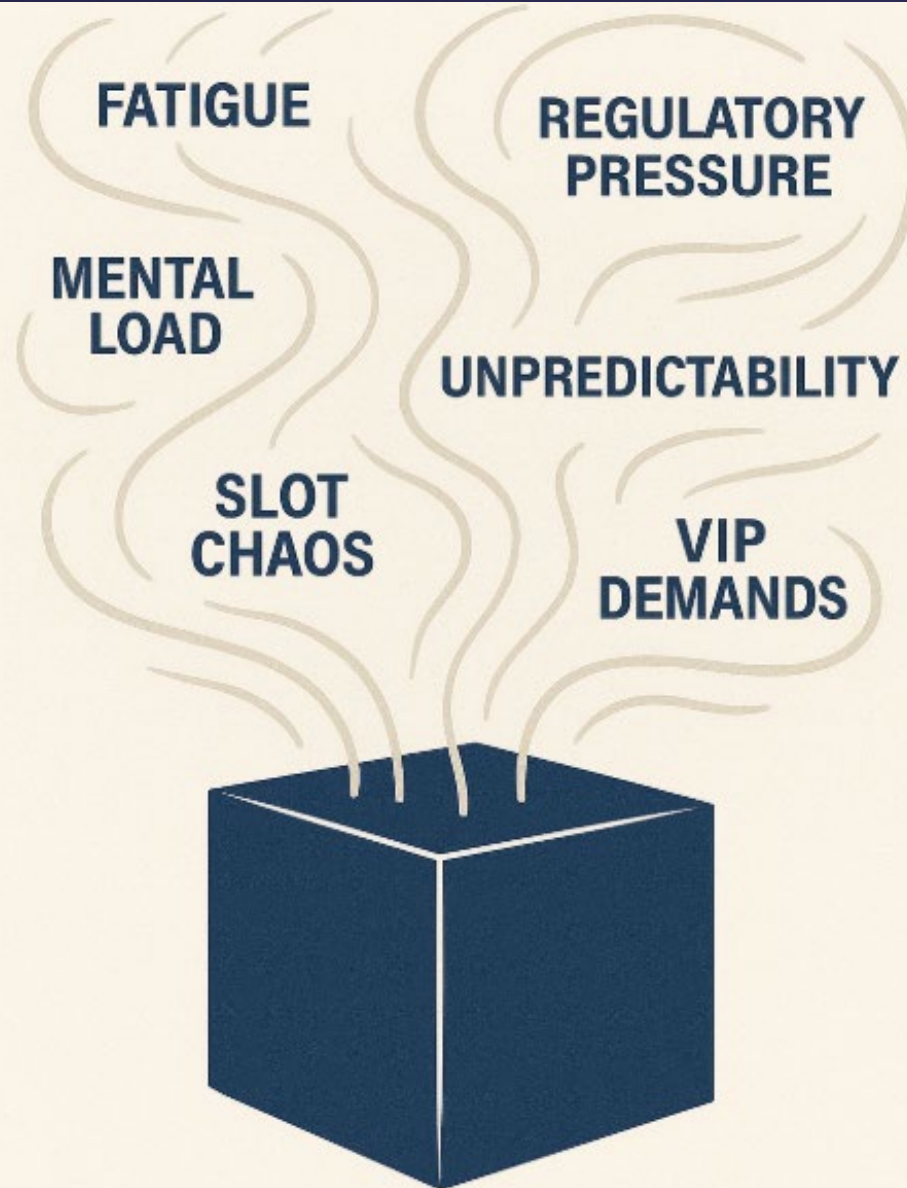
I also animate team buildings, weddings, parties, bar mitzvahs...

Strategic and Operational Topics

Exploring Safety Challenges

Discoveries from IATA's Risk-based IOSA

Edickson Santamaria - IATA

Based Risk IOSA - Overview

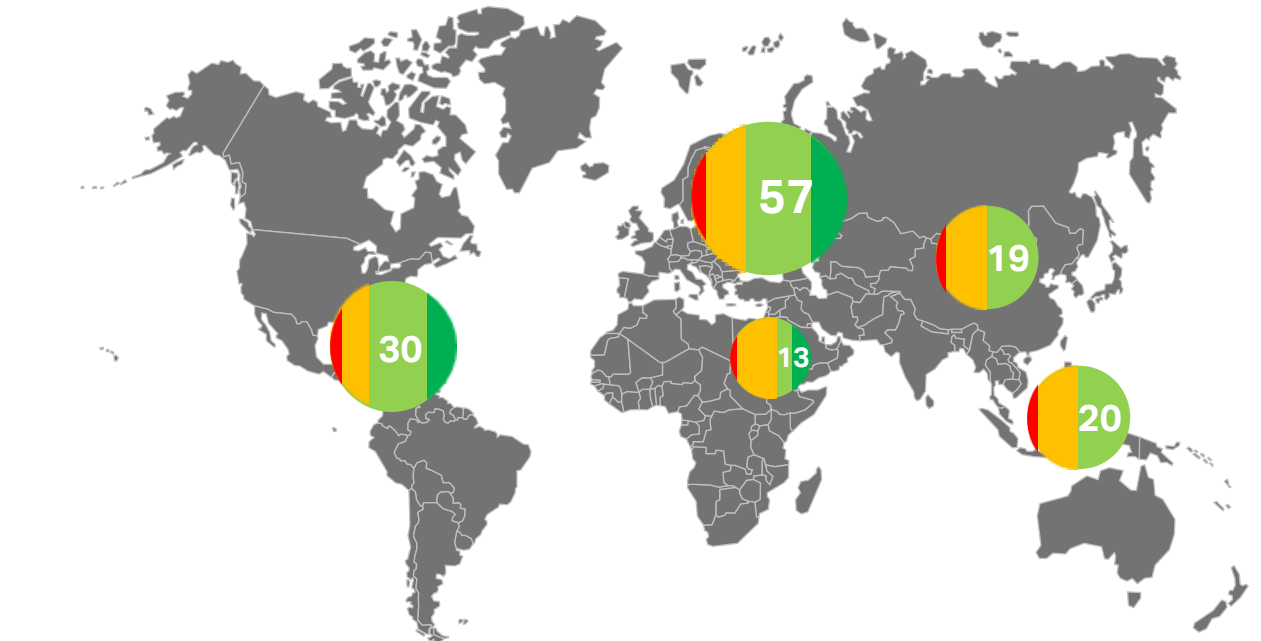**2024** Traditional IOSA Audit transitioned to a Risk-Based IOSA.

2025 (June) **+ 250** Risk-based audits have been conducted.

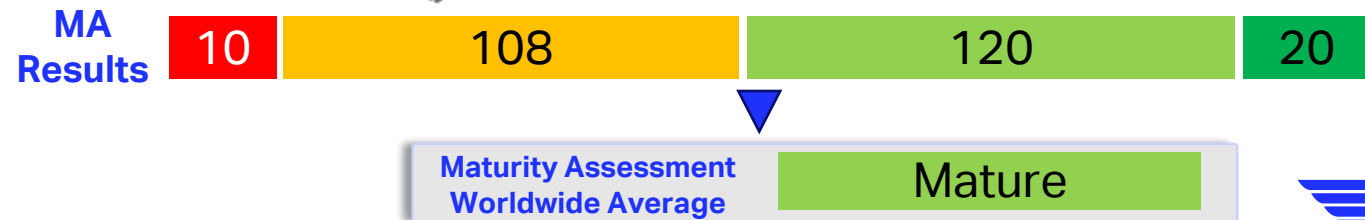**+100** European air carriers have been audited under RBI

The risk-based model:

- Offers a **tailored audit scope** for each airline, and

- Incorporates an SMS **maturity assessment**

Current Status after +250 RBI

57

19

30

13

20

56% IOSA Carriers

MA Results

| 10 | 108 | 120 | 20 |

Maturity Assessment Worldwide Average | Mature

IATA

01.

Management & control

Management Commitment - Poor safety culture / low-level safety reporting/lack of awareness of the safety policy

Lack of a process for setting safety objectives to ensure their continued relevance to operations

Safety Objectives not clearly linked to the relevant aspects of the operational safety performance

IATA

02.

Risk Management

Lack of proactive hazard and threat identification across all operational domains

Lack of safety reports processing, safety investigations of operational occurrences, and feedback to reporters

Lack of External Hazard/Threat identification tools linked to external organizations

IATA

Lack of process for setting safety Performance indicators (SPI) and targets (SPT)

Not interface between Quality Assurance (QA) and Safety Management process

Lack of process for conducting Management of Change

03.

Safety Assurance

04.

Quality Assurance

Deficiency in root cause identification knowledge/understanding

Poor Auditors' training and qualification process

The Quality assurance program does not adapt according to the safety performance needs

IATA

The operator's personnel do not understand their role in the organization's SMS

Operator does not have a process to ensure that external service providers receive safety information relevant to the operations conducted

Lack of a process to update the SMS training program effectiveness

05.

Safety Promotion

IATA

How do the **current challenges** in safety
management **prevent** us from effectively
addressing **operational** safety issues?

"The wider system level challenges that underpin our main safety challenges and tackling the cultural barriers that stop us really fixing them"

Or in Colin's words:

"What is going to sneak up on us and really bite us hard in the arse?"

The only thing that is constant is change

Heraclitus

WHAT DO YOU THINK ABOUT SOCIAL MEDIA?
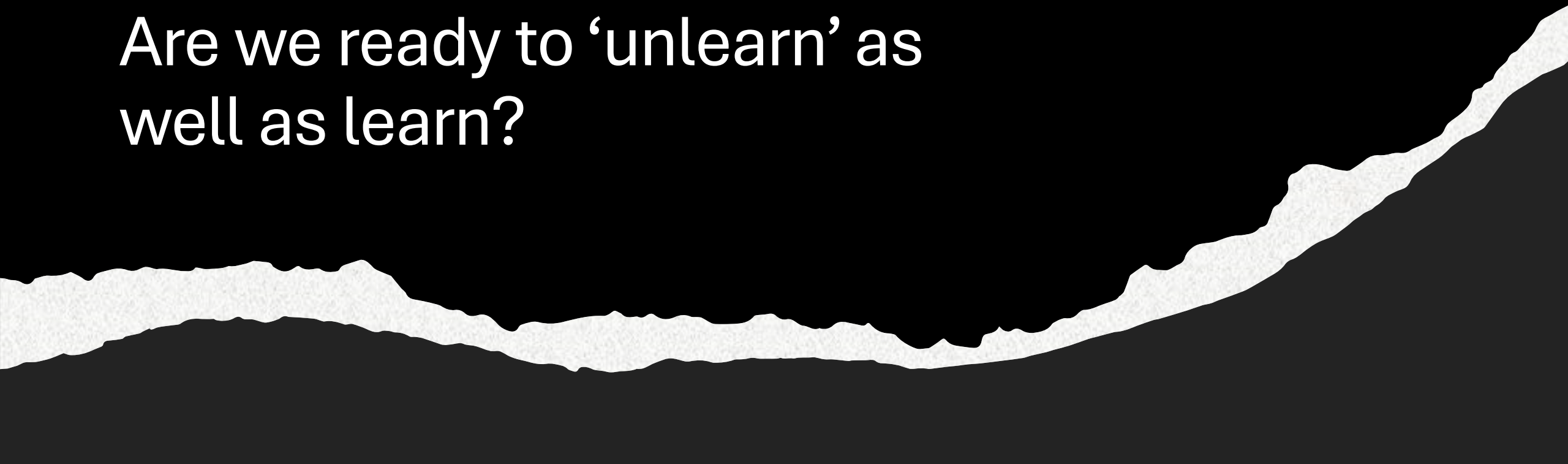
678,000 cabin crew
416,000 aircraft maintenance technicians
300,000 pilots
71,000 air traffic controllers

HOW OPEN-MINDED ARE WE REALLY?

Are we ready to 'unlearn' as well as learn?

Understanding the real safety challenges our operational staff face in ensuring the safety of passengers and staff:

Captain Paul Reuter
European Cockpit Association

EASA SAFE360 2025

The industry is doing well….

European pilots | 2025

EUROCONTROL Monthly Traffic Forecast (STATFOR - February 2025)
(base year 2019)

ARRIVAL PUNCTUALITY — 74.2% (↓ -3.8% vs 2019)
DEPARTURE PUNCTUALITY — 66.7% (↓ -4.1% vs 2019)

+4% vs equivalent week in 2024 — 101% of 2019

| 2019 (35,135) | 2024 (34,186) | 2025 (35,491) |

EASA SAFE360 2025
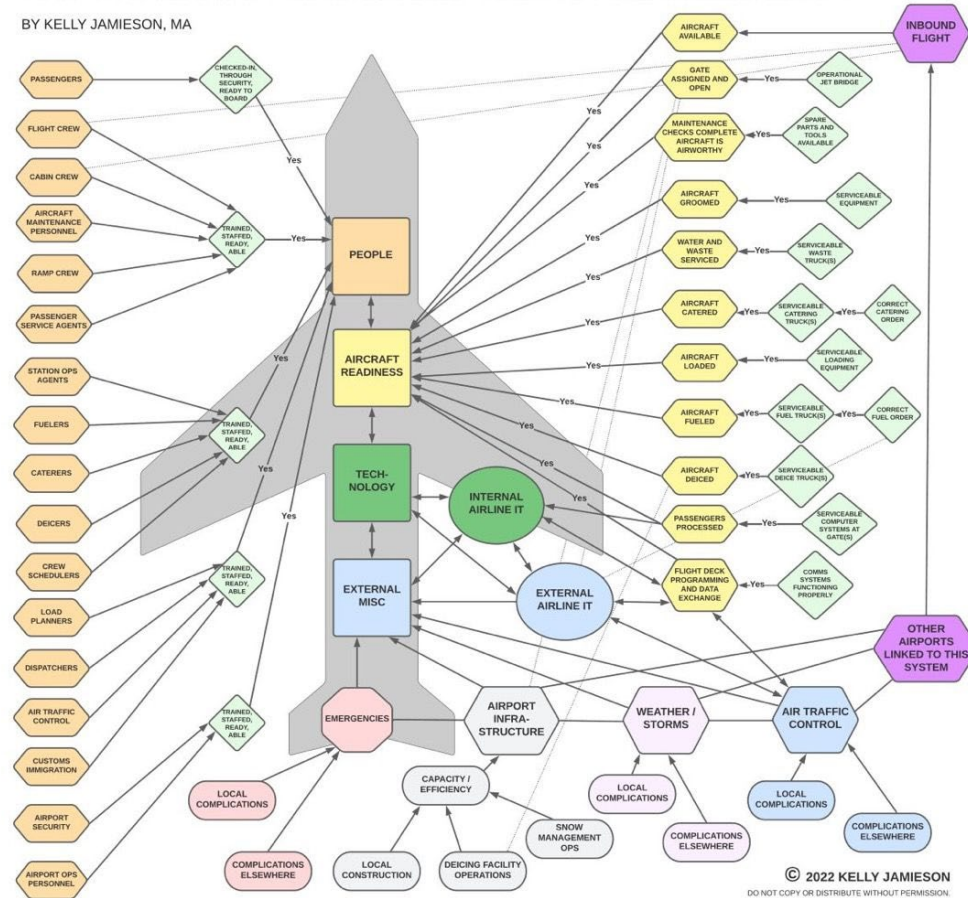
…a sobering thought…

SAFE360°slides for APM slot

Intro

EASA APM Team

Anastasios PAVLOPOULOS
Technical Lead for APM
Senior Expert - Air Operations

Stefano OPRANDI
Flight Crew Training Expert

Lado KULJANISHVILI
ATM/ANS Expert

Aigars KRASTINS
Senior Aviation Safety Risk Manager

Gilles GARDIOL
Project Manager for APM
Senior Impact Assessment Officer

How will Slido be used today?

→ Part of SRM process:

  → Safety Issue Assessment and Impact Assessment of SIA recommendations (validation and rescoping when necessary of proposed actions).

  → This is combined in a report called « Best Intervention Strategy », subject to consultation with Advisory Bodies

→ Today:

  → Slido closed questions to better manage your initial feedback on the proposed actions

  → Slido will also enable to get open questions during the presentation

5. Safety performance measurement

1. Identification of safety issues

4. Implementation and follow-up

The Safety Risk Management Process

2. Assessment of safety issues

3. Definition and programming of safety actions

Join at
slido.com
#SAFE360

APM safety trends for the EASA MS operators

APM accidents and serious incidents and rate per 1 Mio flights

Legend:
- APM accidents and serious incidents
- APM rate
- All accident and serious incident rate
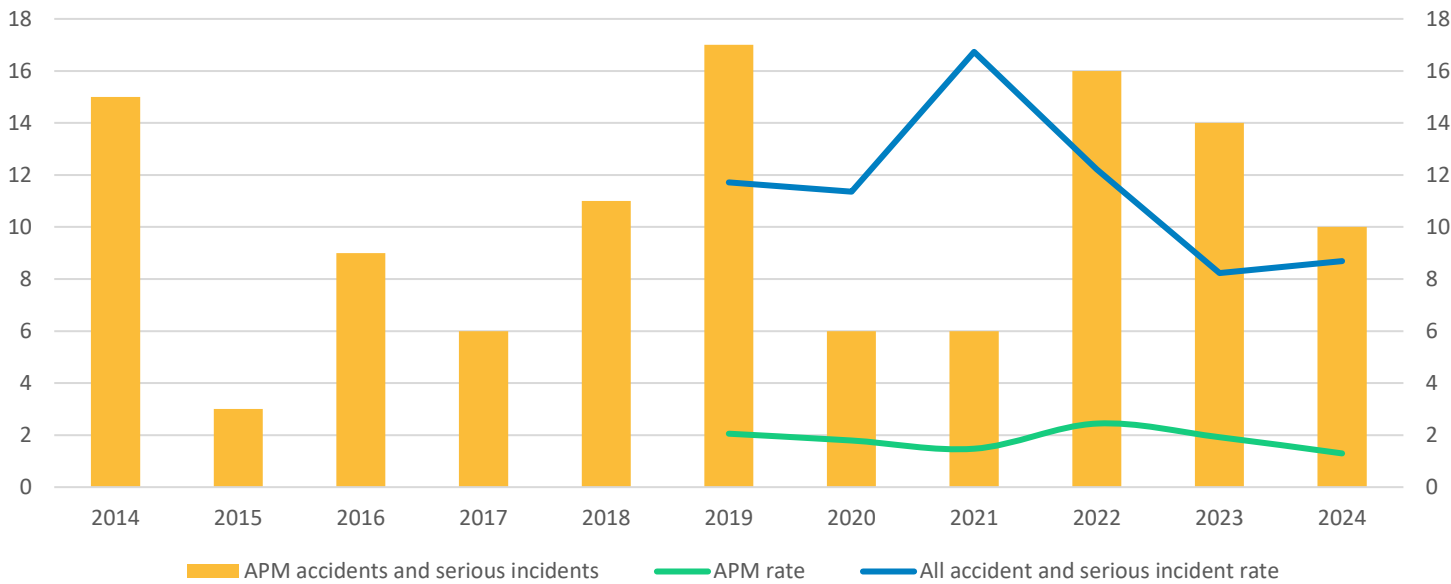
SIA outcome as per the EU SRM process

→ 44 (2016-2020) occurrences included in the bowtie analysis, that highlighted two higher risk threat scenarios among others:

  → Poor weather encounter & poor runway condition, and
  → displaced threshold on runway due to construction works

→ It identified the weak or missing barriers, safety gaps and existing enhancements from the literature review;

→ Various draft mitigating actions were proposed to address these (as rulemaking, safety promotion, research, or Member State tasks);

→ Up to today, several RMTs and SPTs have been implemented that strengthened aircraft design (e.g. Runway Overrun Awareness and Alerting System (ROAAS)) and infrastructure barriers (e.g. GRF);

→ Impact Assessment of the proposed mitigating actions is ongoing: subject of today's session
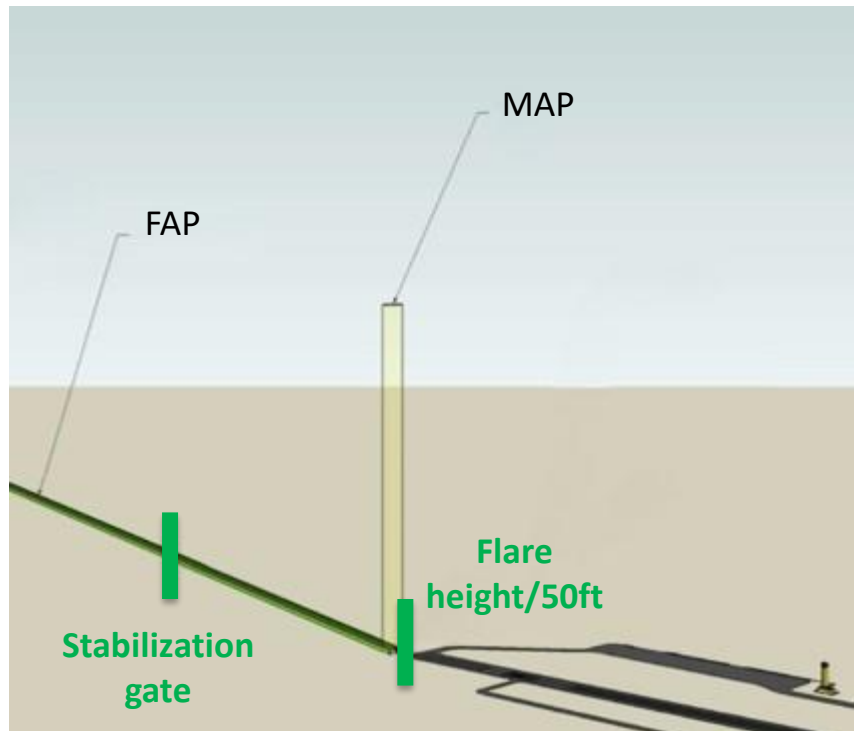
OPS - Where we stand – CAT.OP.MPA.115

FAP

MAP

Flare height/50ft

Stabilization gate

Stable from Gate to Flare height/50ft

Pre-Approach Setup
→ **FMS and approach aids** must be correctly configured.
→ **Radio aids** must be identified before a defined point or altitude.

Flight Parameters from Stabilization Point
→ **Bank angle**: Less than 30°.
→ **Descent rate**: Matches the required vertical path at planned approach speed. Variation: Should not exceed ±50% of the target.

Stabilization Conditions
→ **Lateral and vertical path**: Within acceptable tolerance.
→ **Vertical speed**: Within acceptable tolerance.
→ **Airspeed**: Within acceptable tolerance of landing speed.
→ **Configuration**: Correct for landing (unless final change is planned after visual reference).
→ **Thrust/power and trim**: Appropriately set.

Stabilization Altitudes
→ **Visual reference available**: Stabilized by 500 ft AGL.
→ **No visual reference**: Stabilized by 1000 ft AGL. Exception: Later airspeed stabilization allowed if higher approach speed is operationally required.

EASA

ATM - Where we stand – SERA and ATM/ANS

- Regulation (EU) 2017/373 ATS.TR.155 ATS surveillance serv

  ➢ (c) **An air traffic services provider** shall, in accordance wit
  functions for which ATS surveillance information is used in the
  provision of air traffic services, **establish procedures for**:

    ➢ (2) providing position information to aircraft;

    ➢ (3) vectoring aircraft;

- AMC2 ATS.TR.155(c)(3) ATS surveillance services **(VECTORING FOR APPROACH CONTROL)**

(b) The **air traffic controller should advise the pilot** of an aircraft being vectored for an instrument approach **of its position at least once prior to commencement of final approach**.

⊠EASA

ATM - Where we stand – SERA and ATM/ANS

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slido.com
#SAFE360

MAP

prior to commencement

a) POSITION *(number)* KILOMETRES *(or MILES)* from x). TURN LEFT *(or RIGHT)* HEADING *(three digits)*;

d) CLEARED FOR *(type of approach)* APPROACH RUNWAY *(number)*;

e) REPORT ESTABLISHED ON LOCALISER *(or ON [GLS/RNP/MLS] [FINAL] APPROACH [COURSE])*;

FAF
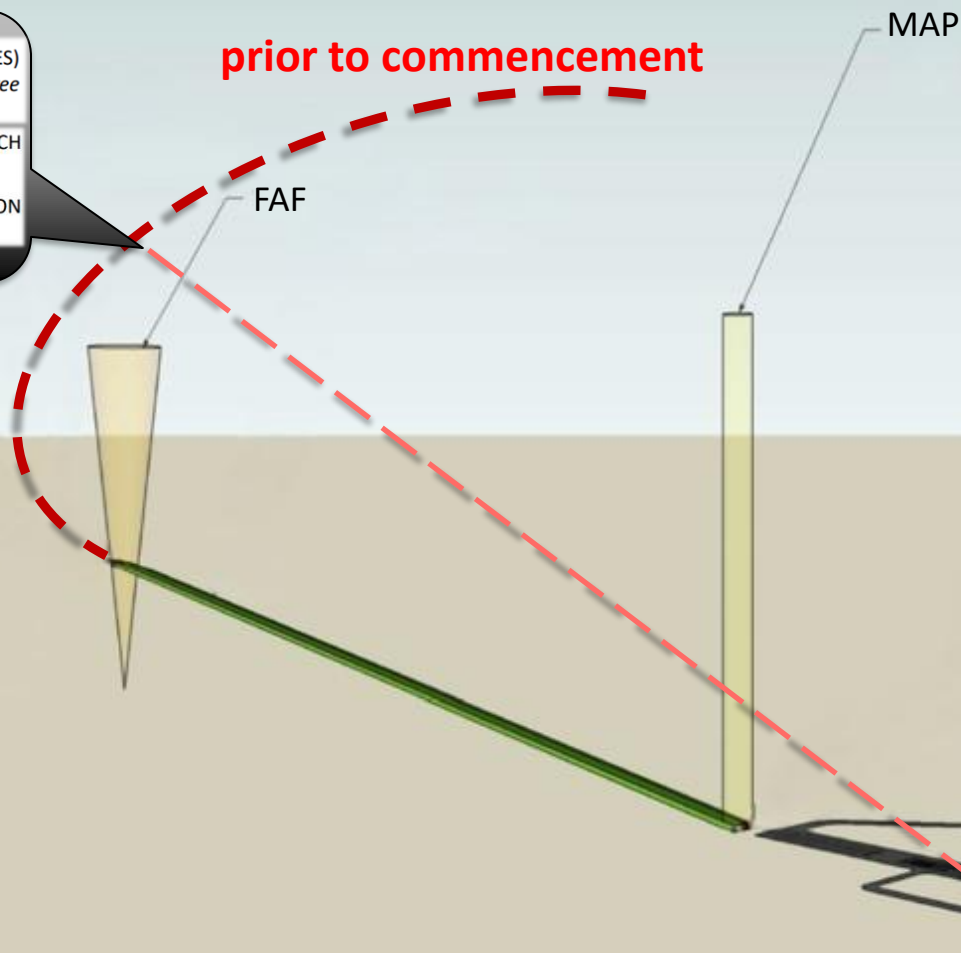
KLM presentation

Microsoft
verPoint Presentat

Martin Nijhof,
Sr Flight Safety Investigator

KLM
Royal Dutch Airlines

EASA

easyJet presentation

VICTOR ZEWALD
LEAD FLIGHT OPERATIONS SAFETY CAPTAIN

easyJet

EASA

13

easJet presentation

→ <mark>easyJet: how to embed these slides in EASA slides? See with John</mark>

→ <mark>FINAL SLIDES TO BE RECEIVED BY STEFANO ON FRIDAY 26/9</mark>

→ <u>Q:\Impact Assessment\SRM TST\TST - Approach Path Management (BIS27 SI-0007)\03-SAFE360\2025\Stakeholders slides\easyJet SAFE360 2025 APM slot.pptx</u>

A way forward for new concepts?

