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Operational and safety information sharing for Unmanned Aircraft Systems

Lennaert Speijker, NLR, Netherlands

iSTARS User Group Meeting (UG/01), 17-19/12/2018, Montreal

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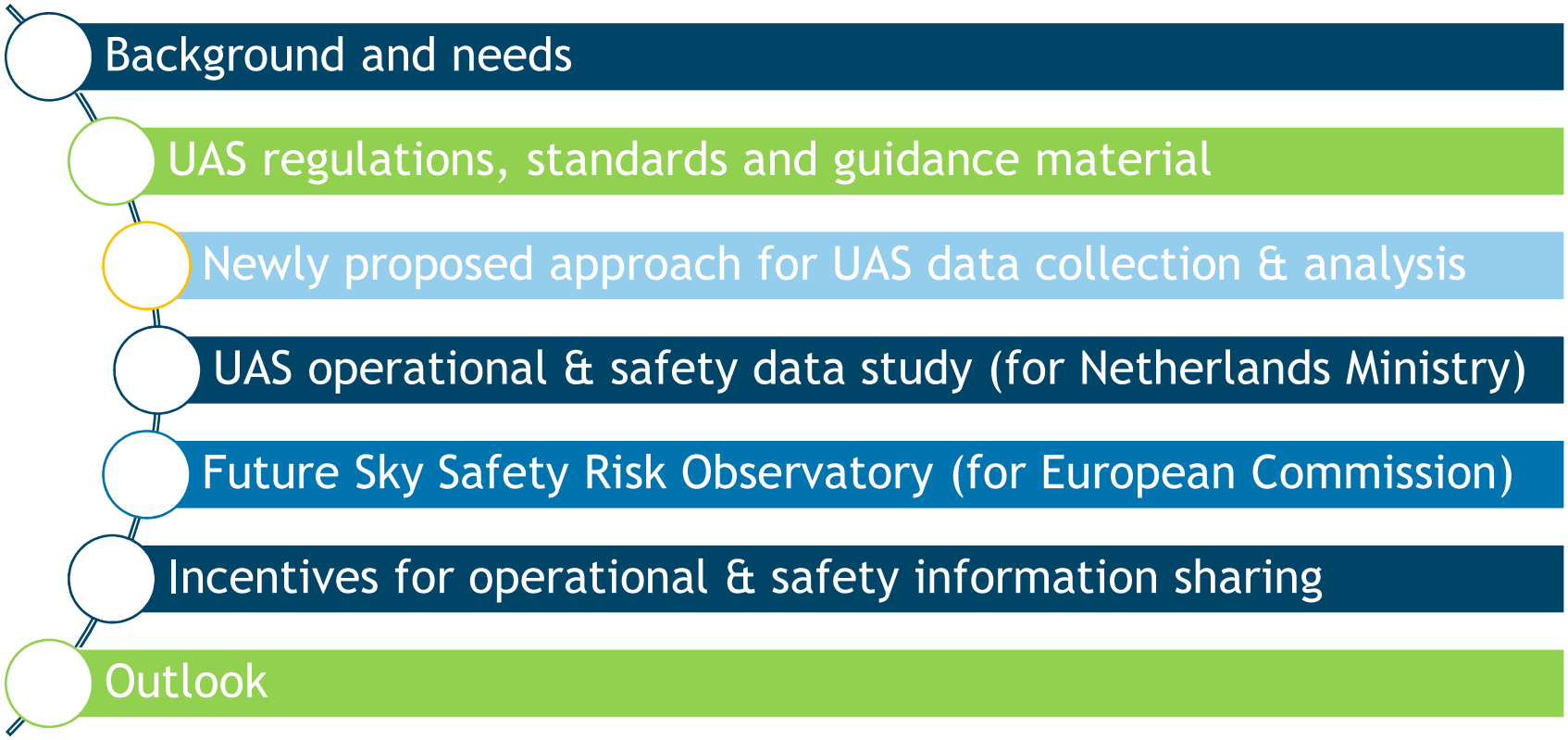
Content



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Background

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Needs and challenges

- Very little UAS operational and safety data available
  → Difficult to identify safety issues & perform oversight
  → Difficult to motivate changes in regulations for UAS
- Reporting systems from UAS operators to States often not commensurate with their size, thus not adequate
- Appropriate methods to support UAS operators with identification and assessment of hazards are needed
- Some countries develop rules to report UAS usage

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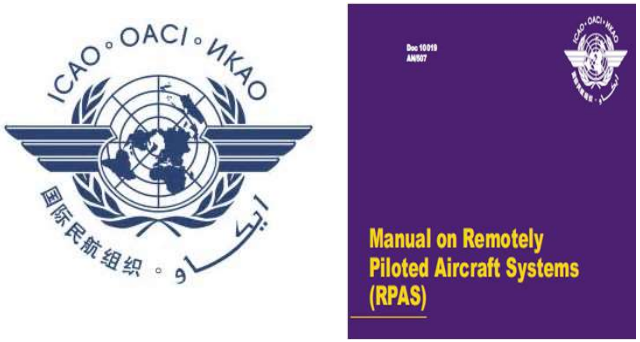
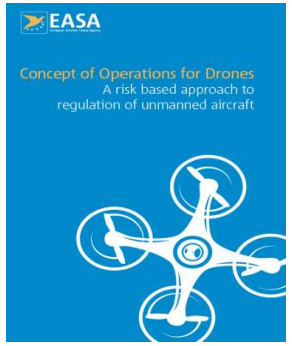
Regulations, standards and guidance





