ANSP Safety Levels

A possible approach

Paula Santos
paula.santos@nav.pt

Summary

Regulation

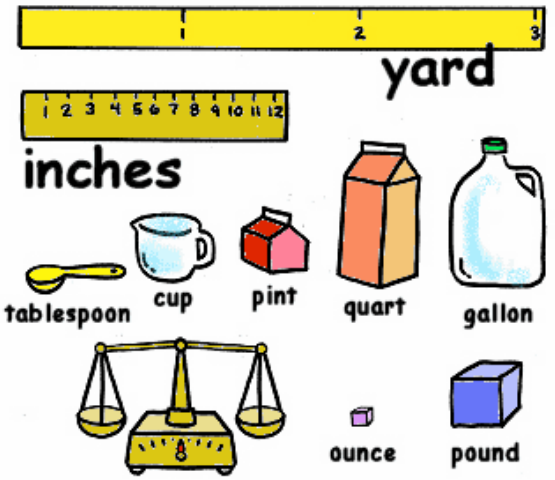
- EU 691/2010
- EU 1035/2011

Definitions / concepts

- Safety Level, indicator, target, objective, …

Proposal

- Unit Safety Case "*credibility*"
- Safety Culture
- Safety Maturity
- Just Culture
- Number of incidents



Regulation

EU 691/2010

"The performance scheme should provide for indicators and binding targets on key performance areas whereby required ***safety levels*** are fully achieved and maintained while allowing for performance target setting in other key performance areas"

1.SAFETY KEY PERFORMANCE INDICATORS
(a) (…) the effectiveness of safety management as measured by a methodology based on the ***ATM Safety Maturity*** Survey Framework.

(b) (…) the percentage of application of the severity classification of ***Risk Analysis Tool***

(c) (…) the reporting of ***just culture***.

COMMISSION REGULATION (EU) No 691/2010

of 29 July 2010

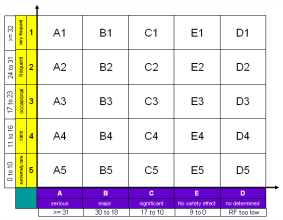
laying down a performance scheme for air navigation services and network functions and amending Regulation (EC) No 2096/2005 laying down common requirements for the provision of air navigation services

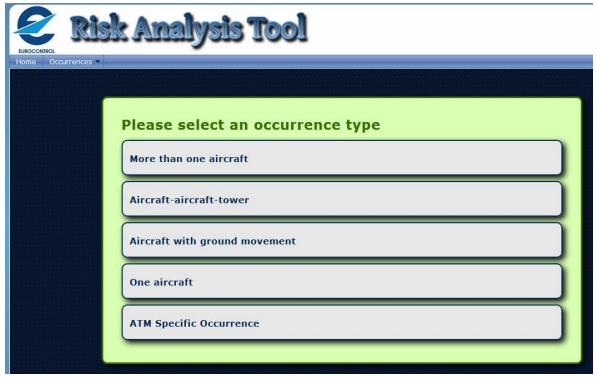
Regulation

Safety maturity

Safety KPI

RAT





Just Culture

Regulation

EU 1035/2011

Business plan

(b) contain appropriate ***performance targets*** in terms of safety, capacity, environment and cost-efficiency, as may be applicable.

Annual plan

(c) information on the measures foreseen to mitigate the safety risks identified in the safety plan of the air navigation service provider, including ***safety indicators*** to monitor safety risk and, where appropriate, the estimated cost of mitigation measures.

COMMISSION IMPLEMENTING REGULATION (EU) No 1035/2011

of 17 October 2011

laying down common requirements for the provision of air navigation services and amending Regulations (EC) No 482/2008 and (EU) No 691/2010

Regulation

EU 1035/2011

3.1.2. Requirements for safety achievement
Within the operation of the SMS, providers of air traffic services shall:

(…)

(c) ensure that, wherever practicable, ***quantitative safety levels*** are derived and are maintained for all functional systems (quantitative safety levels);