Join at
slido.com
#SAFE360

FL100
Start of the
new Approach
Concept

MAP

FAF

Awareness gates
with distance,
altitude, speed and
configuration

Monitor: speed reduction,
touchdown on the appropriate and
agreed upon point, lateral deviation
from center line, bank angle, etc.

SAFE LANDING concept

**Flare
height/50ft**

**Stabilization
gate**

Approach Phase concept

TOUCHDOWN

Is the proposed way forward going to help the crew to do the right thing?

Is it needed to enhance the PF and PM training to manage and monitor energy?
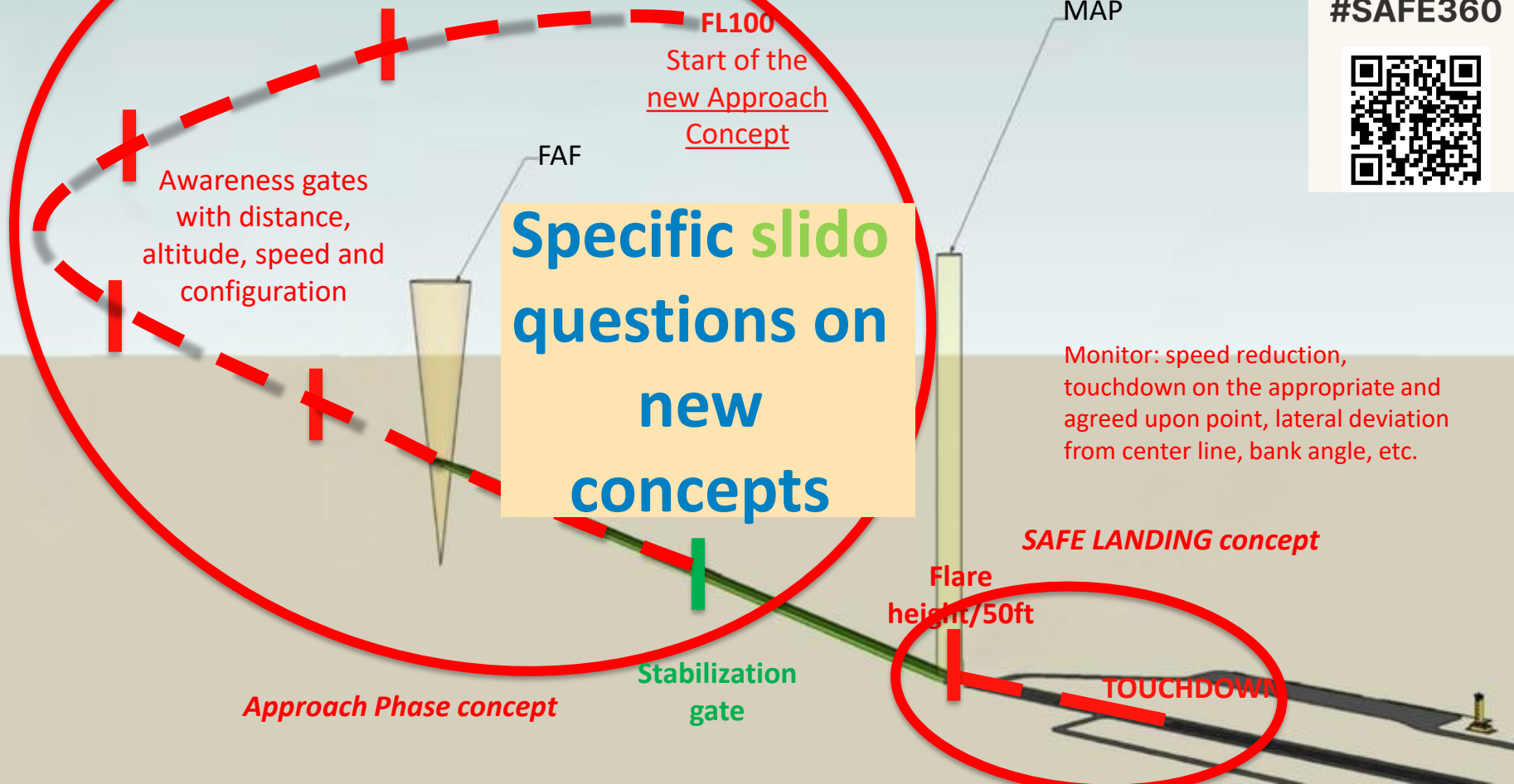

EASA

Do you think such practice (if widened) would support you during approaches on vectors?

Next steps

→ Discussion today and answers to Slido are inputs to finalise an EASA proposal on APM risk mitigation

→ Draft BIS report for EASA Management

→ Consultation of EASA Advisory Bodies

→ EASA ABs members will liaise with the members of their organisations to collect feedback

→ Feedback will enable to finalise the EASA decision, new actions if any will be in the EPAS

5. Safety performance measurement

1. Identification of safety issues

4. Implementation and follow-up

The Safety Risk Management Process

2. Assessment of safety issues

3. Definition and programming of safety actions
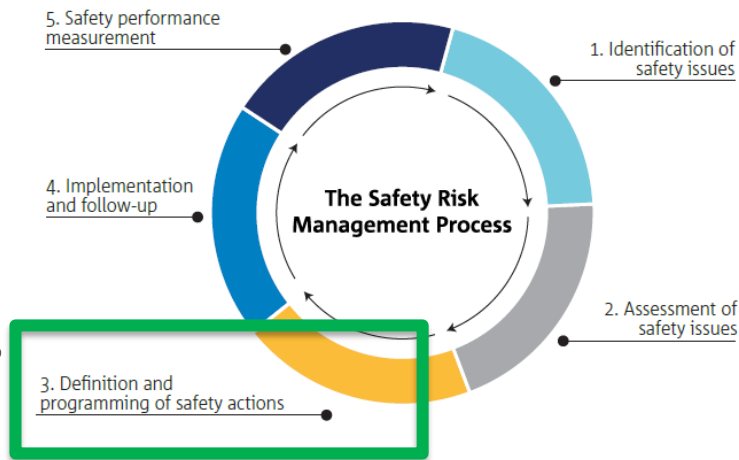
Conclusion

THANK YOU !

Anatomy of an approach and go-around at Sao Paulo (GRU), Boeing 777-300

Martin Nijhof,
Sr Flight Safety Investigator

AMS - GRU incident flight, March 2021

- Three crew, uneventful flight

- ATIS Broken clouds 4500 ft, vis 10 km, no thunderstorms

- ILS approach RWY09R

- Approaching from the north, direct to IAF "UTBUR"

- CB moving westwards near the IF "ISKUL"

Effective 25-FEB-2021
18-FEB-2021
GRU-SBGR

Brazil **Sao Paulo** Guarulhos - Gov.A.F.Montoro Intl

7-70

ILS R or LOC R 09R
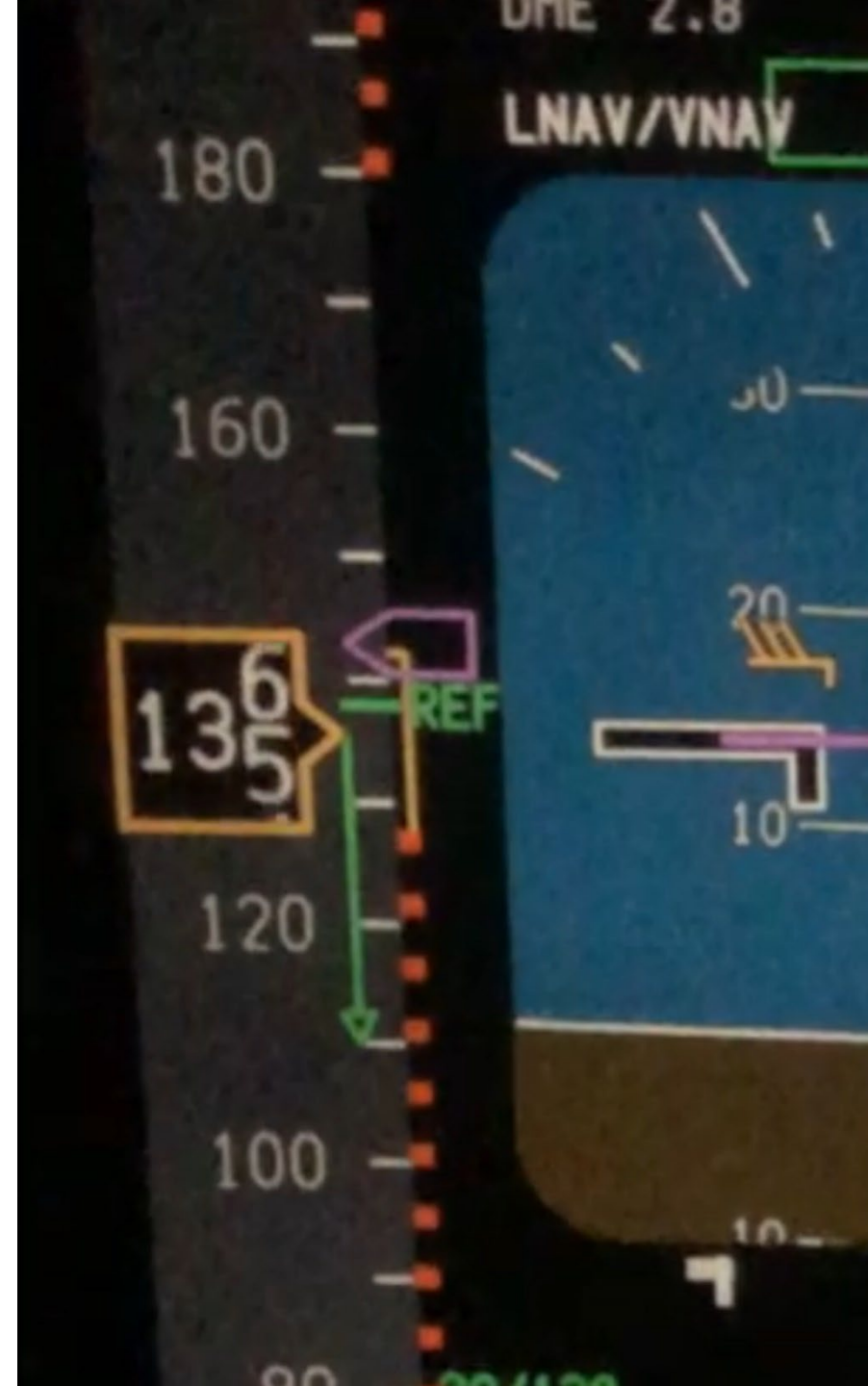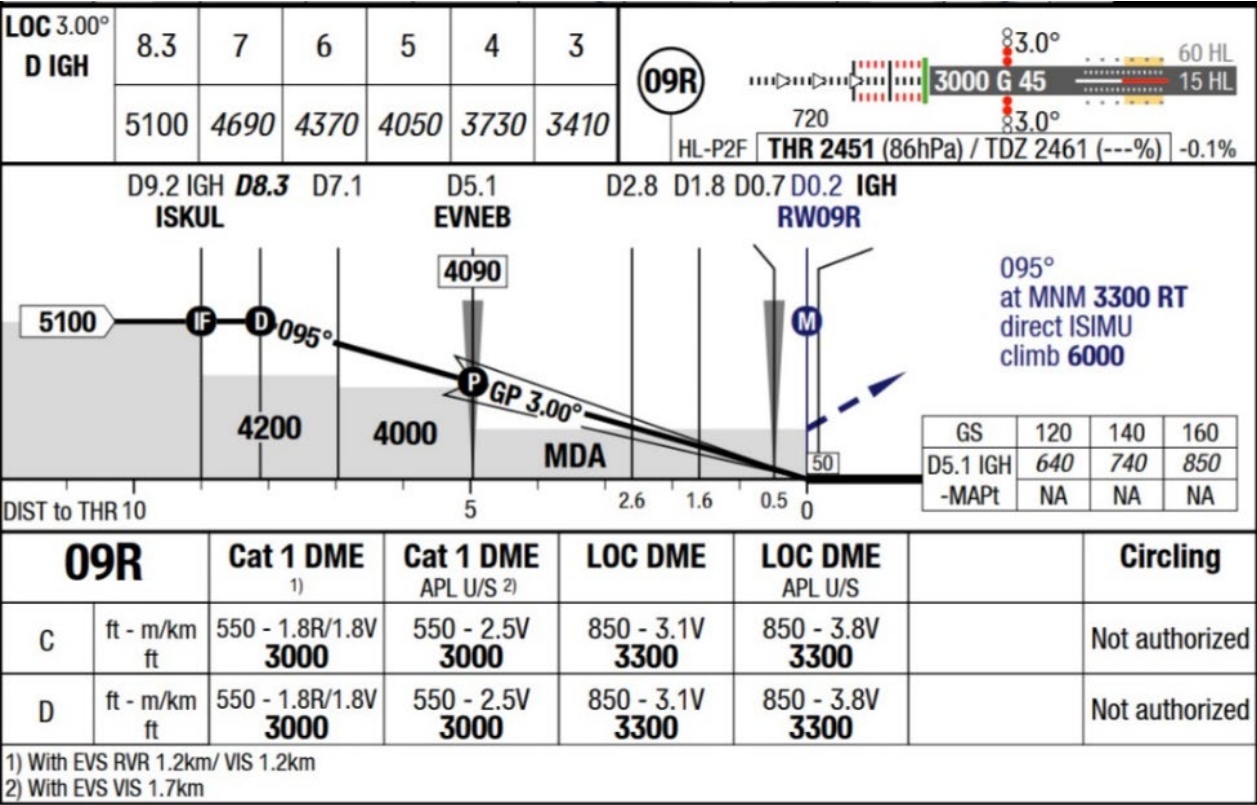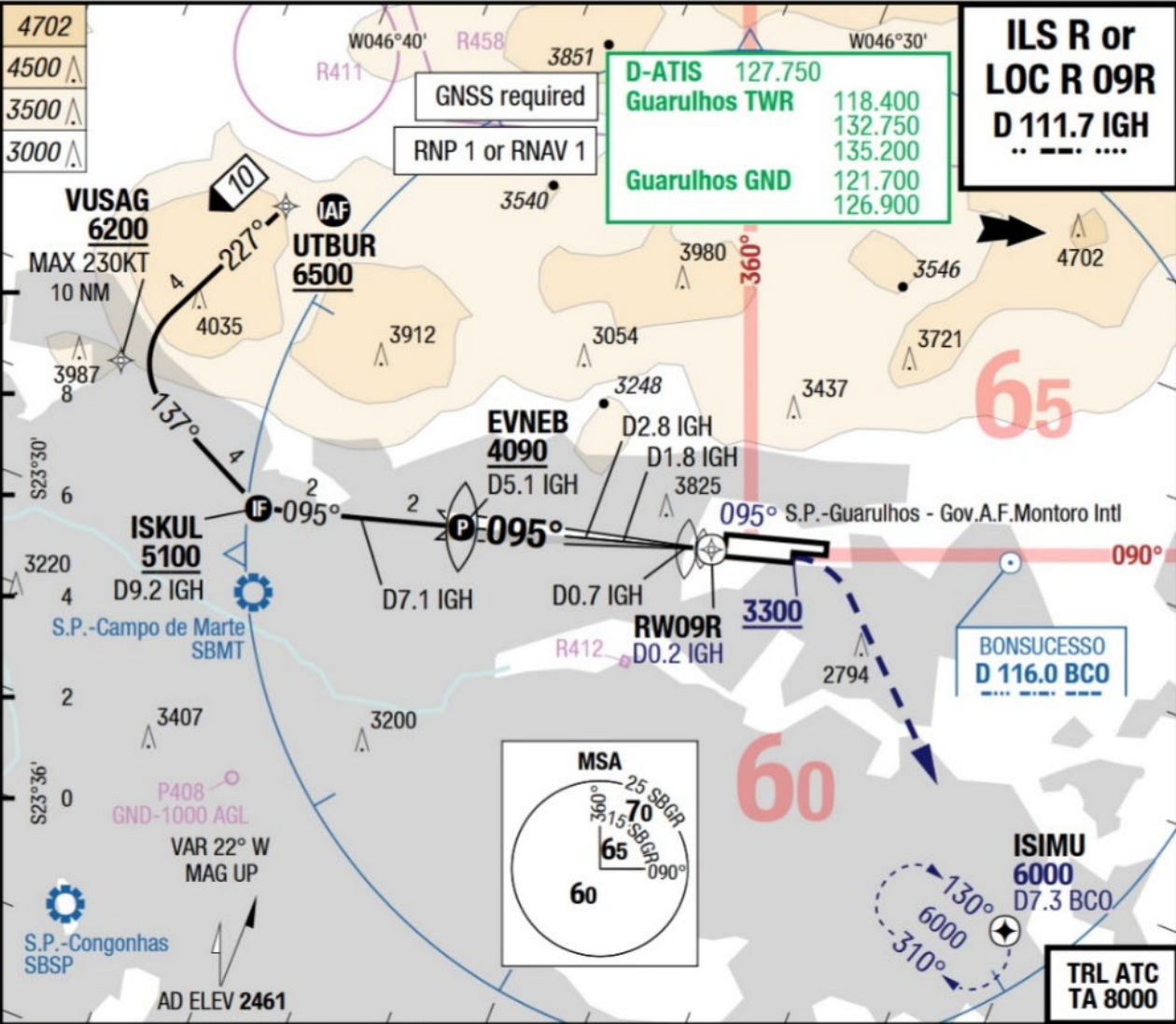
**ILS R or
LOC R 09R**
D 111.7 IGH
·· —·· ··· ····

D-ATIS 127.750
Guarulhos TWR 118.400
132.750
135.200
Guarulhos GND 121.700
126.900

GNSS required

RNP 1 or RNAV 1

4702
4500
3500
3000

W046°40'   R458
R411   3851
10
VUSAG
6200
MAX 230KT
10 NM
227°
4035
4
3987
8
137°
4
UTBUR
6500
3540
3912
3054
3248
3825
EVNEB
4090
D5.1 IGH
D2.8 IGH
D1.8 IGH
360°
3980
3546
4702
65
3437
3721

ISKUL
5100
D9.2 IGH
S.P.-Campo de Marte
SBMT
3220
4
2
IF 095°
D7.1 IGH
P 095°
D0.7 IGH
RW09R
D0.2 IGH
R412
3300
095° S.P.-Guarulhos - Gov.A.F.Montoro Intl
090°
BONSUCESSO
D 116.0 BCO
2794
60

3407
P408
GND-1000 AGL
VAR 22° W
MAG UP
S.P.-Congonhas
SBSP
AD ELEV 2461
3200

MSA
25 SBGR
360°
315° SBGR
70
65
60
090°

ISIMU
6000
D7.3 BCO
130°
6000
310°

TRL ATC
TA 8000

LOC 3.00° D IGH	8.3	7	6	5	4	3	09R
	5100	*4690*	*4370*	*4050*	*3730*	*3410*	720

3000 G 45   60 HL / 15 HL
8 3.0°
8 3.0°
HL-P2F **THR 2451** (86hPa) / **TDZ 2461** (---%) -0.1%

D9.2 IGH *D8.3* D7.1   D5.1   D2.8 D1.8 D0.7 D0.2 IGH
ISKUL   EVNEB   RW09R
4090
M
5100   IF D 095°   4200   4000   P GP 3.00°   MDA   50
095°
at MNM 3300 RT
direct ISIMU
climb 6000

DIST to THR 10   5   2.6 1.6 0.5 0

GS	120	140	160
D5.1 IGH	*640*	*740*	*850*
-MAPt	NA	NA	NA

09R	Cat 1 DME [1]	Cat 1 DME APL U/S [2]	LOC DME	LOC DME APL U/S	Circling
C	ft - m/km **ft**	550 - 1.8R/1.8V **3000**	550 - 2.5V **3000**	850 - 3.1V **3300**	850 - 3.8V **3300**	Not authorized
D	ft - m/km **ft**	550 - 1.8R/1.8V **3000**	550 - 2.5V **3000**	850 - 3.1V **3300**	850 - 3.8V **3300**	Not authorized

1) With EVS RVR 1.2km/ VIS 1.2km
2) With EVS VIS 1.7km

Changes: new

The approach

- In concert with ATC hdg 170 to stay clear of CB

- ATC: descent to 5000 ft, reduce to FAS

- Hdg 130 to intercept ILS

The approach (cont'd)

- Aircraft ends up (1) above the glideslope and (2) behind a slower Airbus A320 also on approach to 09R

- AC fully configured for landing, SPD BRK extended, closing in on the glideslope, thrust at idle

- FO disconnects AP, SPD BRK lever inadvertently not fully stowed

The go-around

- Crew anticipates a go-around, which is then instructed by ATC

- When pressing TO/GA switches: autothrottle disconnects

- PF pitches up, PM reconfiguring MCP altitude and flaps

The go-around (cont'd)

- S/O observes SPD BRAKE lever not fully down

- AIRSPEED LOW aural, followed by AT re-engaging in THR mode

- Remainder of GA is uneventful
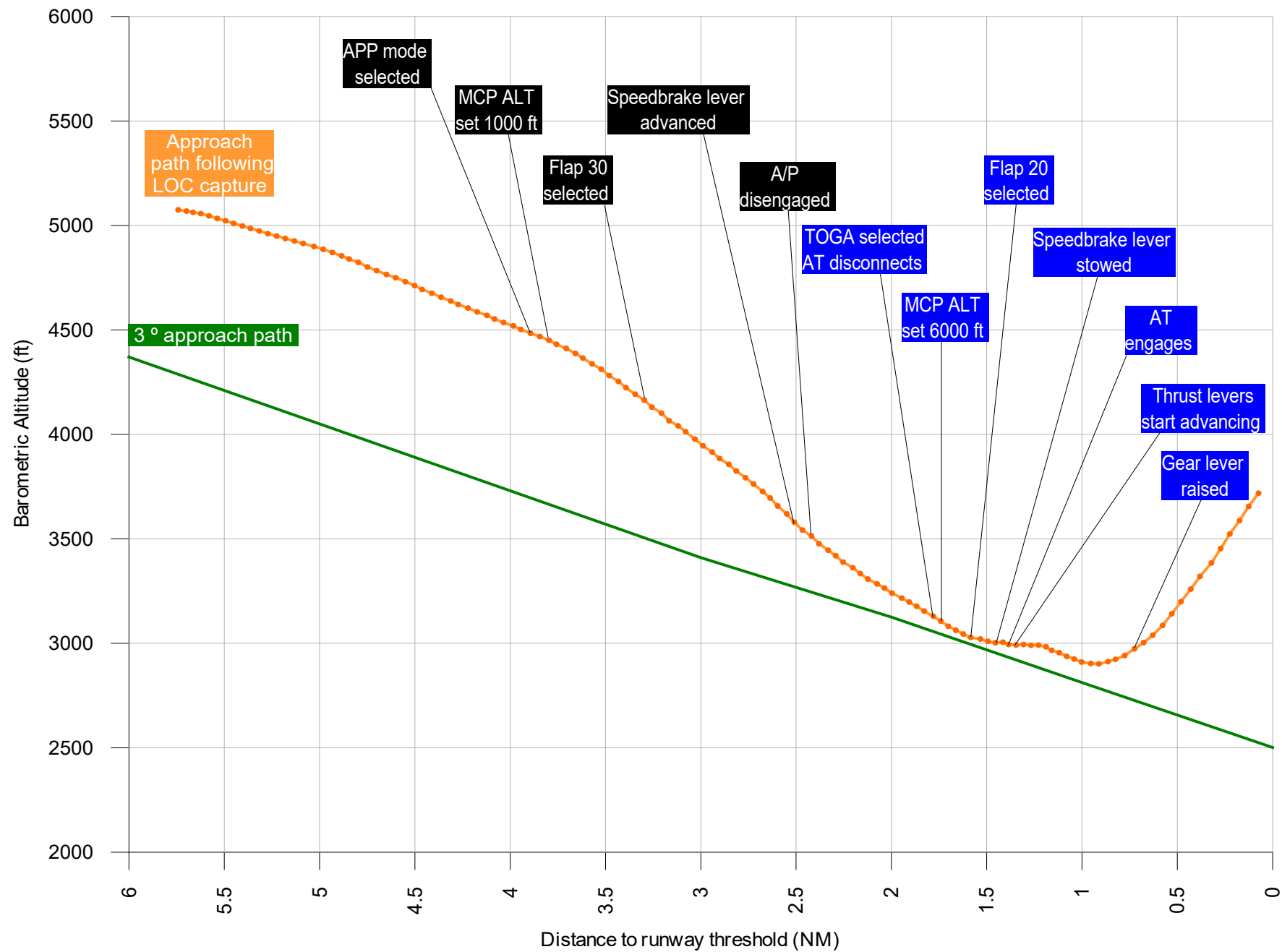
Investigation scope: the go-around

- During go-around the PM has a higher workload, which adversely affects the PM's monitoring role

- This is induced by the operating procedure.

