



# Ensuring the right safety view at the top – Executive-level Safety Dashboards

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# P5 context

Safety Wisdom

**Safety Dashboard**

Safety Blueprint

**Safety Dashboard**

Agile Response

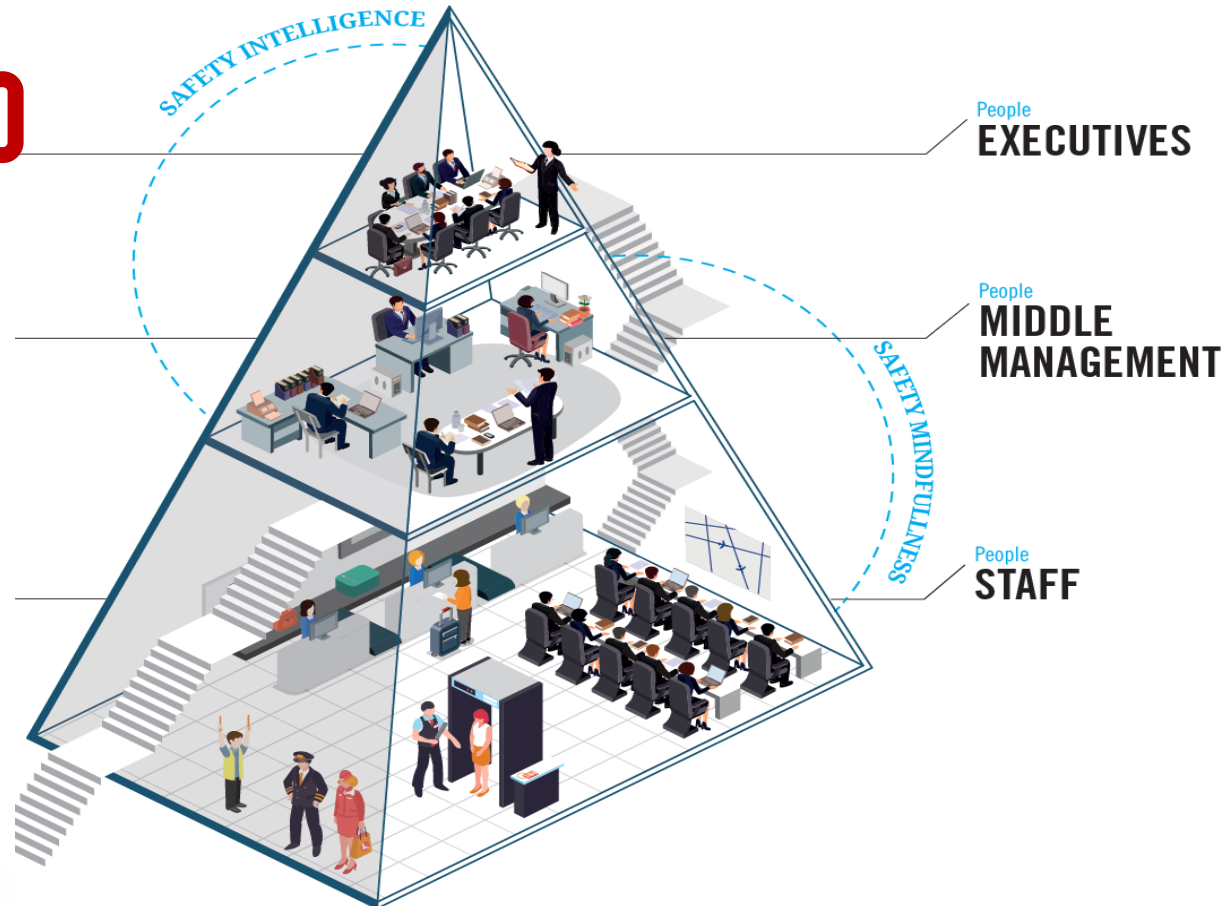
Safe Performance  
System

Safety Culture

Safety Stack

Mindfulness App

Big Data learning

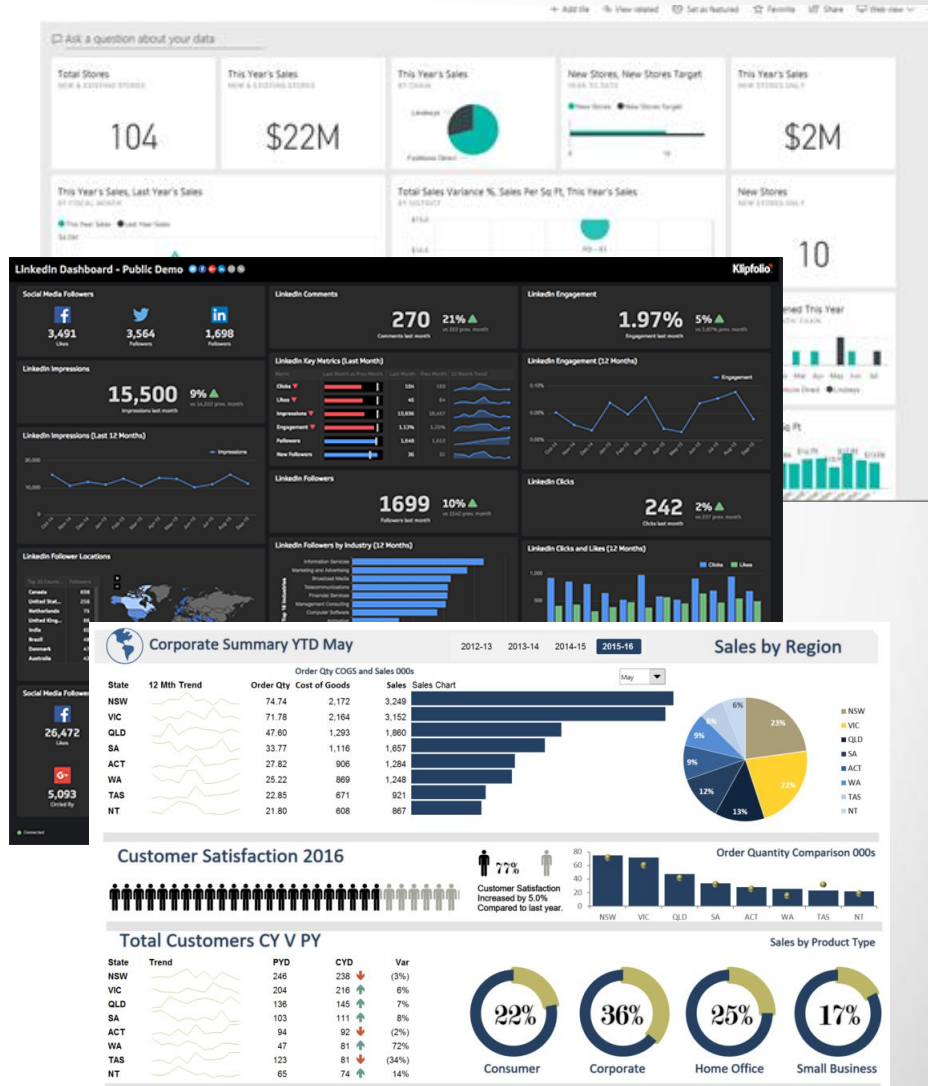


# Safety dashboard: what and why

*“Dashboards [...] are **tools** that improve your **"span of control"** over **a lot** of business **data**.*

*These tools help people **visually identify trends, patterns and anomalies**, reason about what they see, help guide them toward **effective decisions**”\*. (R. Brath & M. Peters)*

\*Richard Brath and Michael Peters, "Dashboard Design: Why Design is Important", DM Direct, October 2004



# Who are we designing for?

## Safety manager

Allow data exploration  
to find patterns and  
causes

## The Executive Board

Provide actionable  
information

# Safety dashboards for ANSP

## Safety Dashboard User group:

- Safety Directors / Managers
- In-person interviews + workshop

