iStars UserGroup Meeting 1
dec. 2018

Towards a more data guided
risk evaluation process
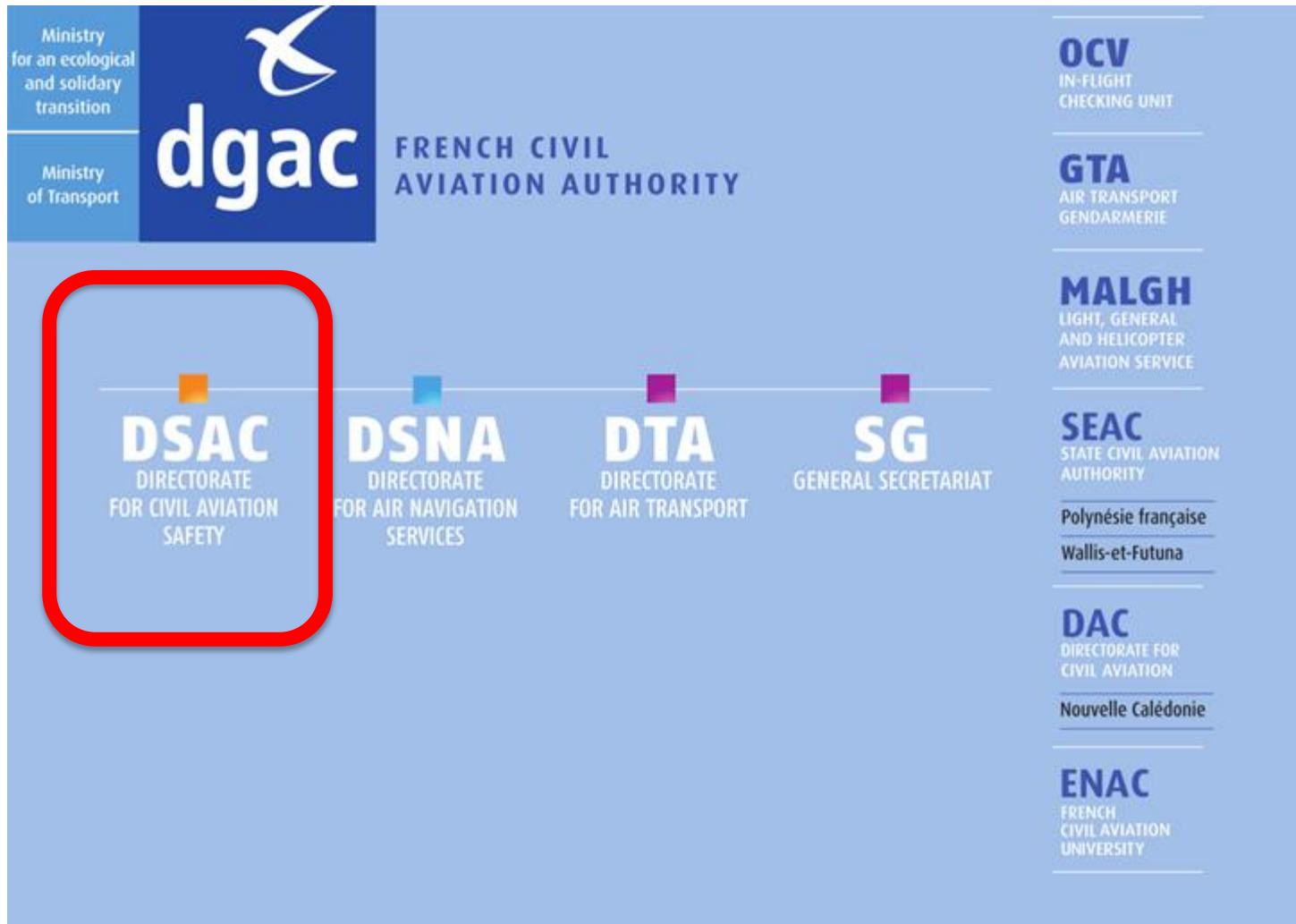
MINISTÈRE
DE LA TRANSITION
ÉCOLOGIQUE
ET SOLIDAIRE
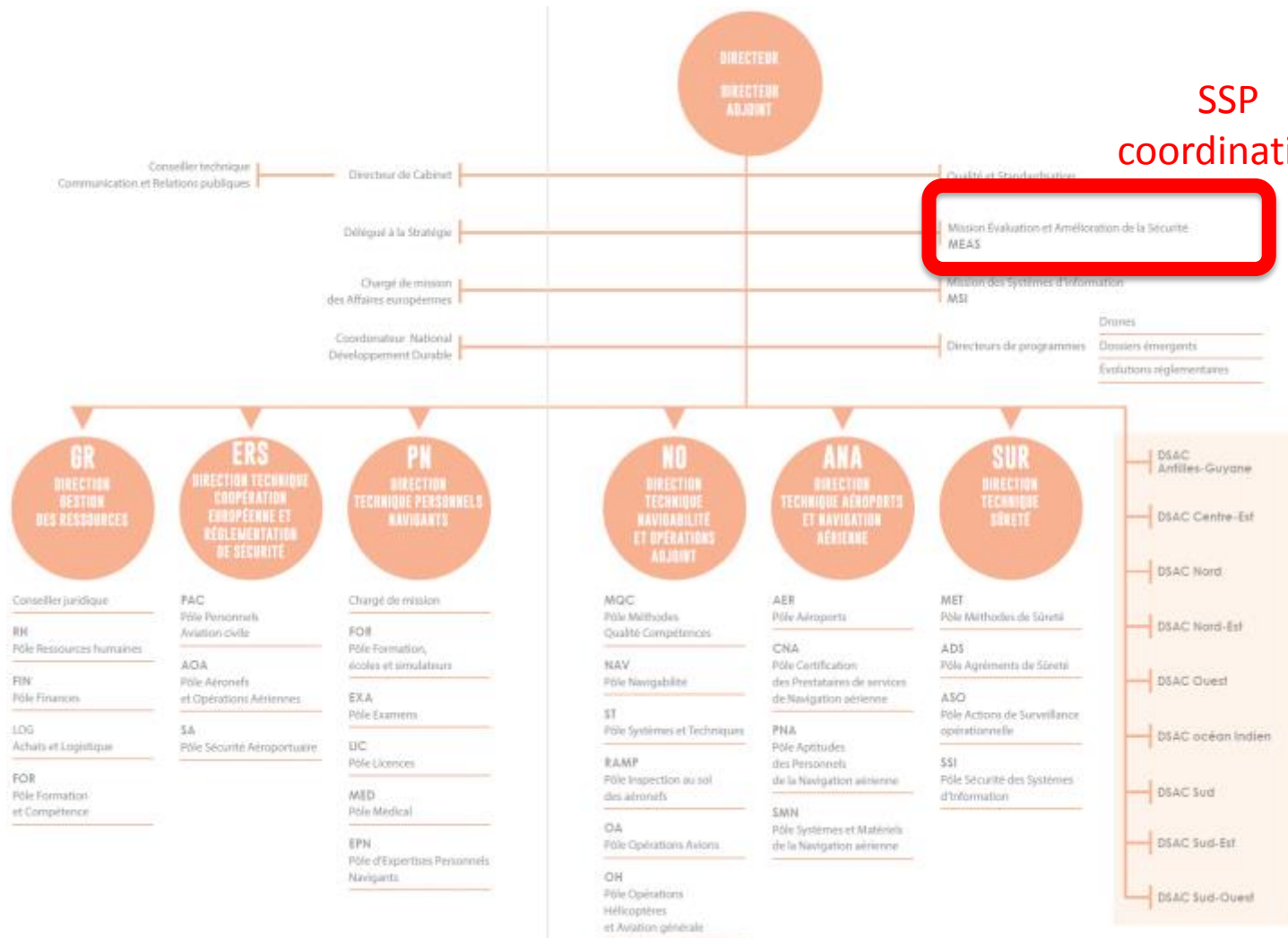
RÉPUBLIQUE FRANÇAISE
Liberté · Égalité · Fraternité