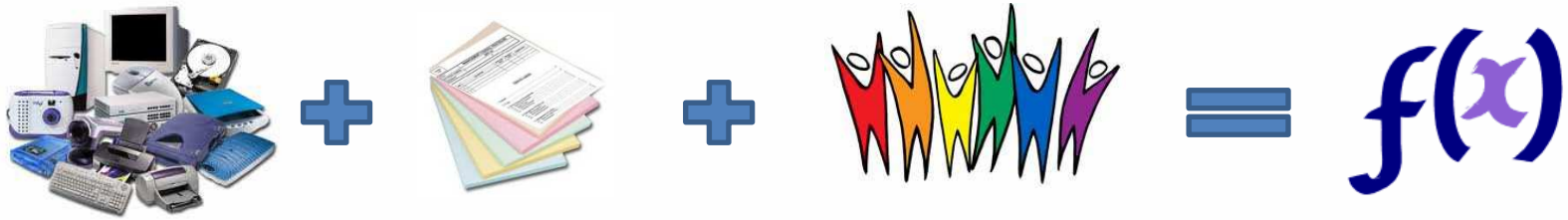
FUNCTIONAL SYSTEMS

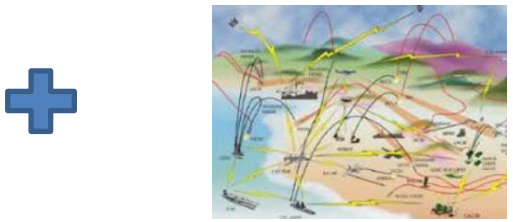
Definitions / Concepts

EU 1035/2011

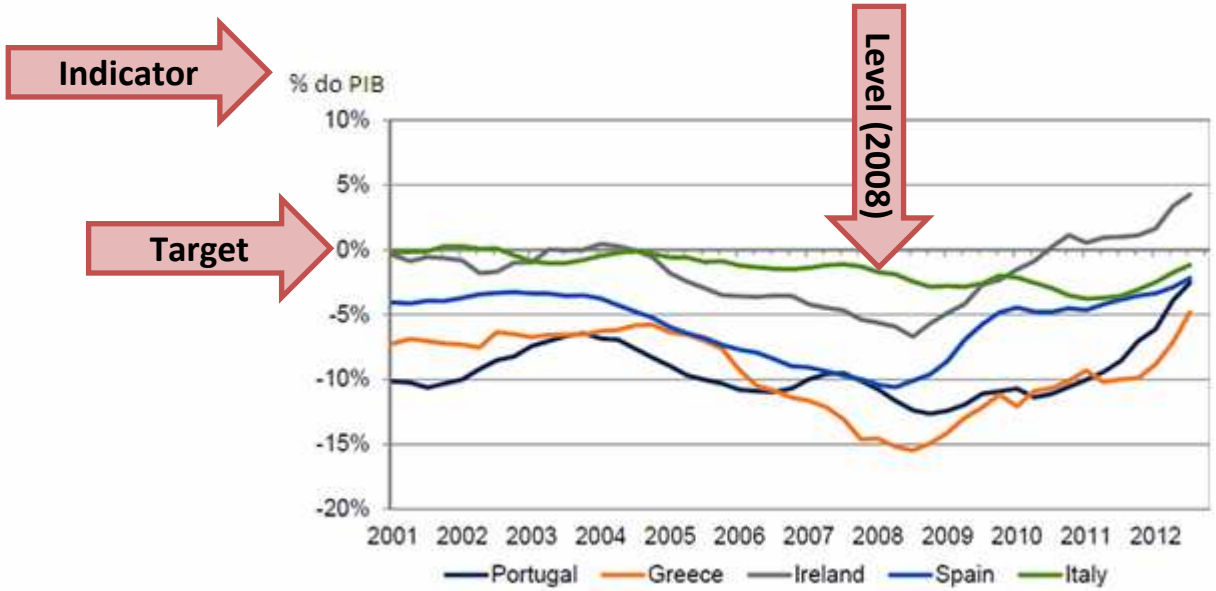
What is a functional system?