**NATS**

skyguide

**austro**  
CONTROL

 ENAV

 EUROCONTROL

 AVINOR

## To understand the state of play:

- Users
- Data
- Content
- Platform
- Level of interactivity
- ...



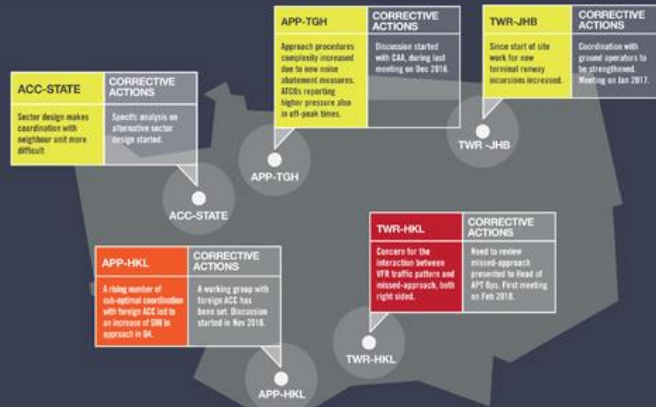
...And come up with a  
SAFETY | FUTURE SKY  
**prototype**

## Safety dashboards for ANSP

- A first version of the SDB was presented at the FSS Brussels public workshop in April 2017
- Meanwhile, interactions with SDB UG members continued in order to validate the dashboard prototype
- This is the result of the iteration...

# ANSP Safety Dashboard - Q4

## Operational risks



### TOP 3 OPERATIONAL RISKS

- TWR-HKL** Risk still with high frequency in Q4 due to exceptionally good weather.
- APP-HKL** Due to rising traffic on HKL, severity likely to escalate for next year.
- TWR-JHB** Occurred RIN were quite severe due to runway and taxiways geometry.

## People in the System

### Reporting Rates - SMI



### Participation to Safety Initiatives



Participation to CISM courses is not increasing despite the communication campaign launched. Safety unit tasked to understand root causes.