dgac

DSAC

DGAC (FRENCH CIVIL AVIATION AUTHORITY)

DGAC/DSAC (DIRECTORATE FOR CIVIL AVIATION SAFETY)


SSP coordination

REGIONAL OFFICES
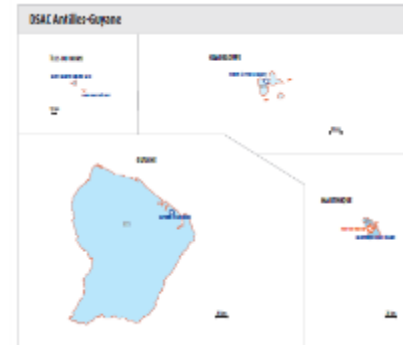
AND APPROXIMATELY

- 8 800 registerd aicraft

- 10 000 referenced uav

- 190 CAT organisations

- 15 000 commercial pilot licences

- 50 000 private pilot licences

- 72 aerodrome certificates (55 european certificates) + hundreds of others AD

- 80 air navigation service providers
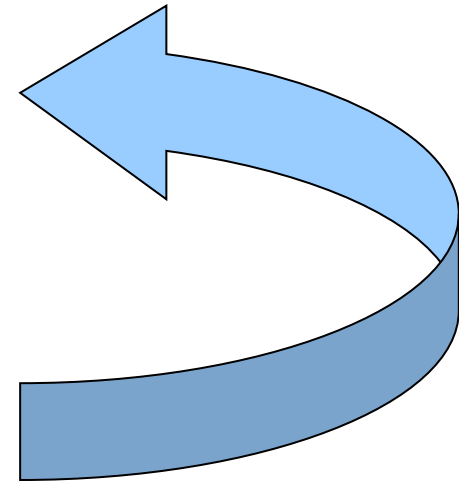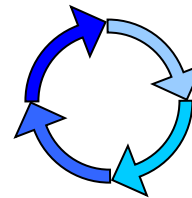
- …

One State Safety Programme

➤ **aims to ensure the implementation of actions :**

regulation

oversight

Safety promotion
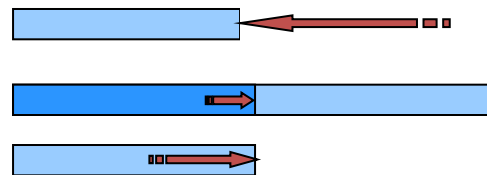
➤ **SSP aims at the efficiency of actions :**

     Risk analysis

     Risk mitigation action plan

     Safety performance indicators

     Action plan adjustments

By allocating human and financial resources accordingly

WHAT DATA DO WE HAVE IN HANDS ?

Data from oversight (audit reports for instance)

Safety reports from organisations

Ad hoc data, as trajectories data (from radar surveillance or ADS-B for instance)

MINISTÈRE
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D S A C

WHAT ARE WE DOING WELL WITH THOSE DATA FOR YEARS

- Follow-up of recieved safety reports

- Collegial safety reviews

  - to analyse information from safety reports and

  - To identify appropriate actions

- Safety issue case studies

WHAT ARE WE DOING WELL WITH THOSE DATA FOR YEARS

- Follow-up of recieved safety reports

- Collegial safety reviews

    - to analyse information from safety reports and

    - To identify appropriate actions

- Safety issue case studies

Always through an approach per oversight domain (airlines, airpots, ansp, …)

Combined with an

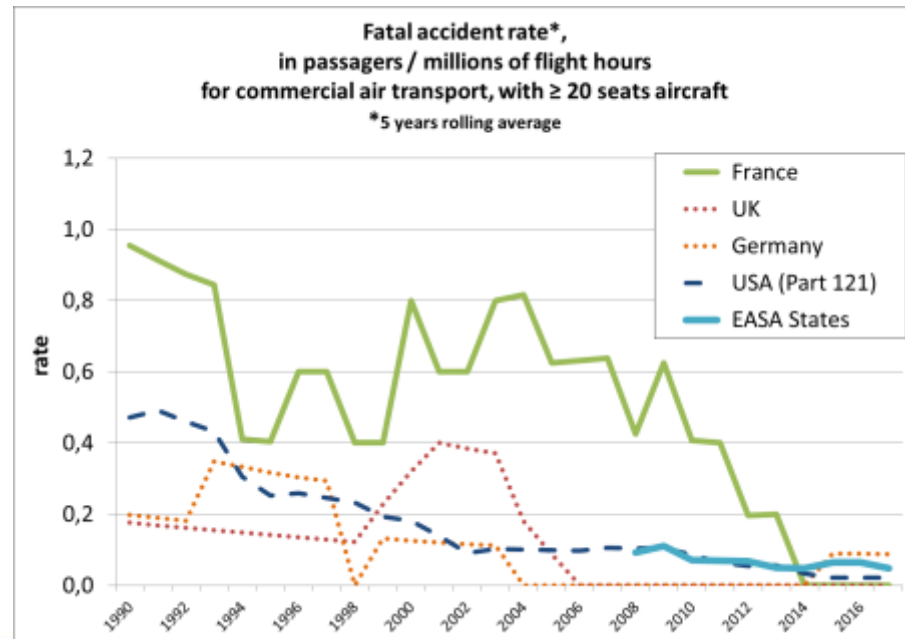SSP transverse approach

At both regional and national level

WHAT ARE WE DOING WELL WITH THOSE DATA FOR YEARS

Production and use of 2 Acceptable Level of Safety Performance

(1 for commercial aviation, 1 for general aviation)