‘functional system’ means a combination of systems, procedures and human resources organised to perform a function within the context of ATM





Definitions / Concepts



Function = Indicator
Target = Goal
Level = Measurement

Definitions / Concepts

EU 1035/2011

'***safety objective***' means a qualitative or quantitative statement that defines the maximum frequency or probability at which a hazard can be expected to occur;

(d) ensures that while providing air traffic services, the principal safety objective is to minimise its contribution to the risk of an aircraft accident as far as reasonably practicable (***safety objective***)

Safety objectives based on risk shall be established in terms of the hazard's maximum probability of occurrence, derived both from the severity of its effect, and from the maximum probability of the hazard's effect.

Proposal

Indicator	Type	Updated	Baseline / Target
Unit Safety Case	Leading	Every 3 years	6.2 The chosen value indicates that there is confidence in the safety of the services and that there are points that can be improved.
Safety Culture	Leading	Every 3 years	To be defined.
Safety Maturity	Leading	Yearly	CANSO and the EUROCONTROL SAFREP TF have jointly agreed as an informal target to have all ANSPs at level 3 or above by the end of RP1. Formal targets should be set and enforced for RP2.
Just Culture	Leading	Yearly	To be defined.
Incidents	Lagging	Monthly	Baseline will be defined during 2014, based on the values of 2013 and 2014.

Unit safety case

A structured argument demonstrating that the services at the unit are safe.

Arg 0 - Claim
The provision of ATS services by NAV Portugal at the TWR of Lisbon is safe and managed so as to improve its safety levels

Safety Criteria

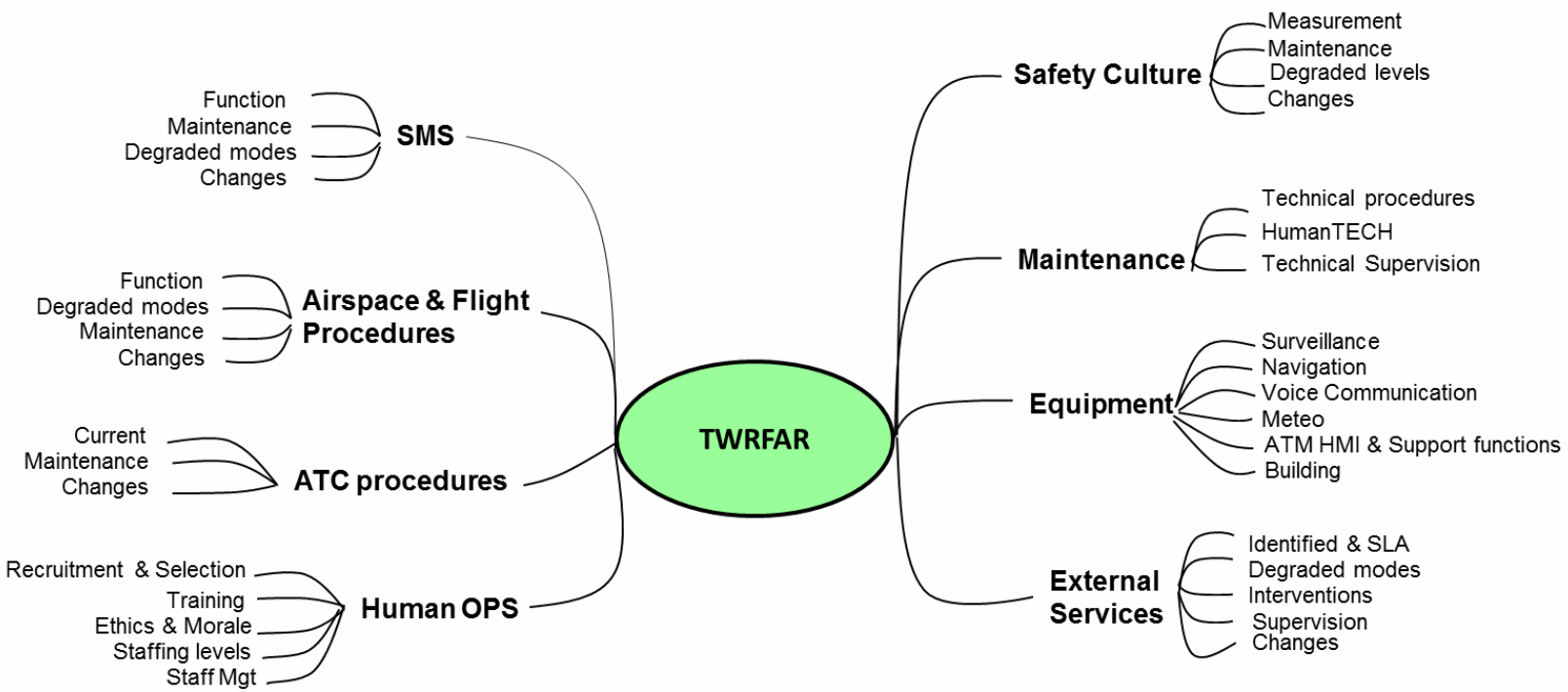
Cr01 Current safety level:
There are no reservations from the regulator with regards to the safety of the services provided by the tower of Lisboa, neither are there issues identified by NAV Portugal.
Cr02 The **SMS** is efficient and mature to continuously improve safety
Cr03 The NAV Portugal's **Safety Culture** supports the SMS