Participation to Human Factors course for safety actors increased during the year. Possible need for local edition of the course, involving different staff.

## European Safety KPI

### EOSM Level of Effectiveness of Safety Management System

Safety Policy and Objectives: **D ANSP**  
 Safety Risk Management: **D ANSP**  
 Safety Assurance: **D ANSP**

Safety Promotion: **C ANSP**  
 Safety Culture: **C ANSP**

### RAT usage % of RAT application

SMI: **87.5% ANSP**  
 RIN: **100% ANSP**  
 ATM specific occurrences: **56% ANSP**

### ATM specific occurrences

**56% ANSP**

### JUST CULTURE % 'YES' answers to EASA survey

**87.5% ANSP**

## Safety Culture Action Progress

Last Survey 30/04/16 Mid-Term Review 15/10/16 Next Survey 30/04/17

ELEMENT	ACTION(S)	DUE	RESULT
COMMUNICATION AND LEARNING	Safety Day Planned	06/10/2008	achieved
	New safety newsletter delivered	15/01/2017	achieved
	Roadshow to regions planned	31/03/2018	
RISK HANDLING	Task force set up. 2/5 risk areas addressed	15/12/2017	achieved
STAFFING AND EQUIPMENT	Engineer fatigue issue TBD	15/03/2017	action blocked
MANAGEMENT COMMITMENT	Safety course for all managers under development	31/01/2017	in progress
INVOLVEMENT	First X-unit trial in Region XYZ ACC Successful. 2nd trial imminent.	30/05/17	in progress

Procedures & Training - JUST CULTURE - College Commitment No action required

## External safety factors

SOURCE	DESCRIPTION	IMPACT	COMMENT
Neighbour country	Plans for new airport on the other side of the country border presented to CAA.	Significant increase of traffic flows on East-West routes and need for anticipating descents. Possible need for large review of procedures to keep safety unaltered	Evolution of the situation monitored together with CAA.
CAA	Prolonged discussion on requirements for sharing of safety reports information.	Deployment of new reporting system is being considerably slowed down.	Issue has been escalated to the Board in Q3. Action on CAA started.
ATC Vendor	Recent massive re-organisation of the vendor, point of contacts placed in other departments.	Delay in the provision of resources for AMAN safety assessment.	New Project Manager named from vendor at the end of Q4 should solve the issue.

## SMI\* / RIN\*\* / AI\*\* (\*100k minutes of occupancy / \*\*100k movements)



## Top 3 contributing factors - Q3/Q4

SMI	RIN	AI
43% Coordination issue with neighbouring Unit	33% Coordination issue with ground vehicles	36% Use of out-of-date charts (VFR pilots)
21% Capacity overload	19% Stop bars failure	16% GPS issues
17% Late instruction to conflicting aircraft	9% Pilot mistake	11% APW failure

## Impact of Change

PROJECT	STATUS	RISK B C	UNITS AFFECTED	COMMENTS	IMPACT ON OPS
P00.03 Integrated CWP label	IMPLEMENTED delayed	1 2	SYSTEM WIDE	All safety requirements implemented except of last training module for ATCOs.	Misalignment with new version of operations manual issued for ACC-State. Some reported cases of wrong procedures application
P02.05 New handover procedure	IN PROGRESS delayed	0 1	TWR JKB	Residual risk concerning inclusion of information on ground operators manoeuvres.	APT operations vehicle involved in RWY incursion just after handover in beginning of Dec 2016.
P00.05 FPL server upgrade	IN PROGRESS delayed	2 0	APP-TGH	Major issue with the conversion of data format to be mitigated in Phase II.	Delay in the upgrade is slowing down the resolution of the "Sudden FPL declassification" issue.
P01.07 - CPDLC	STARTED on time	1 2	ACC-STATE	B risks due to unsatisfactory latency and coverage. C risks due to specific need for combined instructions at the border with TMA.	No impact so far.
P02.05 New handover procedure	IN PROGRESS delayed	0 1	TWR JKB	Residual risk concerning inclusion of information on ground operators manoeuvres.	APT operations vehicle involved in RWY incursion just after handover in beginning of Dec 2016.

**OVERALL IMPACT** Workload on system control team and engineering specialists has grown steadily due to combined delays in projects. Situations is aggravated by ATSEP current understaffed due to long sick leaves. Completion of night testing session has occasionally slowed down the smooth revert to full operations capability in time for evening traffic peaks.

