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# Experience Sharing Enhance SMS

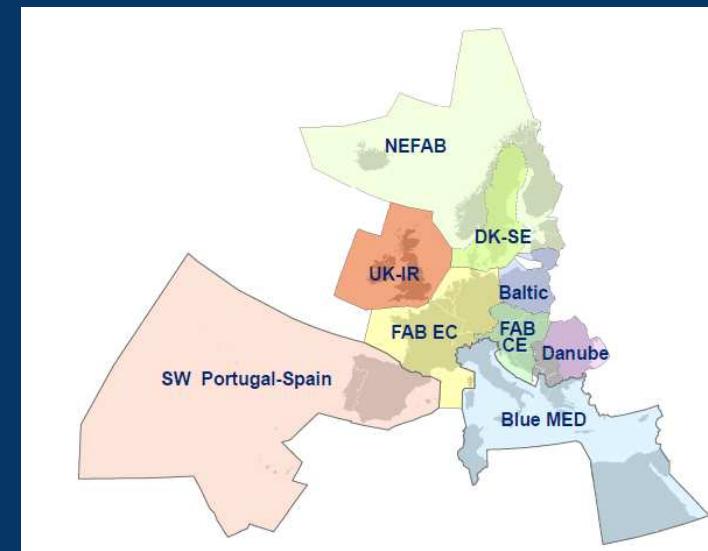
## *ES<sup>2</sup>-WS01-2014*

### Safety FAB Roadmap

#### “The challenges of the forthcoming reference period, RP2”

Rome, 22<sup>nd</sup> & 23<sup>rd</sup> May 2014

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## [ES]<sup>2</sup> 2014 Programme



THEMES	CONTENT	TARGET AUDIENCE	DATES	LOCATION
<i>WS 1-14</i> <i>FAB Safety</i>	FAB Safety FAB SMS Roadmaps	Safety Managers, Safety Specialists (OPS & TECH), EC , EASA,NSAs	22-23 May	Rome
<i>WS 2-14</i> <i>Safety HP</i>	Safety Human Performance Conference	Human Factors and Safety experts, Projects Managers, Safety Managers,	24-26 September	Lisbon
<i>WS 3-14</i> <i>Just Culture</i>	<b>Just Culture and Prosecutors</b>	<b>ATCOs, Safety Experts, Investigators., Safety and OPS managers, Prosecutors</b>	20-21 November	Amsterdam

# Safety FAB Roadmap “The challenges of the forthcoming reference period, RP2”



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Day 1 – 22 <sup>nd</sup> May 2014	
09:00	Welcome and introduction <b>ENAV and EUROCONTROL : Corrado FANTINI &amp; Tony LICU</b>
09.15	Session 1: “Setting the scene” <i>Tony LICU &amp; Fred LIEUTAUD – EUROCONTROL NMD/NOM/SAF - Ops Unit</i>
09.40	Session 2: “EASA activities on safety performance - feedback from RP1 and preparation for RP2” <i>Clarisse RIBEIRO &amp; Clarisa BARBERO - EASA</i>
10.20	Session 3: "Performance Scheme - evolution and way forward" <i>Tamara PEJOVIC – EUROCONTROL/PRU</i>
11.00	<i>Coffee break</i>
11.30	Session 4: “The FABEC Safety Management System – keeping it simple: all models are wrong, but some are useful” <i>Job BRÜGGEN – LVNL, FAB EC</i>
12.10	Session 5: UK-IRELAND – “UK Ireland FAB Status Update” <i>Sam ESPIG &amp; Desmond WHITTY- NATS &amp; IAA, UK Ireland FAB</i>
12.50	<i>Lunch Break</i>
14.10	Session 6: “SAFETY BEYOND BORDERS - Regional Cooperation Activity” <i>Francis BEZZINA – MALTATS, BLUE MED FAB</i>
14:50	Session 7: NEFAB <i>Kaie PEERNA – EANS, NEFAB</i>
15.30	<i>Coffee break</i>
16.00	Session 8: “NAVIAIR and LFV Safety Management Systems” <i>Gert SJOSTEN &amp; Torbjorn HOLMQVIST– NAVIAIR &amp; LFV, DK/SE FAB</i>
16.40	Session 9 – Interactive session
17:15	Conclusions of Day 1 - End of Day 1



# Safety FAB Roadmap “The challenges of the forthcoming reference period, RP2”



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Day 2 – 23<sup>rd</sup> May 2014

08.45	<p><b>Session 10:</b> "Politically Married but living apart, each in own house with separate accounts" &amp; "Is the Performance Regulation going to contribute to the Safety Enhancement of Air Navigation Services or, by contrary, will adversely affect it? - the overwhelming activity of measurement against the activity of achieving safety" <i>Pavel CATINEAN &amp; Valentin MIROIU – ROMATSA, DANUBE FAB</i></p>
09.25	<p><b>Session 11: "FAB CE Safety Roadmap Challenges for RP2 - views of the FABCE Safety Sub-Committee"</b> <i>Maria KOVACOVA &amp; Mihaly KURUCZ- LPS &amp; HUNGAROCONTROL, FAB CE</i></p>
10.05	<p><b>Session 12: "Baltic FAB Safety Roadmap – plans &amp; challenges for RP2"</b> <i>Mariusz KRZYZANOWSKI – PANSA, BALTIC FAB</i></p>
10.45	<p><b>Coffee break</b></p>
11:15	<p><b>Session 13: South West FAB</b> (obo) <i>Antonio GUERRA, Jesus ROMERO HERNANDEZ – NAV-P &amp; AENA, SW FAB</i></p>
11.45	<p><b>Session 14: FAB EC - "The FABEC Safety Risk Assessment Process – why did we not think of this earlier?"</b> <i>Job BRÜGGEN – LVNL, FAB EC</i></p>
12.25	<p><b>Session 15: Interactive session cont'd from Day 1</b> <b>Overall Conclusion &amp; Closure</b></p>
13:15	<p><b>Lunch</b></p>





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## Safety Highlights

- Target Culture
- SES KPIs
  - EoSM / SoE
  - Just Culture
  - Usage of RAT severity
- FAB SMS Roadmaps
- FAB coordination within and across
- Safety Tools
- Support available



# Target Culture

How do numerical targets affect safety?



Common reasons for targets

# Targets set direction



*...they set people in the direction of meeting the numerical target, not necessarily providing the quality of service required from the end-user's perspective.*



# Targets motivate people



*...to do anything to (be seen to) achieve the target, not to achieve the purpose from the end-user's perspective. They motivate the wrong sort of behaviour.*