Arg 1
The safety culture supports the safety and improvement activities

Arg 2
The SMS has all elements and properties to discharge its functions

Arg 3
The ATM system adequate for the service provision and is safely managed

Unit safety case



Unit safety case

Create a Safety Case measure that is simple, comprehensive, and that can be used to determine the level of achievement of the CLAIM. It shall be used later on to compare versions and determine if the safety level is improving.

1. To know where we are.
2. To see if we are going on the right direction.

It should be like a semaphore,
simple enough to show to management.

Unit safety case

Safety level = credibility of the argument

Get a value for each argument

Score	Criteria
10	High confidence, no issues
7	High confidence, and can be improved
5	Confidence, with no identified issues
3	Confidence, with issues
1	Low confidence

Weigh each argument

ID	Statement	Argument V	AHP Weigh	Result
1	The **safety culture** supports the safety and improvement activities			
1.1	The safety culture has been measured	6,238095	2,18%	0,13599
1.2	The Safety culture level is improved or, at least, maintained	6,047619	4,70%	0,284238
1.3	Degraded safety culture levels are identified	5,619048	3,86%	0,216895
1.4	Changes affecting the safety culture level are assessed	6,047619	2,92%	0,17659
2.1	The SMS structure and functions are complete and effective	5,233333	2,26%	0,118273
2.2	The SMS is maintained in an adequate manner	5	2,36%	0,118
2.3	The SMS degraded modes are identified and there are provisions to maintain safety management in the degraded modes	4,166667	3,98%	0,165833
2.4	Impact of changes to the SMS is assessed	4,333333	2,81%	0,121767

Add the weighed values

The measured safety level in 2010 was **6.512**, which indicates that there is high confidence and that there are points that can be improved.

Safety Culture

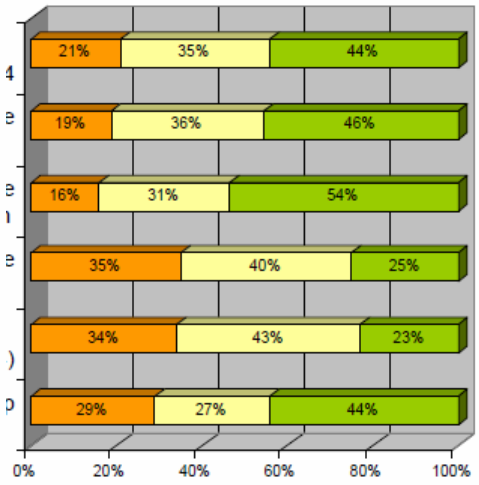
Safety culture is a predictor of safety performance. As such it is considered a significant safety indicator and is evaluated regularly at NAV Portugal by an external entity.