- Go Around Training is mainly focused on the PF

- Better prepare crews to cope with real-world challenges which can be experienced during **all engine** go-arounds

Thank you

martin.nijhof@klm.com

SAFE360

MANAGING THE APPROACH PATH

VICTOR ZEWALD

LEAD FLIGHT OPERATIONS SAFETY CAPTAIN

EASYJET NETWORK

Fleet: Europe's largest Airbus A320 Family operator

Network: 160 destinations / 1200+ routes

CAT C Aerodromes: 10

OVERVIEW — MANAGING THE APPROACH PATH

EASYJET POLICIES ON APPROACH PATH MANAGEMENT

APPROACH INSTABILITY: COMMON CONTRIBUTORS

CHANGING BEHAVIOUR

easyJet

EASYJET POLICIES

- Stable Approach Policy

- Best use of Automation / Equipment

- Operating Instructions / Restrictions

easyJet

APPROACH INSTABILITY: COMMON CONTRIBUTORS

- Environmental conditions

- Operational environment

- <u>Human Factors</u>

➤ Underestimation of risk – *I can "fix" this*

➤ Anticipatory awareness – *VMC vs IMC*

➤ Cognitive lock-up & continuation bias – *Goal orientated*

➤ Social pressures- *First Officers may struggle to challenge Captains*

CHANGING BEHAVIOUR — MONITORING & INTERVENTION

- PM Training
  - Prompt
  - Direct
  - Intervene

easyJet

CHANGING BEHAVIOUR — EVENT MANAGEMENT

- Managing individual events
    - Pressing 'Pause'
    - Understanding Causal Factors
    - Application of Just Culture
    - Confident and Proficient return to line

YOU HAVE CONTROL!

PREVENTING MID-AIR COLLISIONS

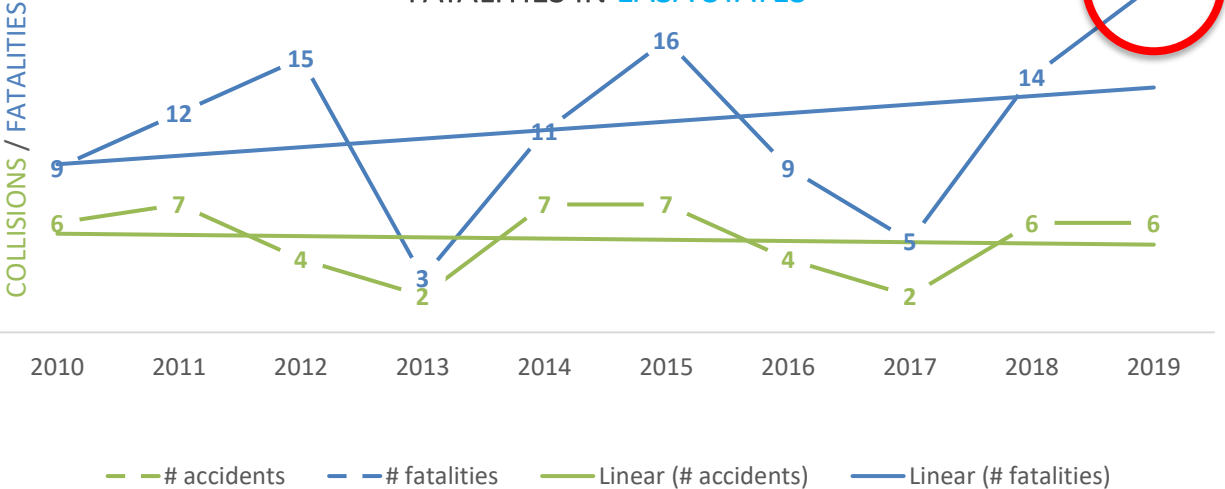SAFE 360° Discussion, 1 October 2025

Vladimír Foltín
GA Flightpath 2030+ Manager
¡*Conspicuity* Project Manager

Safety data 2009 - 2019

FATAL AIRBORNE COLLISIONS / AIRBORNE COLLISION FATALITIES IN EASA STATES

60 FATAL COLLISIONS ~ 6 PER YEAR

137 FATALITIES ~ 13 PER YEAR

ALL UNCONTROLLED TRAFFIC

ALL SMALL AIRCRAFT

Strategy 2025-2028

"Your safety is our mission"

SAFE
Maintain a safe, resilient aviation ecosystem

GLOBAL
Enhance global standards and interoperability

GREEN
Achieve net zero emissions in aviation by 2050

INNOVATIVE
Integrate innovative technologies

RESILIENT
Equip EASA for the next decade

EASA

Safety Risk Management
Efficient SRM process that develops mitigations for the top safety issues through EPAS (focus on safety).

Risk Based Oversight
DOA mechanism designed & endorsed. Principles for other organisations harmonised. Maturity model for NCAs.

ATM & Aerodromes
Certification and oversight of ATM DPO, ATM/ADR ground equipment.

Implement SMS & ISMS across Industry
Full integration into organisation oversight & standardisation. Competence building for NCA/EASA.

Flightpath 2030+
Deliver Programme Objectives related to e-conspicuity and prevention of mid-air collision.

SAFE

Maintain a safe, resilient aviation ecosystem

Ensure that European safety and oversight standards effectively mitigate all risks affecting safety.

Approve safe products that perform as expected in the system as part of a competitive industry.
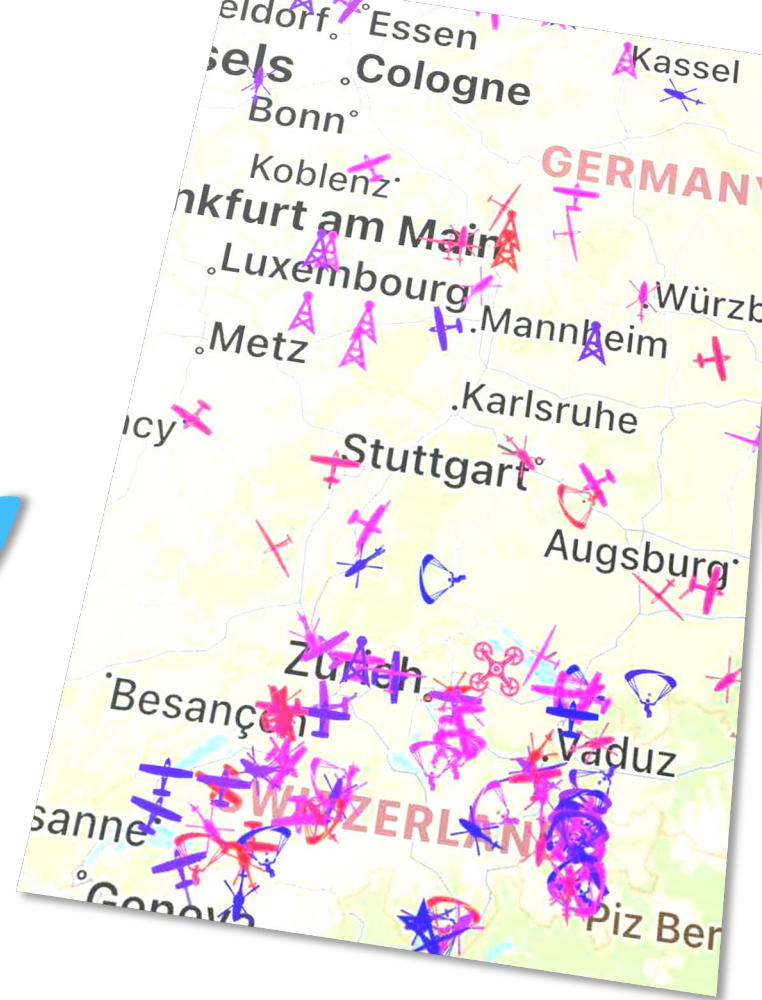
Promote a human-centered approach to maintaining safety.

EPAS – ¡Conspicuity

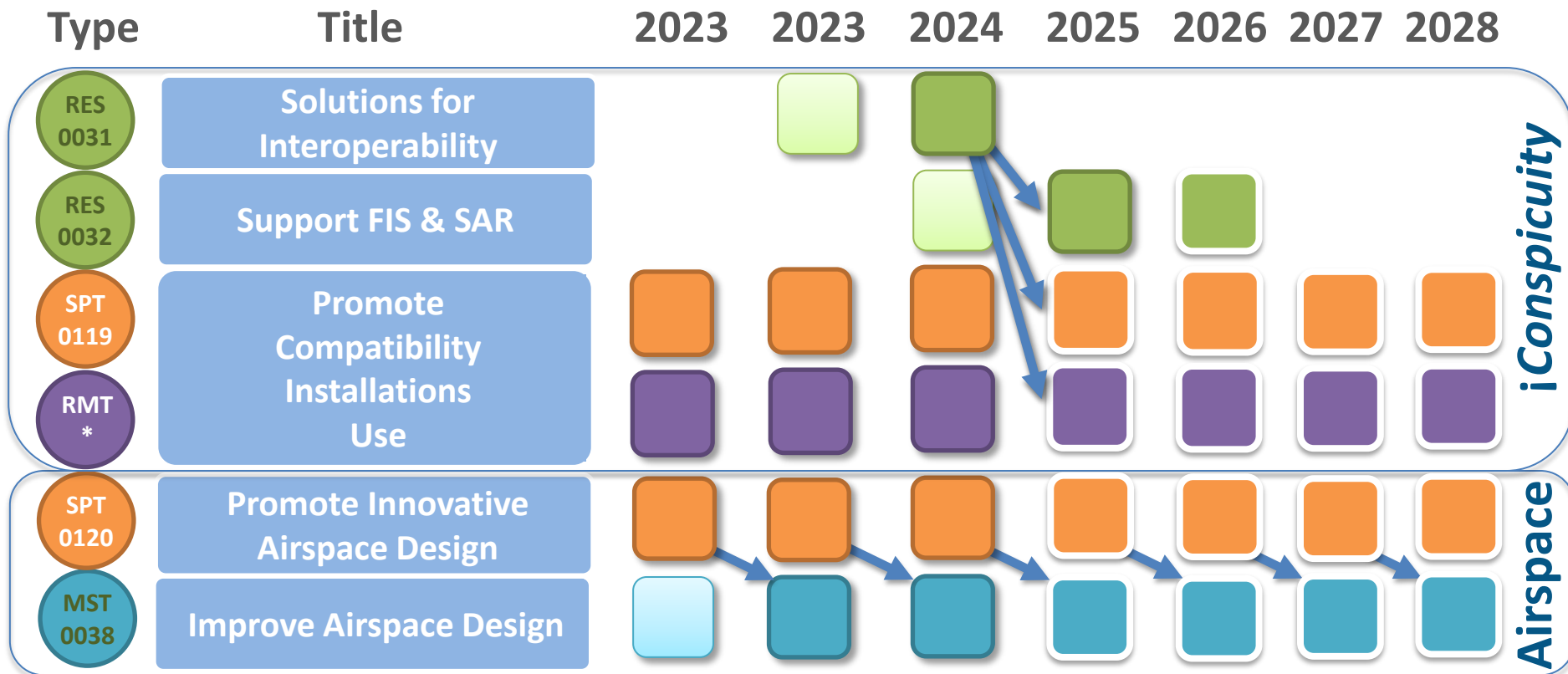| Type	Title	2023	2023	2024	2025	2026	2027	2028

*RMT.0690 (CS-STAN), RMT.0230 (U-space), RMT.0519 (CS-ACNS)

SERA.6005 (c)

Manned aircraft operating in airspace designated by the competent authority as a **U-space airspace**, and not provided with an air traffic control service by the ANSP, shall continuously make themselves **electronically conspicuous to** the **U-space service providers**

One Language ✓ (light)

ADS-L

Affordable
Interoperable
GNSS based
Privacy & Security

To be seen in U-space - SERA.6005(c)

ADS-B Out (1090 MHz)

For certified aircraft, using the **existing certified technology** already installed on board

AVAILABLE NOW

ADS-L 4 SRD-860

Non-certified devices transmitting at low power on the licence-free band SRD-860, in compliance with ADS-L specifications

AVAILABLE NOW

ADS-L 4 MOBILE (telephony)

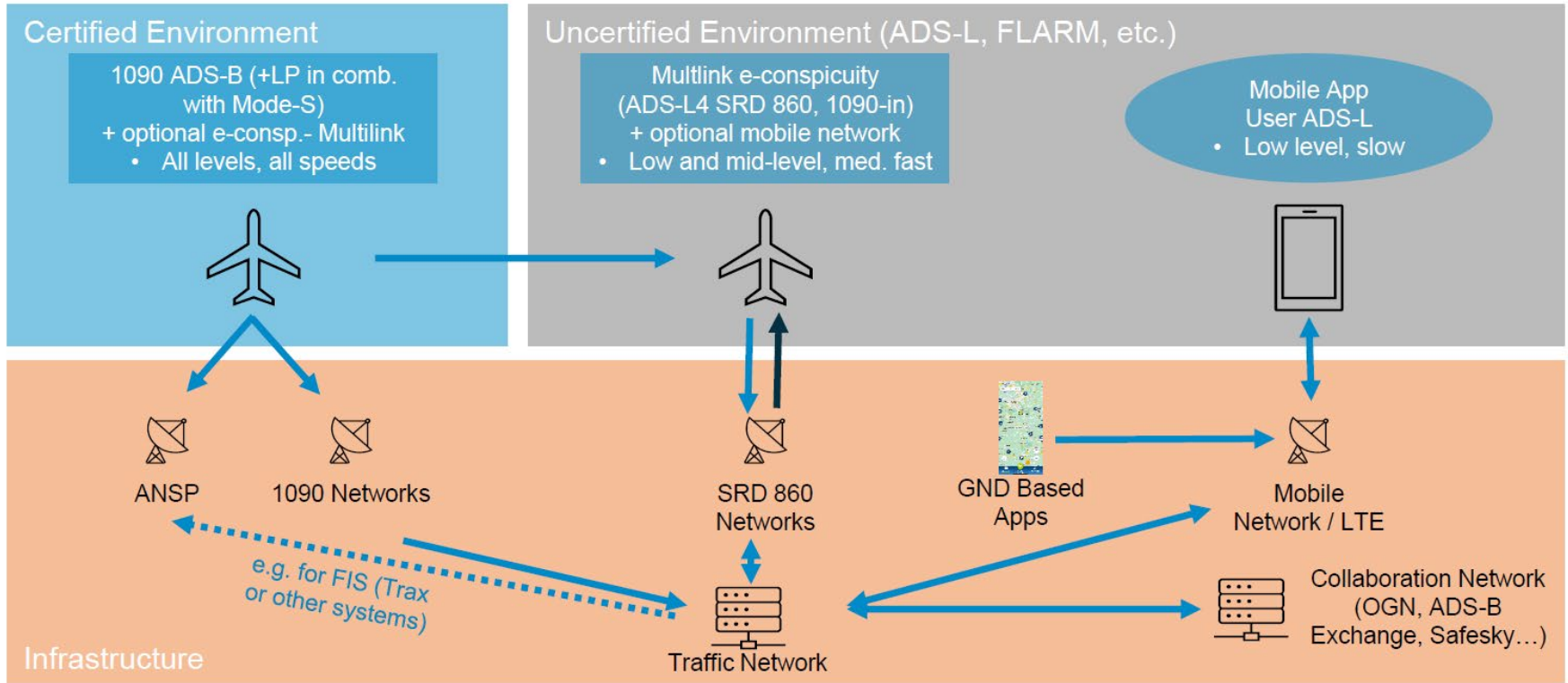**Mobile telephony application** transmitting in compliance with ADS-L specifications

WORK IN PROGRESS

2022

2026
(draft)

Future ¡*Conspicuity* according to RES.0031*

Advice from Sunny Swift

¡Conspicuity Declaration

Introduction

This ¡Conspicuity[1] Declaration is a voluntary policy statement, jointly established by participating aviation authorities and other entities[2], specifically adressed to the **General Aviation (GA)** sector. Its primary objective is to facilitate and encourage the use of ¡Conspicuity devices and data (including ADS-B out[3], ADS-L[4], surveillance data, and similar information) by all stakeholders with the shared aim of improving operational safety and enhancing safety culture in GA[5].

The adoption of this ¡Conspicuity Declaration does not affect the application of Regulation (EU) No 376/2014 regarding the reporting, analysis and follow-up of occurrences in civil aviation and any other applicable European Union or national legislation[6].

Commitment

By adopting this ¡Conspicuity Declaration we, the signatories, express our commitment to foster the developpement of ¡Conspicuity devices and their use and utilisation of related data with the intention of improving aviation safety, fostering innovation and enhancing operational efficiency through collaborative analysis. We pledge to adhere to the following:

Key Principles:

1. **Promoting Safety Culture:** The initiative aims to facilitate and promote safety culture in GA in order to foster positive safety behaviours.

2. **Voluntary nature:** The initiative is a partnership that signatories join on a voluntary basis.

3. **System-wide insights:** Analysis of ¡Conspicuity data will focus on system-wide insights (big data approach) rather than the actions of specific situations. This encourages broad participation and fosters a safe aviation environment.

4. **360-Degree Collaboration:** All relevant stakeholders will be involved in the analysis of ¡Conspicuity data, ensuring a holistic and trusted approach to safety and operational improvements[7]. The collaborative analysis will lead to **jointly agreed actions** that will benefit all participants.

5. **Transparent Monitoring:** The process for analyzing and acting upon ¡Conspicuity data must be transparent, allowing all stakeholders to track progress and ensure alignment with safety improvement goals.

6. **Data protection:** The use of data and information derived from the initiative will comply with the EU's General Data Protection Regulation[8] (GDPR), which governs how the personal data of individuals in the EU can be processed and transferred.

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[1] ¡Conspicuity webpage
[2] Associations representing airspace users and relevant industry
[3] ADS-B stands for Automatic Dependent Surveillance–Broadcast. It's a technology that enables aircraft to broadcast their position, speed, and other data to other aircraft and ground stations, enhancing situational awareness and safety. ADS-B comes in two main types: ADS-B Out and ADS-B In.
[4] ADS-L is a lighter version (subset) of the ADS-B message content, originally developed to make manned aircraft electronically conspicuous when operating in U-space airspace.
[5] European Plan for Aviaton Safety, Volume II., 2024 Edition, task MST.0027 - Promotion of safety culture in GA
[6] Manned aircraft are not required to be electronically conspicuous, except when operating as uncontrolled traffic in U-space airspace
[7] This can serve as preparation for future inclusion in the Data4Safety programme.
[8] Regulation (EU) 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data.

NAAs supporting ¡*Conspicuity* Declaration

EASA

Netherlands

Czech Republic

Republic of North Macedonia

France

Romania

Greece

Slovenia

Latvia

Spain

Lithuania

Switzerland

EASA

Use Cases

Reduce collisions

and other airborne hazards by **enhancing situational awareness** of their surroundings

Access U-space

through **affordable and interoperable electronic conspicuity** for manned aircraft operating without ATC services

Additional benefits*

Complement FIS and SAR without requiring changes to existing ATM/ANS principles and/or operational practices
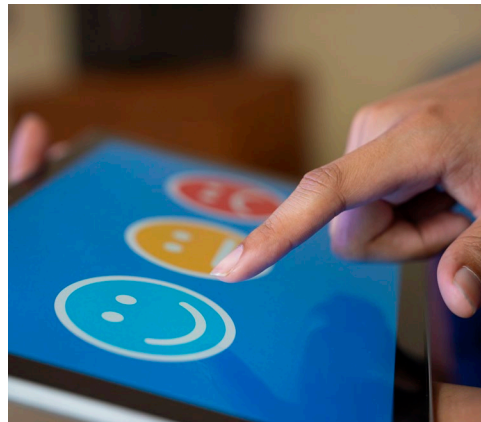

* Subject to further research

Approach

Consider

Key criteria

U-space **mandate**
Voluntary elsewhere
Different needs (IFR vs glider)
Dual use cases (e.g. ADS-B for ATC and U-space)

Communicate

Throughout the process

A **clear strategy and communication** campaign to get stakeholders to implement the right solutions

Address

Use Cases

Pilots' **situational awareness**, Europe-wide at all altitudes

U-space conspicuity, initially geographically limited & low altitude

Assess

Candidate technologies

'One link' based on a **comparison of options** considering **assessment of** ground-based **operations and** the **business case for all users** (airborne and on the ground)   .

EASA   EUROCONTROL

Timeline & Implementation Milestones

Q1 2025

'One language' proposal considering previous and ongoing developments

2025

Comparative assessment of options

2026

Consolidation of 'one link' proposal including transitional arrangements

2027+

Community awareness and endorsement of the concept

EASA   EUROCONTROL

Before 2020

Non-interoperable or private solutions available for GA, no solutions for drones, ¡*Conspicuity* concept developed by EASA

2020-2023

EASA teamed up with industry in development of ADS-L as a solution for GA in U-space airspace

2024-2027

Interoperable (ADS-L) protocol developed tested for air-to-air, U-space and selected ATM use cases. Required spectrum needs finalised.

2028 onwards

Any pilot or operator can choose an interoperable and affordable solution to benefit from enhanced situational awareness in any airspace.

Safety

Number of fatal collisions and related fatalities
EASA MS - 2009 - 2024
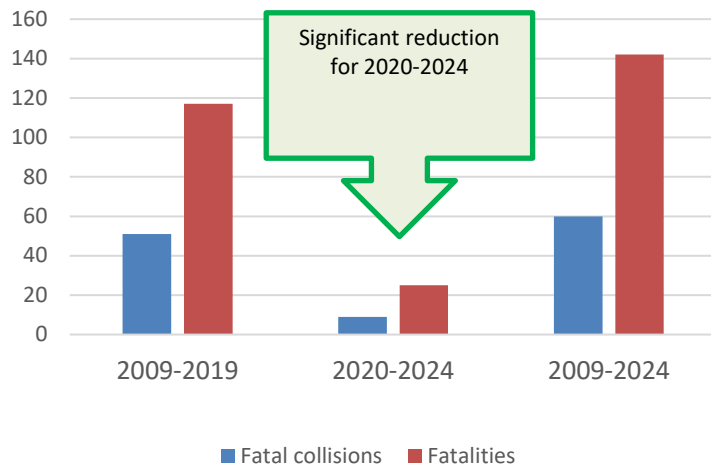
Annual fatal collisions average and average
collision fatalities, EASA MS - 2009 - 2024
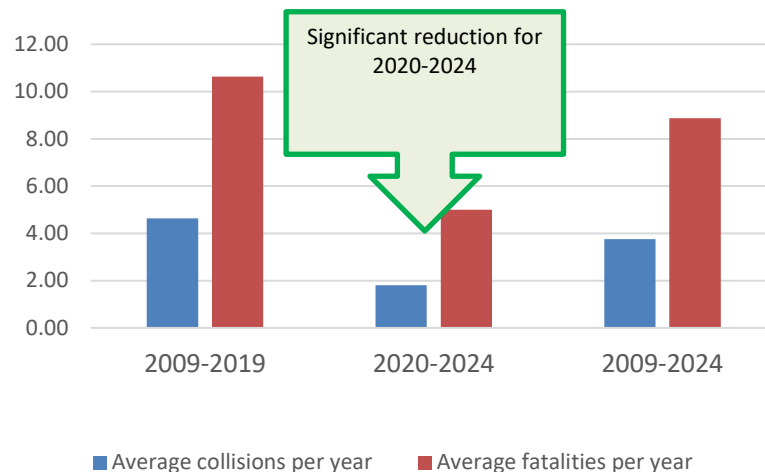
Next in 2024 – ¡*Conspicuity* for FIS and SAR

RES.0032	Use of iConspicuity devices/systems in flight information services

EASA will investigate the use of iConspicuity devices/systems in air traffic management flight information services (ATM FIS), considering the 'net safety benefit' and the 'operational safety assessment' principles for the assessment of implementation issues and of possible benefits for Search and Rescue (SAR).

Status	Not started
SIs	SI-0043 Deconfliction of IFR and VFR traffic
SRs	n/a
Reference(s)	European Action Plan for Airspace Infringement Risk Reduction (EAPAIRR)
	EASA BIS 'Airborne Collision Risk'
Dependencies	RES.0031
Affected stakeholders	Pilots, Aircraft operators - all, NCAs, ANSPs, industry (e.g. avionics and ATM systems manufacturers)
Owner	EASA ED.4 Air Traffic Department

PLANNING MILESTONES		
Starting date	**Interim report**	**Final report**
2024-Q4	2025-Q1 → 2026-Q1	2025-Q2 → 2026-Q2

FIS enhancement

Improve the quality and safety of existing FIS by providing enhanced situational awareness for the FIS Officers or ATCOs (to similar level of information as is available to pilots) without the need to change existing rules, procedures or operational practices.

A few ANSPs are already engaged in this topic.

SAR enhancement

To help SAR teams distinguish between real and false alarms and minimize search times, e.g. through a single web portal that provides real-time and historical positions of aircraft and other aircraft such as gliders, paragliders and hang-gliders.

Pilot project in preparation (led by FOCA).