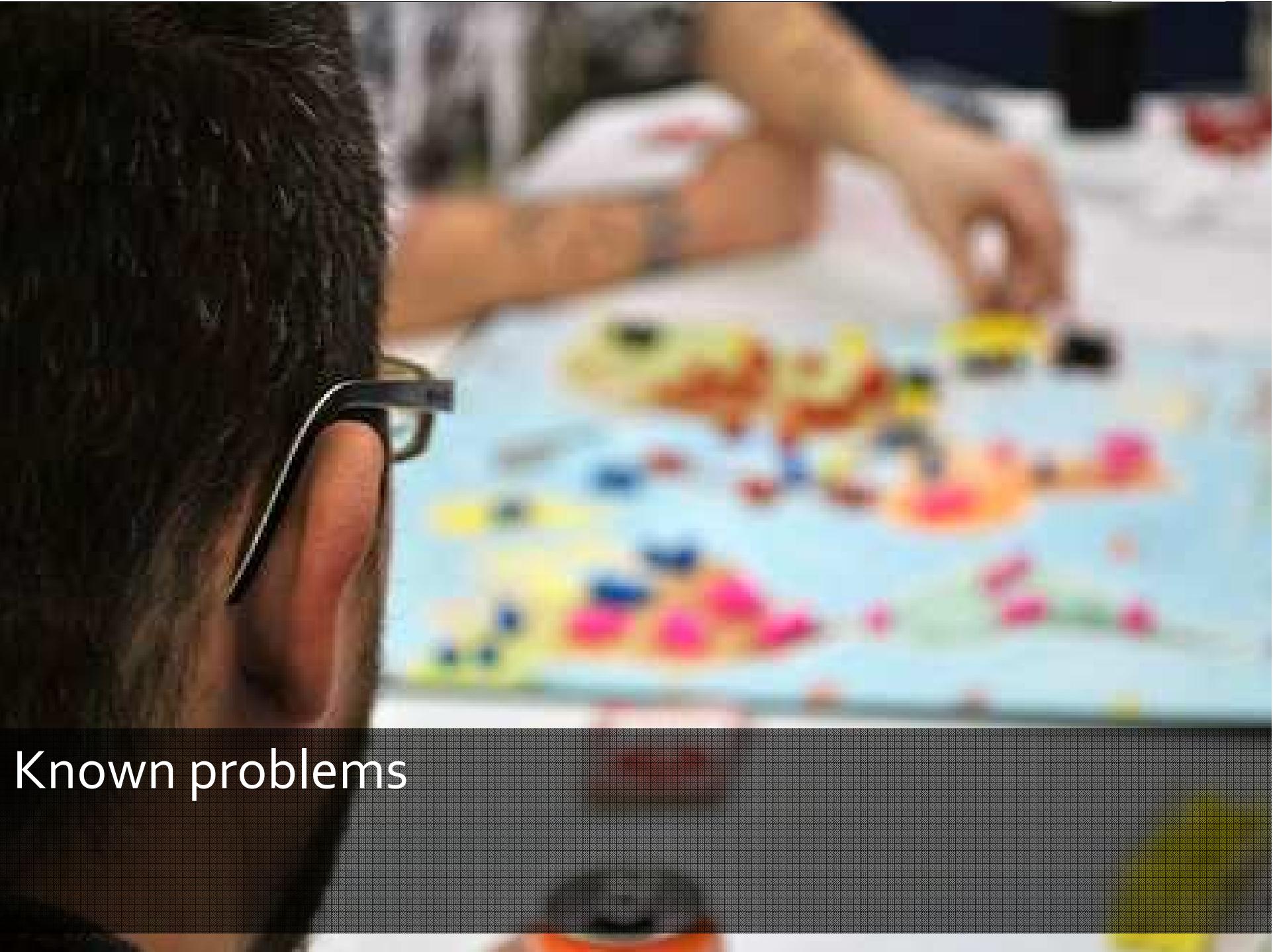


# Targets allow comparison



*...but experience  
shows it allows  
comparing false,  
manipulated or  
meaningless data.*

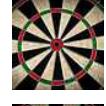




Known problems



# Targets:

-  are usually **arbitrary**, with no reliable way to set them
-  are set from above, **disconnected from the work**
-  focus on **individual functions** & sub-optimise the whole system
-  always have **unintended consequences**
-  lead to **cheating & gaming**, especially if there are sanctions
-  create a **burden of data and supervision**
-  allow other **important but unmeasured aspects of performance to deteriorate**
-  are often **not met anyway**, or become **outdated**, but are still chased



## Unintended consequences Lessons from other sectors



Accident & Emergency →

Healthcare



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# Example targets



*Accident and Emergency waiting times (4 hours)*



*Cancer treatment waiting times*



*Ambulance waiting times*



*Financial performance*



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## Mid-Staffordshire Hospital Scandal



THE MID STAFFORDSHIRE  
NHS FOUNDATION TRUST  
PUBLIC INQUIRY  
Chaired by Robert Francis QC

### Report of the Mid Staffordshire NHS Foundation Trust Public Inquiry

#### Executive summary

HC 947

An estimated 400-1,200 patients died as a result of poor care between January 2005 and March 2009 at Stafford hospital, UK

Public Inquiry report by Robert Francis QC published 6 February 2013

Targets, culture and cost cutting were key themes

Targets related to elective surgery, outpatient waiting times, cancer waiting times and financial performance

Targets led to bullying, falsification, and poor quality care



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# Nurse



**“Nurses were expected to break the rules as a matter of course in order to meet target**, a prime example of this being the maximum four-hour wait time target for patients in A&E. **Rather than “breach” the target, the length of waiting time would regularly be falsified on notes and computer records.”** Whistleblower **Staff Nurse Donnelly**, Evidence to the Enquiry

## Trainee Doctor

**“The nurses were threatened on a near daily basis with losing their jobs if they did not get patients out within the 4 hours target ... the nurses would move them when they got near to the 4 hours limit and place them in another part of the hospital ... without people knowing and without receiving the medication.”** Dr Turner, then a **Specialist Registrar in emergency medicine**, 2002-2006



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# Chief Executives & Director



“As Chief Executives **we knew that targets were the priority and if we didn’t focus on them we would lose our jobs.**” William Price, Chief Executive of South West Staffordshire Primary Care Trust, 2002-2006

“**... the commissioning process focused on activity, money and achieving particular targets ...** In terms of how the issue of quality featured in the context of a culture of monitoring targets and balancing books, **I do not think that quality was ignored. However, it is hard to put my finger on how quality did feature.**” Jean-Pierre Parsons, Chief Executive of Cannock Chase Primary Care Trust (CCPCT), 2002-2006

“I did on occasion feel intimidated by members of the SHA and was **put under a lot of pressure to hit the targets.**” Susan Fisher, **Finance Director** of South West Staffordshire Primary Care Trust



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## Mid-Staffordshire Hospital Scandal



# the guardian

### Mid Staffs report is right: NHS targets went too far

“Over the past 20 years, there has been a **drive to import a commercial mentality into the NHS, which has given rise to a new managerialism and a focus on finance and targets.** “

### Mid Staffs shows everything that's rotten in the house of management

**Targets always result in gaming.** When it does, the knee-jerk reaction on the part of everyone from politicians to top managers is to tighten supervision to identify and root out offenders. Unfortunately, performance management has a poor record – partly because **in overall performance, individuals are far less important than the system in which they operate.**



Police and Criminal Justice



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## Pressure to drop charges



# The Telegraph

Met sex crimes squad 'pressured victims to drop rape claims'

"Officers in a heavily-criticised sex crime squad **pressured rape victims to drop claims to hit targets**...drew up its own policy to encourage victims to retract statements and boost the number of rapes classed as "no crime", improving the squad's poor detection rates threefold, the Independent Police Complaints Commission found.

Deborah Glass, its deputy chair, said it was a "**classic case of hitting the target but missing the point...The pressure to meet targets as a measure of success, rather than focussing on the outcome for the victim**, resulted in the police losing sight of what policing is about."'"



Education



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## Altering records to hit truancy target



# the guardian

### Teachers 'fiddled school roll'

“The government is to investigate truancy at a Newcastle comprehensive after allegations that **teachers fiddled the attendance figures** by persuading parents of persistent absentees to sign forms saying they intended to educate their children at home.

Educational welfare officers were reported to have made a formal complaint about the practice at Firfield school in Newcastle. They suggested that **the school was trying to meet targets for cutting truancy by removing "serial truants" from the roll.**” 11 Dec 1999



# the guardian

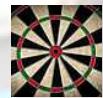
## Targets and league tables

**“League tables, which promote shallow learning and teaching to the test, should be abolished**, as they don't show the true quality of the school.”

“Targets set for schools are driving the curriculum. Heads ... are forced to **play the game and offer qualifications that are 'easier' to pass** in less curriculum time...”