JARUS

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Safety Management in UAS sector
(anticipated)

- Operational limitations in *Low Risk Category* *
  - Safety Management System not required to be regulated
- Elements safety management in *Regulated Lower Risk Category* *
  - Risk assessment of proposed operations
  - Analysis of safety data
  - Sharing of safety information
  - Safety promotion
  - Occurrence reporting
- SMS (*ref*. ICAO Annex 19) for *Regulated Increased Risk category* *

* *Three categories of operations are distinguished in ICAO's UAS Toolkit*

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Drone Operational Repository for Safety *DORSEY*

- Study for Dutch Ministry of Infrastructure and Water Management
  - What UAS data and information is useful and required?
  - How to gather data from operators in a user-friendly way?
  - How to visualize data and provide feedback to operators?
  - What are appropriate user and system requirements?
  - How to use data to support safe introduction of UAS operations?
- Involvement certified Dutch operator associations (DARPAS, DCRO)
- ICAO is informed through Information Papers for the ICAO RPASP

Government of the Netherlands

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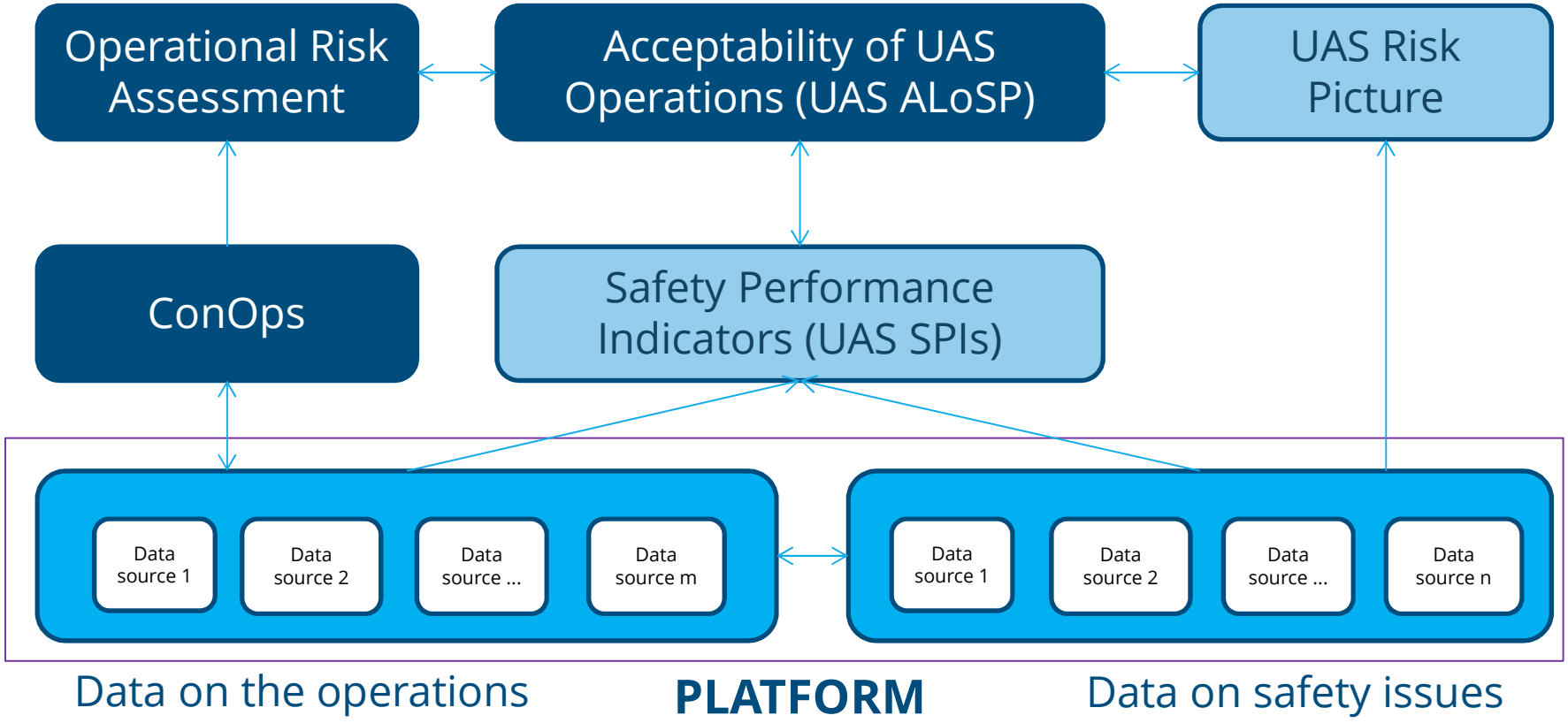
Concept for UAS data analysis