And what about Digital Towers or Airside / Runway Safety?
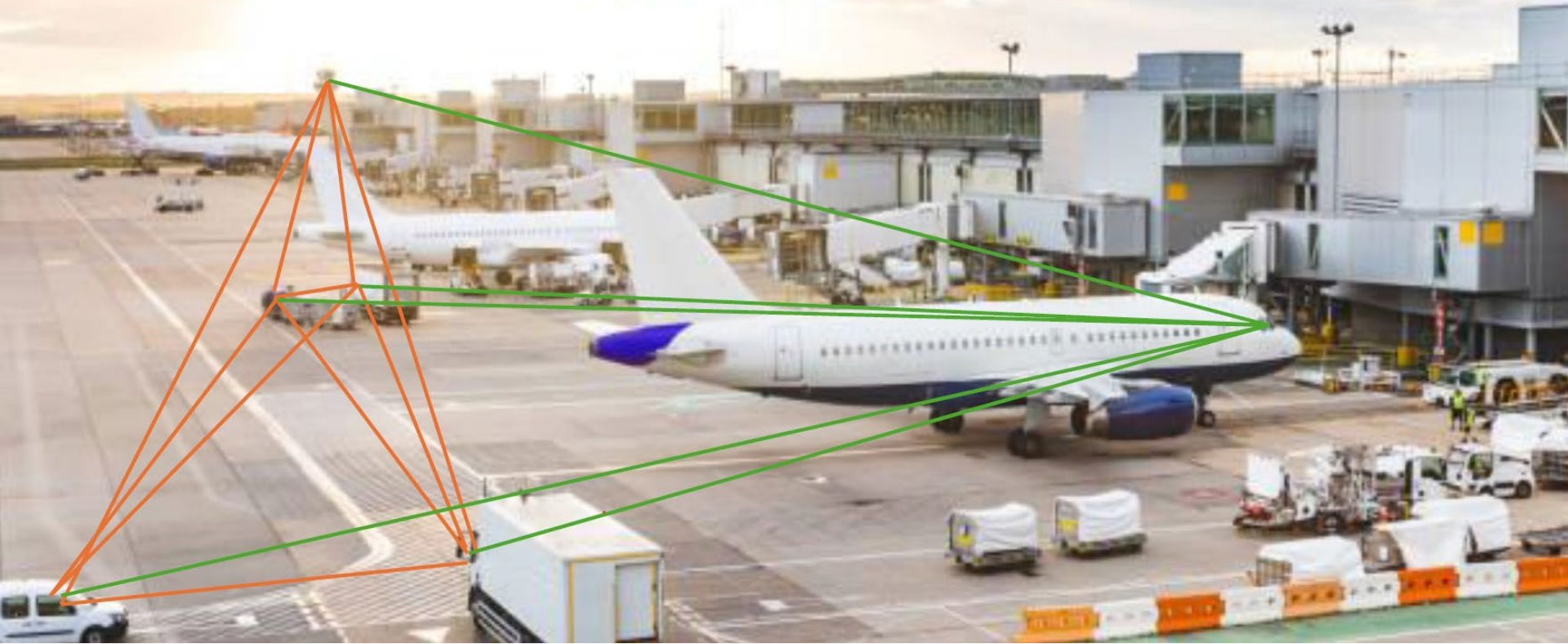
What is RES.0032 ?

→ Desktop research

→ Industry led (ANSPs, OEMs, associations)

→ Explore how electronic conspicuity could help to enhance situational awareness in ATM

→ Without changing existing rules or operational practices

→ EASA role is to coordinate research activities and assist in drafting research objectives

Expected Deliverables*

Use Cases

List and description of use cases where electronic conspicuity could help to improve situational awareness in ATM operations

Information Items

List of mandatory and optional information to be transmitted from aircraft in relation to a specific ATM use case

Regulatory clarifications

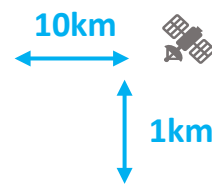List of areas for further development/clarification by regulators to support the use of electronic conspicuity in ATM
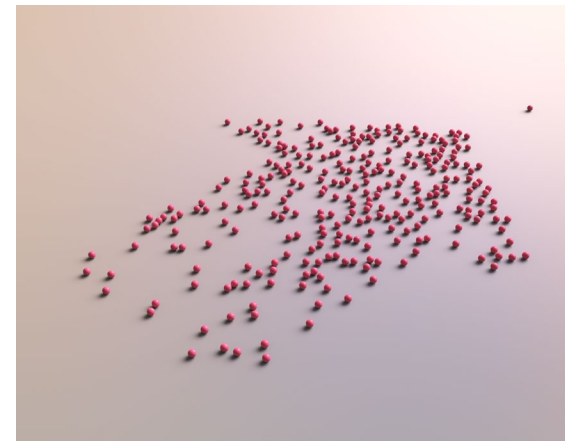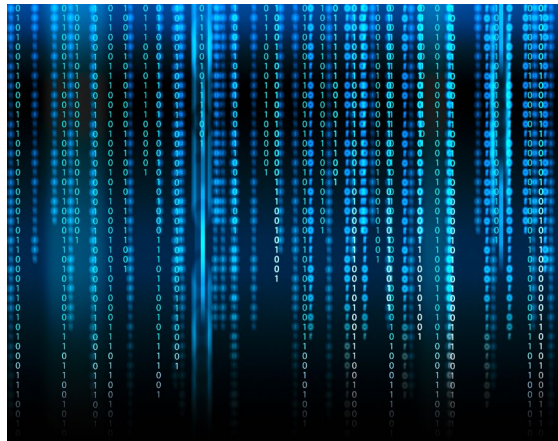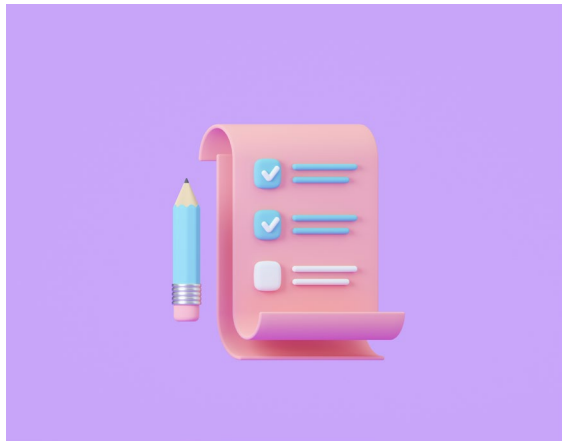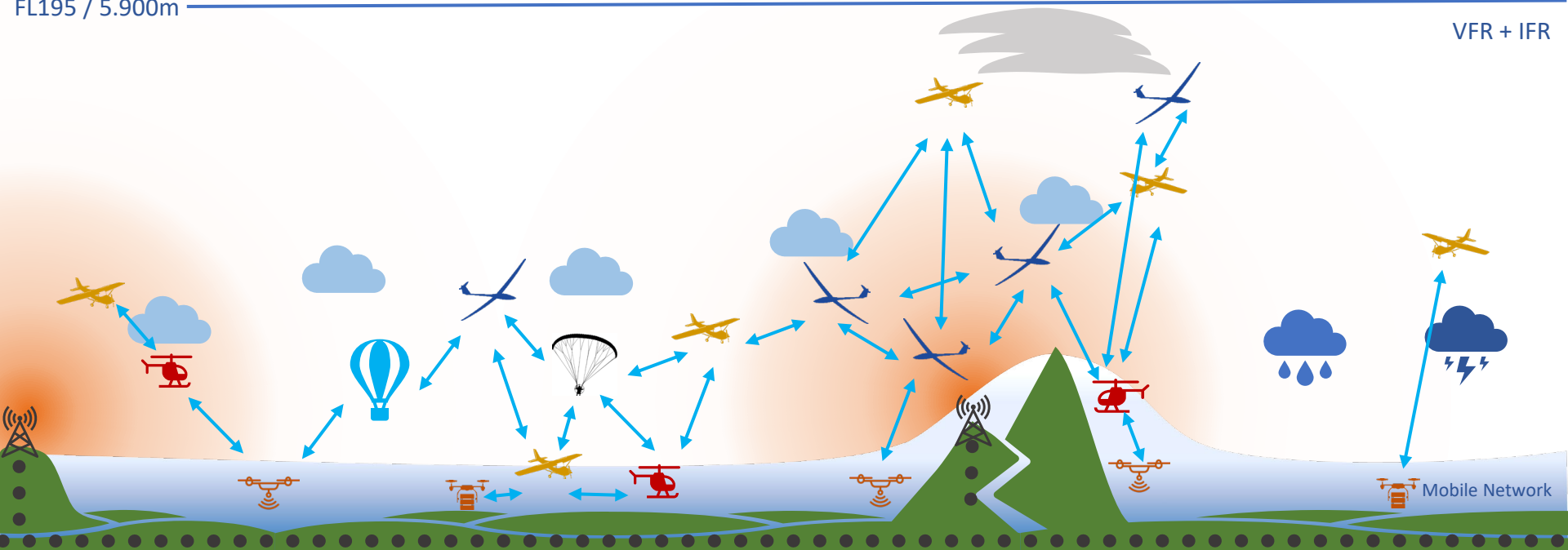
EASA station

ADS-L for General Aviation and Drones

10km

1km

IFR

FL195 / 5.900m

VFR + IFR

Mobile Network

Preventing Mid-Air Collision
Managing the Risk from an Airline Perspective

Preventing Mid-Air Collision
Contents

- Limitations of "see and avoid" in the 20th century
- Airspace Status Quo
- Legal Framework
- Fact-Based Analysis
- Fact-Based Threat and Error Management
- Summary

RYANAIR

Limitations of "see and avoid" in the 20th century

MAC Risk in Europe

EAPAIRR (2009)

- " 'See and avoid' is seen as a potentially weak barrier in an IFR-VFR flight encounter and the need to strengthen the other barriers… is further reinforced"

EASA (2013)

- Develop actions/processes to measure effectiveness of Member State preventative measures

European Aviation Safety Plan '14 -'17 (#2 Risk)

- 15 Member States, Only 15% Initiatives Implemented

EASA Vector (2014)

- ATM & Aerodromes will incorporate MAC mitigation requirements

RYANAIR

Limitations of "see and avoid" in the 20th century

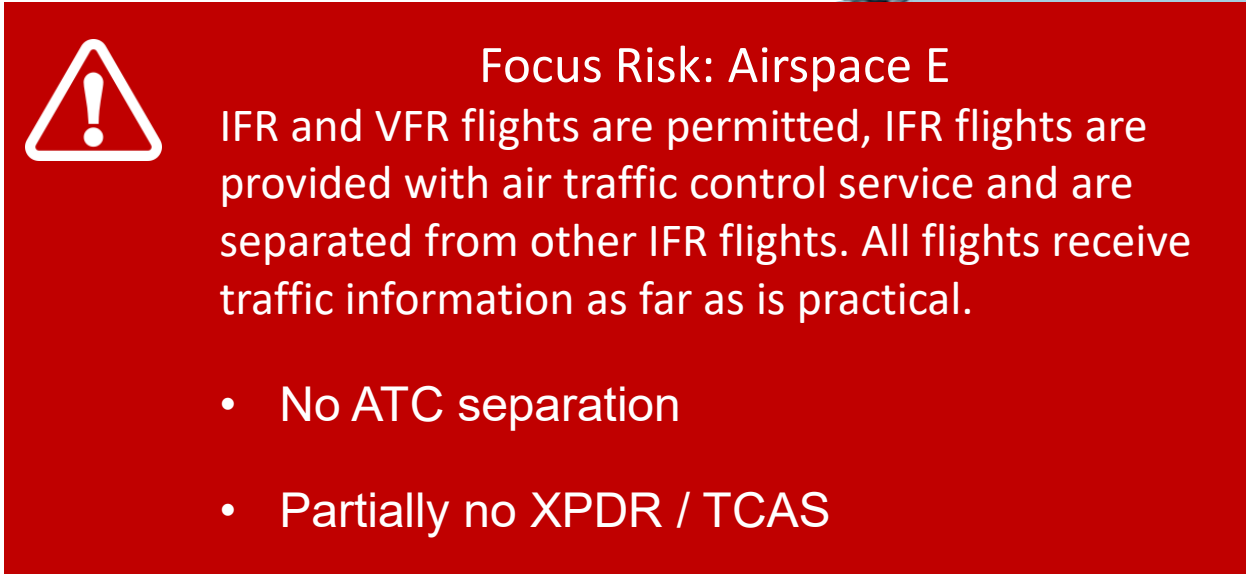| Distance	Time to Impact	Detection System	Visual Reference

Preventing Mid-Air Collision
Airspace Status Quo

Focus Risk: Airspace E

IFR and VFR flights are permitted, IFR flights are provided with air traffic control service and are separated from other IFR flights. All flights receive traffic information as far as is practical.

- No ATC separation

- Partially no XPDR / TCAS

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ICAO International Standards

Annex 2 to the Convention on International Civil Aviation

Rules of the Air

Eleventh Edition, July 2024

3.2.5   Operation on and in the vicinity of an aerodrome
An aircraft operated on or in the vicinity of an aerodrome shall, whether or not within an aerodrome traffic zone:
a) observe other aerodrome traffic for the purpose of avoiding collision;
b) conform with or avoid the pattern of traffic formed by other aircraft in operation;
(...)

3.2.2 Right-of-way
3.2.2.5 Landing
3.2.2.5.1

An aircraft in flight, or operating on the ground or water, shall give way to aircraft landing or in the final stages of an approach to land.

SERA.13001 Operation of an SSR transponder

(a) When an aircraft carries a serviceable SSR transponder, the pilot shall operate the transponder at all times during flight, regardless of whether the aircraft is within or outside airspace where SSR is used for ATS purposes.

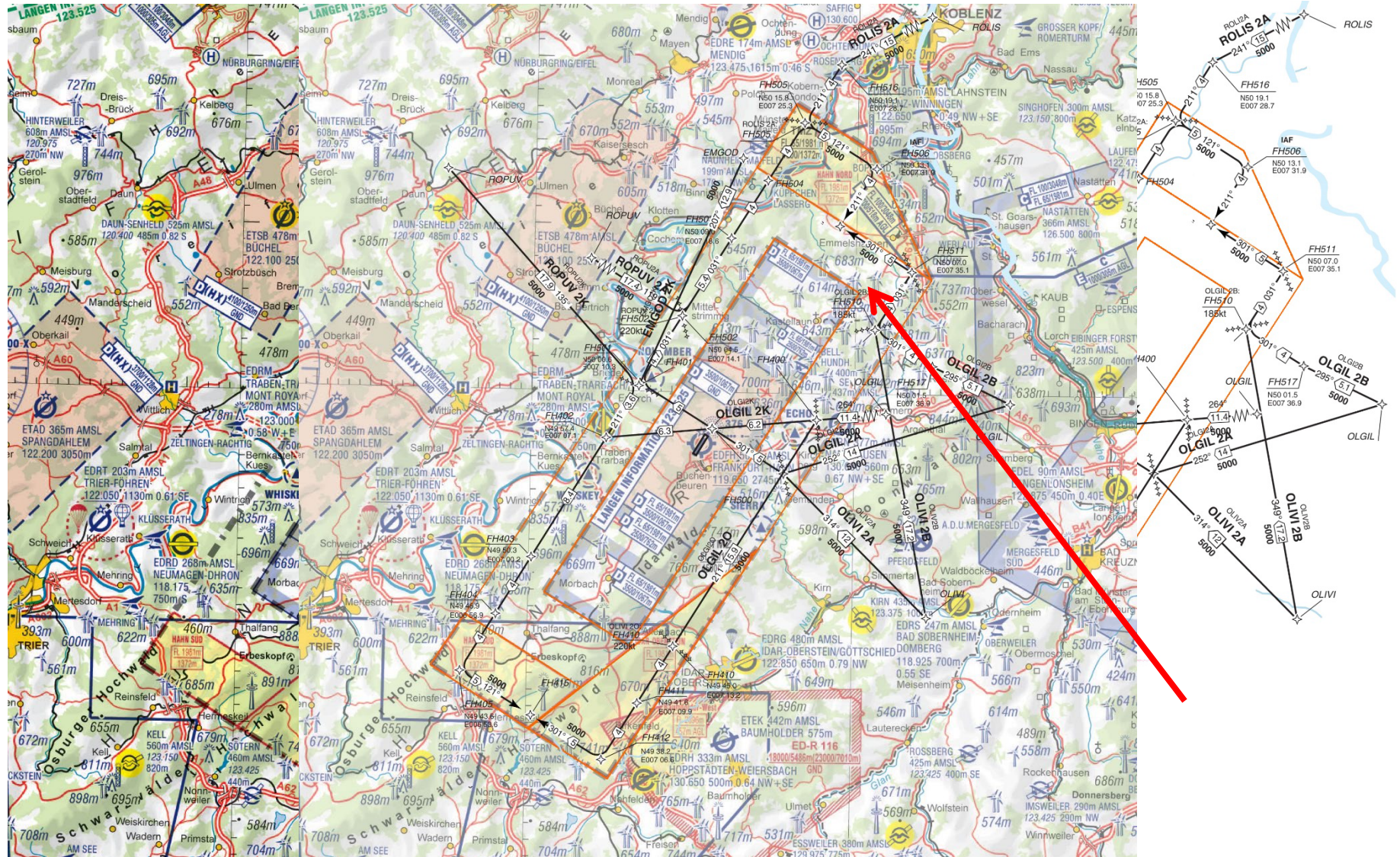# HHN Safety Alert Initial Reports

Significant event:

During approach with capt as PF using automatics between Olivi and FH510, with no shortcuts requested, First officer reported seeing glider at very close proximity moving from left to right under right wing. Distance estimated vertical 100 ft horizontal below 100m with FO able to see colour hair of glider pilot. No TCAS contact, informed ATC
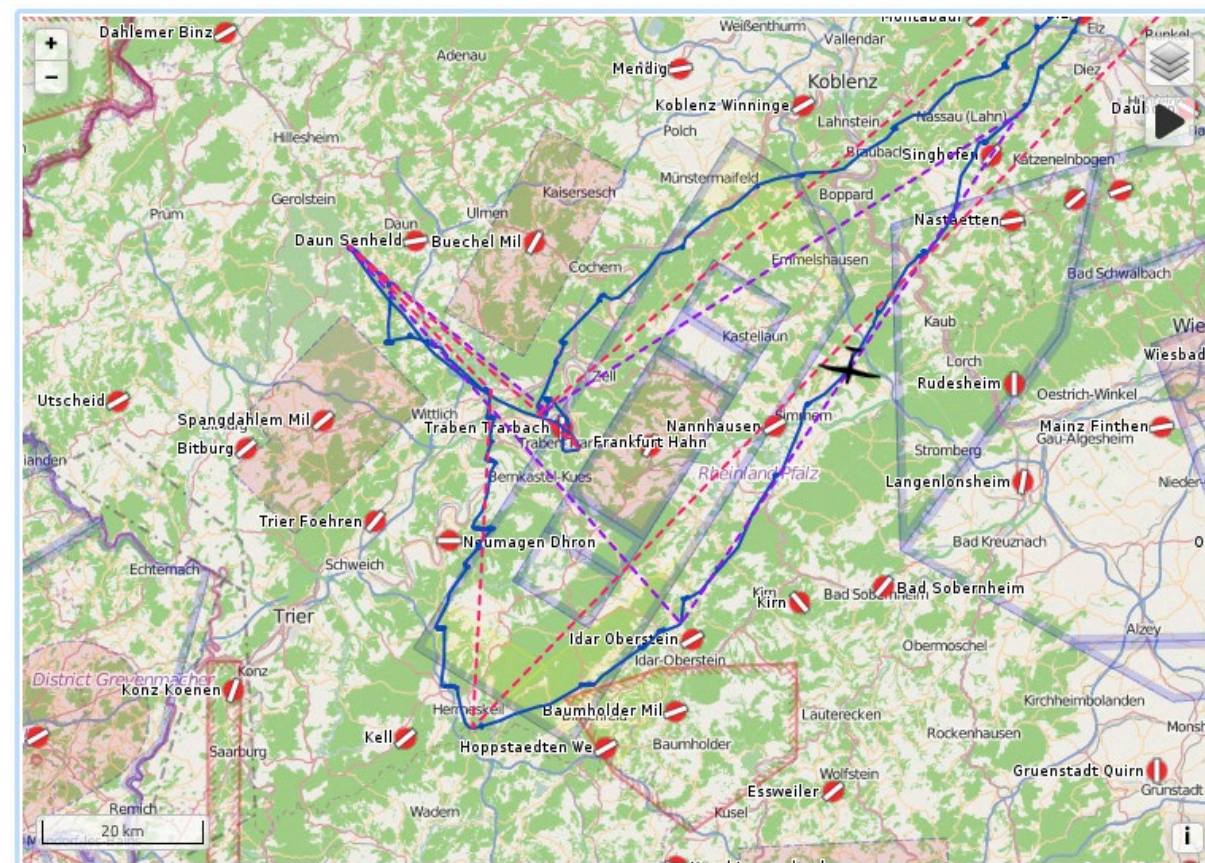
RYANAIR

Preventing Mid-Air Collision
Fact-Based Analysis

Airline KPI: Safe, efficient & punctual

ANSP KPI: Safe, orderly & efficient

Preventing Mid-Air Collision
Fact-Based Analysis

Fact-Based Threat and Error Management

8.3.1 **VFR/IFR Policy**

CAT.OP.MPA.100

All flights shall be operated in accordance with Instrum
plan shall be submitted prior to operating. Air Traffic Se
to the airspace and the applicable rules of the air sha
whenever available. In-flight operational instructions i
ATS flight plan, when practicable, shall be coordinated
unit before transmission to an aircraft.

Commanders sh
a flight.

Aircraft operati
e.g. a visual app
duration of suc
is the responsib
runway to cond

OPERATIONS MANUAL PART A

The NPFO may approve
is typically a departure f
to be flown VFR before
authorized because th
unserviceable.

Clearances to maintain '
Commander for limited
following conditions:

• Relevant traffic can be

• It is assured that suffic

• VMC can be maintained.

• ATC has coordinated the clearance with both aircraft.

TCAS RA/Level Bust Avoidance (RYR)

When within 1000 feet of the cleared altitude there should be no distractions in the flight deck and the ALT ACQ closely monitored by the PF.

Maximum use of the AFDS shall be made in busy TMAs and class D and lower airspace. This is to assist situational awareness and allow an effective outlook.

ICAO guidance for ACAS training for pilots states: "If an RA manoeuvre is inconsistent with the current ATC clearance, pilots shall follow the RA." It follows that pilots are required to level off at previously assigned altitudes/flight levels if doing so does not conflict with the Vertical Speed RA. There is an industry wide recognition that poorly handled Vertical Speed RA's have developed into unnecessary or erroneous level busts.

• At 3000ft to level off if ROD exceeds 3000ft per min, reduce to a maximum of 3000ft per min.
• At 2000ft to level off if ROD exceeds 2000ft per min, reduce to a maximum of 2000ft per min.
• At 1000ft to level off if ROD exceeds 1000ft per min, reduce to a maximum of 1000ft per min.

When flights are conducted within class F and G airspace crews shall refer to the 'Air Traffic Services Outside Controlled Airspace' in the FSB (Flight Supplement Booklet, OMC), Communication > Area > ATSOCAS (1-1) and request the highest service available.

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Fact-Based Threat and Error Management

EASA — European Union Aviation Safety Agency

EUROPEAN PLAN FOR **AVIATION SAFETY** (EPAS)

2025 Edition

European Union Aviation Safety Agency

RYANAIR

MST.0038 — **Airspace complexity and traffic congestion**

Member States should consider 'airspace complexity' and 'traffic congestion' as safety-relevant changes affecting uncontrolled traffic, including the changes along international borders.

Status	Ongoing
SIs	SI-2025 - Airspace infringement SI-4009 - Deconfliction between IFR and VFR traffic SI-4010 - Airborne separation
SRs	n/a
Reference(s)	European Action Plan for Airspace Infringement Risk Reduction (EAPAIRR) BIS 'Airborne collision risk'
Dependencies	SPT.0120
Affected stakeholders	Pilots, aircraft operators - all, NCAs, ANSPs
Owner	Member States

EXPECTED OUTPUT	
Deliverable(s)	Time
Produce Best practices (task MST.0038)	2025
Provide feedback on implementation of MST.0038	2025

SPT.0120 — **Promoting good practices in airspace design**

Promote good practices in airspace design that reduce 'airspace complexity' and 'traffic congestion' with reducing the risk of airborne collisions involving uncontrolled traffic.

Status	Ongoing
SIs	SI-2025 - Airspace infringement SI-4009 - Deconfliction between IFR and VFR traffic SI-4010 - Airborne separation
SRs	n/a
Reference(s)	European Action Plan for Airspace Infringement Risk Reduction (EAPAIRR) BIS 'Airborne collision risk'
Dependencies	MST.0038
Affected stakeholders	Pilots, aircraft operators, NCAs, ANSPs, industry (e.g. avionics manufacturers)
Strategic level	Standard
Strategic priority	
Owner	SM.1 - Safety Intelligence & Performance department

EXPECTED OUTPUT	
Deliverable(s)	Timeline
Produce Safety promotion material (task SPT.0120)	2025

SPT.0119 — **Promoting iConspicuity**

The concept of iConspicuity has to be understood as the 'in-flight capability' to transmit position and/or to receive, process and display information about other aircraft, airspace, weather or support navigation in real time with the objective of enhancing pilots' situational awareness.

The objective of this task is to:

- facilitate the installation of iConspicuity devices in all aircraft that have been granted with an EASA TC;
- promote their use by airspace users at an affordable cost for them;
- support the initiatives that enhance the interoperability and performance of iConspicuity devices/systems, and take into consideration the spectrum congestion.