“I think that the **targets culture is ruining education**. Teachers and senior staff are now more interested in **doing whatever it takes (including cheating) to get their stats up than doing what is best for the students.**” 3 Oct 2011

# Concluding thoughts about Targets



Targets encourage people to manage the numbers, leading to waste, cheating, gaming and worse;



There is usually no reliable way to set them;



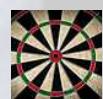
Targets introduce conflict within the system and create additional need to data gathering and supervision ;



Measures need to reflect how the work really works, and have meaning to those who do it;



They are often not met anyway, but even when they are, whole system performance tends to get worse;



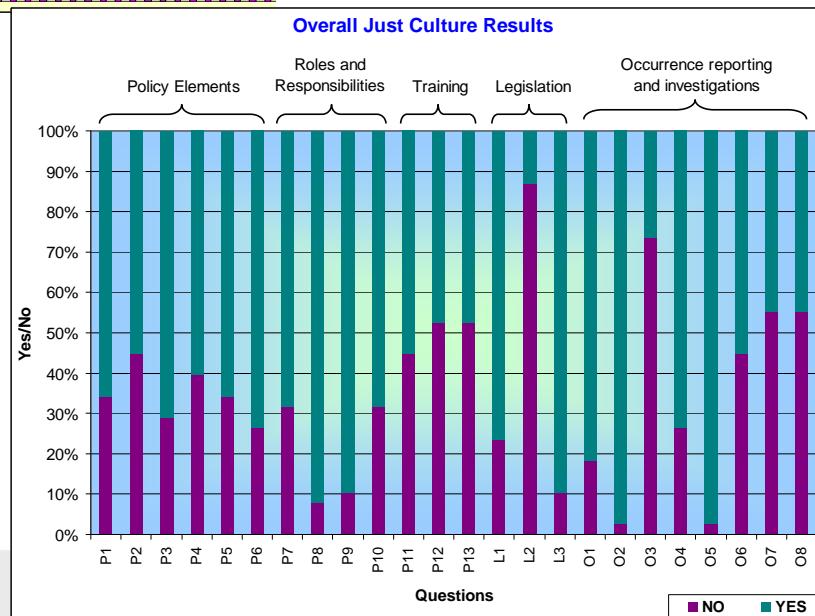
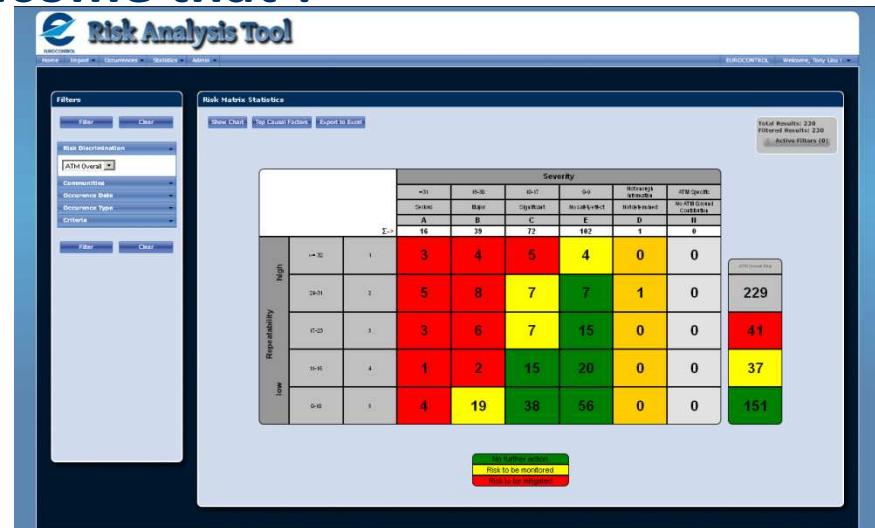
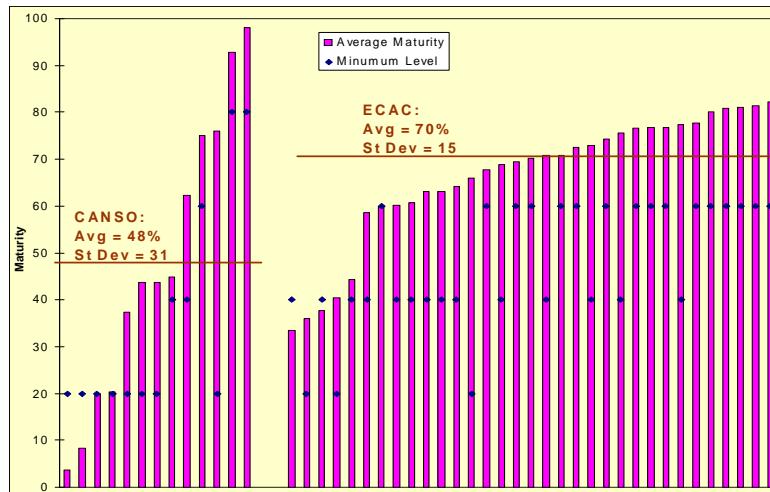
**“When a measure becomes a target, it ceases to be a good measure.” Prof. Marilyn Strathern.**

# Concluding thoughts on Measures

- 🎯 Echo Organisational goals;
- 🎯 Are cross-checked top—down but also bottom-up;
- 🎯 Provide context;
- 🎯 Create meaning at all Organisational Level;
- 🎯 Are based on Legitimate Data (not encourage cheating, gaming, etc
- 🎯 Are easy to understand and lead to Action.