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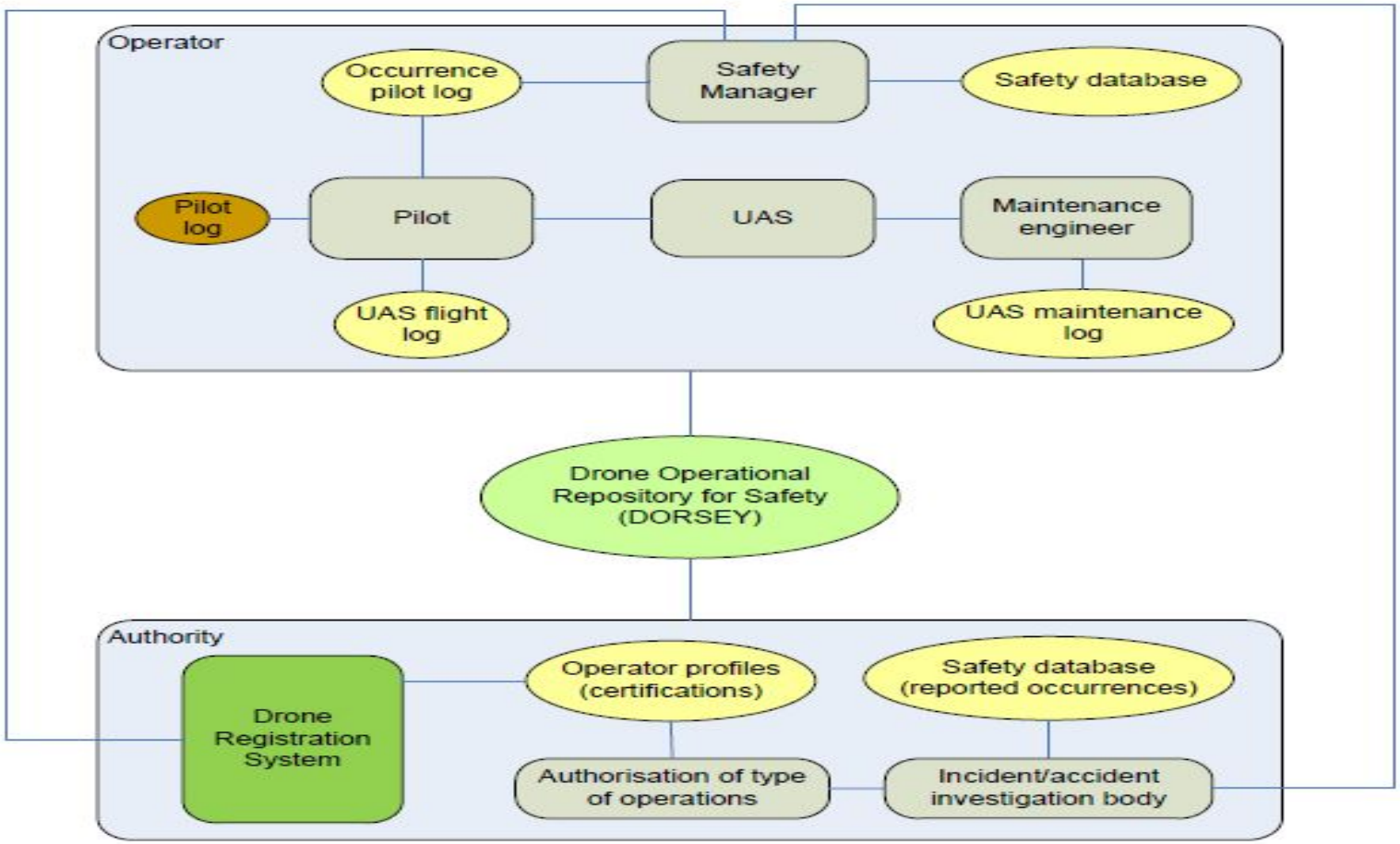
DORSEY - Approach