## Technical malfunctioning with operational impact



## What has been done so far

- All this work found endorsement by **ECTL Safety team**
- Two meetings were held in Q1 2018 to further **refine** and **validate** the safety dashboard



## What then?

- At the end of the last SDB meeting, ENAIRE volunteered to start a collaboration with P5 to develop a **digital SDB for Executives**
  - ENAV expressed interest as well
- Two meetings so far in ENAIRE, May and August 2018

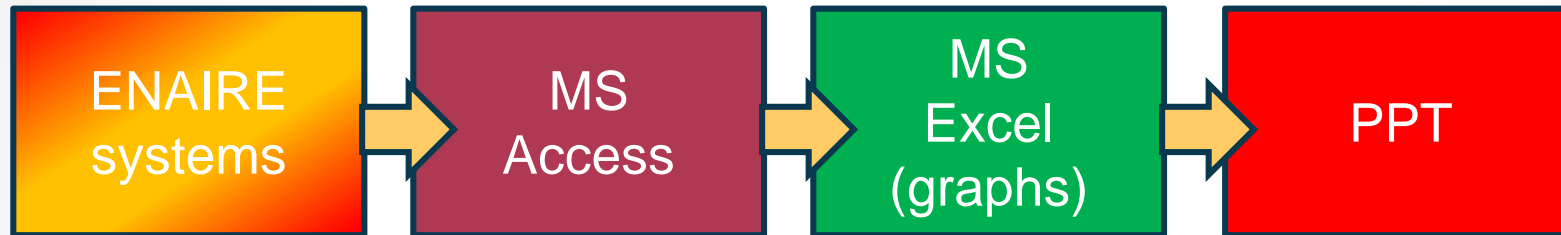


# The work done with ENAIRE

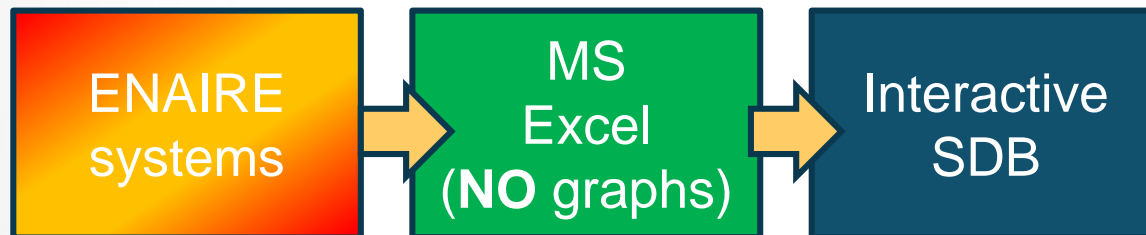
- **Starting point:** the current SDB presented to the Board
  - A PPT slide collating graphs created in Excel
- **Needs:**
  - Make data feeding automatic (backend)
  - Make data visualisation interactive (e.g. select time interval, filter by risk etc.)
  - Make visualisations intuitive and compelling
- **User:**
  - Executive Board
- **Owner:**
  - The Safety Manager