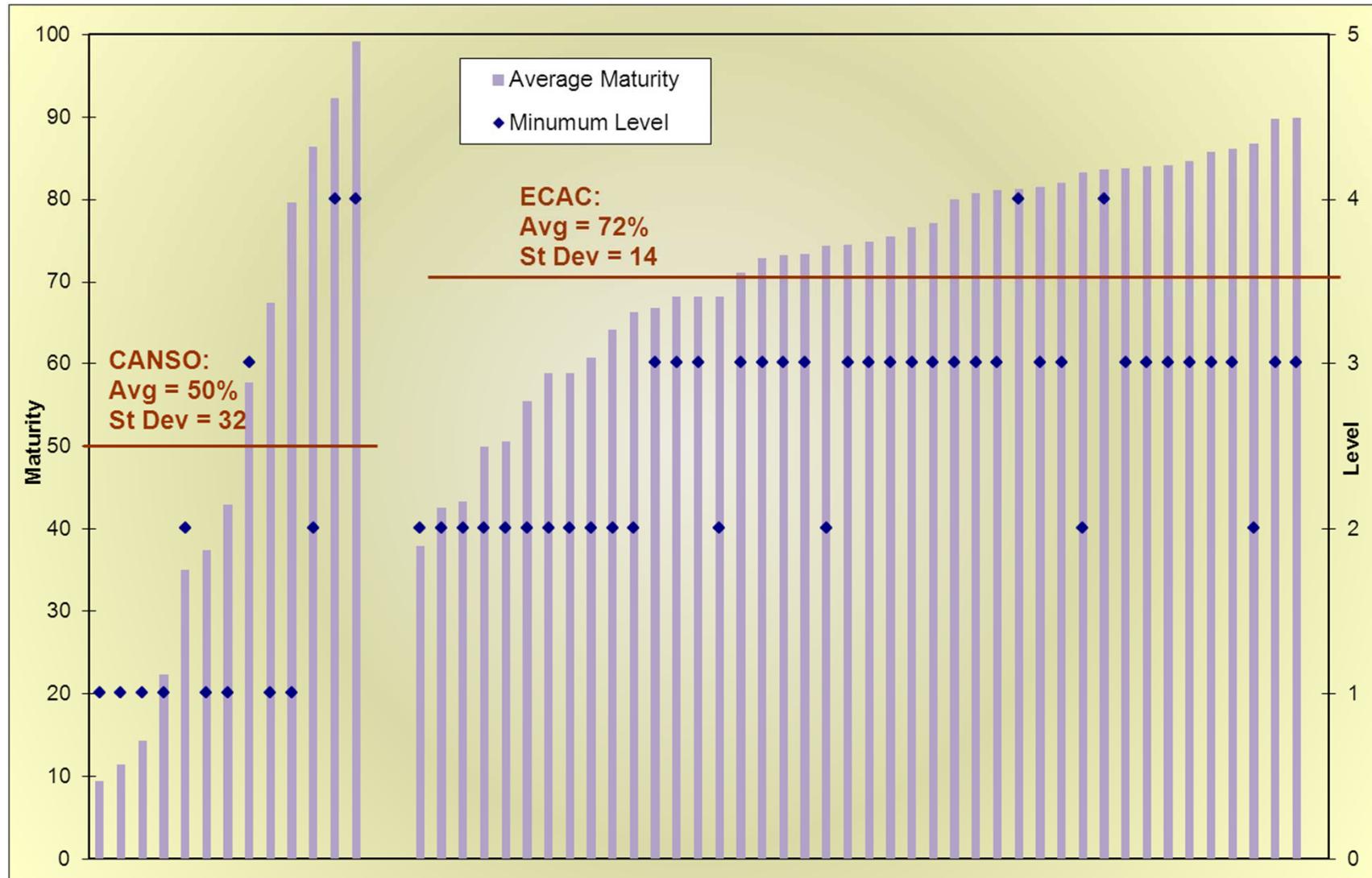


## What is the situation in ATM – we have 3 KPIs but with no Targets in RP1 – We should welcome that !





## Overview of the 2013 SoE Measurement





## SoE Conclusions and Challenges

- The weakest and strongest SAs are unchanged from last year;
- Greater emphasis on safety culture was noted, but significant work remains;
- Top management support for safety continues, but overall remains a challenge;
- The FAB cooperation is seen as largely positive for safety and improving;
- Publication of safety performance improves slowly;
- Justification and Evidence, in particular for D/E scores remains a challenge for some ANSPs;
- Likewise, changing a score downwards or even maintaining it is still perceived as a negative outcome. It is not;
- SAs are not always seen in connection; some scores are contradictory;
- Some best (good) practices have been identified, more will be in the future.



## Conclusions for the 2013 Survey

- Overall the maturity level in the ECAC Region has increased slightly since the 2011 survey;
- Relationships within FABs seem to have improved;
- More ANSPs CEO/DGs are personally involved in Safety decisions;
- Among the additional CANSO ANSPs the more developed SMS are within ANSPs that have been developing their SMS for at least 5 years, some longer. The other ANSPs are only at the implementation stage at best.



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# Standard of Excellence Measurement at FAB level



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# Topics

- Applicability of SoE to FABs
- Possible calculation methods
- Examples
- Conclusion

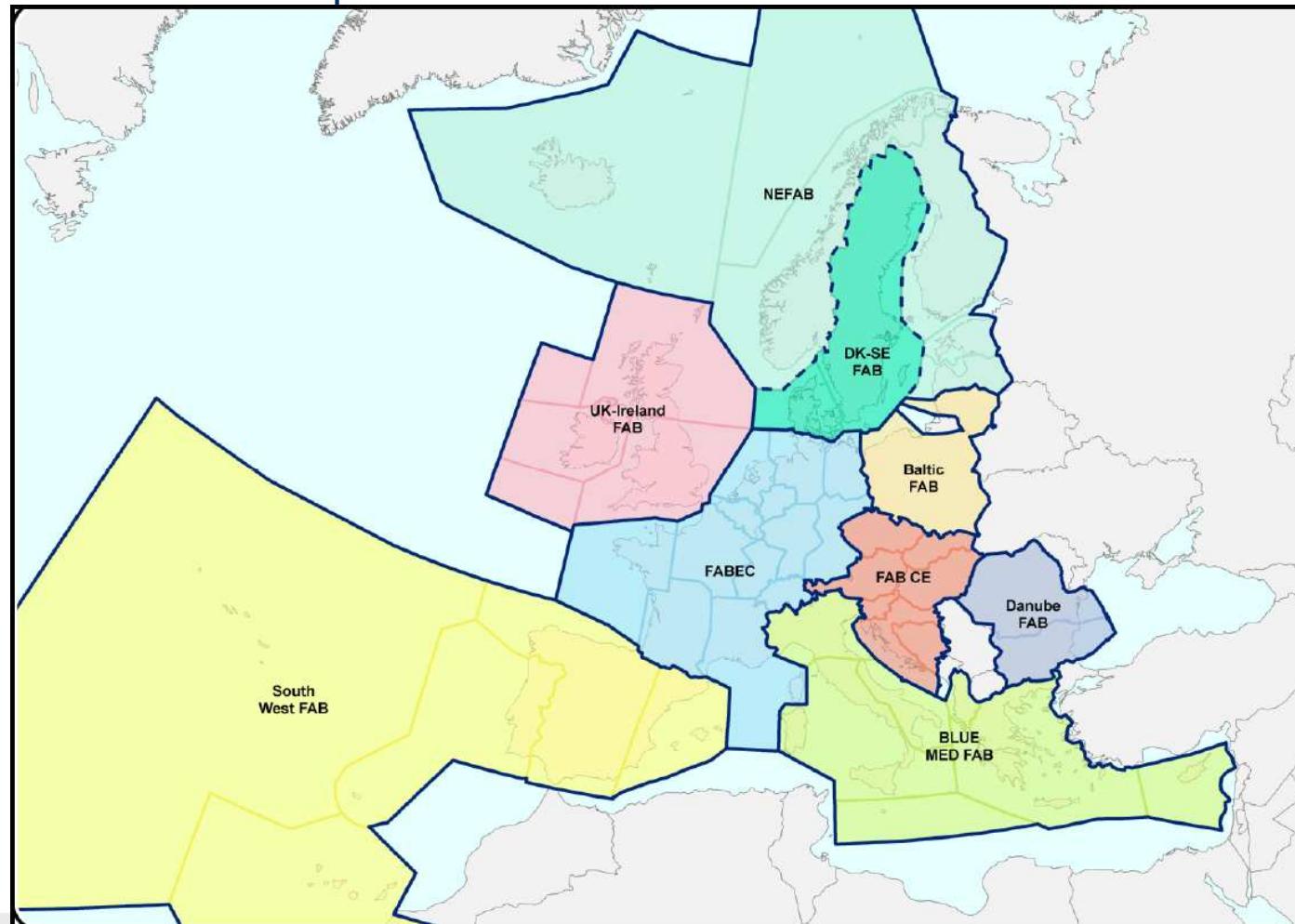


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# Applicability to FABs

Two-State versus Multiple-States FAB?



Safety FAB Roadmap



## Calculation Methods

- Four methods for calculation of an average score:
  - Simple Average
  - Weighted Average by Traffic
  - Weighted Average by Complexity
  - Weighted Average by Traffic and Complexity (combined)
- In all cases the Level carries the same significance: lowest answer.
- Now brace for a good run of numbers!



# Average Score

## Example FAB

Max	Individual Scores					Min	AVG
88	64	80	70	45	38	52	62.43

- Pros:
  - No other data required (i.e. only the SoE data);
  - Very easy to understand
  - Shows Highs and Lows
  - Similar to overall ANSP score when multiple units considered
- Cons:
  - All count equal, while size, complexity and traffic differ
  - Will not show the real spread;
  - May not reflect a relevant result.



# Weighted Average by Traffic

## Example FAB

Scores	38	64	80	70	45	88	52	Sum	
Traffic ('000)	300	500	200	100	60	1800	900	3860	Avg.
T*S	11400	32000	16000	7000	2700	158400	46800	274300	71.06

- Pros:
  - Takes into account traffic;
  - Will more accurately reflect areas with larger traffic volumes;
  - Will better reflect FAB, as scores are influenced by individual traffic.
- Cons:
  - Low traffic areas will not have a significant impact on the final score;
  - Final score might change based on traffic changes and not safety maturity;
  - Safety maturity is not necessarily related to traffic.



# Weighted Average by Complexity

## Example FAB

Scores	38	64	80	70	45	88	52	Sum	
Compl.	10	12	7	5	3	10	9	56	Avg.
S*C	380	768	560	350	135	880	468	3541	63.23

- Pros:
  - Takes into account Complexity of the airspace (not all ANSPs equal);
  - Will give more weight to areas with a more complex airspace;
  - Remains more stable in time, as complexity is more stable than traffic.
- Cons:
  - Low complex areas will not have a significant impact
  - Score might look better/worse due to complexity variances within FAB;
  - Safety maturity is not necessarily related to complexity.