Fatal accident rate*,
in passagers / millions of flight hours
for commercial air transport, with ≥ 20 seats aircraft
*5 years rolling average

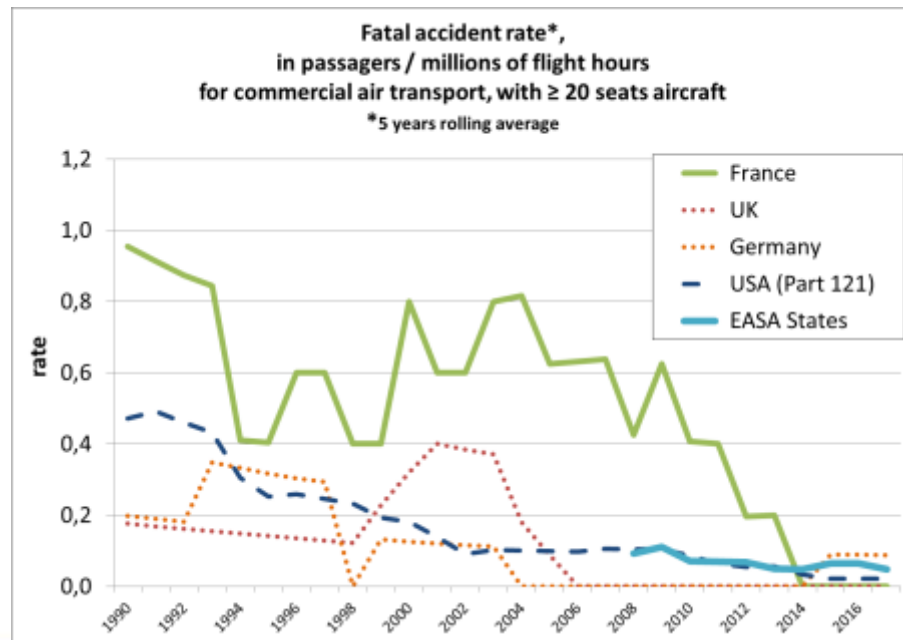# WHAT ARE WE DOING WELL WITH THOSE DATA FOR YEARS

Production and use of 2 Acceptable Level of Safety Performance

(1 for commercial aviation, 1 for general aviation)

ALoSP choosen definition : "The SSP aims to place France among the leading

European countries whose operators are the safest in commercial aviation.

A comparison with the main European countries, as a five-year rolling average,

serves as an indicator.»

Fatal accident rate*,
in passagers / millions of flight hours
for commercial air transport, with ≥ 20 seats aircraft
*5 years rolling average

Legend:
- France
- UK
- Germany
- USA (Part 121)
- EASA States

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WHAT DOES THE SSP ALLOW US TO DO

- To identify risks

- To define appropriate actions

- To elaborate tools as risk portfolios

N°	IDENTIFICATION DE L'ÉVÉNEMENT INDÉSIRABLE	CFIT	LOC-I	COLLISION EN VOL	COLLISION AU SOL	SORTIE DE PISTE	DOMMAGES / BLESSURES EN VOL	DOMMAGES / BLESSURES AU SOL
EI3.1	Approche non stabilisée ou non conforme	■	■			■		■
EI3.2	Position inusuelle (assiette, inclinaison, incidence,...)		■				■	
EI3.3	Evénement lié aux conditions d'aérodrome (état de la piste et aérologie)		■			■	■	■
EI3.4	Rencontre de phénomènes météo dangereux hors proximité de l'aérodrome (orage, turbulence, givrage)		■	★			■	■
EI3.5	Mise en œuvre inadaptée des systèmes aéronef (masses et centrage, vitesses, trajectoires, configuration aéronef,...)	■	■	■	■	■	■	■
EI3.6	Evénement lié à des travaux/maintenance sur ou à proximité d'une piste		★		■	■		■
EI3.7	Mauvaise coordination / exécution des opérations sol (dégivrage, chargements, arrimages, maintenance en ligne...)	■	■		■		■	■
EI3.8	Incursion sur piste		★		■	■		■
EI3.9	Perte de séparation en vol / pénétration d'espaces		★	■			■	
EI3.10	Péril animalier dont aviaire		■		■	■	■	■
EI3.11	Défaillance des interfaces sol-bord (incompréhension, inadaptation des infos transmises,...)	■	■	■	■	■	■	■
EI3.12	Evénement relatif à l'entretien de l'aéronef	■	■		★	■	■	■
EI3.13	Feu/fumée en vol	★	■			■	■	■
EI3.14	Défaillance de système bord entraînant une perturbation de la gestion du vol	■	■	★	★	■	■	■
EI3.15	Dépressurisation		■	★			■	
EI3.16	Dommage aéronef suite à rencontre de FOD		■			■	■	■

RÉPUBLIQUE FRANÇAISE

MINISTÈRE DE LA TRANSITION ÉCOLOGIQUE ET SOLIDAIRE

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MOST COMMON QUESTIONS WE ARE ASKED FOR

- « How is this portfolio produced ? »

- « What (scientific) process is it the result of ? »

- « What the hell do you do with our data ? They're falling into a black hole, we never get any feedback »