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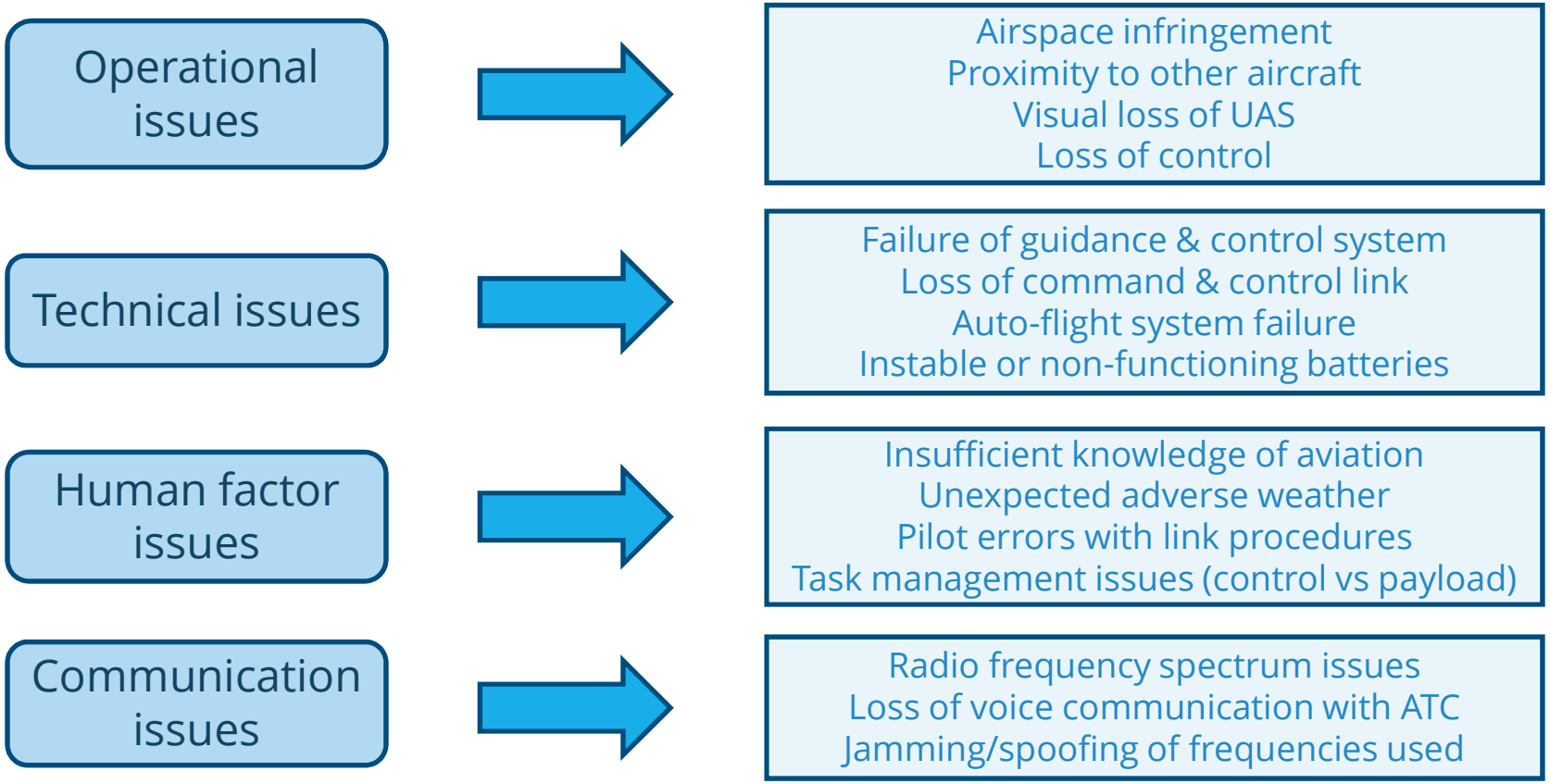
Example safety issues



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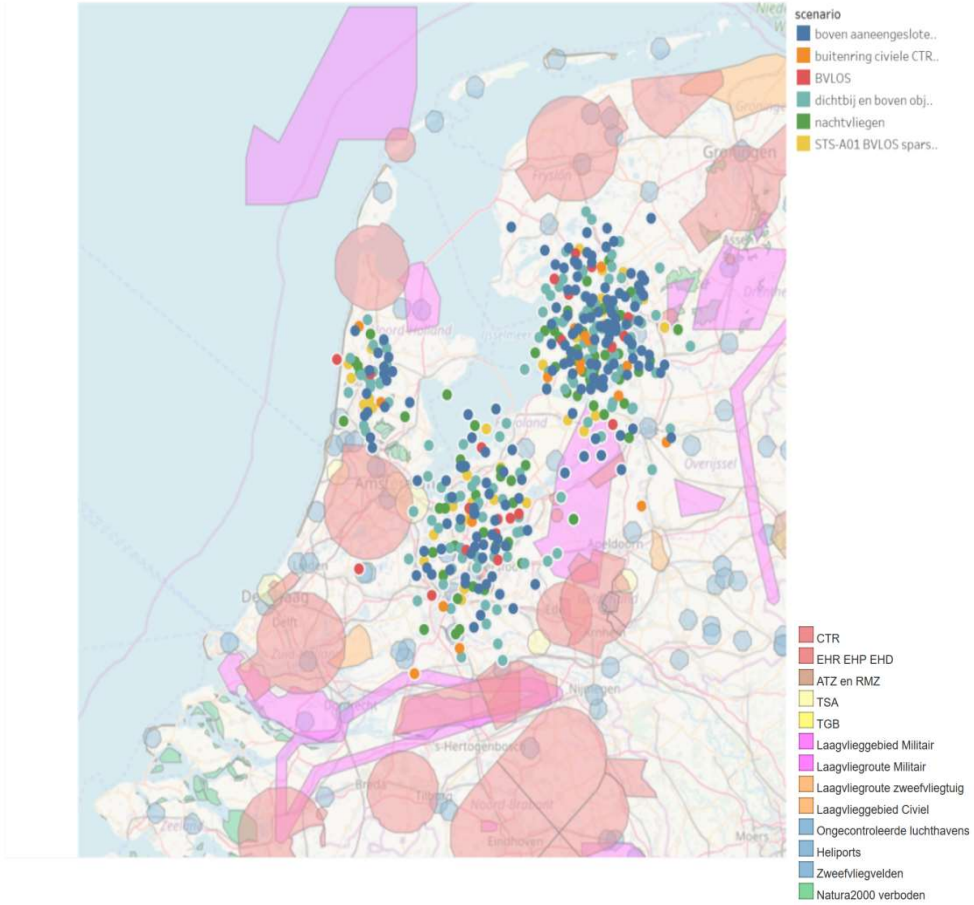
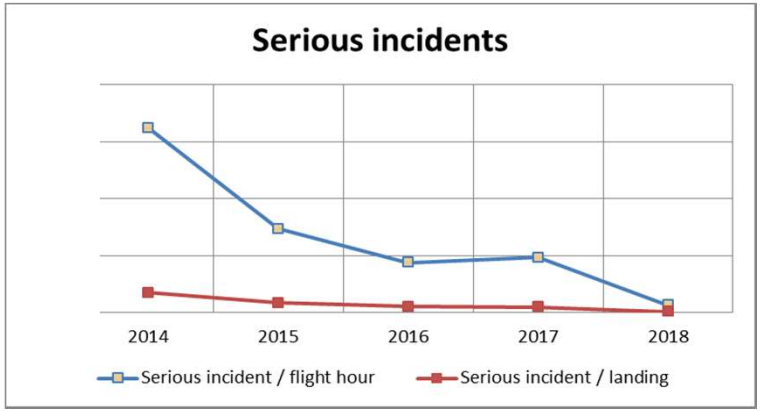
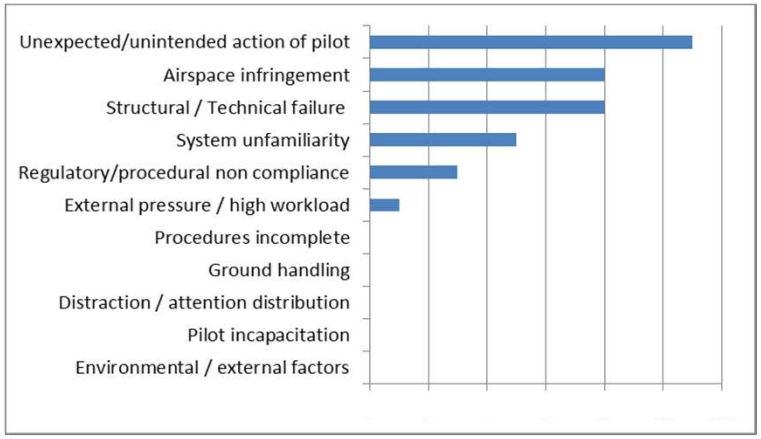
UAS Data Visualization