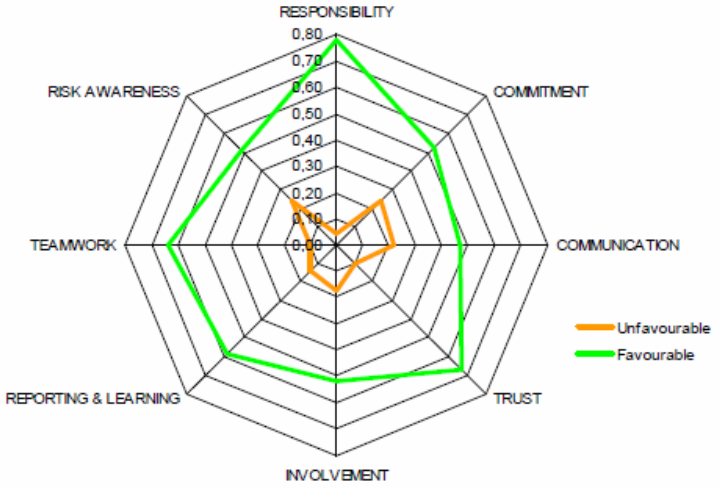
1. Commitment to Safety
2. Communication
3. Trust and Just Culture
4. Involvement in Safety
5. Reporting and Learning
6. Teamwork
7. Risk Awareness
8. Responsibility for Safety

Safety Culture

Measuring safety culture, how?
The report has a lot of numbers…

But, can we quantify Safety Culture?





Safety Maturity

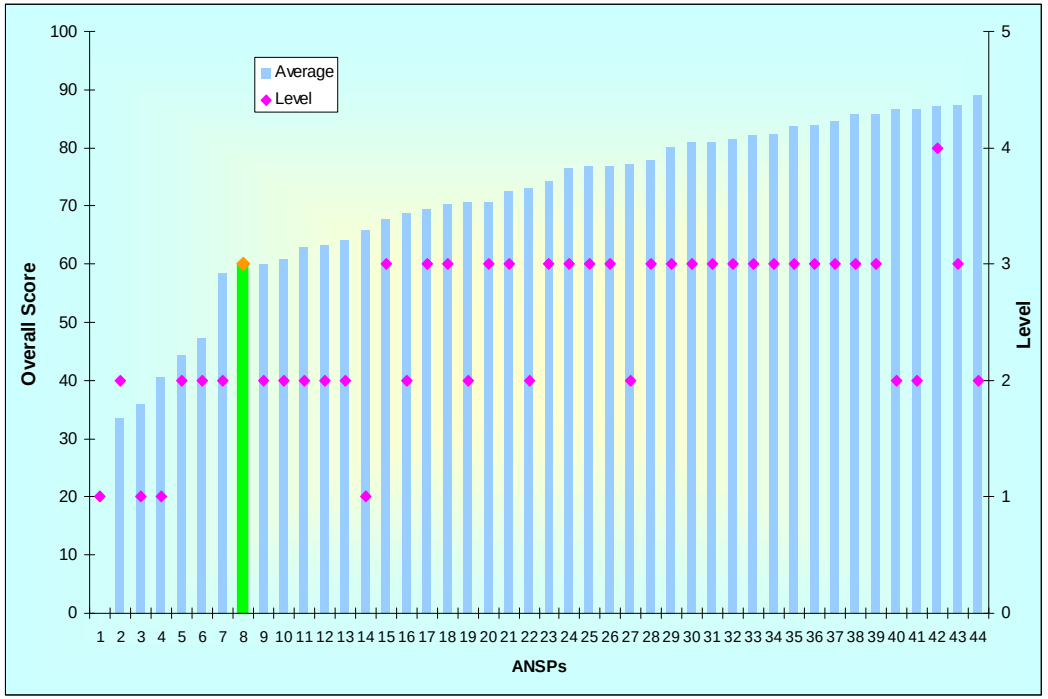
Measures the maturity of their safety management system

- Development of a positive and proactive safety culture
- Organisational and Individual Safety Responsibilities
- Timely Compliance with International Obligations
- Safety standards and procedures
- Competency
- Risk Management
- Safety Interfaces
- Safety Reporting, Investigation and Improvement
- Safety Performance Monitoring
- Operational Safety Surveys and SMS Audits
- Adoption and Sharing of Best Practices

Level	Question score	Interpretation
1	A	Initiating
2	B	Planning/ Initial Implementation
3	C	Implementing
4	D	Managing & Measuring
5	E	Continuous Improvement