Nowadays, it is mainly a synthesis of experts, based on the previous described process
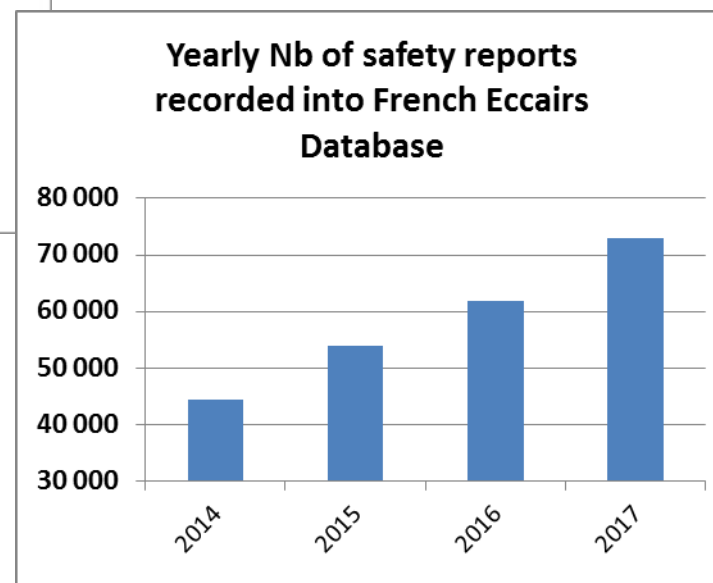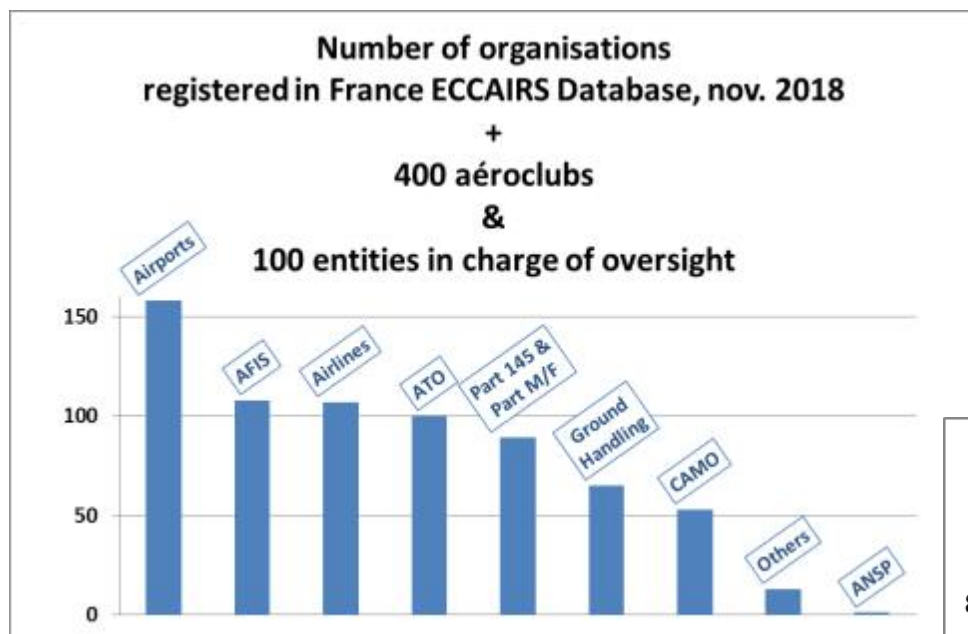
And a continuous collaborative work with professionals

No magic tool

HOW TO IMPROVE OUR SSP TO KEEP OUR ALOSP AT ITS REACHED LEVEL

- Improve the way we use the data to complete our risk assessment awareness

- Make the link between safety data and SSP outputs more visible to organisations that provide some of the most important data

WHAT WE ARE BUILDING,
FOCUS ON THE USE OF ECCAIRS SAFETY REPORTS DATABASE

Number of organisations registered in France ECCAIRS Database, nov. 2018
+
400 aéroclubs
&
100 entities in charge of oversight

Yearly Nb of safety reports recorded into French Eccairs Database

WHAT WE ARE BUILDING,
FOCUS ON THE USE OF ECCAIRS SAFETY REPORTS DATABASE

- Exploration and appropriation

- Revision of the data collection process

- and update of associated procedures

(is of no interest to everyone but is crucial)
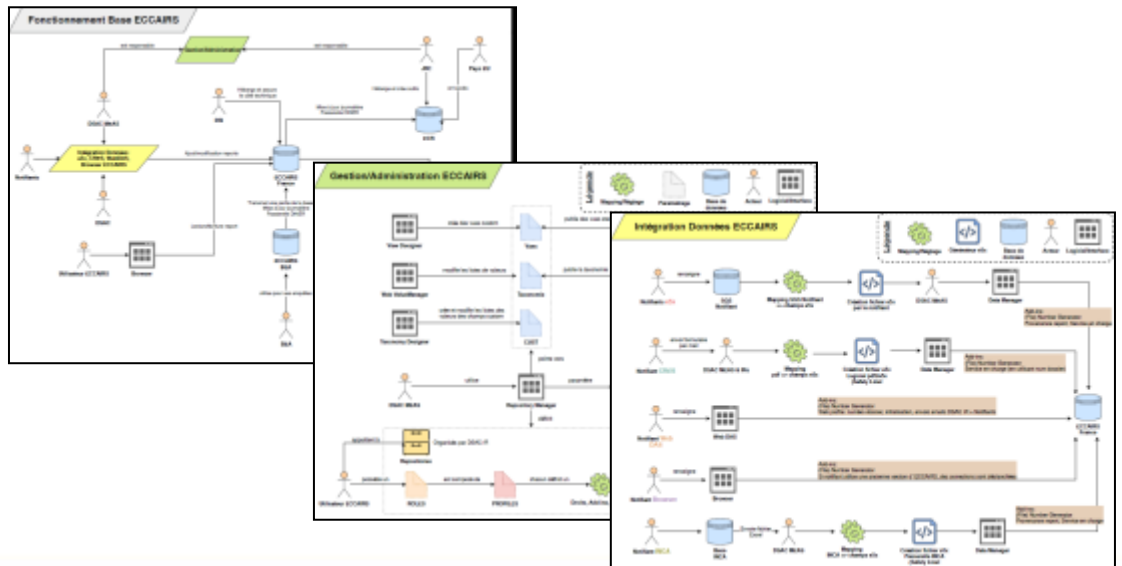
WHAT WE ARE BUILDING,
FOCUS ON THE USE OF ECCAIRS SAFETY REPORTS DATABASE