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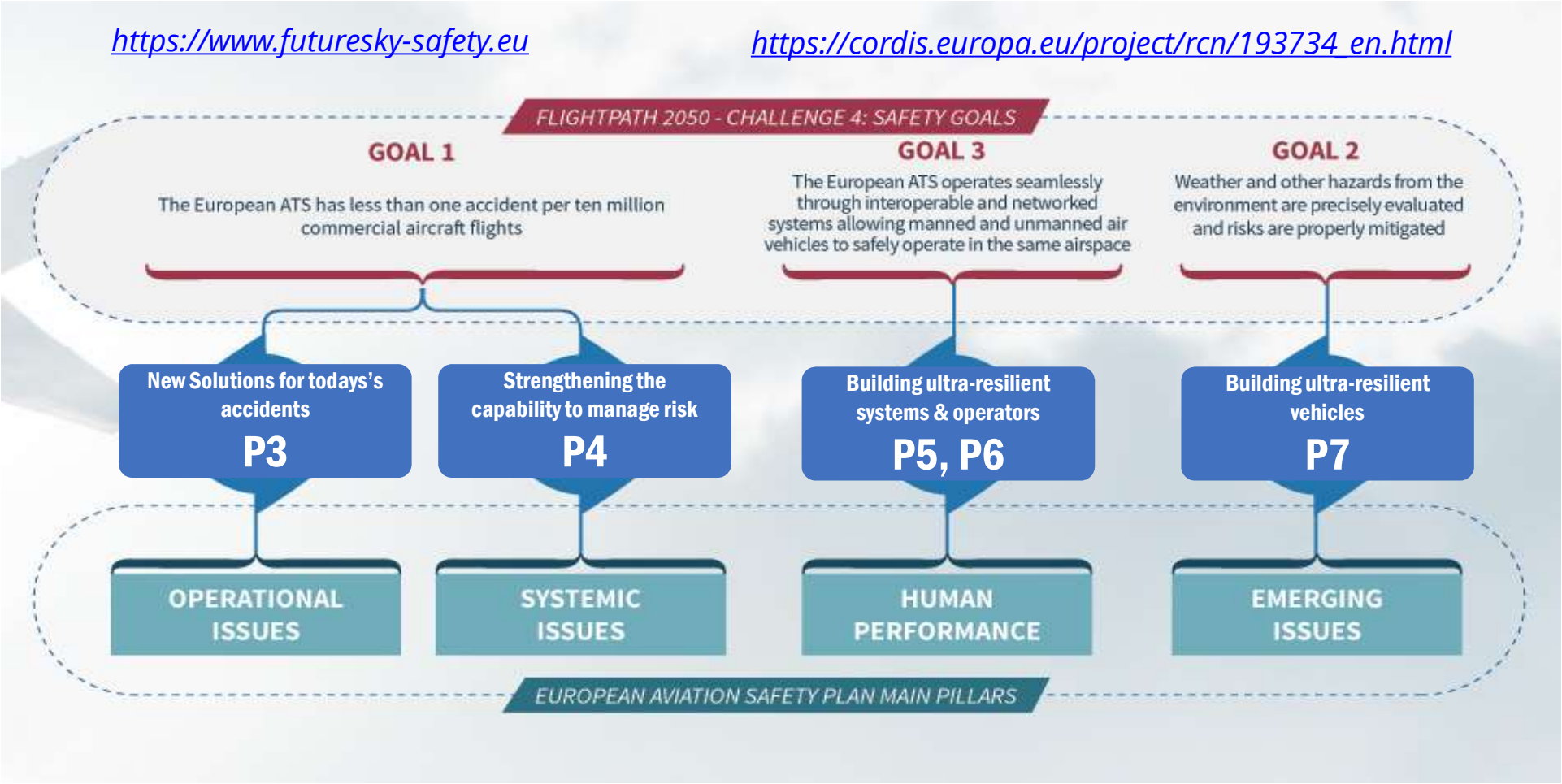
FUTURE SKY SAFETY