# Data feeding

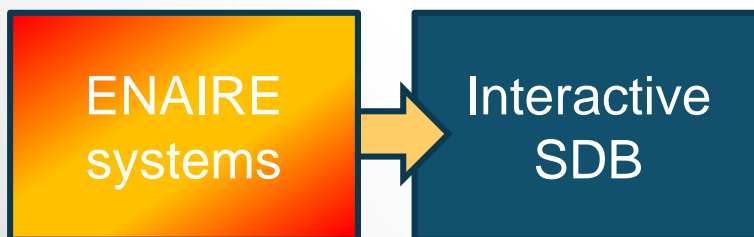
## Now



## Near future



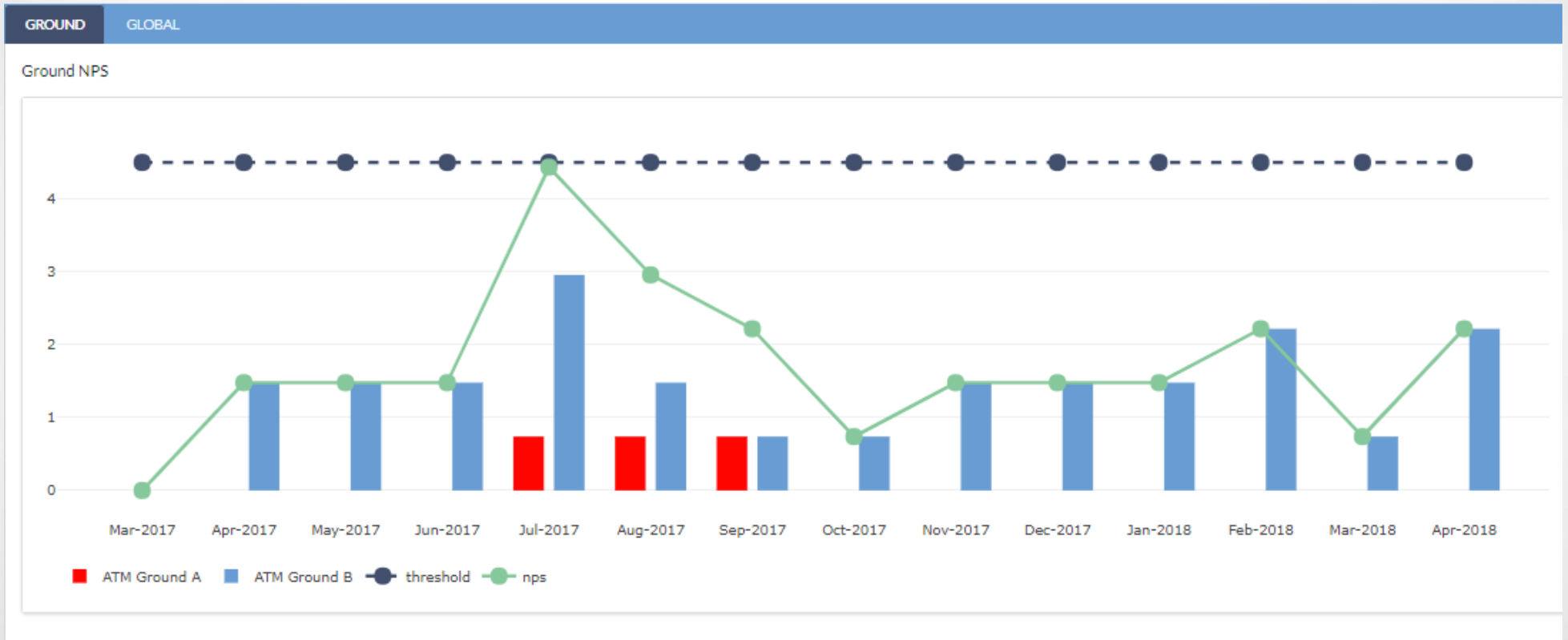
## Future



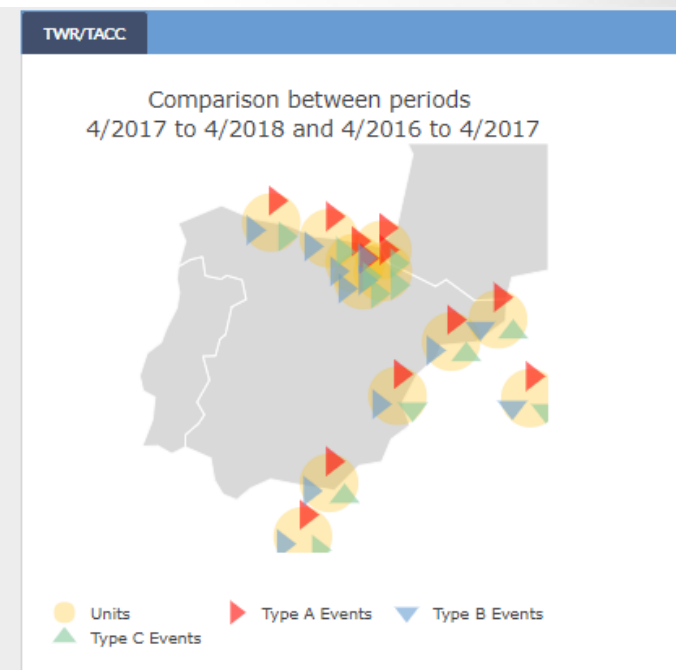
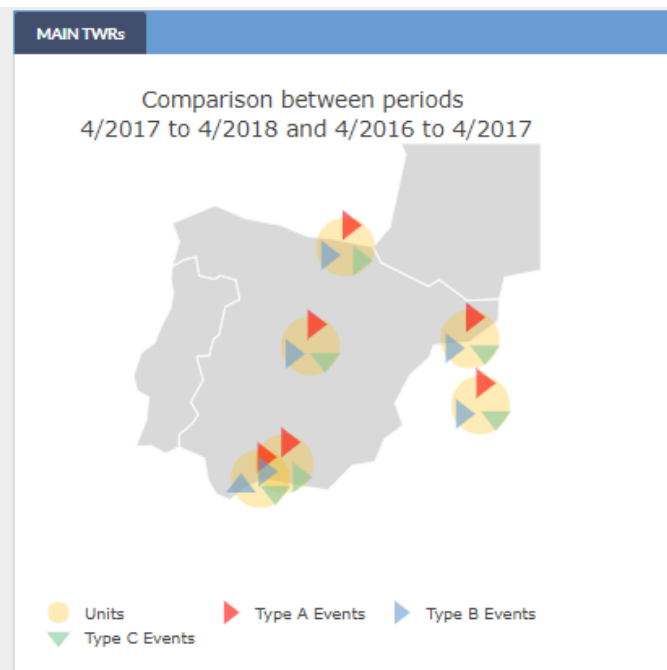
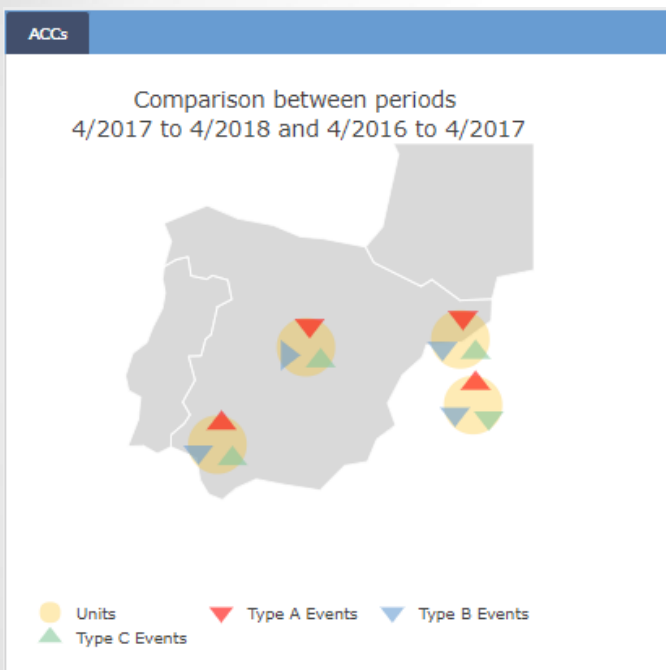
# The Dashboard live!