Eccairs is a data collection tool,

it allows us to consult the stored data,

But it is not an analytical tool
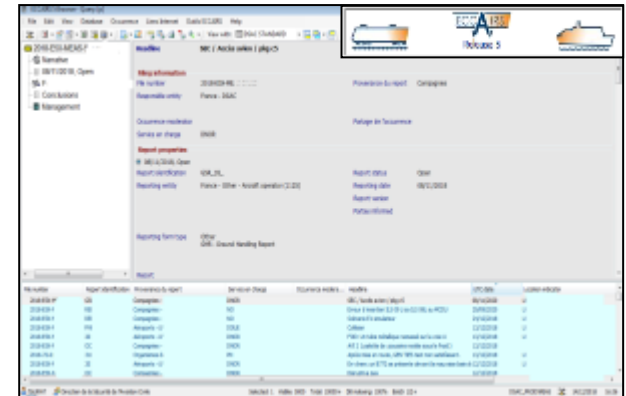
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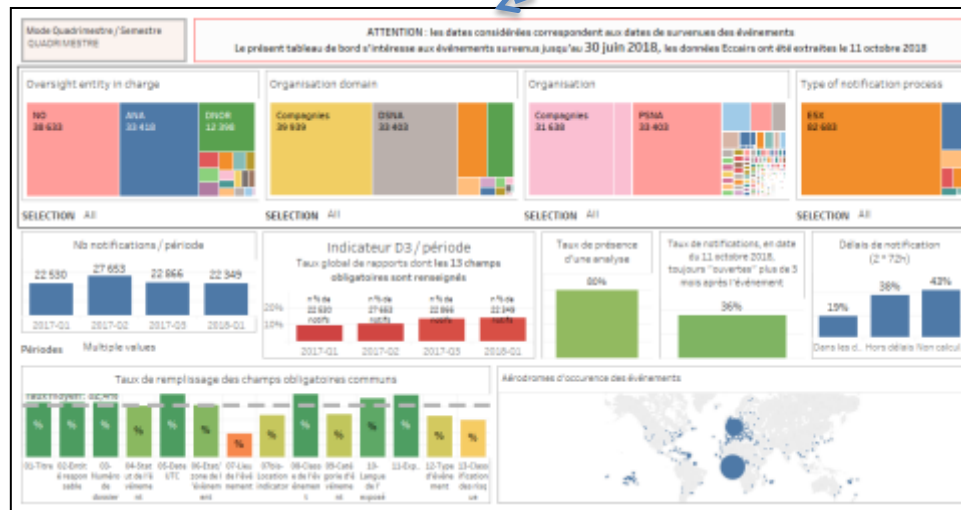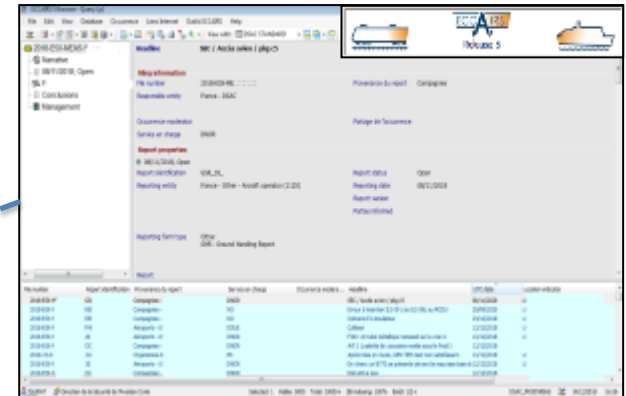
Thanks to modern data visualization tools, the database can become intelligible to non data analysis experts (interactive dashboards)

WHAT ARE WE BUILDING, FOCUS ON THE USE OF ECCAIRS DATABASE

1 / Back to basics

- Compliance of organisations regarding safety report notification process

- Data quality
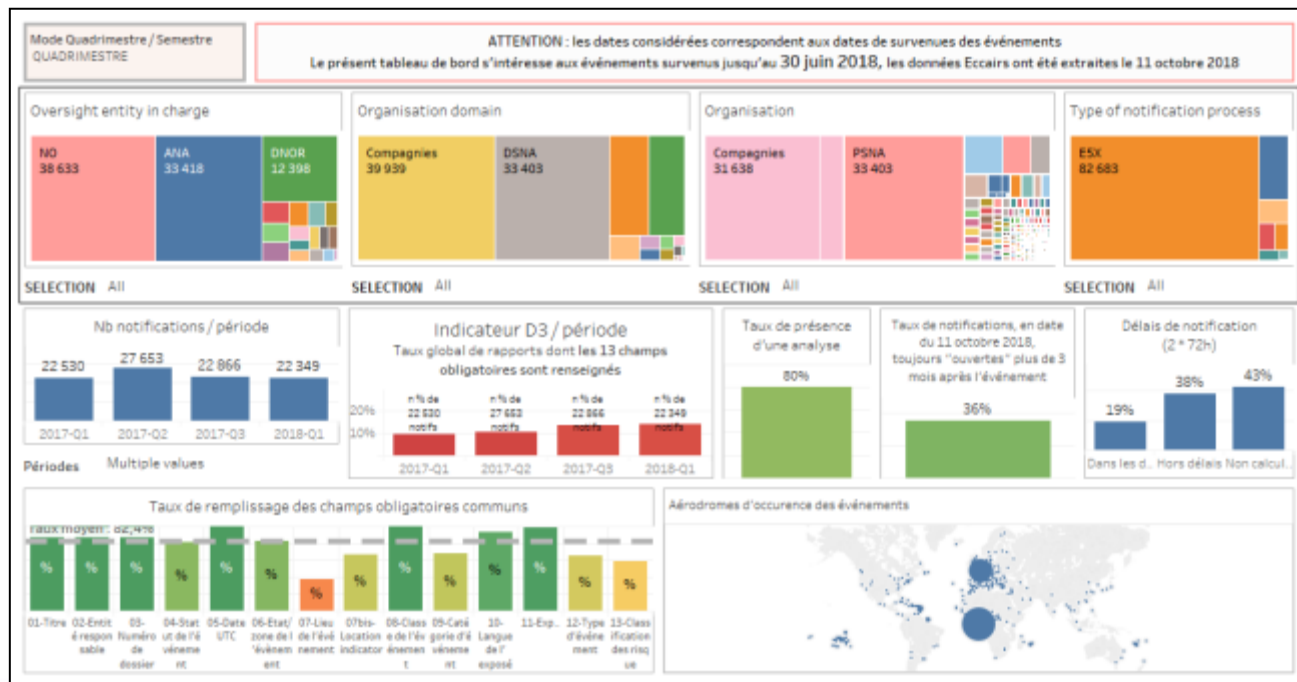
WHAT ARE WE BUILDING,
FOCUS ON THE USE OF ECCAIRS DATABASE