Status	Ongoing
SIs	SI-4009 - Deconfliction between IFR and VFR traffic SI-4010 - Airborne separation SI-8028 - Inadequate airborne separation under VFR operation
SRs	AUST-2008-002 AUST-2016-001 AUST-2016-002 AUST-2016-003 AUST-2016-004 FRAN-2015-057 FRAN-2016-100 IRLD-2014-017 NETH-2018-003 SWTZ-2016-002
Reference(s)	BIS 'Airborne collision risk'
Dependencies	RES.0031 RES.0032 RMT.0230
Affected stakeholders	Pilots, aircraft operators, NCAs, ANSPs, industry (e.g. avionics manufacturers)
Strategic level	Standard
Strategic priority	
Owner	SM.1 - Safety Intelligence & Performance department

EXPECTED OUTPUT	
Deliverable(s)	Timeline
Produce Safety promotion material (task SPT.0119)	2025

Effective and global requirements

- *Standard framework for 20th century practicability*

- *ICAO / SERA conformability*

- *"Known Airspace" concept & respective interpretation*

- *Airspace design reflecting ICAO SMM*

- *Standardization for reporting & analysis*

- *Mitigation strategies, such as briefings, info, prescribed routings in VMC and restrictive speed control*

- *CAT and ANSP Operational commitments:*

  - *Airspace design must allow respective mitigation*

  - *Maximum usage of existing airspace structure for CAT & ANSP*

Requirement for Mitigation, Safety Awareness and Publication inside and outside own organization

RYANAIR

Simple ATM Barrier Model per ICAO Global ATM Concept for controlled traffic
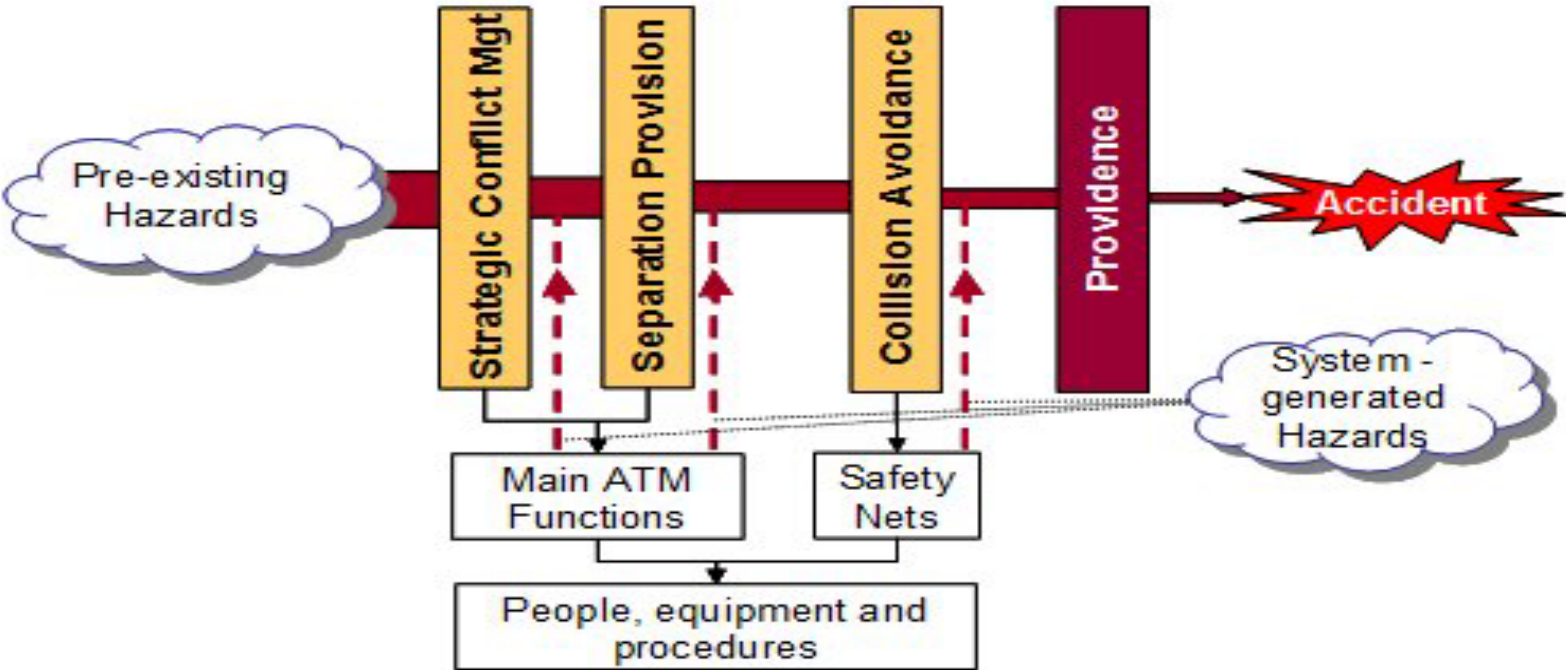
Simple ATM Barrier Model per ICAO Global ATM Concept for uncontrolled traffic
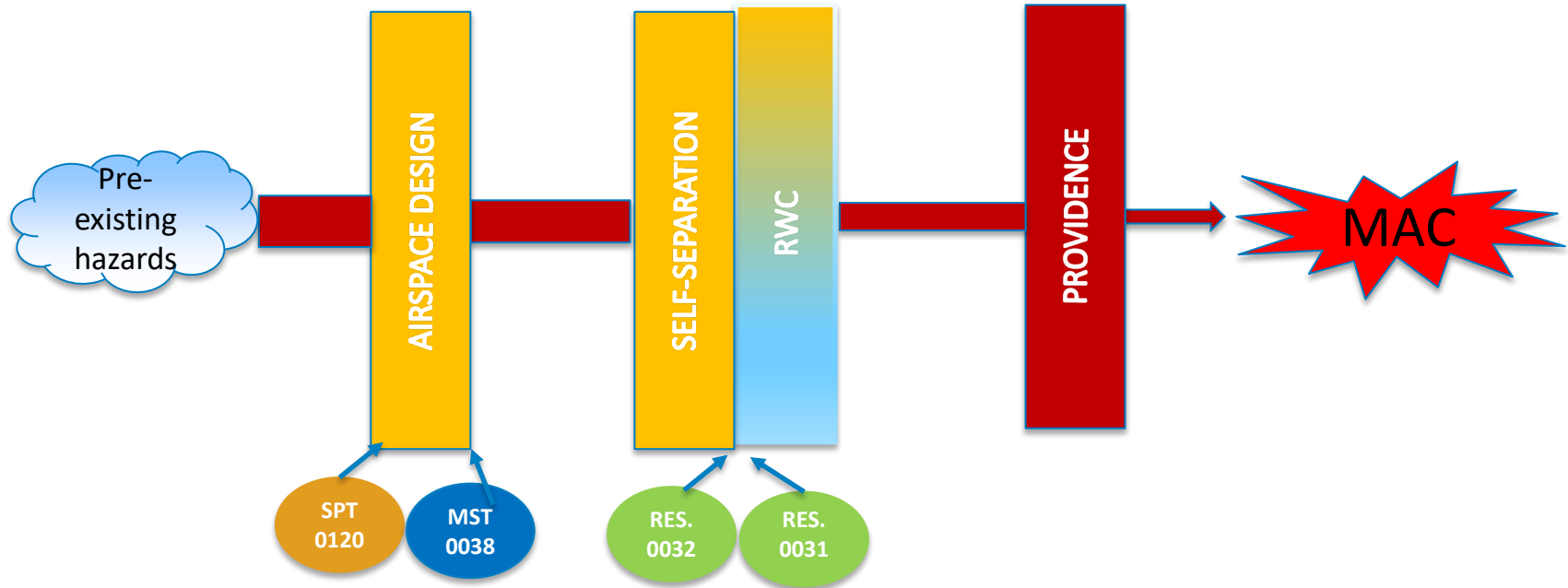
WHERE ¡Conspicuity data and implementation help!!!

Airspace Complexity
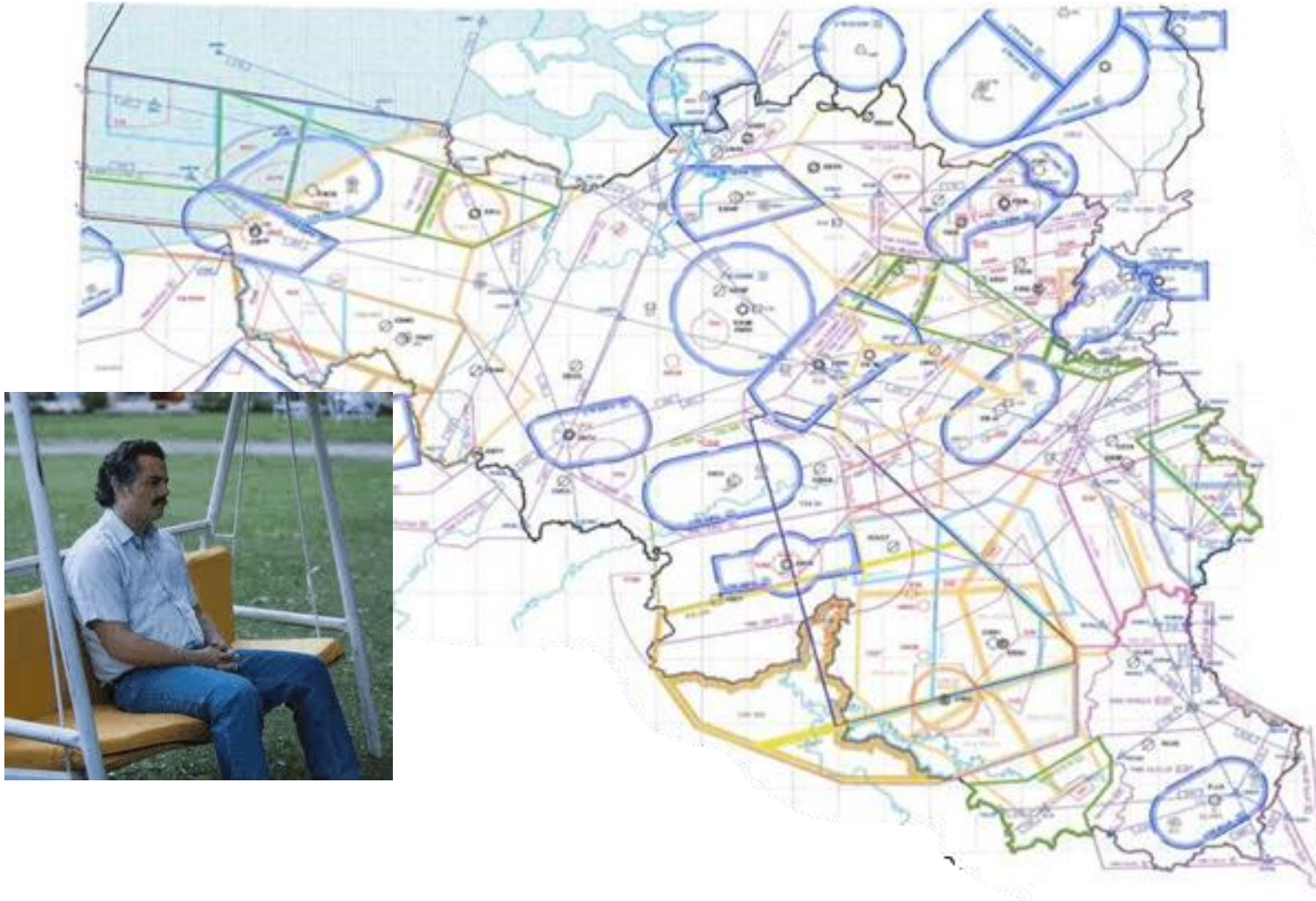
EASA's Annual Safety Review 2025

Figure 2.32 Numbers of occurrences by occurrence category involving non-commercial other than complex aeroplanes
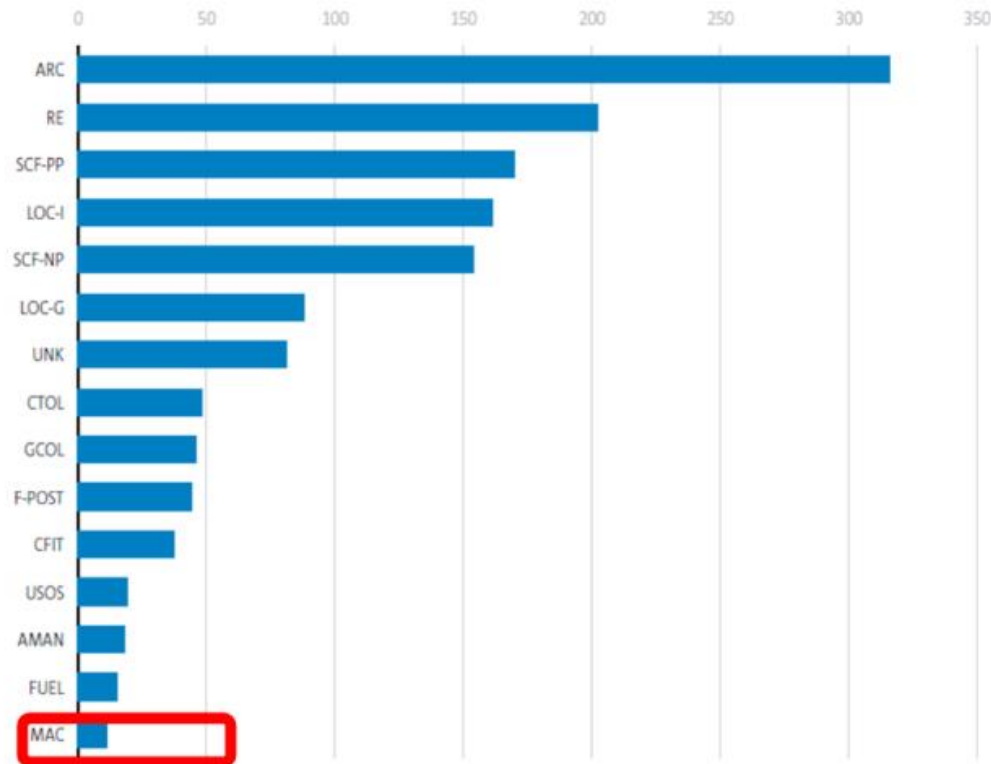
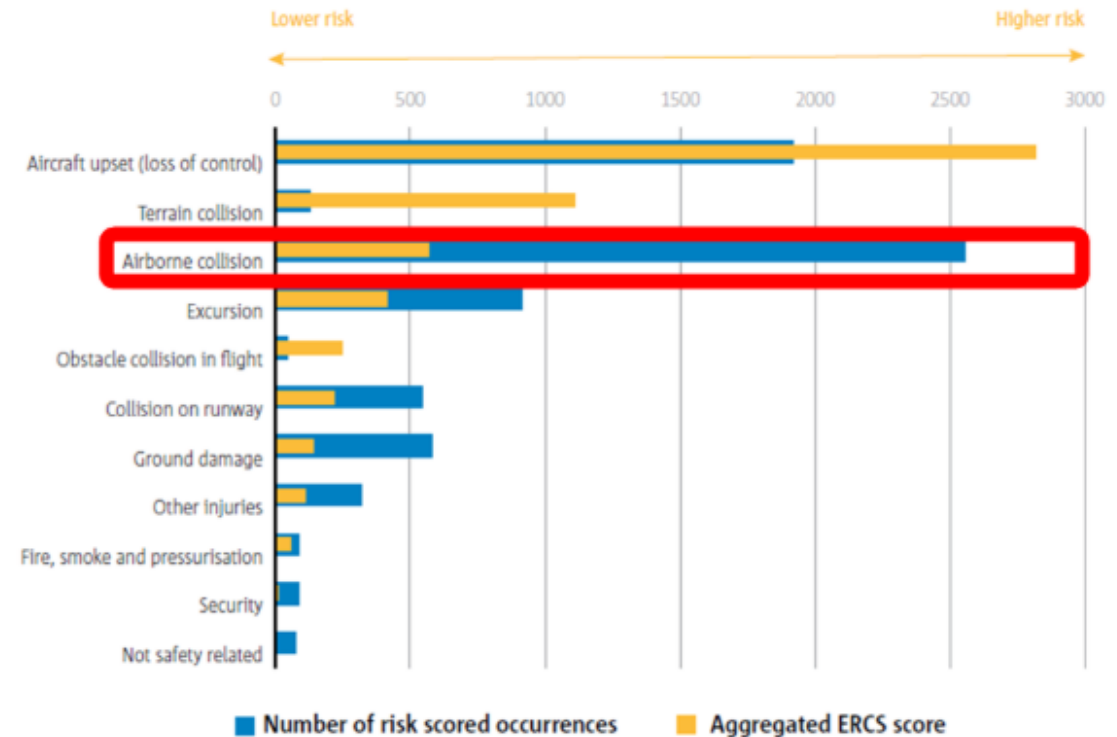ARC: Abnormal runway contact; RE: Runway excursion; SCF-PP: powerplant failure or malfunction; LOC-I: Loss of control - inflight; SCF-NP: System/component failure or malfunction [non-powerplant]; LOC-G: Loss of control - ground; UNK: Unknown or undetermined; CTOL: Collision with obstacle(s) during take-off and landing; GCOL: Ground Collision; F-POST: Fire/smoke (post-impact); CFIT: Controlled flight into or toward terrain; USOS: Undershoot/overshoot; AMAN: Abrupt manoeuvre; FUEL: Fuel related; MAC: Airprox/ACAS alert/loss of separation/(near) midair collisions.

Figure 2.40 KRAs by aggregated ERCS score and number of risk-scored occurrences involving NCO aeroplanes

The importance of data

DATA: To manage the risks, we must understand the risks, and we are working with very **incomplete data.**

- Accidents
- Occurrence Reports
- Exposure / Flight Hour
- Identify high risk areas

GAMA fully supports the EASA-EUROCONTROL Electronic Conspicuity Roadmap
&
EASA's iConspicuity declaration
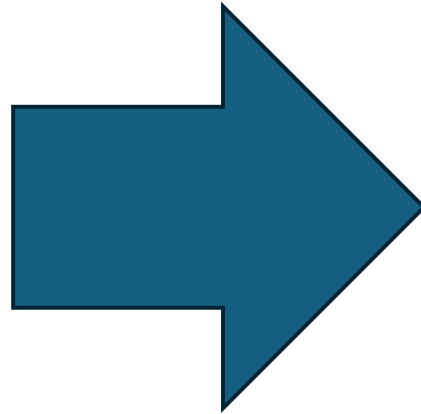
Data 4 Safety to include General Aviation in 2026

Electronic Conspicuity Solutions

✦ 1090 ADS-B

✦ UAT

✦ SRD860

✦ Mobile telecom

We need inter-operable, reliable, and affordable solutions covering the full spectrum of airspace user and activities, including:

➢ VFR + IFR

➢ Controlled + Uncontrolled Airspace

➢ Certified CS-23 aeroplanes

➢ Certified Helicopters

➢ Microlights/ULM + Gliders + balloons

➢ Drones (in shared airspace)

Runway Incursions

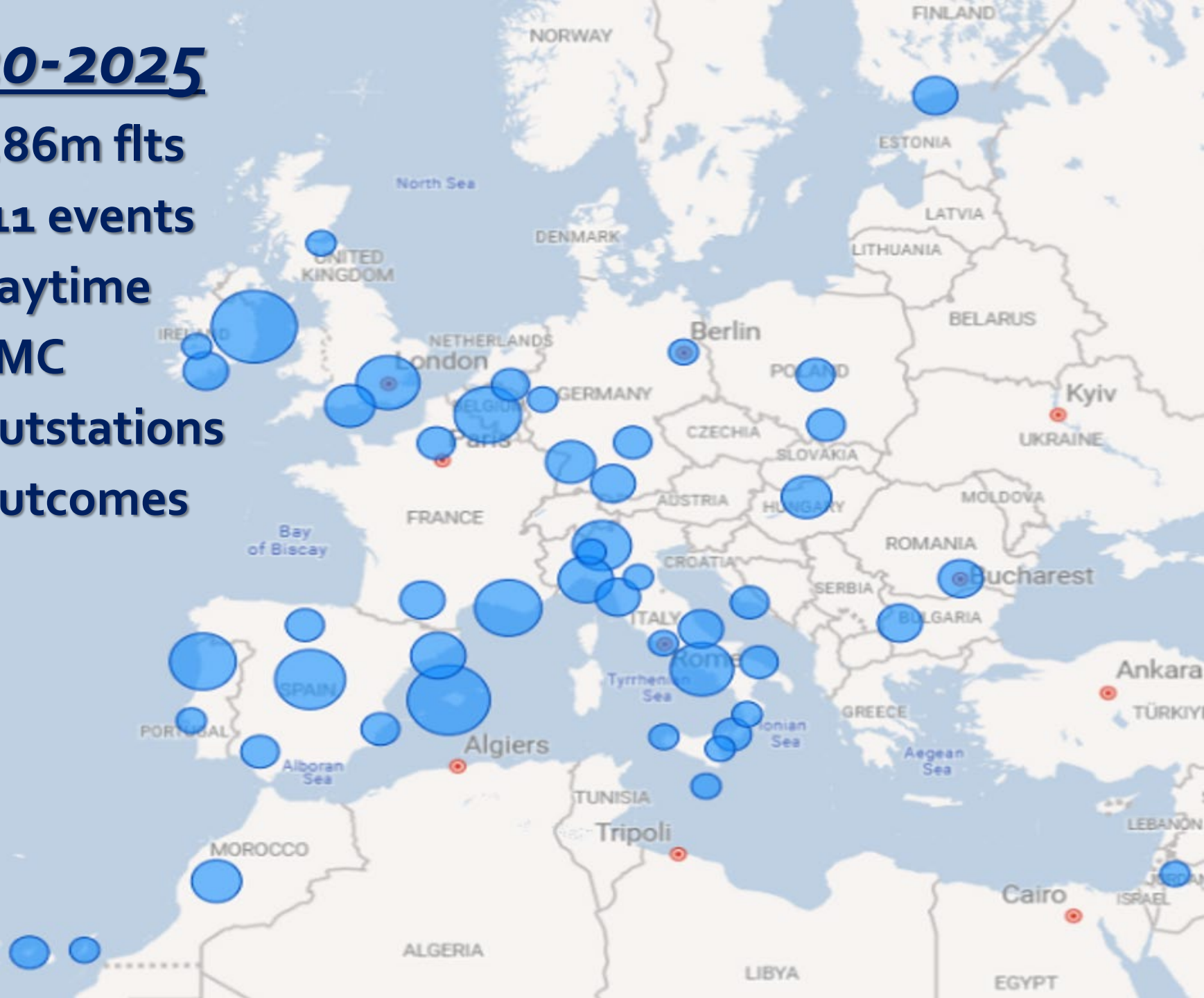## Risk Mitigation - Operator Perspectives

SAFE 360°

Capt. Drew Elbert

- **Corporate Safety Strategy**

- **Scope & Scale**
    - *~ 625+ aircraft; 230+ airports*
    - *~ 3,700 daily flights*
    - *~ 8,000 movements* (hold short, entry, crossing, etc.)

- **Exposure**
    - *~ 500 per hour*

2020-2025

- ✓ **4.86m flts**
- ✓ **111 events**
- ✓ **Daytime**
- ✓ **VMC**
- ✓ **Outstations**
- ✓ **Outcomes**

- **Root Causes**

- **Industry Trends**

- **Toolboxes**
  - *Industry & Organisational*
  - *Pilot's Onboard Toolbox*

MIND THE GAP

- **Collaboration across Stakeholders**

- **Utilisation of Toolkits**

- **Safety Promotion, Awareness**

- **Practical Solutions**

Global Action Plan for the Prevention of Runway Incursions

Part I - Recommendations
Part II - Guidance and Explanatory Material

Triple One – Safe 360°

Ivan Satriano – Safety & Compliance Monitoring Manager

01/10/2025

ADR
AEROPORTI DI ROMA

FCO – starting situation
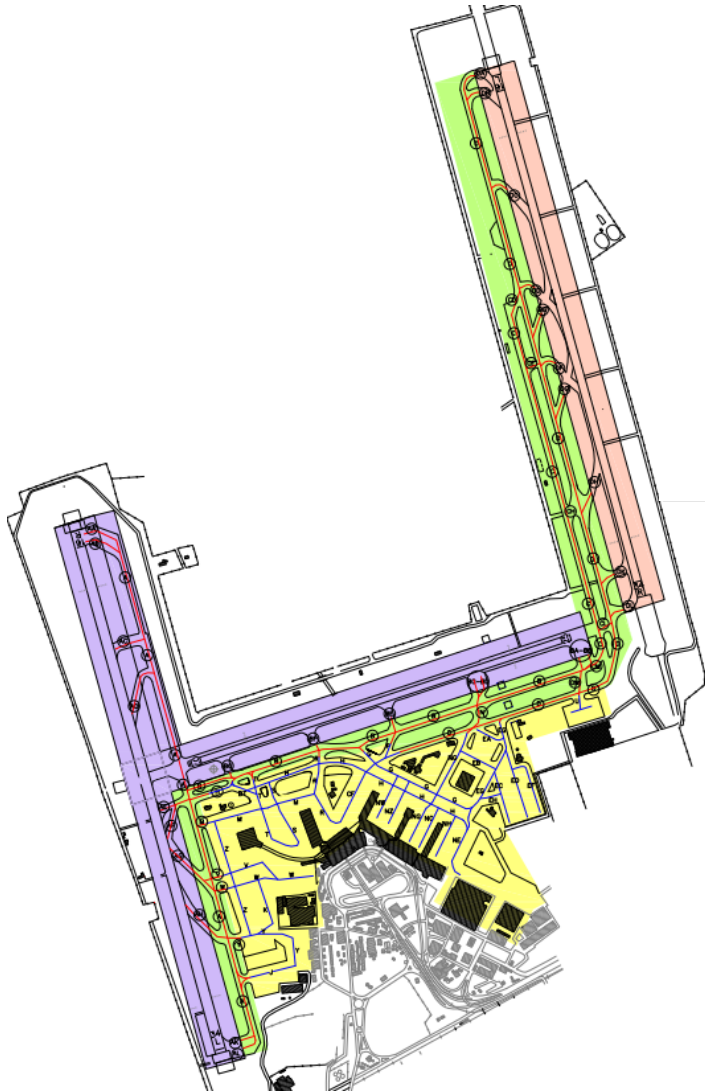
TWR – Freq. 118.700/127.625*

MANOEUVRING AREA
SERVICE PROVIDED ATC

TWR – Freq. 118.700

MANOEUVRING AREA
SERVICE PROVIDED ATC

GROUND Freq. 121.900/122.125**

MANOEUVRING AREA
SERVICE PROVIDED ATC

Ground Freq. 121.900/122.125**
FIUME Ramp Freq. 121.725

APRON AREA – SERVICE PROVIDED

"Orderly Movement of Aircraft on Aprons"
(ref. ENR 1.1 Ground Movement Control
Service and AD2, tab 20, Item 2 Apron)

- 3 RWYs (16R/34L – 07/25 – 16L/34R)

- 07/25 and 16R/34L are intersected,
  sharing the same frequency

- 2 TWR manoeuvring area frequencies
  and 2 ground frequencies

RUNWAY PREFERENCIAL USE:
- RWY 07/25 for take-off
- RWY 16L/34R for landing
- RWY 16R/34L is used for some heavy
  aircraft and as parallel runway for
  landing on ATC discretion

RWY	n. TAKE OFFS (2024)	n. LANDINGS (2024)
07	-	-
25	136 101	109
16L	592	107 211
34R	189	21 960
16R	16 400	23 423
34L	4 322	4 617

ADR

Triple One concept

The Triple One concept affirms, in layman terms, that while working on a Runway, all operators should communicate on a single frequency in a single language.