Safety Maturity

Already quantified by EUROCONTROL and CANSO

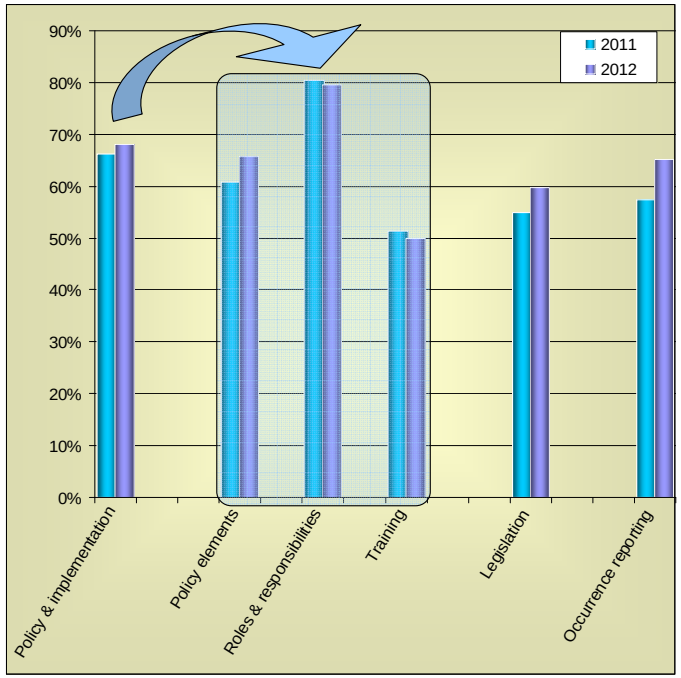


Just Culture

A good reporting system can only exist if there is a Just Culture

Just Culture

Quantification is being done by counting yes/no answers to Just Culture questionnaire.

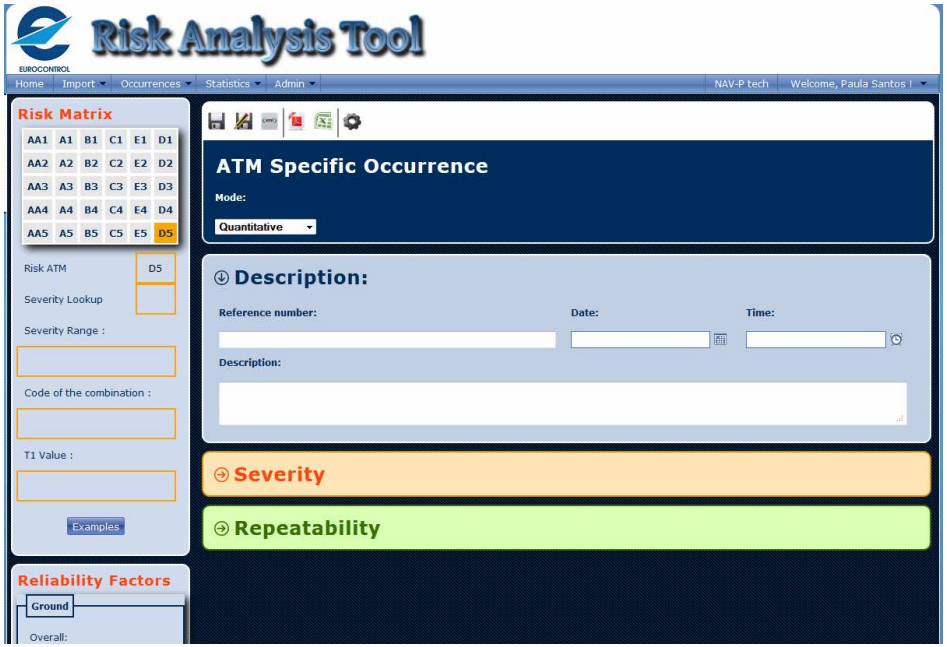


Can we quantify Just Culture?
Is this indicator OK?
What are we really measuring?