1 / Back to basics

Complexity due to the variety of organisations at stake

and the corresponding oversight organisation
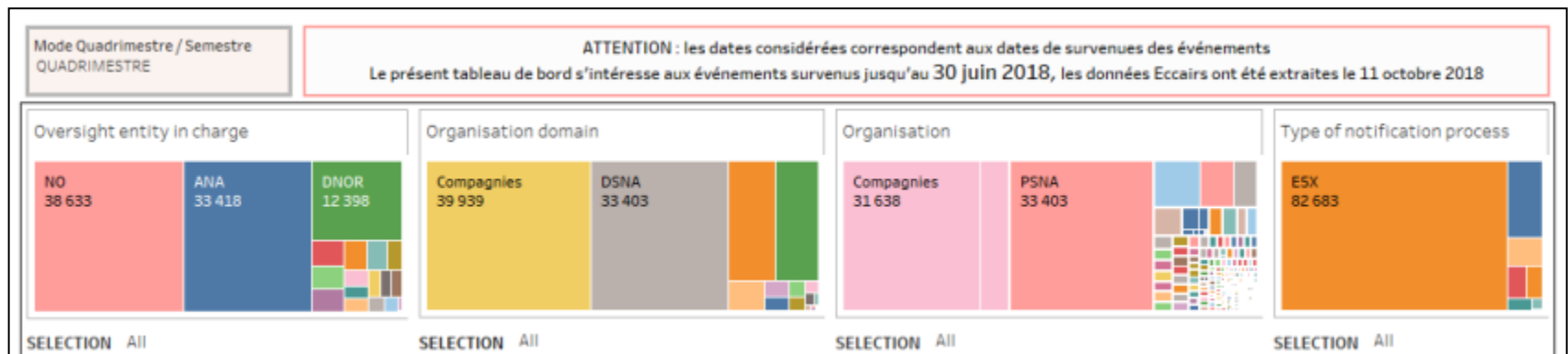
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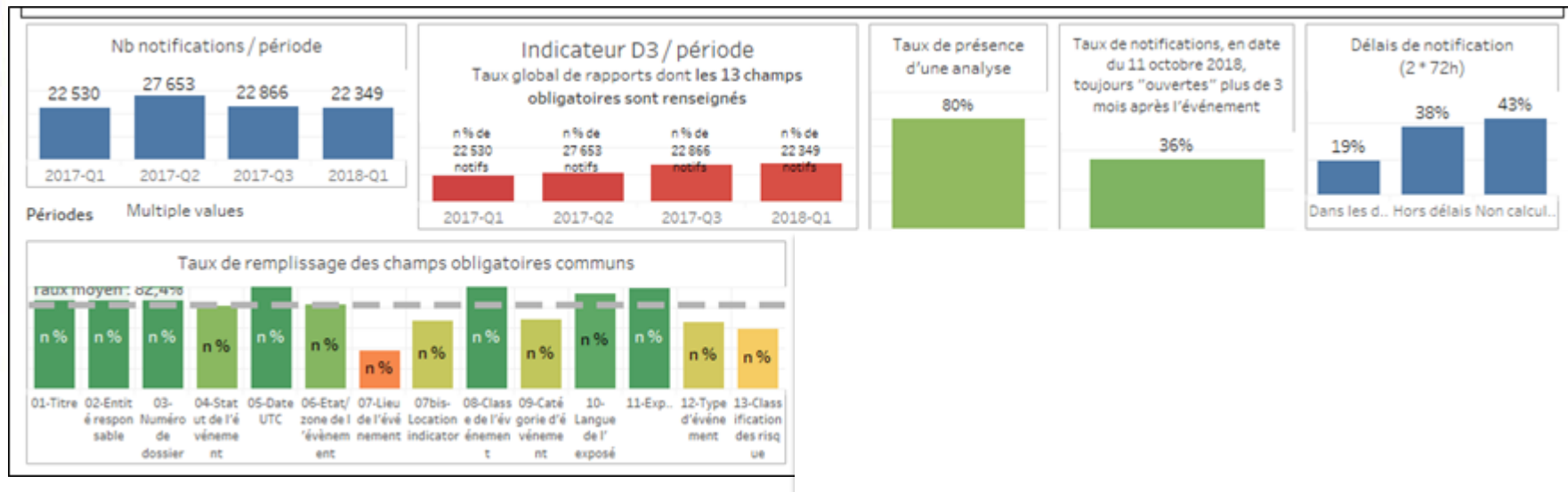
WHAT ARE WE BUILDING,
FOCUS ON THE USE OF ECCAIRS DATABASE

1 / Back to basics

Goals :