# Weighted Average by Traffic and Complexity

## Example FAB

Scores	38	64	80	70	45	88	52		
Traffic ('000)	300	500	200	100	60	1800	900	Sum	Avg.
Compl.	10	12	7	5	3	10	9		
T*C	3000	6000	1400	500	180	18000	8100	37180	
T*S*C	114000	384000	112000	35000	8100	1584000	421200	2658300	71.50

- Pros:
  - Takes into account both Traffic and Complexity
  - Emphasis on ANSPs with higher complexity and more traffic
- Cons:
  - Low complex / traffic areas will not have a significant impact
  - Score might look better / worse due to variances within FAB
  - Different magnitude between Traffic and Complexity figures



## Recap of all methods:

Scores	38	64	80	70	45	88	52	Average	<b>62.43</b>
Traffic ('000)	300	500	200	100	60	1800	900	Weighted average (traffic)	<b>71.06</b>
Complexity	10	12	8	5	2	7	10	Weighted average (complexity)	<b>62.30</b>
T*C	3000	6000	1600	500	120	12600	9000	Weighted average (traffic & complexity)	<b>68.35</b>

- Various methods yield different results;
- Variance is not huge, but not negligible either;
- In all cases it may make sense to show the min and max values;
- This would indicate the total range, but not the spread;
- Other values that can be calculated, but not considered here:
  - Inter-quartile range;
  - Standard deviation;
  - Median value.



## Some real numbers

Averages		FABEC	FABCE	BlueMed	NEFAB
Simple		77.5	70.5	66.1	74.5
Weighted by	traffic	85.2	76.8	67.5	80.6
	complexity	82.6	76.1	67.1	74.2
	traffic & complexity	85.1	78.5	71.5	80.5

- No clear pattern is discernible;
- Range of values rather contained;
- No method seems better than the other.



## Conclusion

- A two-State FAB will not realistically need any aggregation;
- This is then applicable only to Multi-State FABs;
- There are many ways to skin a cat;
- The major question is: Then what?
- The only immediately apparent use is inter-FAB benchmarking;
- Difficult to see any directly actionable conclusion from aggregated scores;
- Any actions for improvement will have to be directed at ANSP level;
- A single aggregated FAB-level score is likely to be meaningless;
- Other indicators will be required, such as level, min/max etc.
- It is therefore suggested that for the time being, only ANSP-level scores will continue to be considered.



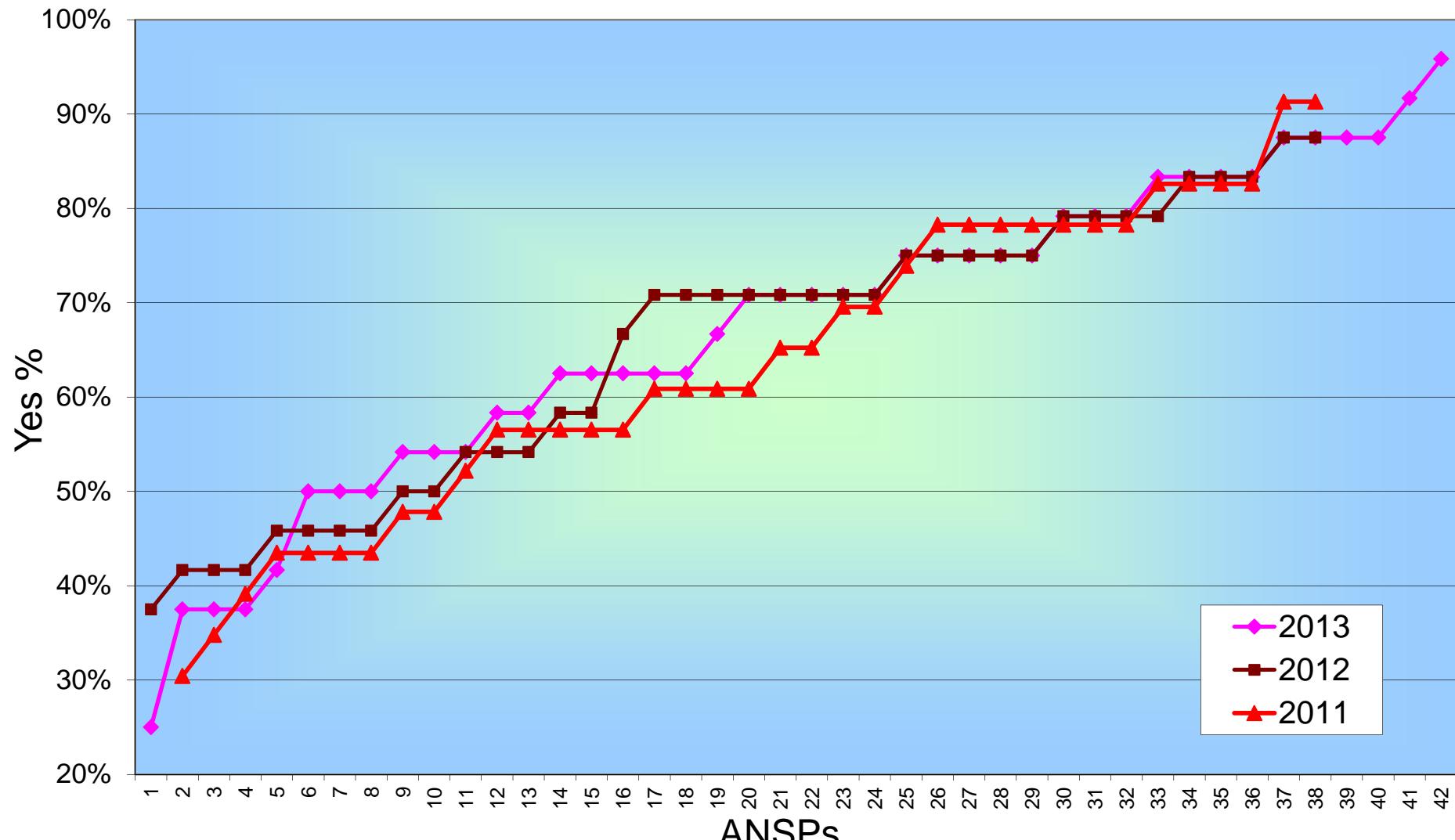
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# Just Culture