Why we believe in this project

We believe in **Triple One** for its positive effects on Safety: Triple One implies an increase in situational awareness of all the stakeholders involved and thus an increase in the Safety of operations on RWYs.

One
Runway

Triple
One
Concept

One
Language

One
Frequency
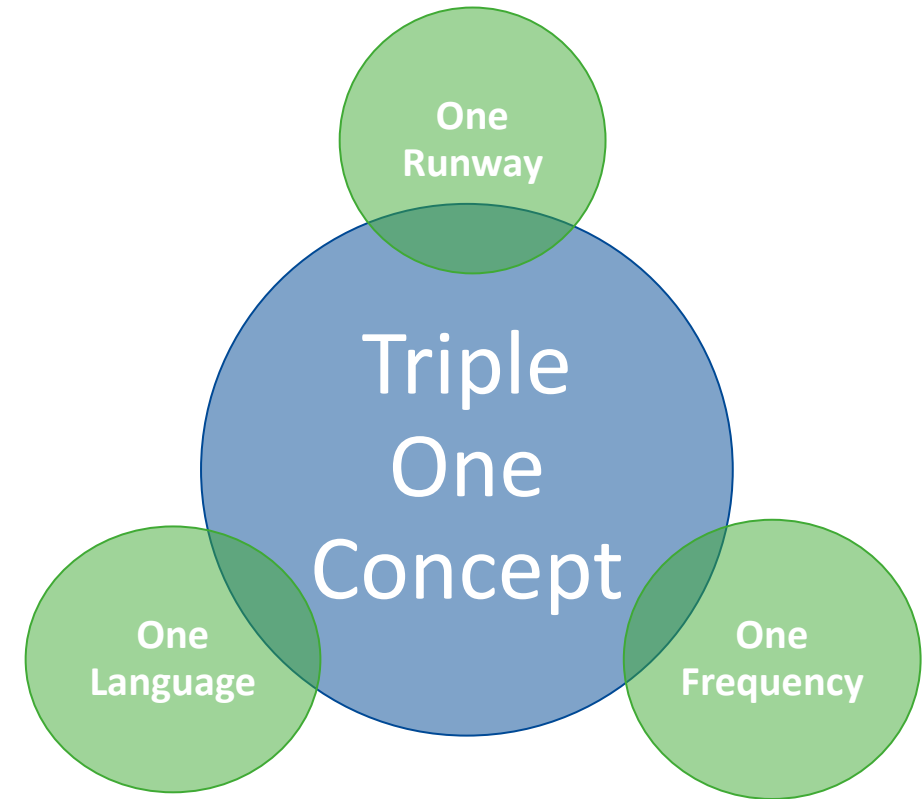
Two consequences:
A. Aircraft operations on runway engaged by operations vehicle.
B. Vehicle operations on a runway engaged by aircraft.

ADR

Hazards and change

Hazard	Undesirable Event
HZ.001 More transmission on TWR frequency	Frequency overload
HZ.002 More stakeholders on TWR frequency	Too much information and/or information overload
HZ.003 Insufficient English language skill	Miscommunication
HZ.004 Higher training/qualification requirements	Lack of aerodrome personnel operating on RWY
HZ.005 Inability to follow communication regarding traffic on dependent RWYs	Loss of situational awareness (concerning dependent RWYs)
HZ.006 Higher number of used frequencies/areas of responsibility	Ineffective and inefficient coordination and use of frequencies

Before the implementation
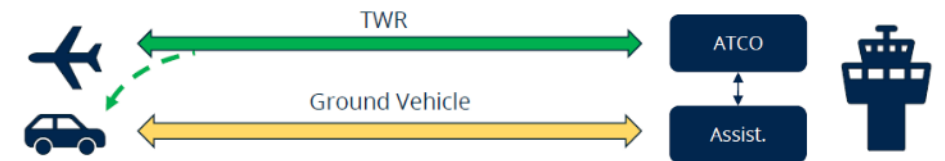
During the implementation
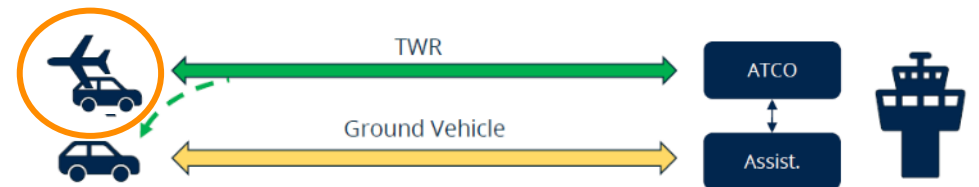
SPI – Runway Incursions

An estimated **50%** of Runway incursions in the 2018-2025 timeframe involving a vehicle, could have been prevented/mitigated thanks to the Triple One concept. Two examples are shown below.

By allowing the Safety car to communicate on the TWR-Pilots VHF frequency in English, the previously authorized vehicle could have been aware that an aircraft was entering the runway during an inspection on RWY 07/25. At the same time, the pilot could have realized that a runway inspection was in progress.

During a scheduled inspection on RWY 16R/34L, the Safety car misunderstood a communication and believed it was authorized to cross the intersecting RWY 07/25, while an aircraft had already initiated takeoff on RWY 07/25. By allowing the Safety car to communicate on the TWR-Pilots VHF frequency, the vehicle could have realized that an aircraft was already on the runway.

ADR

Timeline of the trial implementation

Working group [WG] to share Change and Safety Assessments with the ANSP (ENAV) and other stakeholders

Safety Review Board 19/09/2019: Green Light	English training for Manoeuvring Area operators starts in 2019	SAG 11.21 of 24/03/2021	WG ADR-ENAV of 22/07/2021
LRST of 28/07/2021	WG ADR-ENAV of 09/09/2021	WG ADR-ENAV of 14/10/2021	LRST with **Airsight** of 13/07/2023
LRST of 28/02/2024	Trial start 08/04/2024 Phase one	Monthly meetings	Bimonthly meetings
LRST of 08/05/2024	24/09/2024 Phase two	Phase three (LVP and hail & snow) CHANGE IN PROGRESS	Phase four – all RWY inspections ETA 01-2026

ADR – ANSP

Bimonthly meetings to assess feedbacks received from ADR operators, Pilots and TWR controllers.

ADR – ANSP – CAA

Monthly meetings to evaluate the development of the trial.

ADR

Challenges: Aviation English proficiency

Aviation English Training Programs for Ground operators: 2019 - to date

Over 100 participants (*) involved

ICAO Lev. 4 qualified	39
Ready to begin Lev. 4 Program and in progress	39
Remedial training on going	17
Not eligible	14
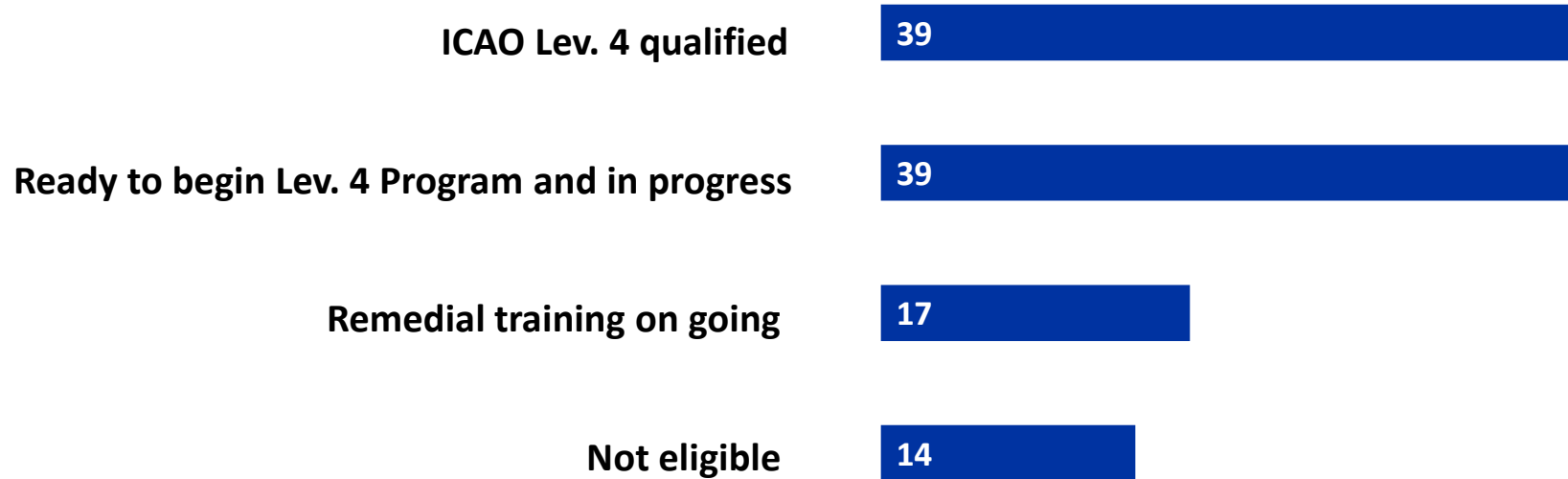
(*) ADR employees holding an Airside Driving Certificate for the manoeuvring area: Ground safety (SAR) and Airport lighting aids Maintenance Staff at FCO.

ADR

Trial evolution

Milestones

First inspection on RWY 07/25 on the 08th of April 2024

On the 13th of May 2024, the trial was extended to the second RWY (16R/34L)

Finally, on the 19th of June 2024 the trial was extended to the third RWY 16L/34R.

First Phase
One scheduled inspection per day per runway, no adverse weather conditions.

Second Phase
On the 24th of September 2024, the trial has moved from the first to the second phase: all scheduled inspections, including rain conditions excluding snow, hail and LVP.

ADR
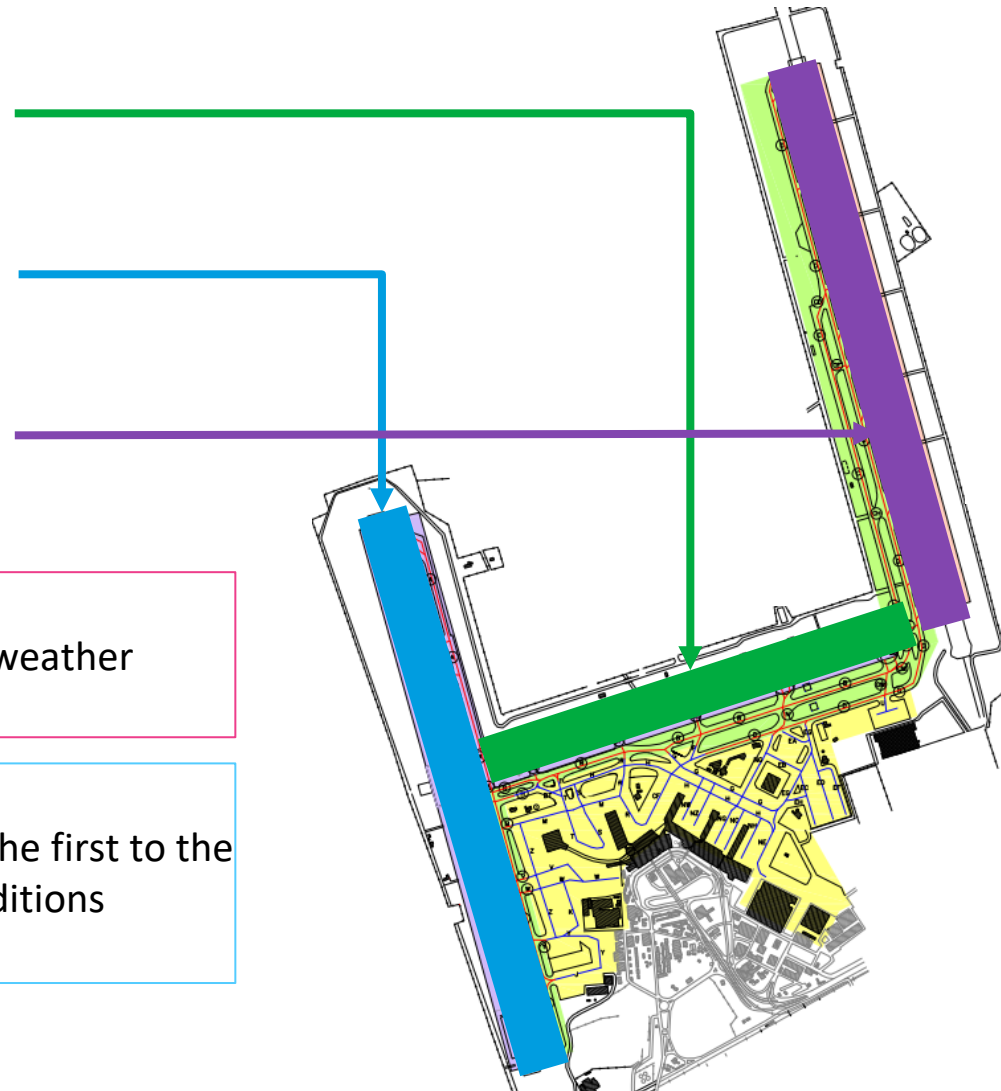
Pre-trial Communications and Feedback

Before the start of the trial, several actions were taken to inform pilots:
- Issue of a NOTAM
- Information shared during the Pilots' Conference
- Information shared during LRST
- Issue of a Pilot Safety Notice

> **ON TRIAL BASE AND TO IMPROVE SITUATIONAL AWARENESS, AD OPERATOR WILL CARRY OUT VEHICLE RWY SAFETY INSPECTION PERFORMING GROUND TO GROUND COMMUNICATION ON TWR FREQ ASSOCIATED WITH OPS FOR EACH RWY.**
>
> **RMK: RADIOTELEPHONY CALL SIGN ASSIGNED TO AD WILL BE "SAR" FOLLOW BY TWO DIGIT NUMBERS.**

To assess and evaluate the trial efficacy, surveys were created to gather feedbacks from ADR inspectors, flight commanders and TWR controllers.
Furthermore, there is the issue of a monthly report, with identification of any actions.

Feedback to date (19/09/2025)

1657 total feedbacks recorded from the start of the trial to date:

- 565 on RWY 07/25
- 560 on RWY 16R/34L
- 532 on RWY 16L/34R

Feedback throughout the trial is **positive**.

In one case the frequency was so crowded that the Runway Inspectors were unable to promptly report "runway vacated". In other situations, there were radio anomalies (e.g. disturbed signal, negative radio checks, radio calibration/configuration), promptly resolved after technical intervention.

In general, pilots stated that when heard on frequency, communication was good, and conversations did not overlap.

In total, **28 feedbacks** have been recorded from the start of the trial:

- 5 take offs from RWY 07/25
- 1 landing and 2 take off from RWY 16R/34L
- 20 landings on RWY 16L/34R

Feedback throughout the trial is **positive**, with some highlights:

Landing aircraft could switch to TWR-VHF frequency after a Runway Inspector vacated the runway without being aware that an inspection had been performed.

Departing aircraft, could still be in GROUND frequency during an inspection (and not on TWR freq.).

One particularly positive feedback reported "**We felt we had better Situational Awareness as ATC shared a runway inspection was taking place and speaking in English meant we knew when the runway was clear. very important in low visibility**".
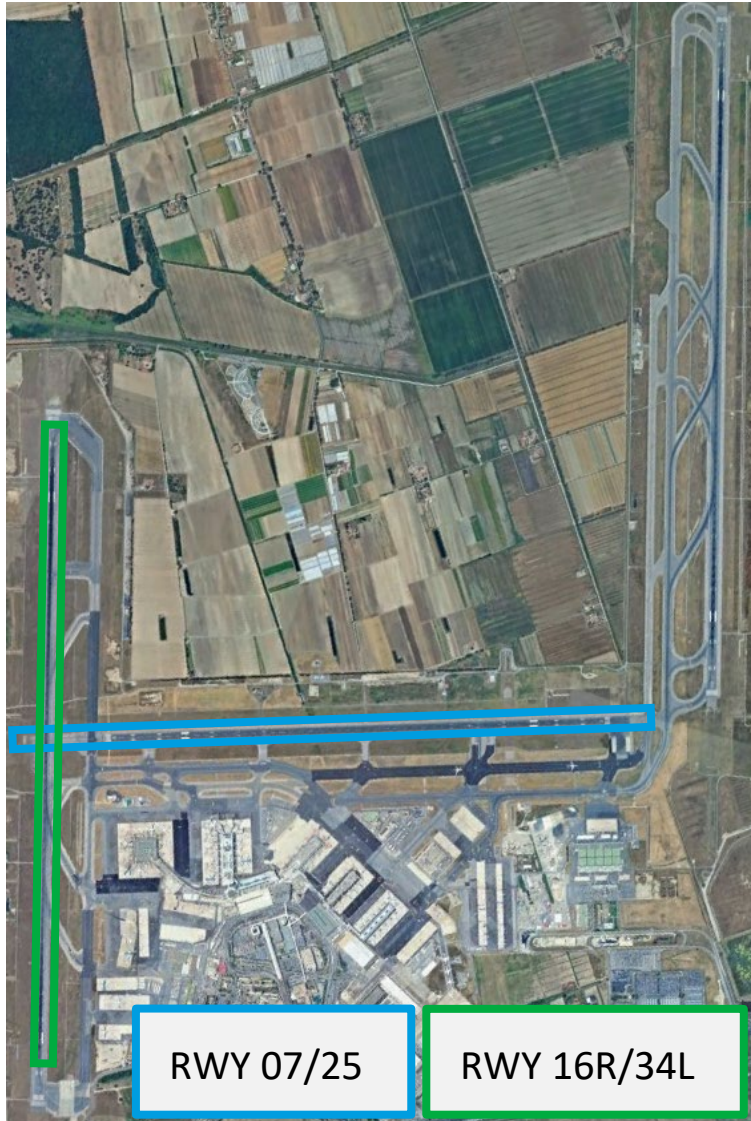
The communication at LIRF was professional so we didn't have the impression that a trial was in progress.

ANSP controllers' representative gave **positive feedback** during the trial.

ADR

Runway Incursions – Triple One as a barrier

RWY 07/25

RWY 16R/34L

An estimated **50%** of Runway incursions in the 2018-2025 timeframe involving a vehicle, could have been prevented/mitigated thanks to the Triple One concept. Two examples are shown below.

By allowing the Safety car to communicate on the TWR-Pilots VHF frequency in English, the previously authorized vehicle could have been aware that an aircraft was entering the runway during an inspection on RWY 07/25. At the same time, the pilot could have realized that a runway inspection was in progress.

During a scheduled inspection on RWY 16R/34L, the Safety car misunderstood a communication and believed it was authorized to cross the intersecting RWY 07/25, while an aircraft had already initiated takeoff on RWY 07/25.
By allowing the Safety car to communicate on the TWR-Pilots VHF frequency, the vehicle could have realized that an aircraft was already on the runway.

The drivers, during an authorized inspection, while monitoring the frequency, listened that an aircraft was entering the runway, and promptly vacated it.

ADR

Future development

Next steps

| Extension to other scheduled RWY inspections | Adverse weather conditions | Maintenance operators | Other stakeholders operating on runways |

We are goingo to extende the trial to all scheduled RWY inspections including LVP, hail and snow conditions.

ADR

Our Triple One team

All ADR - SAR staff who passed the exam at the end of the "TRIPLE ONE" training received a pin to wear on their uniform while working in FCO airside.

RUNWAY SAFETY ALERTS
SURF-A INTEGRATION WITH EGPWS SMART-X

October 1, 2025

thea.feyereisen@honeywell.com

RUNWAY SAFETY AREAS OF CONCERN

Wrong Surface
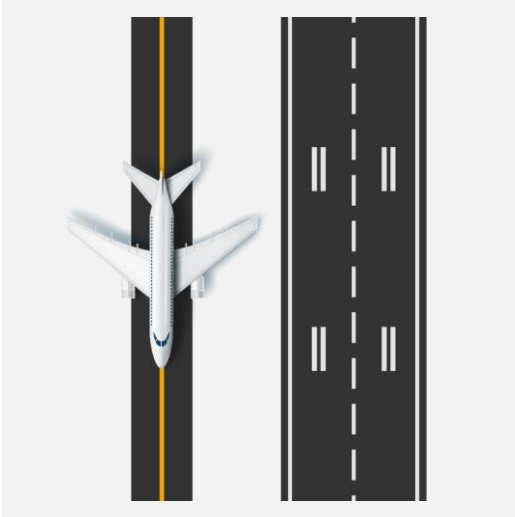
Takeoff or land on a taxiway, on the wrong or too short runway

Runway Excursions
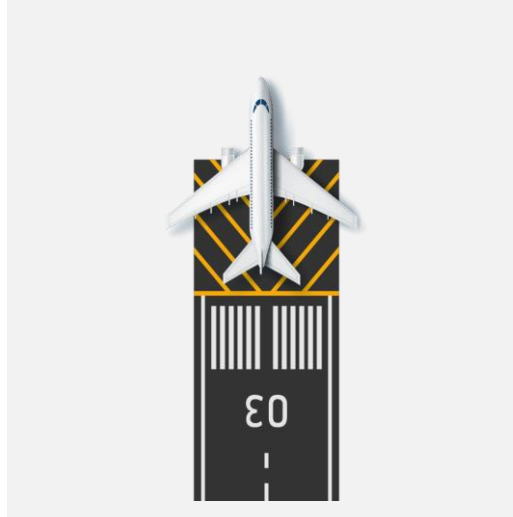
Aircraft runs off or veers off a runway (too high, too fast)

Runway Incursions
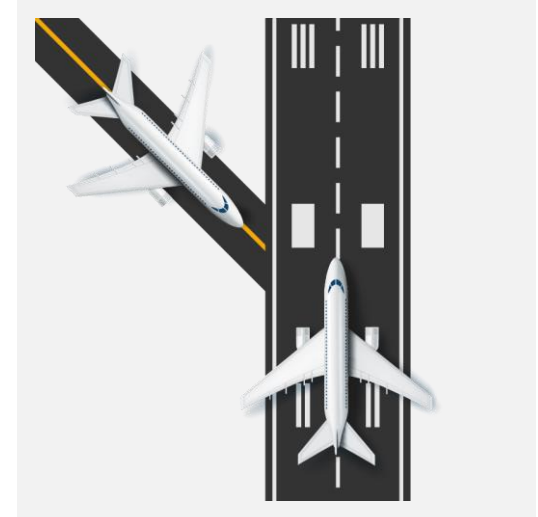
Collision with another aircraft or vehicle on the runway

Runway Awareness Alerting System
RAAS • SMART-X

Runway Collision Alerting System
SURF-A

WRONG SURFACE SMART-X

Onboard direct alert for pilots of taxiway takeoff / landing, or too short runway takeoff / landing

Orlando FL, March 2025 — *Photo: YouTube*

San Francisco CA, July 2017 — *Photo: YouTube*
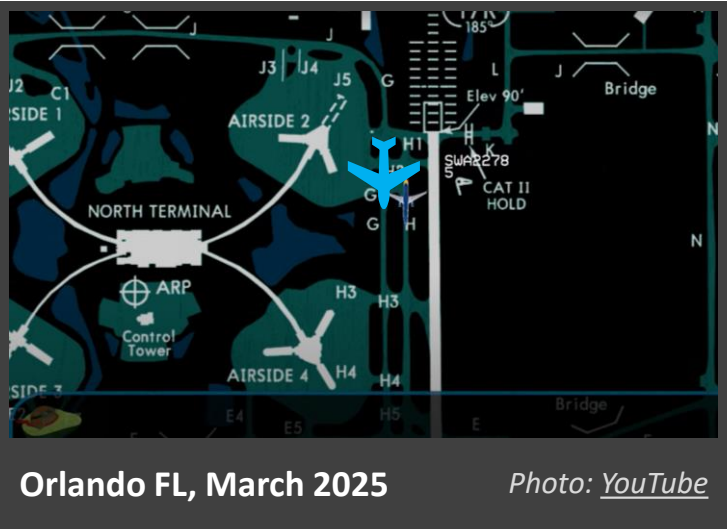
Taxiway Takeoff

B737 mistakenly tried to take-off on a parallel taxiway instead of the runway

Aircraft reached ~70kts prior to rejecting takeoff

Taxiway Landing

A320 mistakenly tried to land on a parallel taxiway instead of the runway

Last moment go-around initiated at 89' above the ground, narrowly avoiding disaster with 4 aircraft on taxiway

Taxiway Takeoff

Aural and Text alert provided by EGPWS when ground speed >40kts and not on a runway

🔊 *Caution on Taxiway!*

Available Today

RUNWAY EXCURSIONS SMART-X

Onboard direct alert for pilots of stabilized approach monitor, long landing, and altimeter monitor
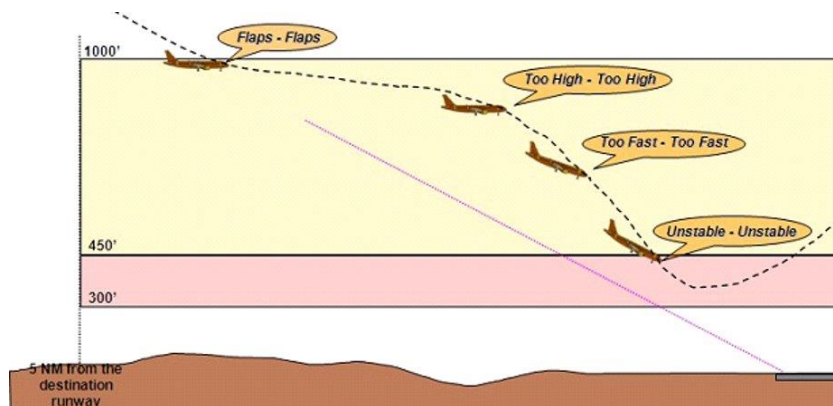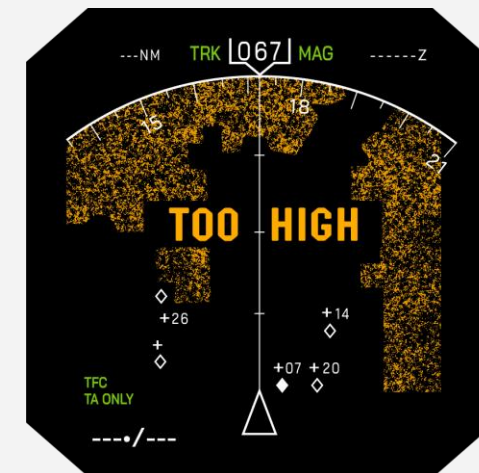
TOO HIGH

Burbank CA, March 2000   *Photo: NTSB*

Overrun on Landing

Excessive approach angle (7° vs. 3°)

Excessive speed (~180+ kts approach vs 138)

Touchdown at 182kts
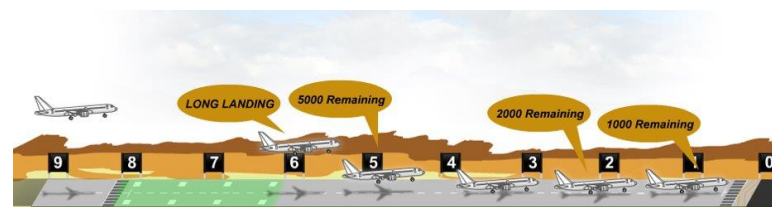
🔊 **RAAS Alerts**

- *Flaps - Flaps!*
- *Too High - Too High!*
- *Too Fast - Too Fast!*
- *Unstable!*
- *Long Landing!*
- *3000 Feet Remaining*

Available Today

RUNWAY INCURSIONS SURF-A

Onboard direct alert for pilots of a potential runway collision

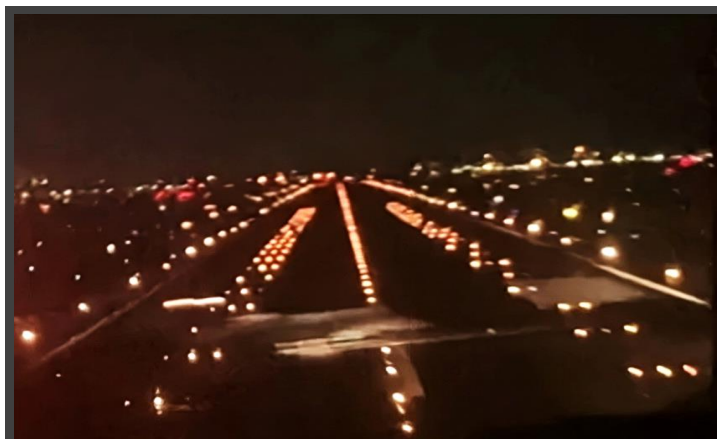**Chicago IL, March 2025** — *Photo: YouTube*

Traffic on Runway

B737 on final approach executes a last moment go-around as intruder business jet taxied across landing runway.