**(Note!!!: Toy-datasets  
used,  
not the actual ones!)**

# Weighted level of safety (Normalised A + B safety occurrences )



# Trend of A, B and C occurrences by Unit (12-month rolling average comparison)



# Safety recommendations and incidents highlights



## TOP 5 SAFETY RECOMMENDATIONS

Recommendation	Rationale	Related Evidence
Upgrade SNETs with DAPs (e.g. SFL)	More incidents due to missed alerts	1 A SMI incident in the last month (GCCC). 3 B SMI incidents in the last 3 months (LECM).
Installation of ground radar in LECO	New routes for vehicles increased chances for error	1 A and 2 B RI in the last three months
Partial re-design of LECP procedures	More encounters due to new flows from Marseille ACC	From 0 to 5 B SMI in the last 6 months
Discuss with ATC system vendor	CWP HMI issues as contributing factors to misperception	From 0 to 3 B AI in the last 6 months
Acquisition of new reporting system	Decreasing reporting rates due to usability issues	Last 2 quarters negative data on reporting

## RECOMMENDATIONS FROM EXTERNAL BODIES

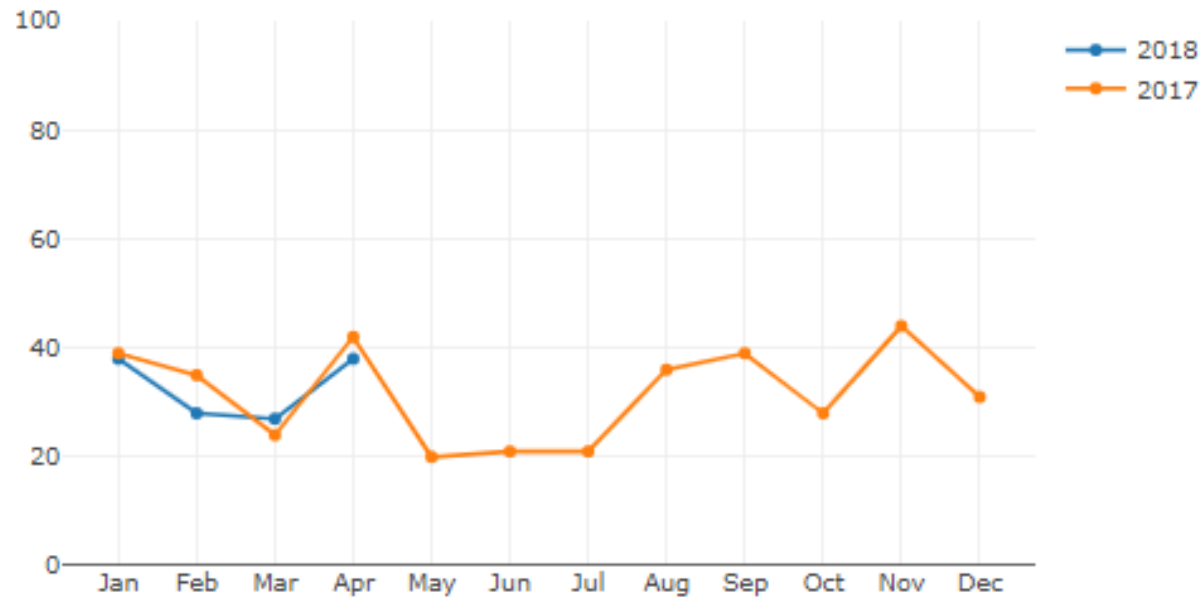
Source	Recommendation	Status
NSA	Revise requirements for sharing of safety reports information	Ongoing
EASA	Focus on Just Culture activities considering result of last survey	In Progress - Delayed
Ministry of Defense	Coordination with military to be reviewed in light of new joint framework agreement	On Hold

## NARRATIVE

- 1 B incident in April (global and ground) in LECM TMA (LEMDRNS).
- 1 B incident (global and ground) on 02/06 in LECP, preliminary evaluation.
- 6 global B with ATM contribution and 6 ground B in the first quarter of the year
- 0 incidents A/B global in May
- 1 incident C global - B ground in Jun in LECM
- 1 incident C global - B ground in July in GCXO, scaled up to B global - B ground