European Commission

https://www.futuresky-safety.eu

https://cordis.europa.eu/project/rcn/193734_en.html



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FUTURE SKY SAFETY

European Commission

- Study performed for European Commission (EC), coordinator NLR
- Consortium of 35 partners, budget 30 MEuro, duration 2015–2019

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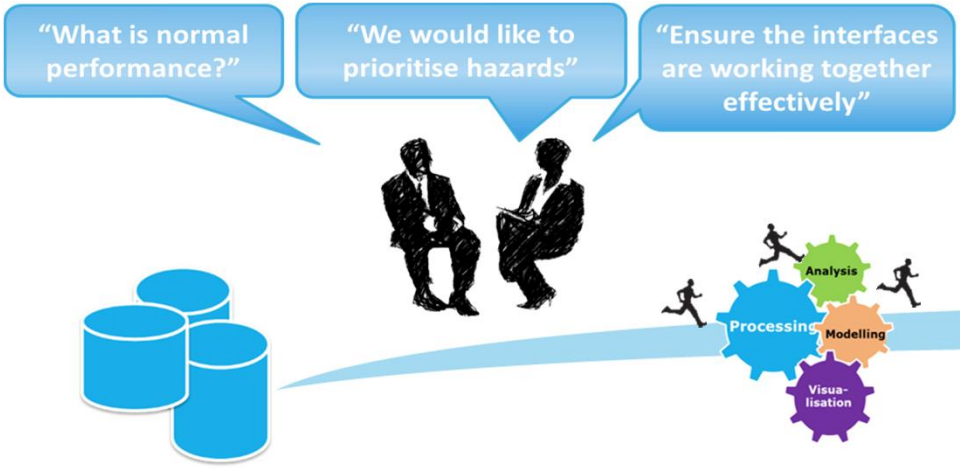
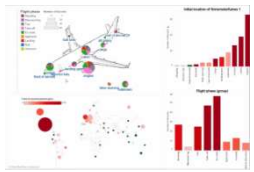
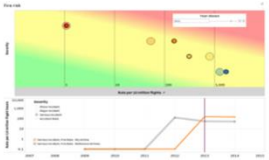
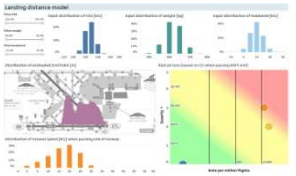
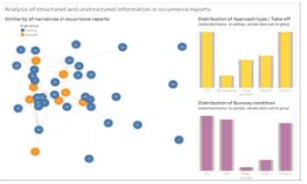
Why P4? Why Risk Observatory? How?











Occurrence data | Exposure data | Risk modelling | Prediction | Text/Data mining

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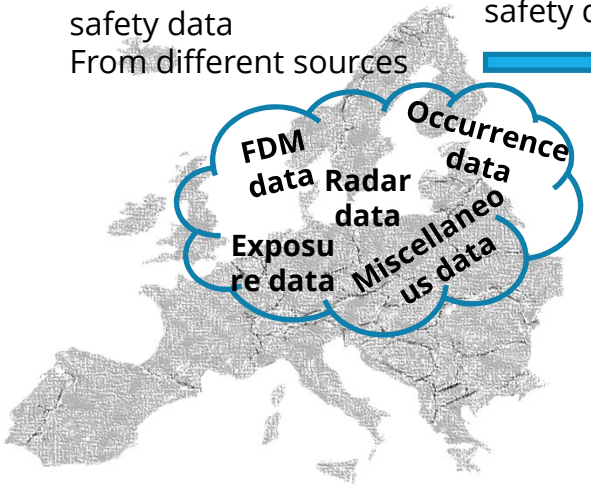
Introducing the Risk Observatory

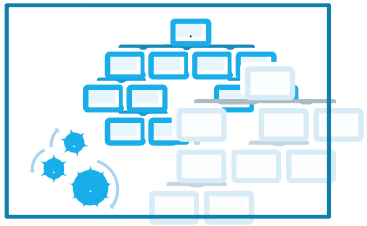
Gather
safety data
From different sources



Structuring of
safety data

FDM data
Occurrence data
Exposure data
....