Boston MA, Feb 2023 — *Photo: NTSB*

Intersecting Runway Traffic

E190 on final approach executes a last moment go-around as intruder regional jet takes off on intersecting runway.

EXAMPLE

SURF-A Alerts

★ *Traffic on Runway!*
- *Traffic on Final!*
- *Traffic Behind!*
- *Traffic Intersecting Runway!*

Available 2026

JFK ✈

TRAFFIC ON RUNWAY
20:44:45
14 sec TTC

TRAFFIC ON RUNWAY
20:44:36
23 sec TTC

✈ **B777**

✈ **B737**

20:44:45
14 sec TTC
TRAFFIC ON RUNWAY

20:44:55
4 sec TTC
"Cancel Takeoff Clearance"

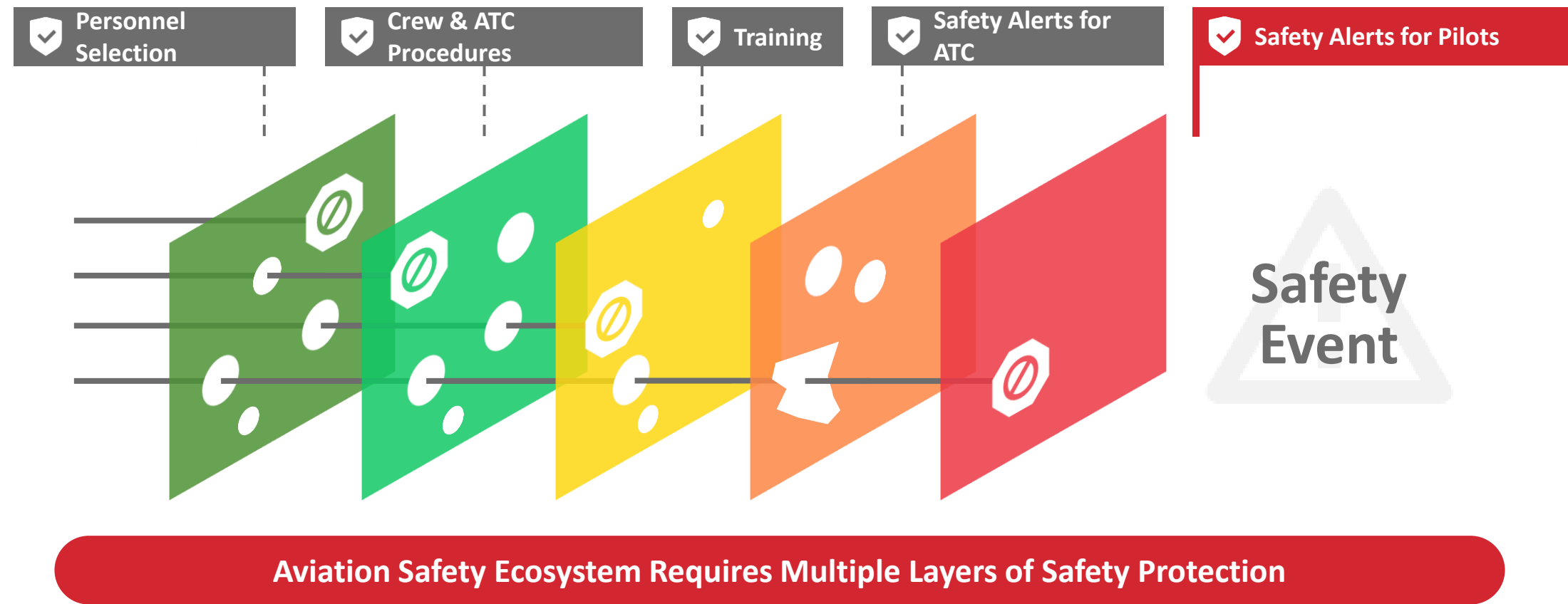**SURF-A = 10 sec additional time to collision alert**

Note: Simulated based upon publicly available data if equipped with SURF-A

SWISS CHEESE MODEL FOR ACCIDENT CAUSATION

Multiple layers of defense are required to maintain safety in air transportation system

SURF-A & SMART-X provide pilots with the most impactful layer of defense to help mitigate potential runway disasters

Personnel Selection

Crew & ATC Procedures

Training

Safety Alerts for ATC

Safety Alerts for Pilots

Safety Event

Aviation Safety Ecosystem Requires Multiple Layers of Safety Protection

⏱ EVERY SECOND COUNTS!

- **Runway safety incidents & accidents** pose significant risks to passengers, crew, and aircraft

- **Smart-X (Runway Awareness Alerting System aka RAAS) and SURF-A** provide direct alerts to pilots of potential wrong surface events, runway excursions, and runway incursions

- **Pilots are our last line of defense!** - automated runway safety alerts in the cockpit can give pilots precious time they need to recognize hazards and take corrective action

FLYING

is still one of the **safest** travel methods

> **We all must act to prevent future runway incidents and accidents**
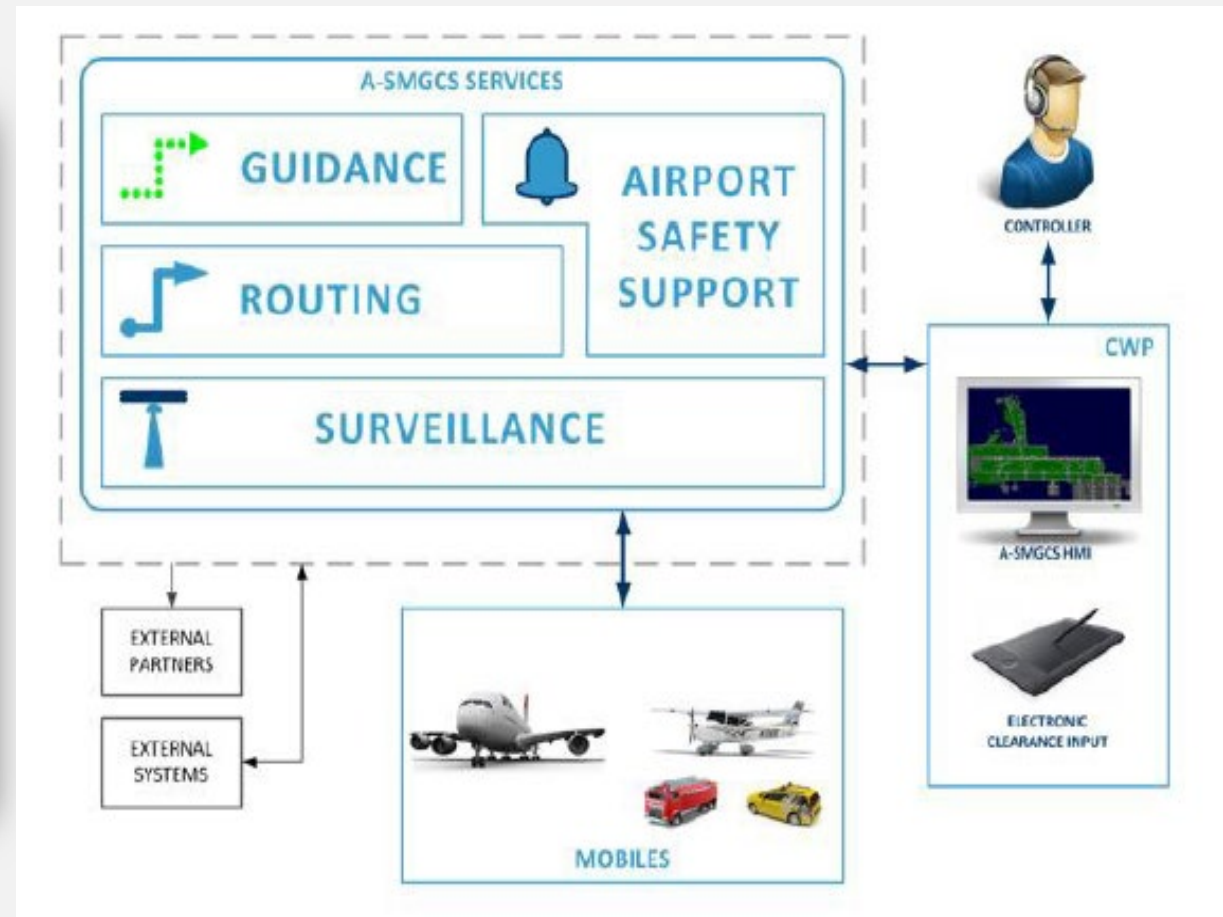
THANK YOU

Honeywell

Advanced surface movement guidance and control system

improve airport throughput, whilst **maintaining the required level of**

safety. By improving the way aircraft and vehicles are **managed** on the ground, it makes aerodrome surface movement operations **more**
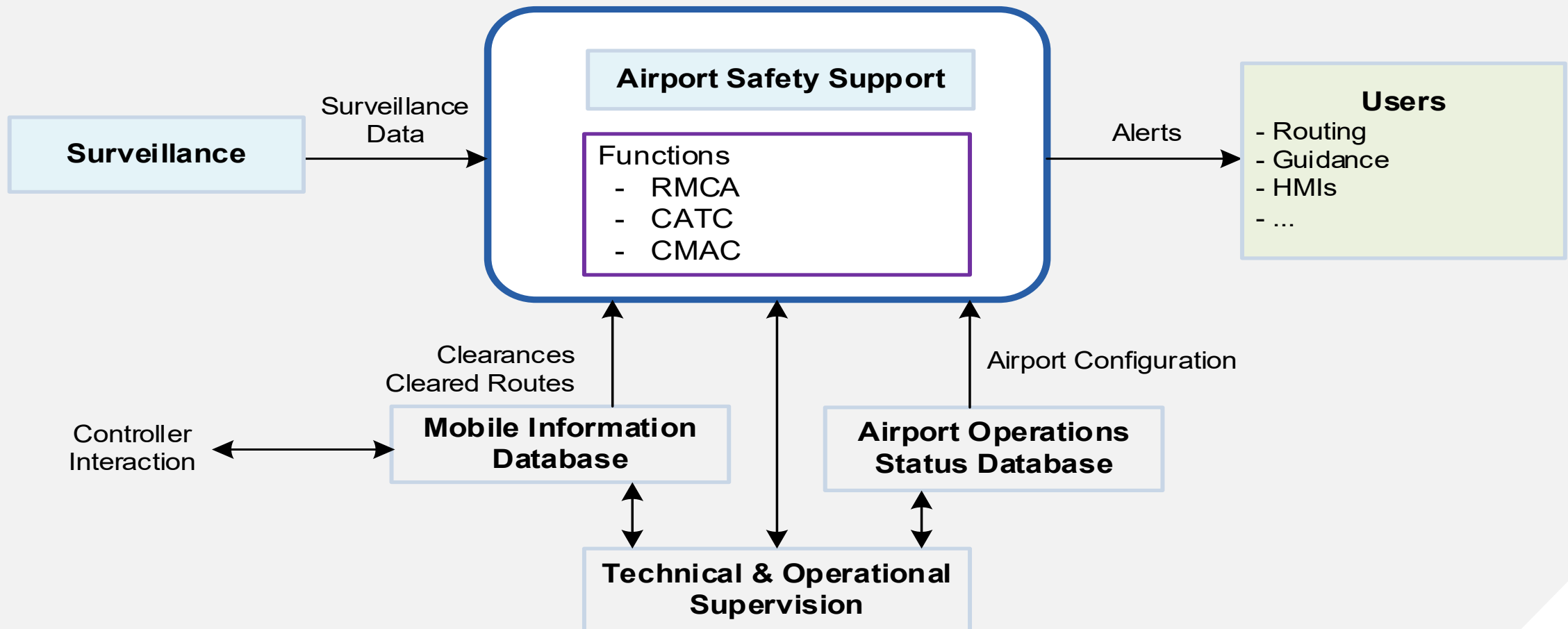
efficient in **all weather** conditions
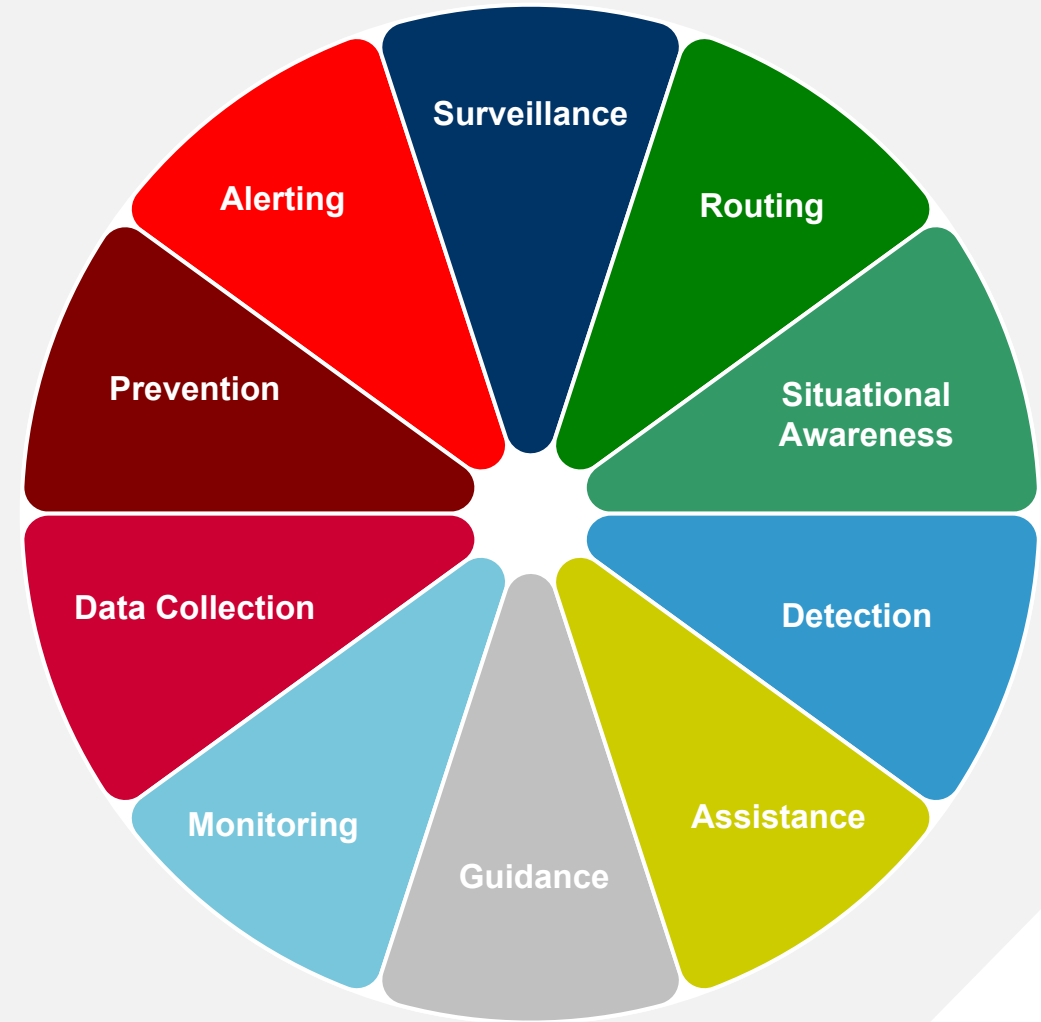
A-SMGCS Services

Airport Safety Support Service

- **Runway Monitoring and Conflict Alerting (RMCA).**
- **Conflicting ATC Clearances (CATC).**
- **Conformance Monitoring Alerts for Controllers (CMAC)**

CATC & CMAC

LUXEMBOURG– 21/1/2010 B744 lands on Vehicle

OSLO – 25/2/2010 AFL A320 Departs from TWY M

- Not all airports have RMCA

- The ones with RMCA are still having incidents

- RMCA is a Short Term Conflict Detection tool, triggers at the last moment.

- Based only on surveillance. Tuning has proved to be a challenge at many airports.

- CATC and CMAC serve to be more predictive tools

Conflicting ATC clearances   (CATC)

Based on incorrect inputs made on the Electronic Flight Strips and the position of the mobiles, examples 2 aircraft given cleared to land/line up/take off/cross on the same runway
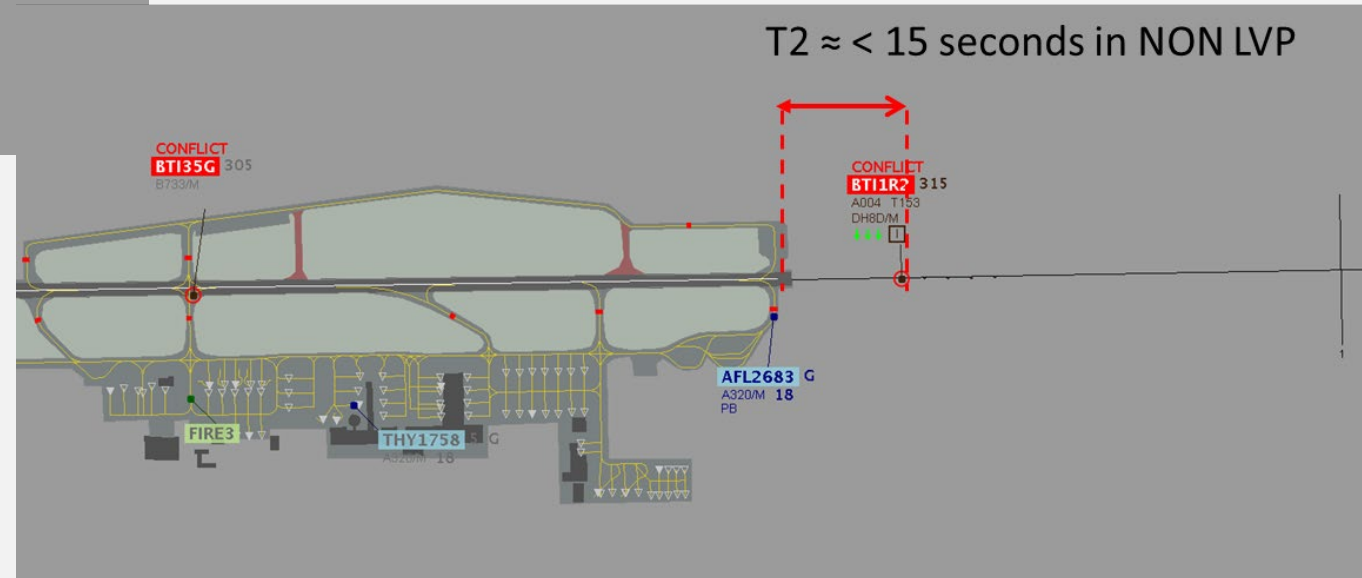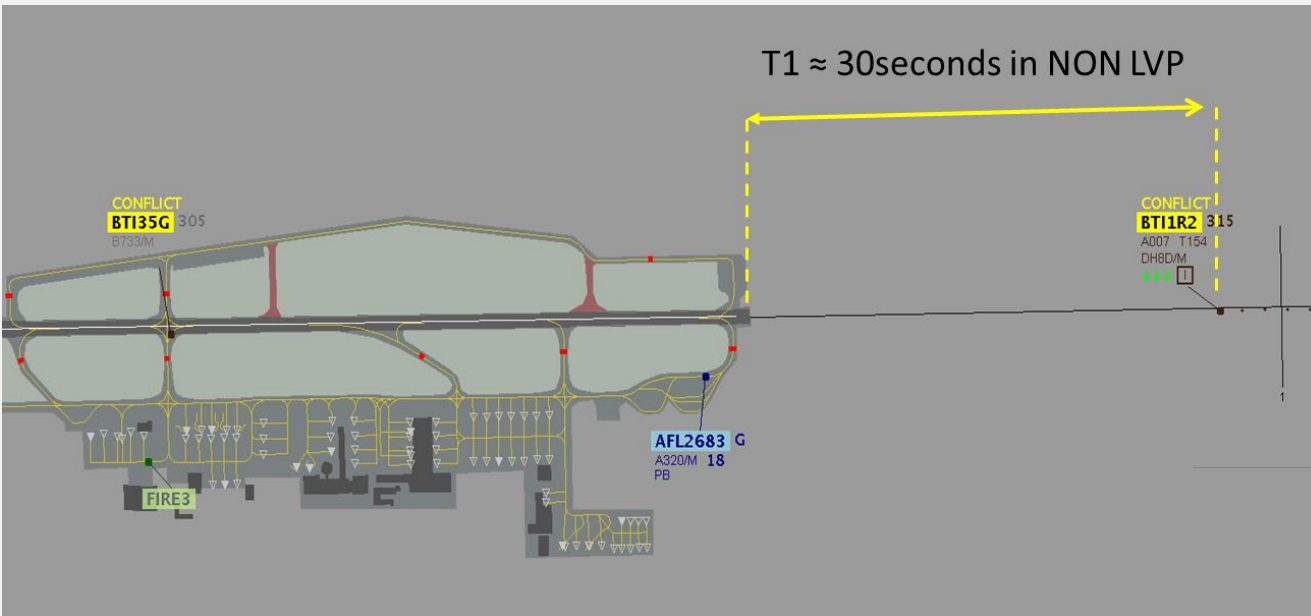
Identify the need for CATC

LOS ANGELES 1 Feb 1991 – US Air B737 lands and hits a Metroliner because the ATCO was distracted and forgot that she had lined up the Metroliner.

35 Died

Stages of Alert

Examples of Alerts with an Arrival Conflicting with a Vacating Aircraft.