## Overall Just Culture Results



90%

80%

70%

60%

50%

40%

30%

20%

10%

0%

Policy &amp; implementation

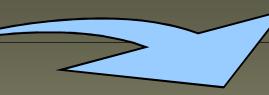
Policy elements

Roles &amp; responsibilities

Training

Legislation

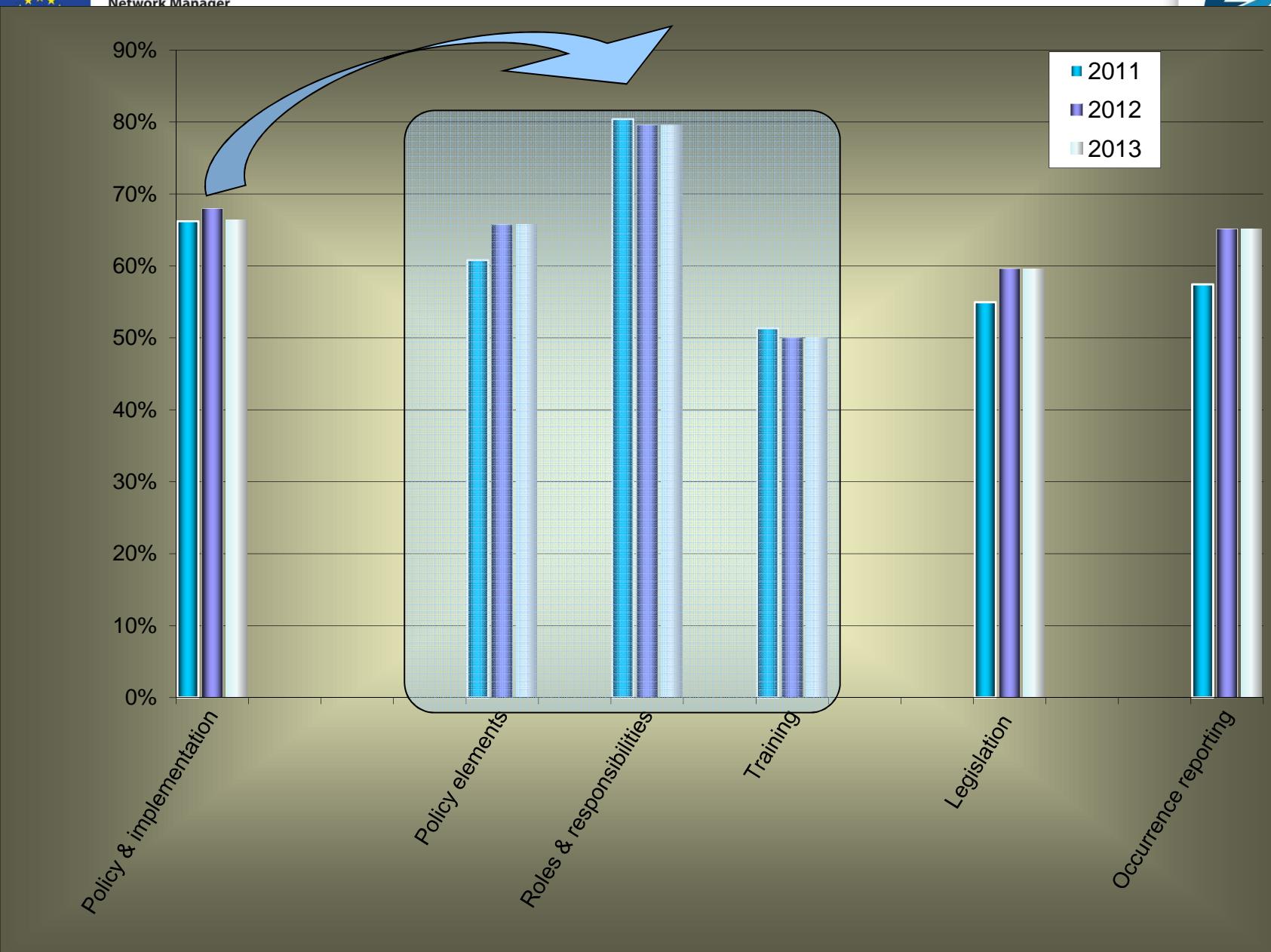
Occurrence reporting



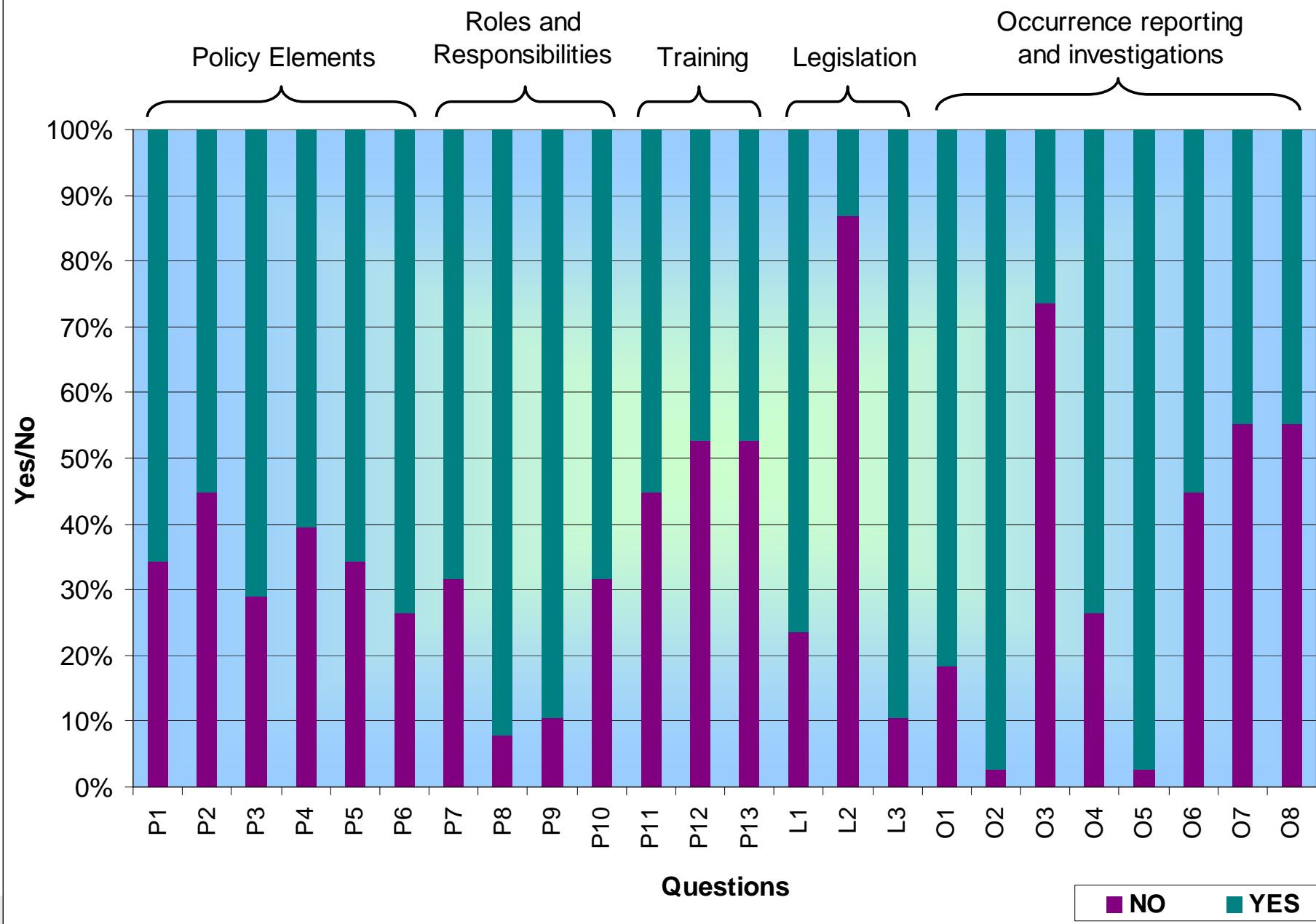
2011

2012

2013



## Overall Just Culture Results





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# RAT and other Safety Tools



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## RAT and its developments - Neutralised explanatory factors

The screenshot shows the Risk Analysis Tool (RAT) interface. At the top, there are two dropdown menus for 'Other Contributing Factors' and 'Non-Systemic/ Human Involvement Issues without Contextual Consequences', each with a limit of 8 items. Below these is a 'Window of Opportunity' section. The main content area is titled 'Risk Analysis Tool' and shows a 'Please select an occurrence type' dialog box with the following options:

- More than one aircraft
- Aircraft-aircraft-tower
- Aircraft with ground movement
- One aircraft
- ATM Specific Occurrence

At the bottom left, there is a 'Just test' button and the EUROCONTROL logo. The footer contains the text 'Copyright © 2013 EUROCONTROL v. 1.1.0.2'. On the right side of the interface, there is a vertical sidebar with sections: D. Contextual Factors, D-3. Training and Experience, and D-3-1. Training (completeness), each with a small circular icon.



## What went right as well as wrong?

- Understanding local rationality (goals, expectations, intentions, information available)
- Flexibility to deal with changing system demands
- Handling of multiple goals (macro-meso-micro)
- Quality of resources (equipment, staffing, training, etc)
- Flow of information
- System constraints
- ETTOs & TETOs
- Adjustments to changing goals and system conditions



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eTOKAI



Hide Tree

search



EUROCONTROL

ATS Reports & Notification Data Gathering RAT Querying & Statistics HERA Admin

Unit 1 Welcome, sa !