- Identify technical issues into the data collection process

- Adapt the analysis to each type of organisation

- detect gaps in the information provided

- Etc

- Useful for inspectors, safety analysts, managers, …

WHAT ARE WE BUILDING,
FOCUS ON THE USE OF ECCAIRS DATABASE

2 / Go further : issues at stake

Choosing from which angle to look into data

ADREP Taxonomy /
Event Type

WHAT ARE WE BUILDING, FOCUS ON THE USE OF ECCAIRS DATABASE

2 / Go further : issues at stake

Choosing from which angle to look into data

ADREP Taxonomy / *Event Type*

WHAT ARE WE BUILDING,
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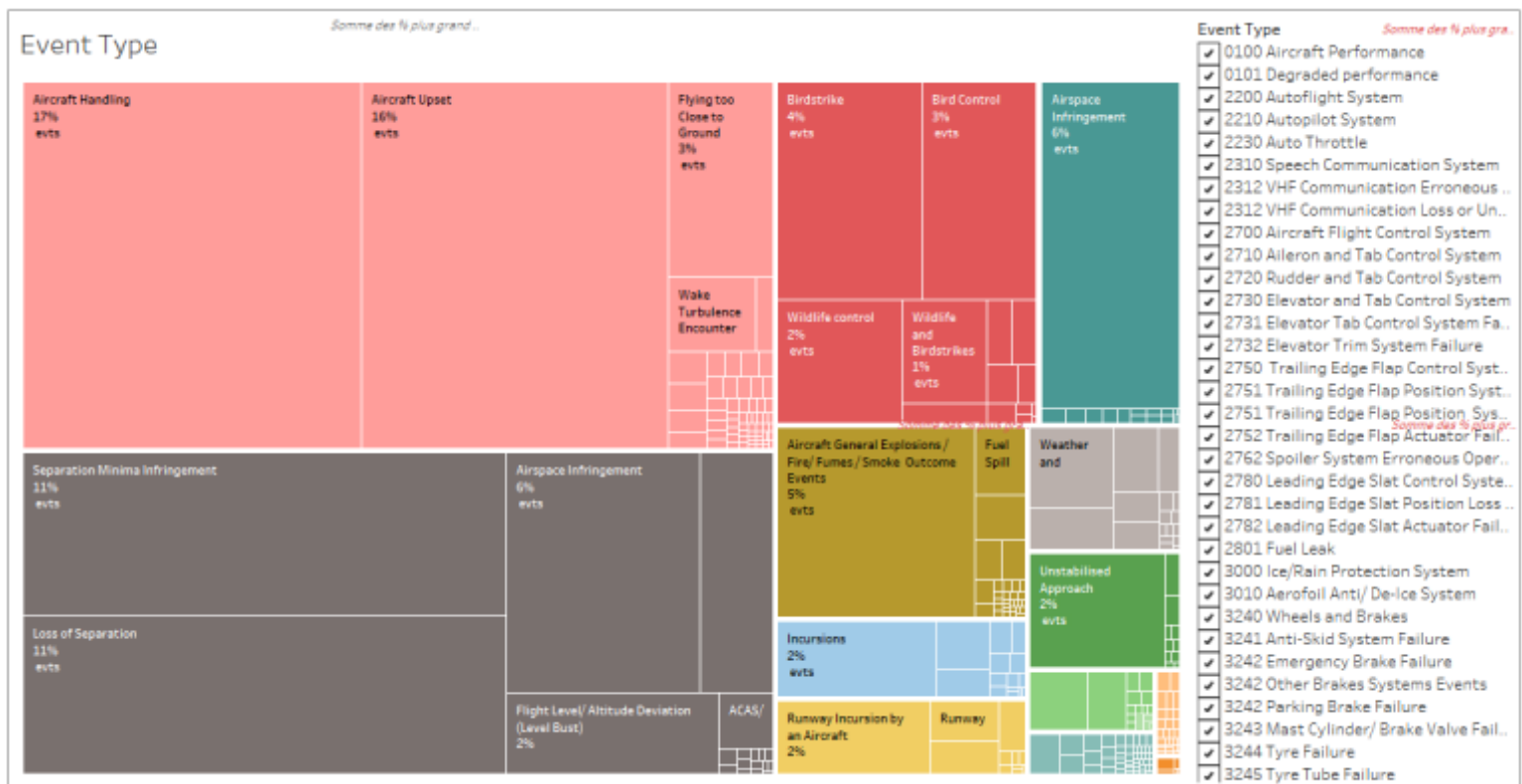
2 / Go further : issues at stake

Choosing from which angle to look into data

WHAT ARE WE BUILDING, FOCUS ON THE USE OF ECCAIRS DATABASE
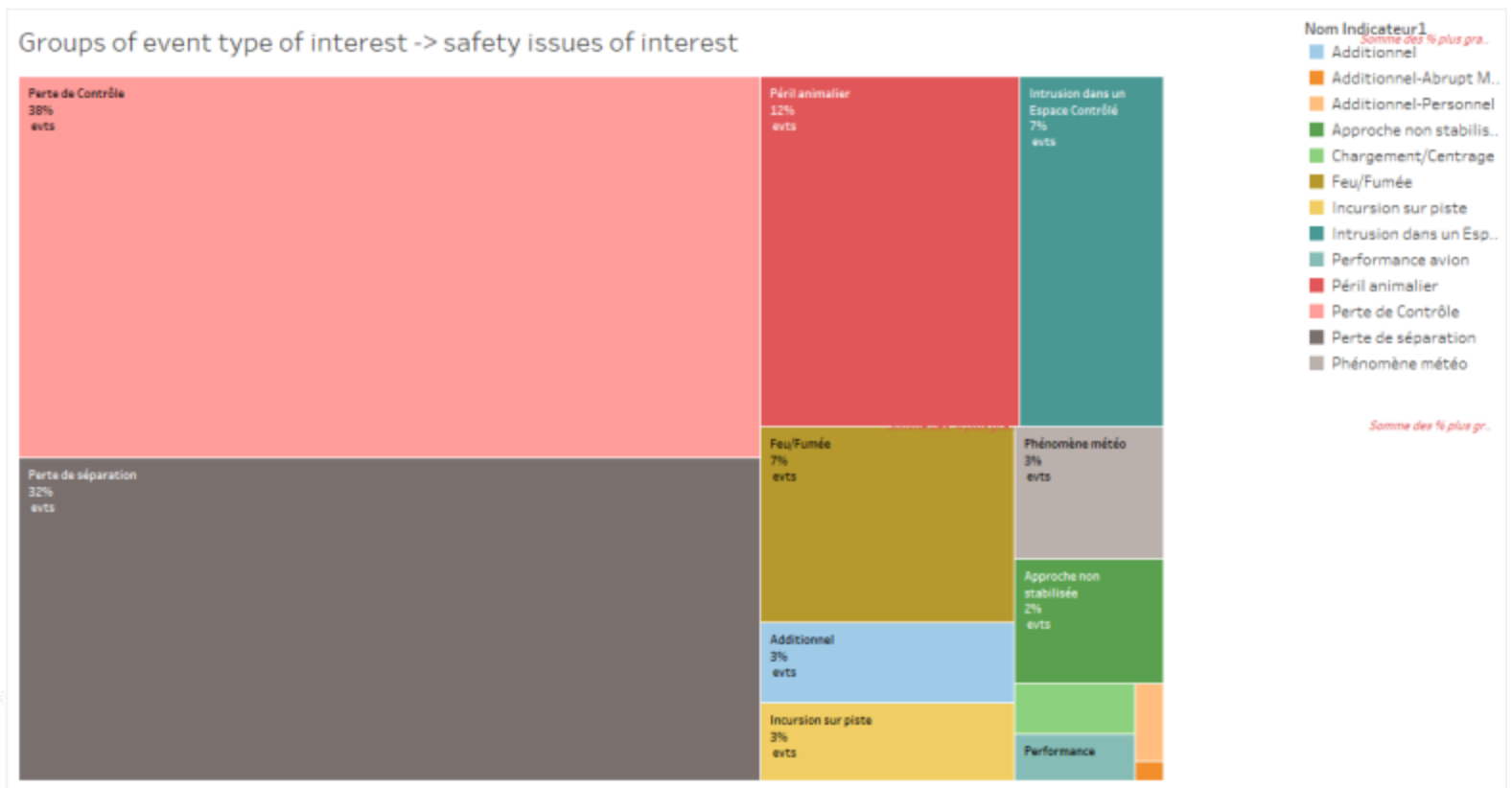
2 / Go further : issues at stake

Decide and build what to focus on : groups of interest -> same issue related reports