Feed into integrated
risk assessment
framework (models)



Floris

Acquire
safety information

Acquire
safety information

User:
Analyst
Manager

Domain:
Operator
ANSP
Manufacturer
Airport
Authority

The risk observatory acquires, fuses and structures safety data and translates it into actionable safety intelligence

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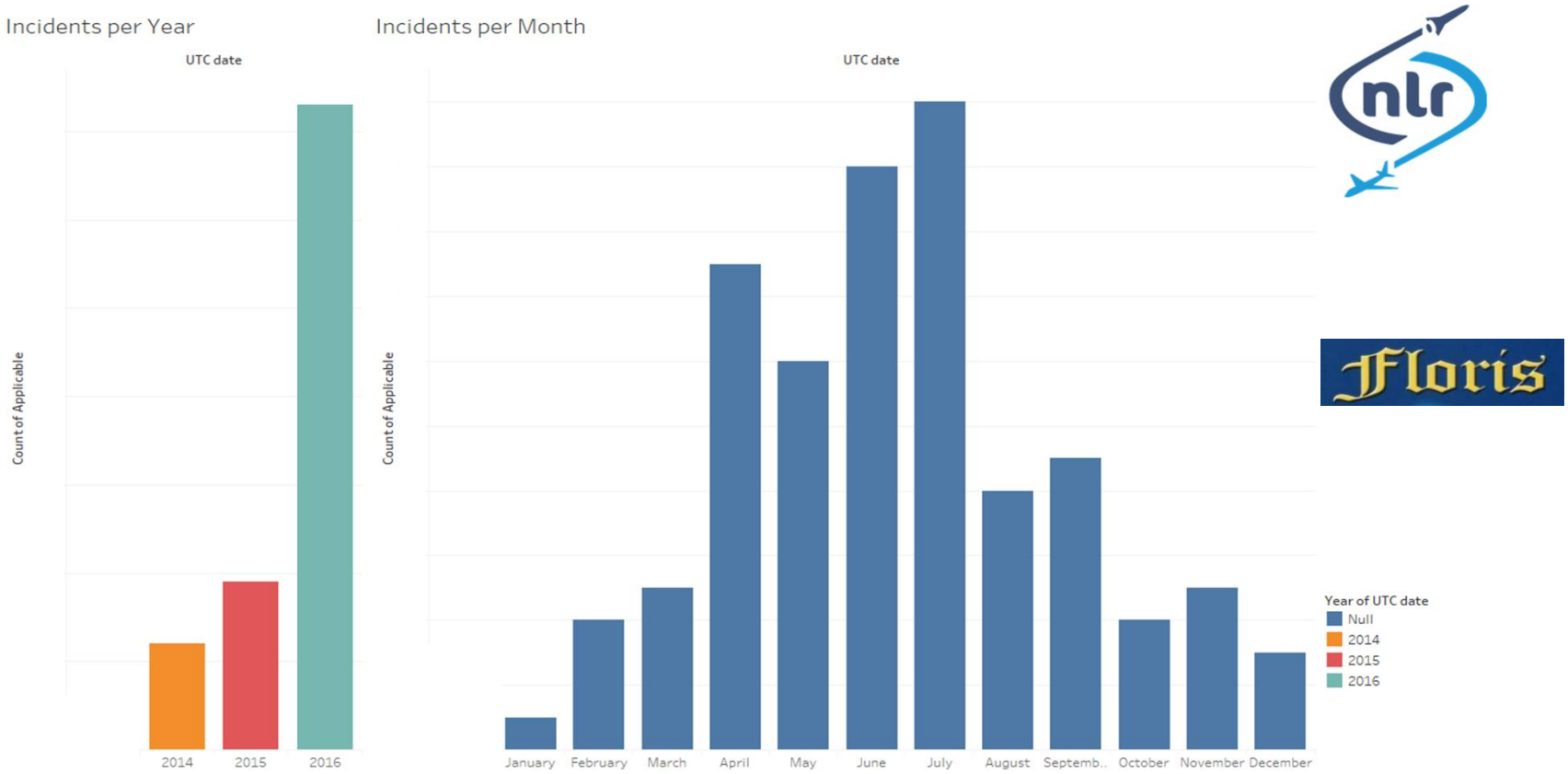
Risk Observatory – Use Case UAS