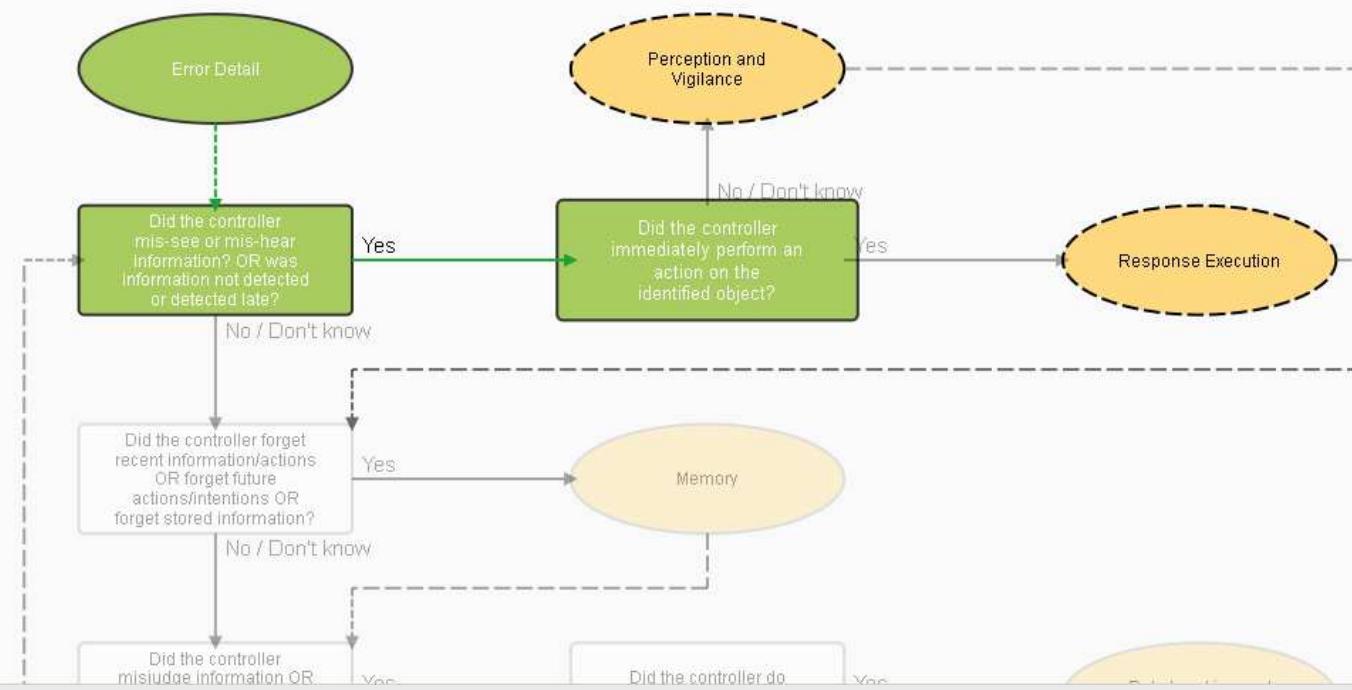


EUROCONTROL

ATS Reports & Notification Data Gathering RAT Querying & Statistics HERA Admin

Unit 1 Welcome, sa !

Flowchart

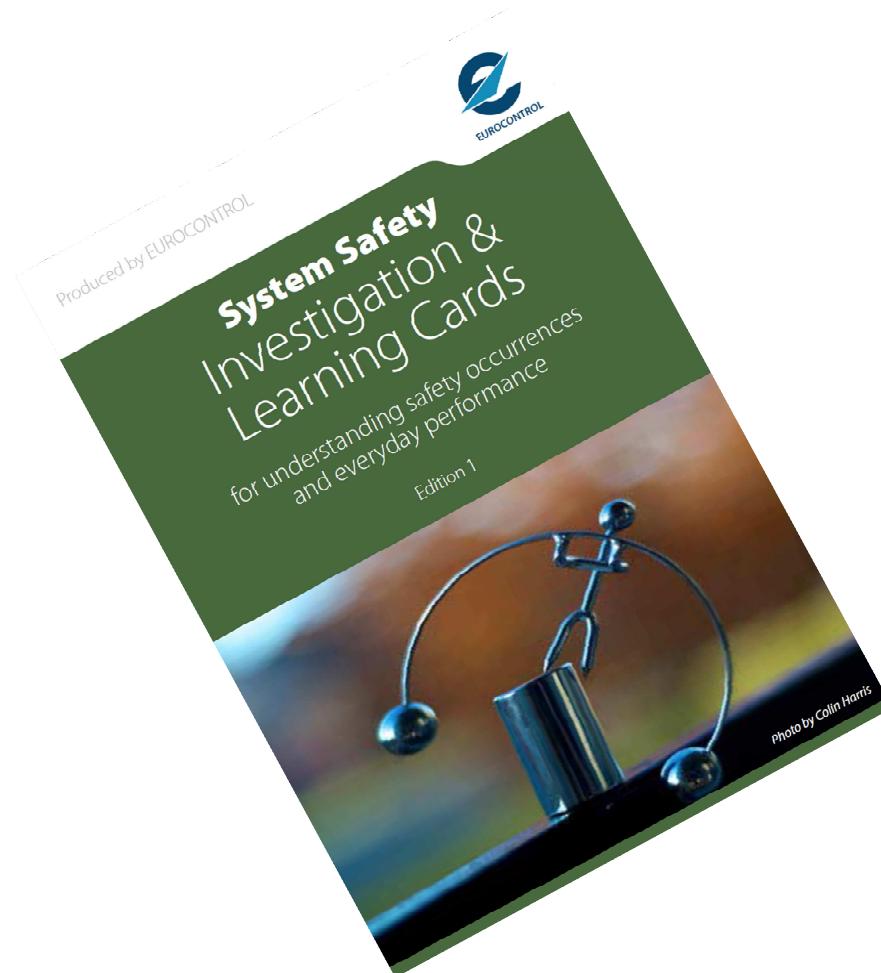




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# Investigation & Learning Cards





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0h



### Fundamental Principles

## Principle 9. Efficiency- Thoroughness Trade-Off (ETTO)

People have to balance the thoroughness and efficiency of performance in a complex and uncertain environment

Consider how people balance efficient and thoroughness, from their point of view, and understand the tactics they use to maintain efficiency (e.g. multitasking, recognition) and thoroughness (e.g. checking).



0e



### Fundamental Principles

## Principle 6. Demand, Production Pressure & Goal Conflict

Pressures relating to efficiency and capacity have a fundamental effect on performance

Performance needs to be understood in terms of demands, resulting pressures and conflicts between goals of production and protection





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## Front

A3 Safety Investigation Cards



**Personnel**

### Decision

Judging or projecting the accuracy of spatial or temporal information and forming a decision or plan to achieve an intended outcome

Judgements and decision-making requires continuous adjustments to the context and conditions. Decision making must be considered from the point of the view of the person, including goals, knowledge, understanding of the situation and focus of attention at the time, as well as the context of work.