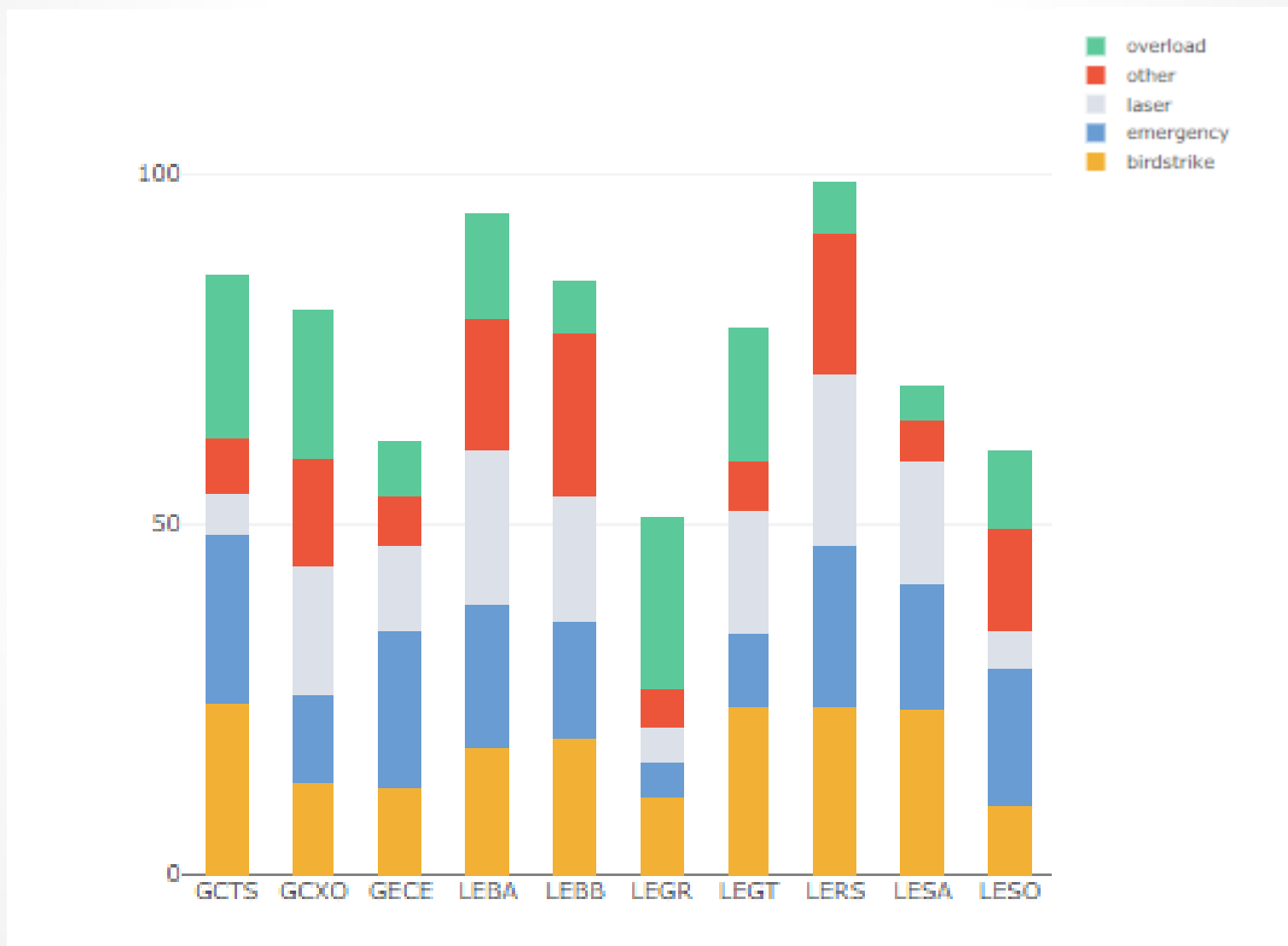
# Reporting trends

## REPORTING TREND

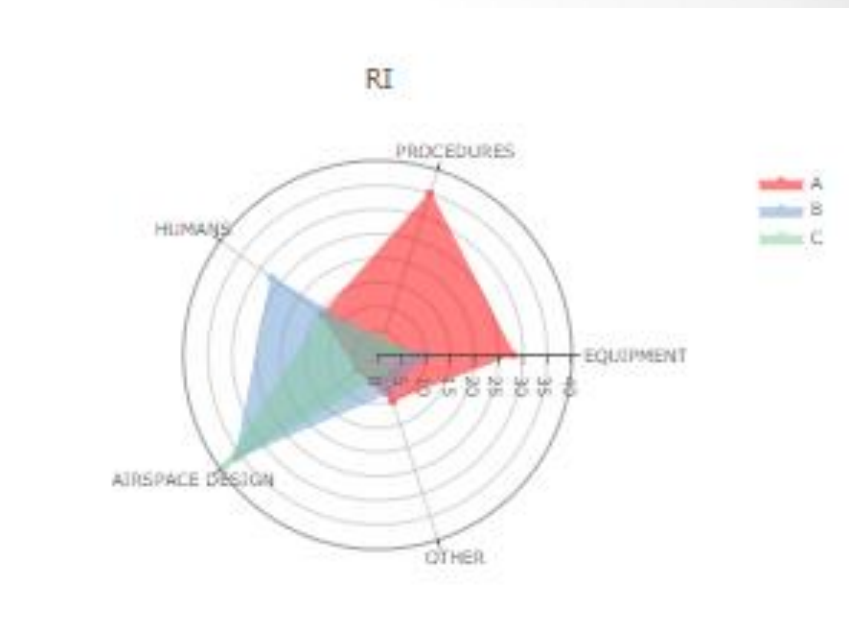
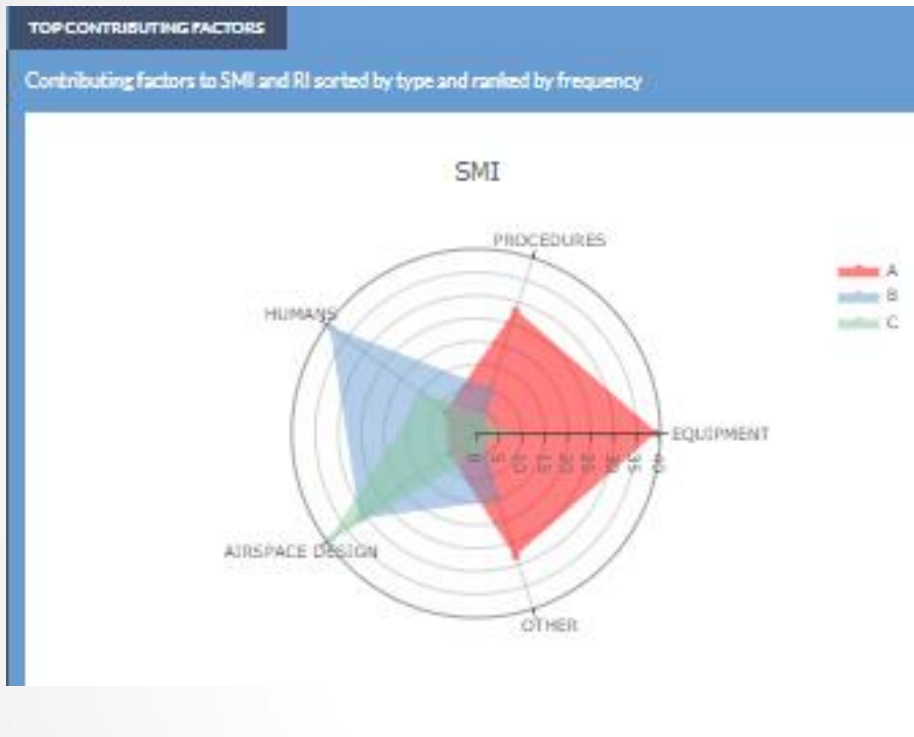




# Reporting trends



# Reporting trends



## Way forward

- Releasing a full-working SDB to ENAIRE on Jan 2019 to be used for the next Board meetings
- Exploring other platforms (e.g. Microsoft Power BI)
- Keep looking for the best way to answer this question:

***«What data are worth showing to Executives to help them run a safe business?»***



## Consortium

Stichting Nationaal Lucht- en Ruimtevaartlaboratorium  
Deutsches Zentrum für Luft- und Raumfahrt  
Office national d'études et de recherches aérospatiales  
Centro para a Excelência e Inovação na Indústria Automóvel  
Centro Italiano Ricerche Aerospaziali  
Centre Suisse d'Electronique et Microtechnique SA  
Institutul National de Cercetari Aerospatiale "Elie Carafoli"  
Instituto Nacional de Técnica Aeroespacial  
Výzkumný a zkušební letecký ústav, a.s.  
Totalförsvarets FOrskningsInstitut  
European Organisation for the Safety of Air Navigation

Civil Aviation Authority UK  
Airbus SAS  
Airbus Operations SAS  
Airbus Defence and Space  
Thales Avionics SAS  
Thales Air Systems SA  
Deep Blue SRL  
Technische Universität München  
Deutsche Lufthansa Aktiengesellschaft  
Service Technique de l'Aviation Civile  
Embraer Portugal Estruturas em Compositos SA

Russian Central Aerohydrodynamic Institute TsAGI  
Ente Nazionale di Assistenza al Volo Spa  
Boeing Research and Technology Europe SLU  
London School of Economics and Political Science  
Alenia Aermacchi  
Cranfield University  
Trinity College Dublin  
Zodiac Aerosafety Systems  
Institut Polytechnique de Bordeaux  
Koninklijke Luchtvaart Maatschappij  
Sistemi Innovativi per il Controllo del Traffico Aereo

<http://www.futuresky.eu/projects/safety>

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