Airport Safety Support Service

RMCA
Runway Monitoring and Conflict Alerting.
(aka RIMS or Level 2)

CONFLICT
CONFLICT

CATC
Conflicting ATC Clearances

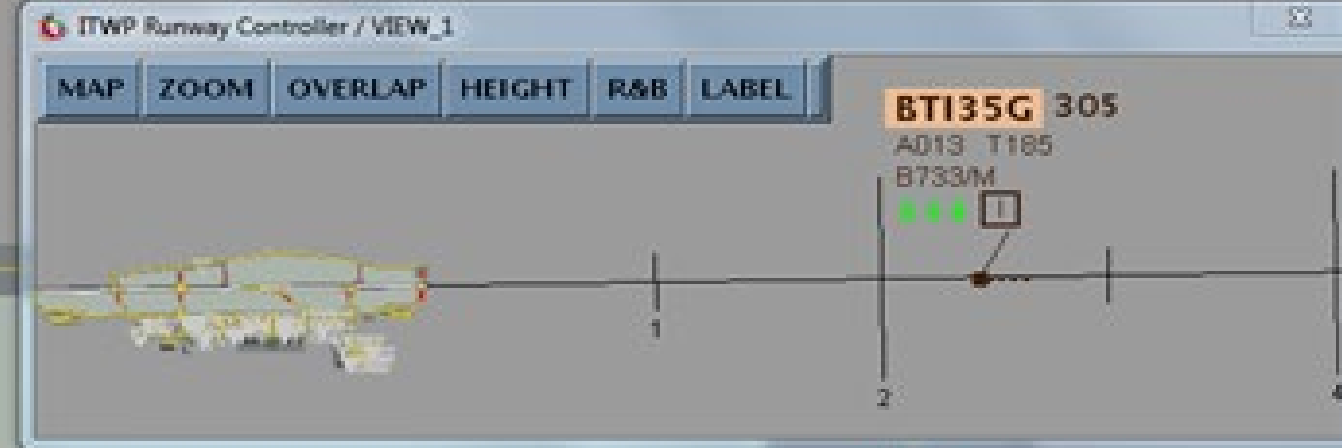|	
LINE-UP	LINE-UP, CROSS, ENTER, TAKE-OFF, LAND
CROSS or ENTER	LINE-UP, CROSS, ENTER, TAKE-OFF, LAND
TAKE-OFF	LINE-UP, CROSS, ENTER, TAKE-OFF, LAND
LAND	LINE-UP, CROSS, ENTER, TAKE-OFF, LAND
PUSH-BACK	PUSH-BACK, TAXI
TAXI	PUSH-BACK, TAXI, CROSS
CROSS	TAXI

CMAC
Conformance Monitoring Alerts for Controllers
(R)=Routing Service Required)

ROUTE DEVIATION (R)	ROUTE DEVIATION (R)
NO PUSH / NO TAXI CLEARANCE (R)	STATIONARY
STATIONARY	NO TAKE-OFF CLEARANCE
NO CONTACT	NO LANDING CLEARANCE
NO TRANSFER	LANDING ON THE WRONG RUNWAY
NO TAKE-OFF CLEARANCE	RED STOP BAR CROSSED
NO LANDING CLEARANCE	LINING-UP ON THE WRONG RUNWAY
LANDING ON THE WRONG RUNWAY	RUNWAY INCURSION
LINING-UP ON THE WRONG RUNWAY	RUNWAY TYPE
RUNWAY TYPE	TAXIWAY TYPE
TAXIWAY TYPE (R)	RUNWAY CLOSED
RUNWAY CLOSED	TAXIWAY CLOSED
TAXIWAY CLOSED (R)	RESTRICTED AREA INCURSION
HIGH SPEED	HIGH SPEED
STAND OCCUPIED	

EUROCONTROL

CONFLICTING ATC CLEARANCES (CATC) – If the ATCO inputs the clearance then there is an additional warning window asking to confirm their intention. Cancelling closes the window.

RPA – Runway Protected Area and Some Associated Alerts

Stationary in RPA

No Line Up Clearance

No CROSS Clearance

Route Deviation

Runway Incursion

No Take Off Clearance

No Landing Clearance

RMCA

RMCA

EUROCONTROL
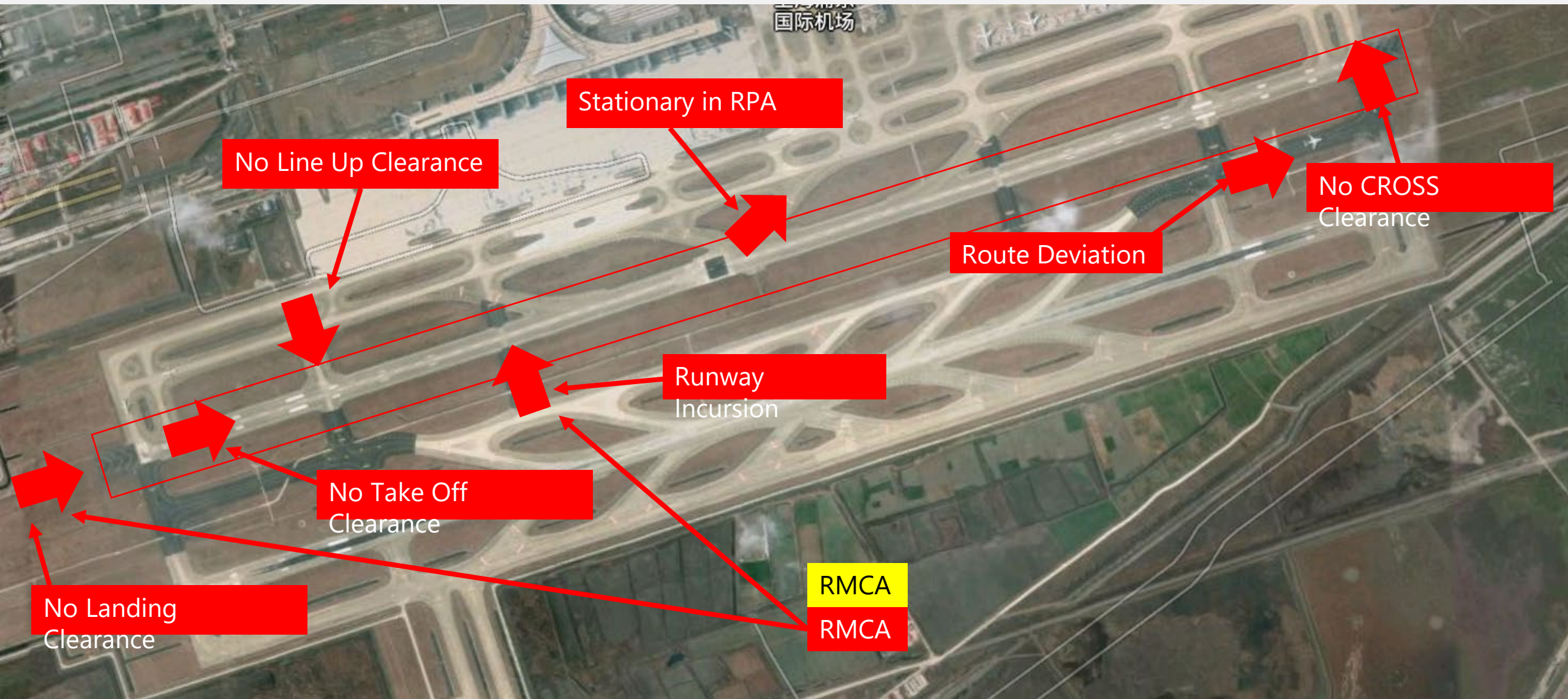
Why combining CMAC & CATC : Nice Use Case (21/09/2025)

ATCO Clear Nouvel Air To Land 04R

ATCO Clear Easy Jet Line Up 04R

=> CATC: Land/Line UP

ATCO Clear Nouvel Air To Land 04L

Nouvel Air detected On 04R ILS

⇒ CMAC: Land On Wrong RWY
⇒ Than RMCA

Surface Movement Awareness System
Product scope and objectives

"SMAS SPECS PRESENT MINIMUM REQUIREMENTS TO ENSURE AIRPORT SAFETY AND IF IMPLEMENTED FULLY, THE COMPLIANCE IS ACHIEVED"

REGIONAL AIRPORTS	BASED ON COOPERATIVE SURVEILLANCE	2 SERVICES: SURVEILLANCE (MANDATORY) ALERTING (OPTIONAL)

EUROCONTROL

Surface Movement Awareness System
Operational Tool

Surveillance Service (+ Alerting Service)

≠

Controller's tactical tool

Surveillance Service (+ Alerting Service) + **Additional means**

=

Controller's tactical tool

To use SMAS as a tactical Controller's tool, additional technical and/or procedural means to control non-cooperative mobiles within the Coverage volume, shall be implemented.

Note: Examples of technical means – magnetic loops, flight strips, closed-circuit television; example of procedural means – follow me car, specific taxi routes, designated sectorization of aerodrome for non-suitably equipped mobiles, communication protocols.

EUROCONTROL

# CMAC Alerts

Alert Name	Brief description
STATIONARY	A mobile doesn't move within a certain time period in the RPA.
LANDING ON THE WRONG RUNWAY	An arriving aircraft is about to be aligned to a runway that differs from the designated active runway.
LINING-UP ON THE WRONG RUNWAY	A departing aircraft is about to be lined-up on a runway that differs from the designated active runway.
RUNWAY TYPE	Runway is not suitable for the aircraft type e.g. runway is too short.
RUNWAY CLOSED	An aircraft is about to enter a closed runway.
TAXIWAY TYPE	An aircraft is about to enter a taxiway that is not suitable for the aircraft type.
TAXIWAY CLOSED	An aircraft is about to enter a closed taxiway.
HIGH SPEED	An aircraft taxies with speed exceeding x knots (x=parameter).

STATIONARY	A mobile doesn't move within a certain time period in the RPA.
LANDING ON THE WRONG RUNWAY	An arriving aircraft is detected to be aligned to a runway that differs from the designated active runway.
LINING-UP ON THE WRONG RUNWAY	A departing aircraft is lined up on a runway that differs from the designated active runway.
TAKING-OFF FROM THE WRONG RUNWAY	A departing aircraft is detected taking-off from a runway that differs from the designated active runway.
RUNWAY TYPE	An aircraft is on a runway that is not suitable for the aircraft type.
TAXIWAY TYPE	An aircraft is on a taxiway that is not suitable for the aircraft type.
RUNWAY CLOSED	An aircraft has entered a closed runway.
TAXIWAY CLOSED	An aircraft has entered a closed taxiway.
RESTRICTED AREA INCURSION	An unauthorised mobile is detected entering, or predicted to enter, a restricted area.
HIGH SPEED	An aircraft taxies with speed exceeding y knots (y=parameter).

EUROCONTROL

aircraft equipage with ADS-B version 2

ADS-B v2 equipage
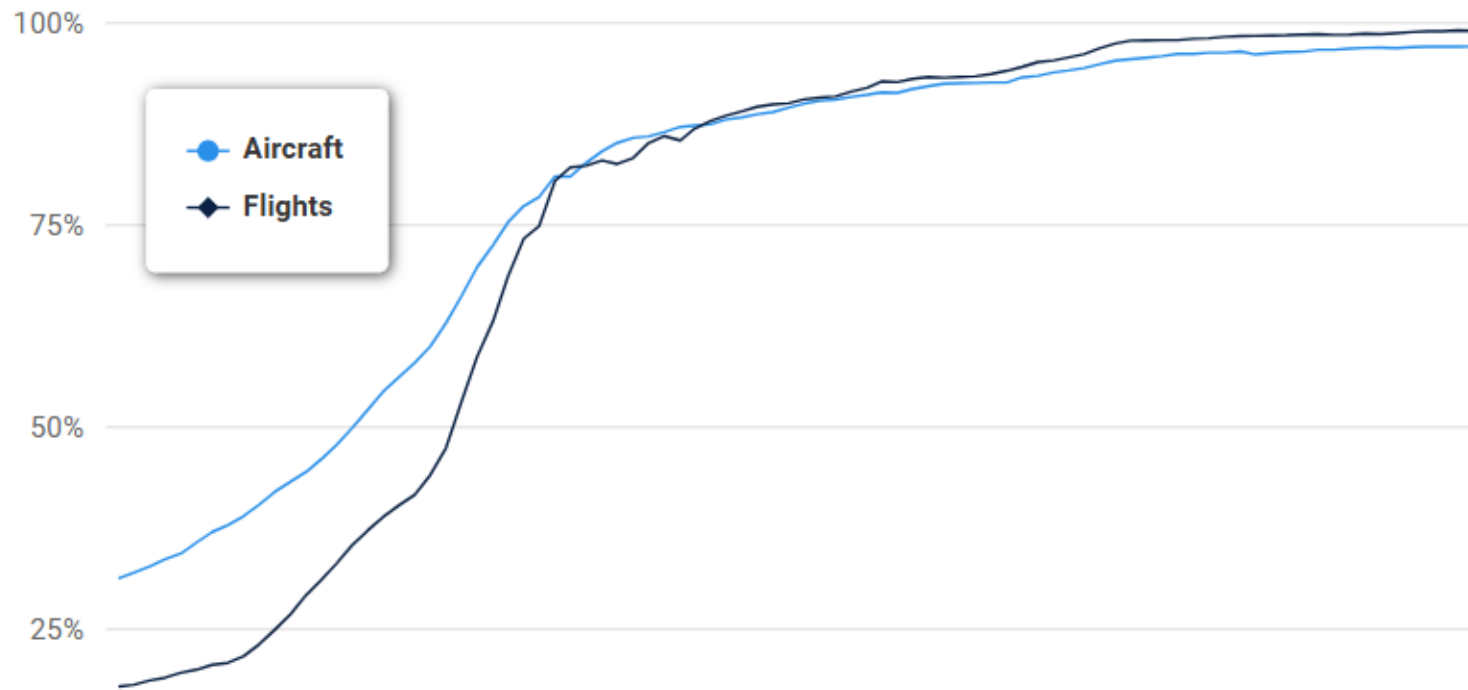
Aircraft
Flights

Current equipage by May 2025

AIRCRAFT
96.9%

FLIGHTS
98.9%

EUROCONTROL

Validation of SMAS

- Live trial in Liepaja from 18th to 21st of August

- Live trial in Gdansk (date to be confirmed with PANSA and Aptech)

- RTS in EUROCONTROL Innovation Hub 4th to 7th of November:
  - Objective to evaluate the Ops procedures for the mix between equipped and not equipped
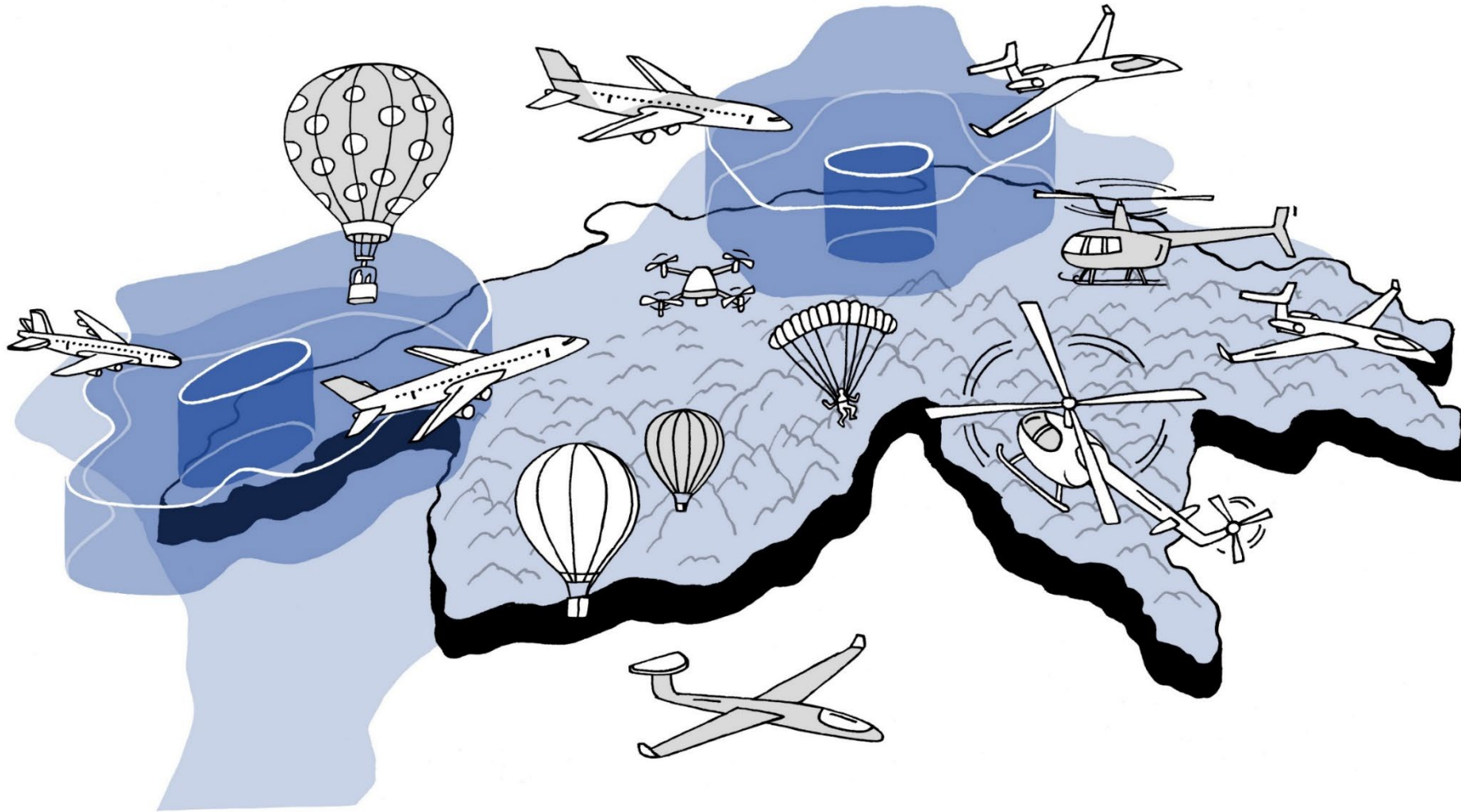
EUROCONTROL

Liepaja validation

Continous Stop Bar Use

Best practices: LSZH, LSZG

Switzerland – in a nutshell

- The inner circle: international airports services (Geneva & Zurich)
- The outer circle: regional approach & ATM supporting services (Alps Radar, FIS)

Understand our environment
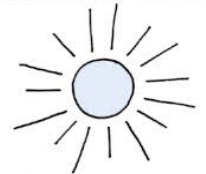
Build resilient
services on solid foundations

Optimise & improve

THE OL JOURNEY

beyond horizons

Virtual Centre

Super TMA

Vision 2035

Maintain a high Level of safety
Reduce unit costs
Ensure quality of service
Ensure service continuity
Reduce environment footprint.

GENEVA 2020-2030+

ZURICH 2020-2030+

FIS

ALPS
RADAR

LFN
PINS

HB-SKY
@035

PBN EDNY

Delta & FIC
move

VFR Hdl

AoR △

PBN LSZR
& LSZS

A&D
grouping

@alps
radar

stripless

central
regio
app

R-TWR

2030+

GVA
TWR APP

PAGE 1
TWR

FATO & North
stop bars

PBN LSGG

new
AOS

ARSI

NRH

AMAN

PAGE 2
APP

LORD

Skyscope

AOP

2027

< 2020

@TWR

robustness

2025

Partial
Compliance

WAM-CH

SKYC@T

LADY

new TWR

ZRH
TWR APP

ARSI

CROPS

e-coordination
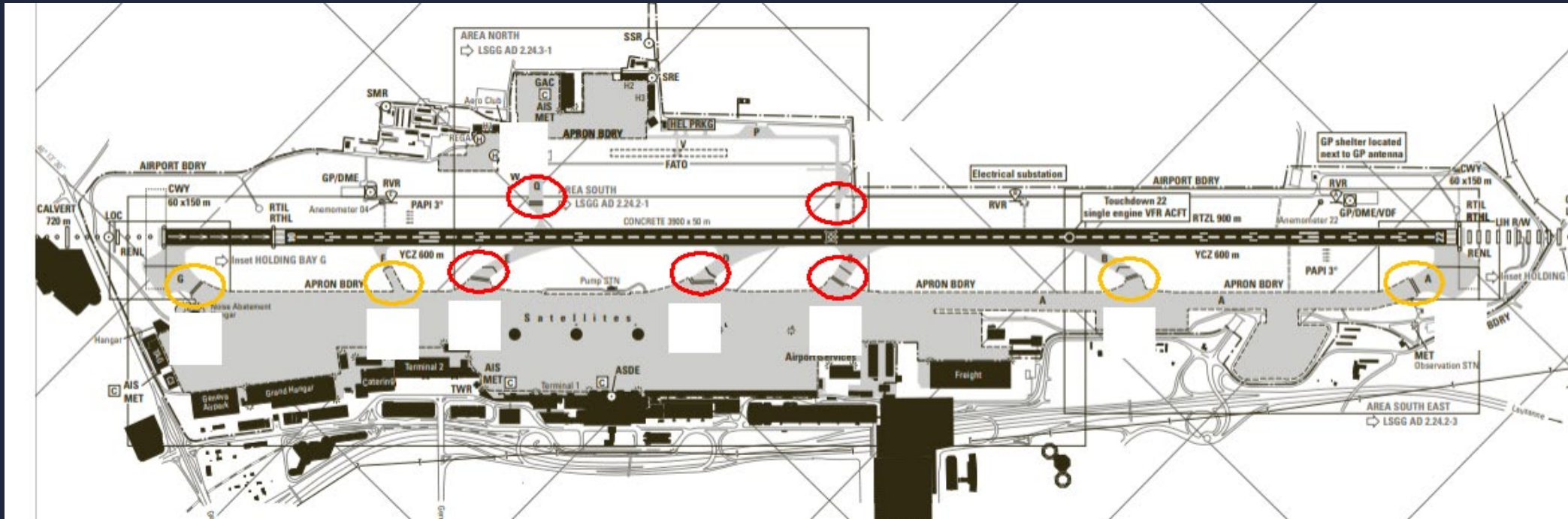AMAN

RNAV

TRACE
perf. plan

TMA redesign

Reducing
Complexity

new DARTS

LUFTWAFFE

OL Strategy

operational excellence in lower airspace
focus on international airports
synergies with upper airspace

CCO
CDO

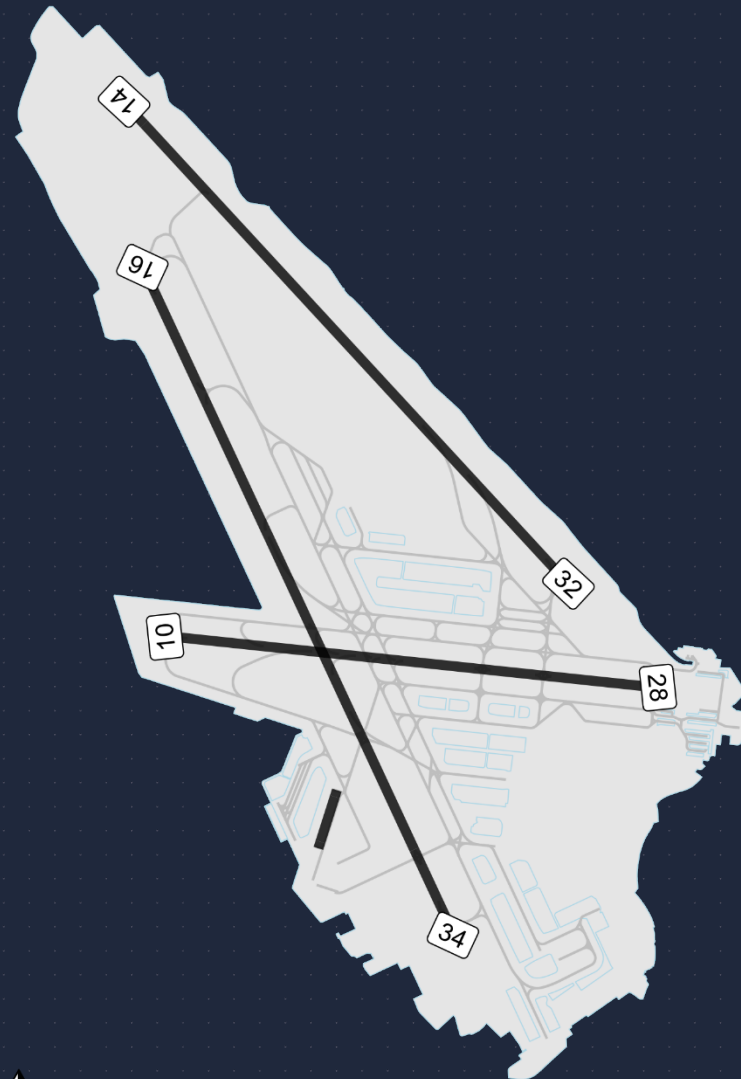v1.15 - September 2025

skyguide

- RWY22/04 single runway ops
- Main TARMAC in the south, GA/BA in the north
- CAT I or II/III not collocated
- No of RWY crossings <5 per day

- Implementation OCT 24
- Red = H24 stop bar, orange = only under LVP

- OCT23 – OCT 24 = 11 RWY incursions

- NOV24 – SEPT25 = 0 RWY incursions

skyguide

- RWY14 = main landing RWY
- RWY28 = main departure RWY
- No of RWY crossings (mainly RWY28) **= ~400 per day**
  - Aircraft
  - Towed aircraft
  - Several trucks and cars
  - Rescue service

- ALL runways protected by H24 stop bars
- Stop bars CATI/II/III collocated

beyond horizons

skyguide

- Introduction before in 1996
- Since 2000 – stop bars operated 24h

Working style ATCO:
1. talk – 2. push stop bar button

- Introduction e-strip system

Working style ATCO:
1. talk – 2. push stop bar button – 3. click action on E-strip

- 2004 Introduction RIMCAS
- 2008 RIMCAS advanced with 32 RUs
- collocate CAT I/II/III stop bars

- 2014 Introduction ARSI

Working style ATCO:
1. talk – 2. click action on E-strip

- Stop bar ON/OFF
- Alert for conflicting clearance
  (e.g. Cross RWY vs. Take-Off clearance)
- Marks RWY (partially) blocked

Additional system features:
- Handling of aircraft, vehicles, towed aircraft
- Conditional clearances
- Overrun alerts (magnetic and SMR based)

skyguide

"SWR374P, hold short of RWY28"

"SWR374P, on TWY F cross RWY28"

skyguide

- Use of 24h stop bar part of ATCO training from the very beginning

- All procedures and systems based on the 24h use of stop bars

- In case of system failure = contingency case with fallback scenarios

Stop bars and 24h usage = part of our DNA

skyguide

THANK YOU