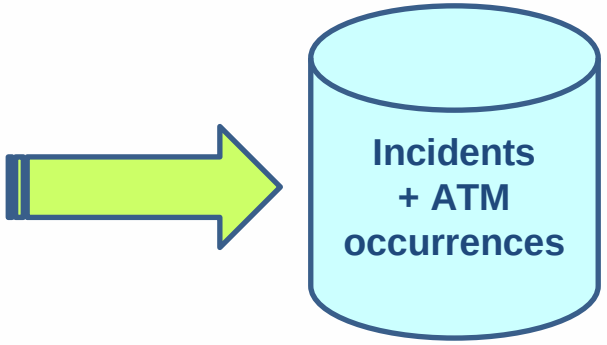
Incidents

The Annual Summary Template (AST)

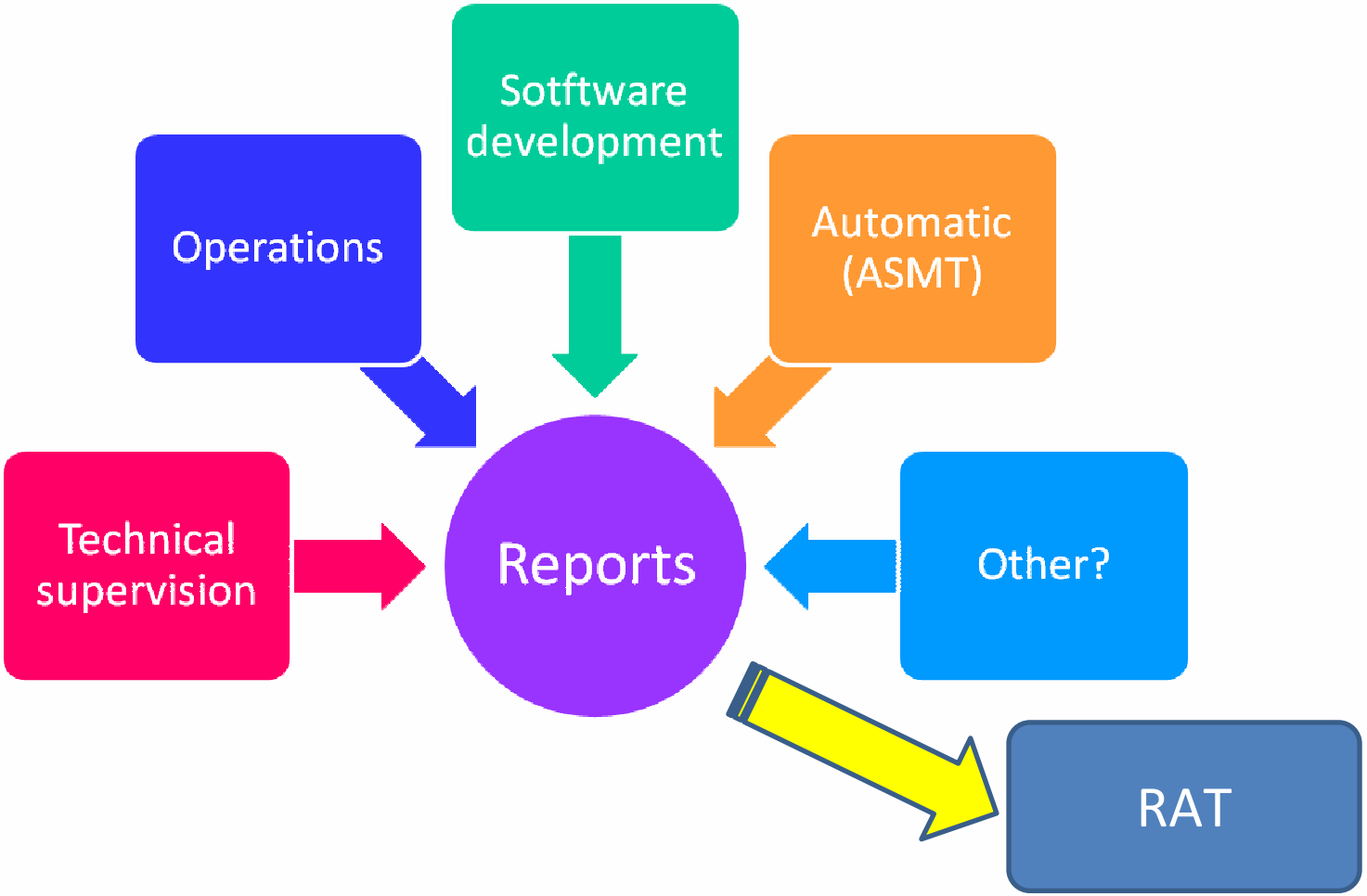
RAT (Risk Analysis Tool)