Spread of drone sightings over the year



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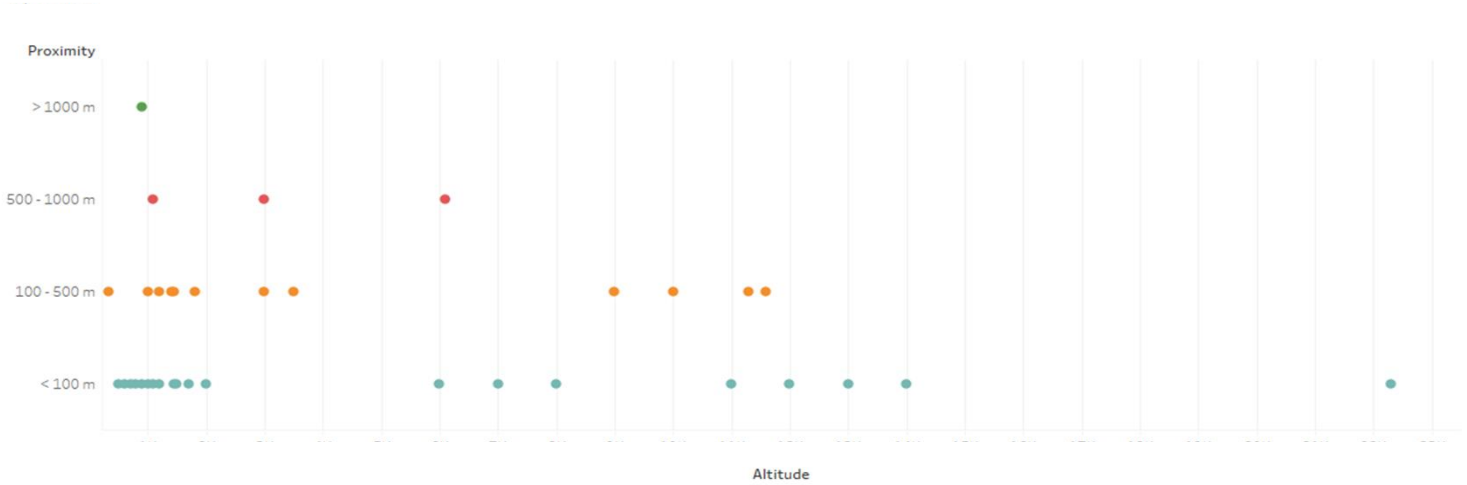
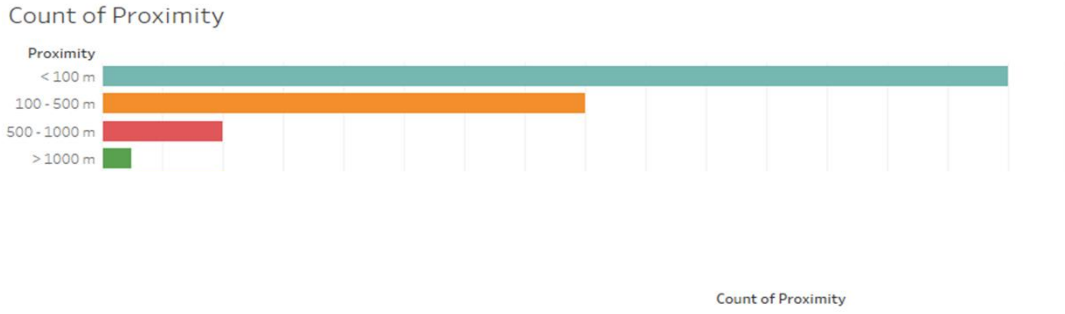
Risk Observatory – Use Case UAS

Drone sightings – Proximity to other aircraft





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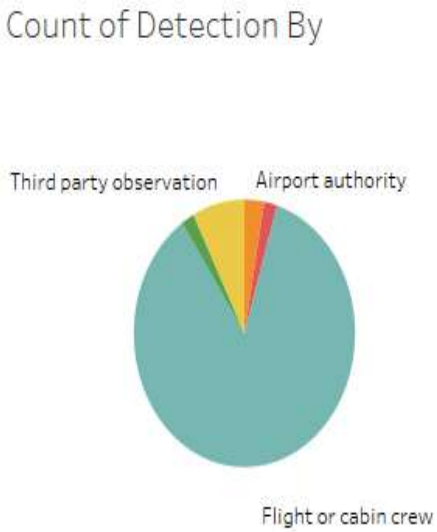
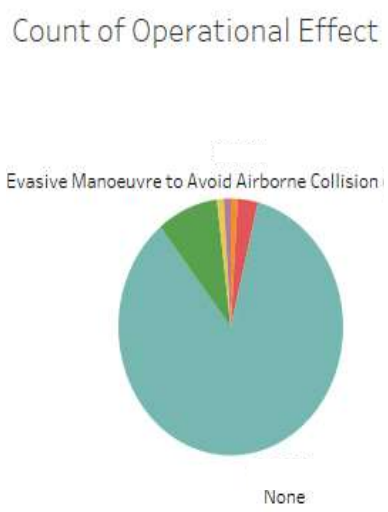
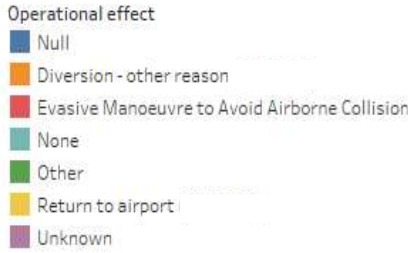
Risk Observatory – Use Case UAS

Drone sightings - Reporting & operational effect







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Need for new approach for UAS

- UAS operations growing significantly. Wide variety applications. Surveillance, aerial work, inspections & agricultural purposes, ...
- New challenges for safety assurance of UAS operations
- A key step towards increased integration in airspace is to collect basic operational and safety information about UAS operations
- This makes it easier for authorities to approve (specific) safe UAS operations under certain conditions and requirements
- This will enable UAS operators/industry to perform more flights

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Incentives for voluntary data sharing

- Intelligence in risks and causal factors of safety events enables predictive risk analysis & defining safety performance indicators
- Compare safety performance between operators and States
- Access to data that is difficult to get on its own from own sources
- Demonstrate that safety is taken seriously and in a pro-active way
- Protect data against misuse for purposes other than safety
- Possible benefits in return for sharing operational/safety data

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Outlook

- Need for validation of new UAS rulemaking proposals with data
- Some countries already developed rules to report UAS usage
- New approach for UAS data collection & analysis is needed
- Test Case with DORSEY in the Netherlands (2018/2019)
- Future Sky Safety Risk Observatory Use Case (2018/2019)
- Alignment with iSTARS and possibly SIMS (new UAS module?)
- Prepare for ICAO UAS SMS standards *(in new Annex 6 Part 4 & Annex 19)*

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Fully engaged

Netherlands Aerospace Centre

Your contribution to this work:

- **Possible cooperation?**
- **Sharing of information or ideas?**

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