## Back

Safety Investigation Cards

### A.3. Decision

- A3-1. Judge / project
- A3-2. Decide / plan ('correctness'/workability)
- A3-3. Decide / plan (sufficiency)
- A3-4. Decide / plan (timing)
- A3-5. Decide / plan (presence of decision/plan)

**RAT  
explanatory  
factors**



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# APF – Aerospace Performance Factor

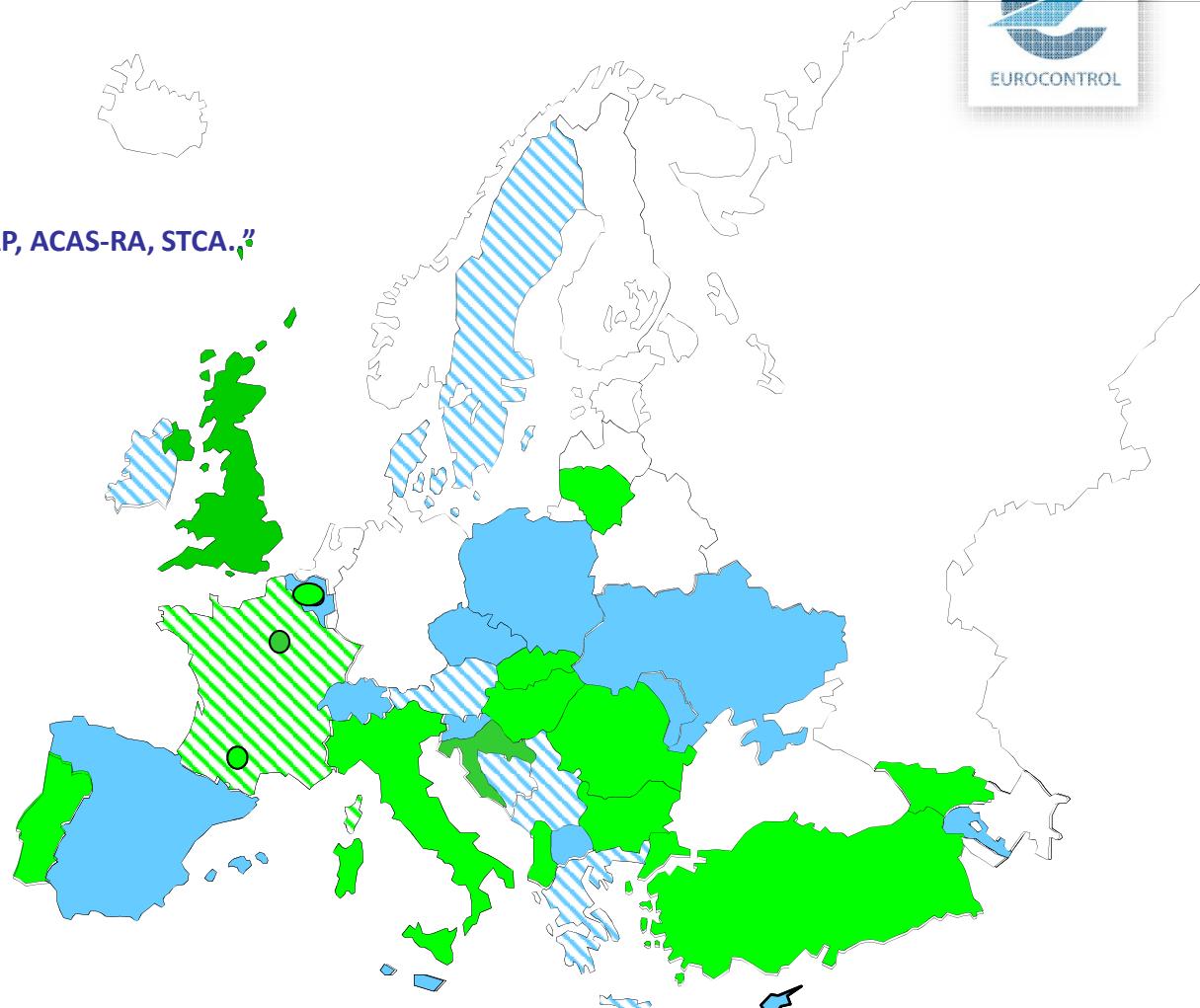




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- ▲ ANSPs upgrades/on going deployment  
Different usage vs ASMT Modules “PRX, AP, ACAS-RA, STCA.”  
Cooperation Analyses/Trends (ECTRL)
- ASMT RTS & Data Analysis
- ▲ ANSP ASMT Initiation
- ▲ ANSP Contact mail



<http://www.eurocontrol.int/services/automatic-safety-monitoring-tool>





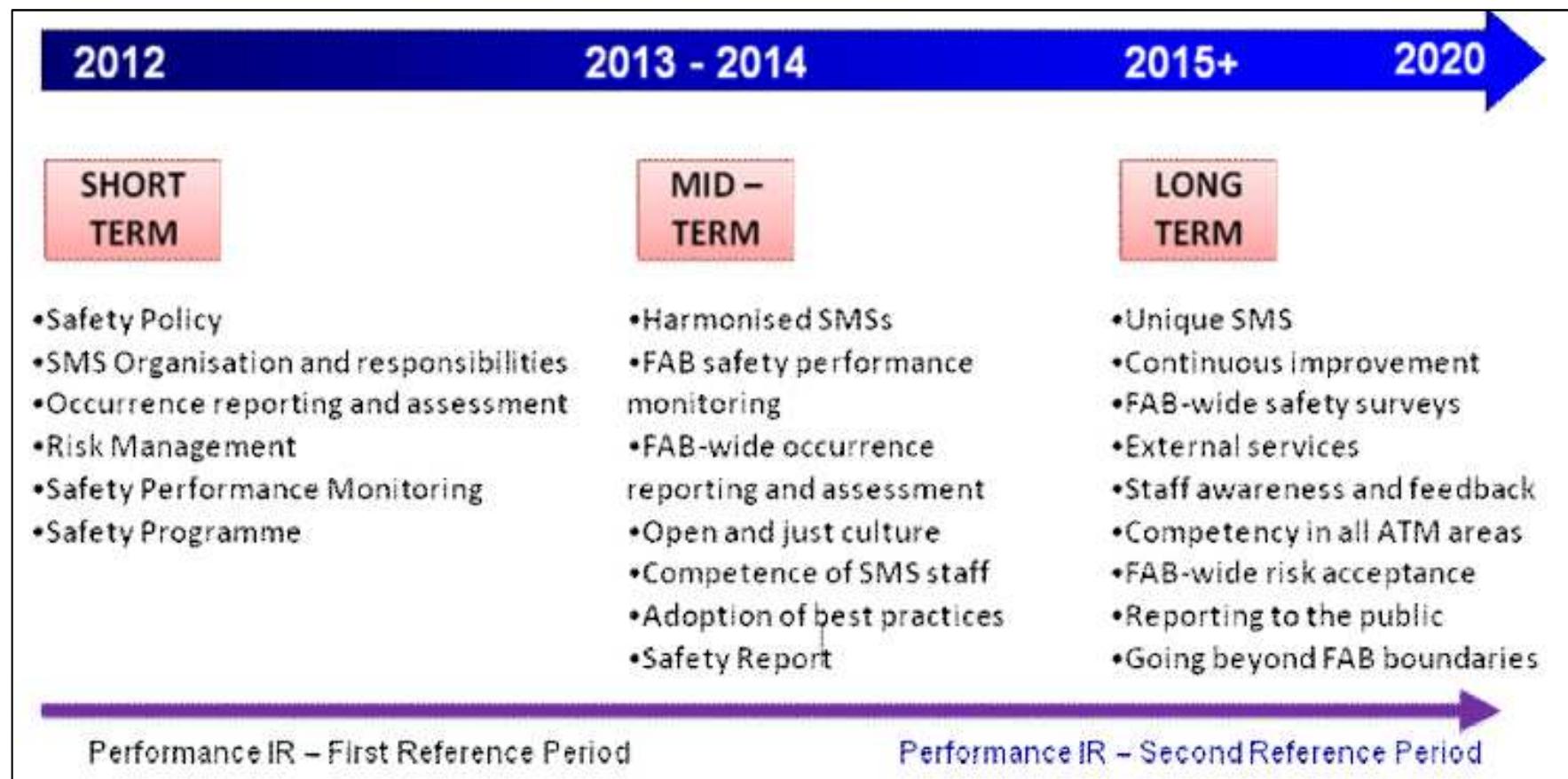
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# FAB SMS



## Sample of SMS roadmap and challenges





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