RAT database



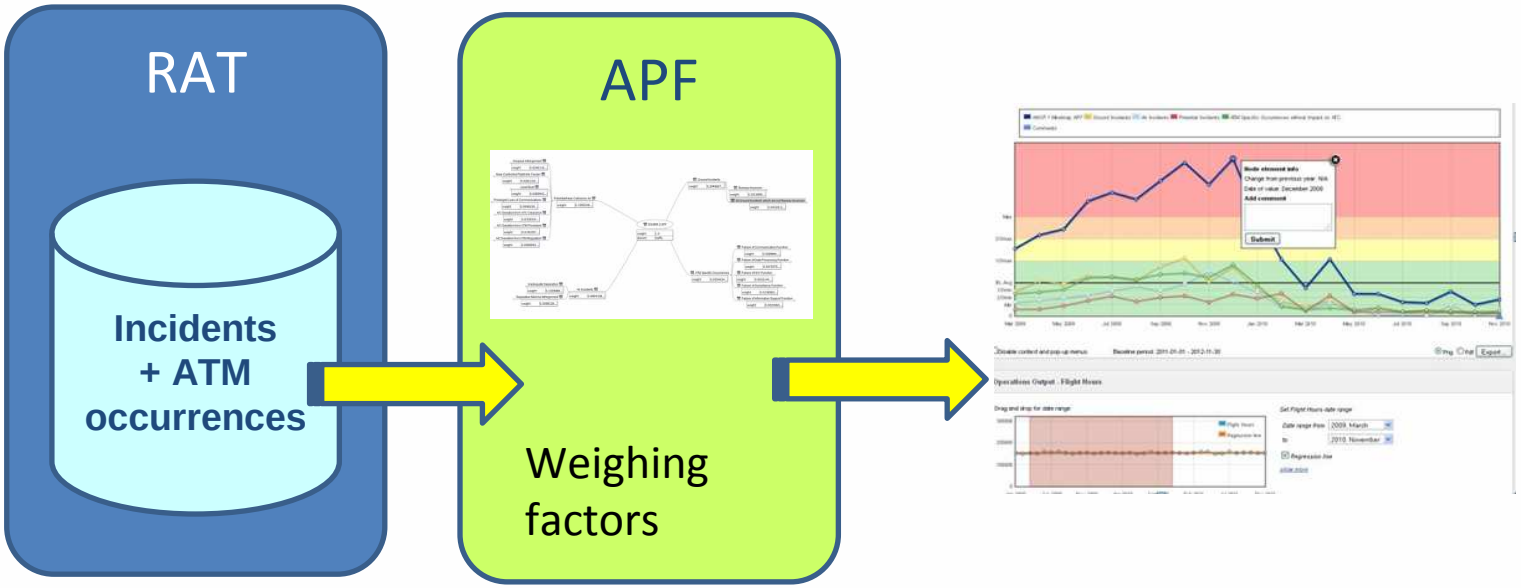
Incidents


Sotftware development
Operations
Automatic (ASMT)
Technical supervision
Reports
Other?
RAT

Incidents

Not every incident has the same "*importance*"

APF (Aerospace Performance Factor) attributes different weights based on expert judgement



Alignment

Safety tools

- ASMT (Automatic Safety Monitoring Tool)
- RAT (Risk Analysis Tool)
- APF (Aerospace Performance Factor)

Aligned with Strategic Objective SO7 of Network Strategy Plan 2012-2019
Edition Nov. 2012

Proposal

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Conclusions

- Safety KPI can be used to measure Safety levels
  - Are leading indicators
- Safety monitoring provides lagging indicators
  - Depends on incident reports
- Quantification is possible, but…
  - Hides information
  - Can be manipulated

Questions