WHAT ARE WE BUILDING,
FOCUS ON THE USE OF ECCAIRS DATABASE

2 / Go further : issues at stake

Decide and build what to focus on

WHAT ARE WE BUILDING,
FOCUS ON THE USE OF ECCAIRS DATABASE

3/ Deep further

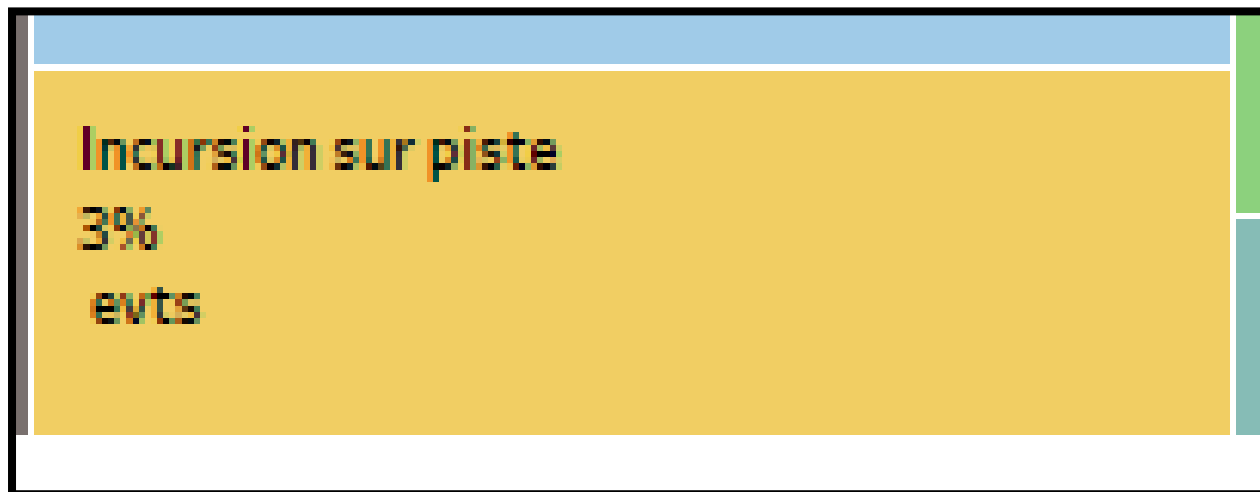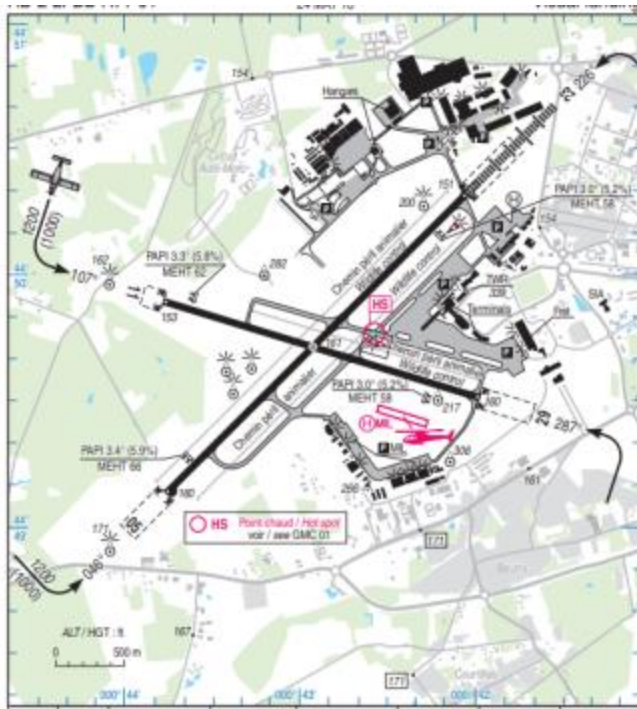Focus on one and investigate on what it means (or does not) ?

WHAT ARE WE BUILDING,
FOCUS ON THE USE OF ECCAIRS DATABASE

3/ Deep further

Focus on one and investigate on what it means (or does not) ?
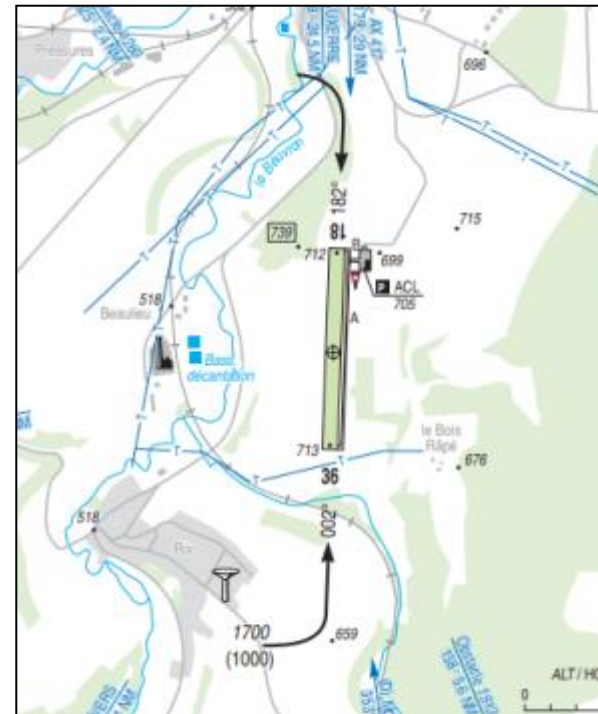

Incursion sur piste
3%
evts

WHAT ARE WE BUILDING,
FOCUS ON THE USE OF ECCAIRS DATABASE

3/ Deep further

Is it really relevant to count an overall national number of

« runway incursion related » events

 = ?

3/ Deep further

airports of corresponding

« runway incursion related »

safety reports

WHAT ARE WE BUILDING, FOCUS ON THE USE OF ECCAIRS DATABASE

WHAT ARE WE BUILDING,
FOCUS ON THE USE OF ECCAIRS DATABASE

3/ Deep further

Caution : for this presentation, need for de-identification of the airports

But, for the the CAA internal process,

of course we must work on non de-identified data

WHAT ARE WE BUILDING,
FOCUS ON THE USE OF ECCAIRS DATABASE

3/ Deep further

Caution : for this presentation, need for de-identification of the airports
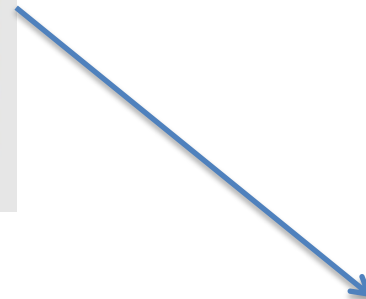
But, for the the CAA internal process,

of course we must work on non de-identified data

WHAT ARE WE BUILDING,
FOCUS ON THE USE OF ECCAIRS DATABASE

3/ Deep further

Computation of « nb of runway incursion related report per 10k ops »

WHAT

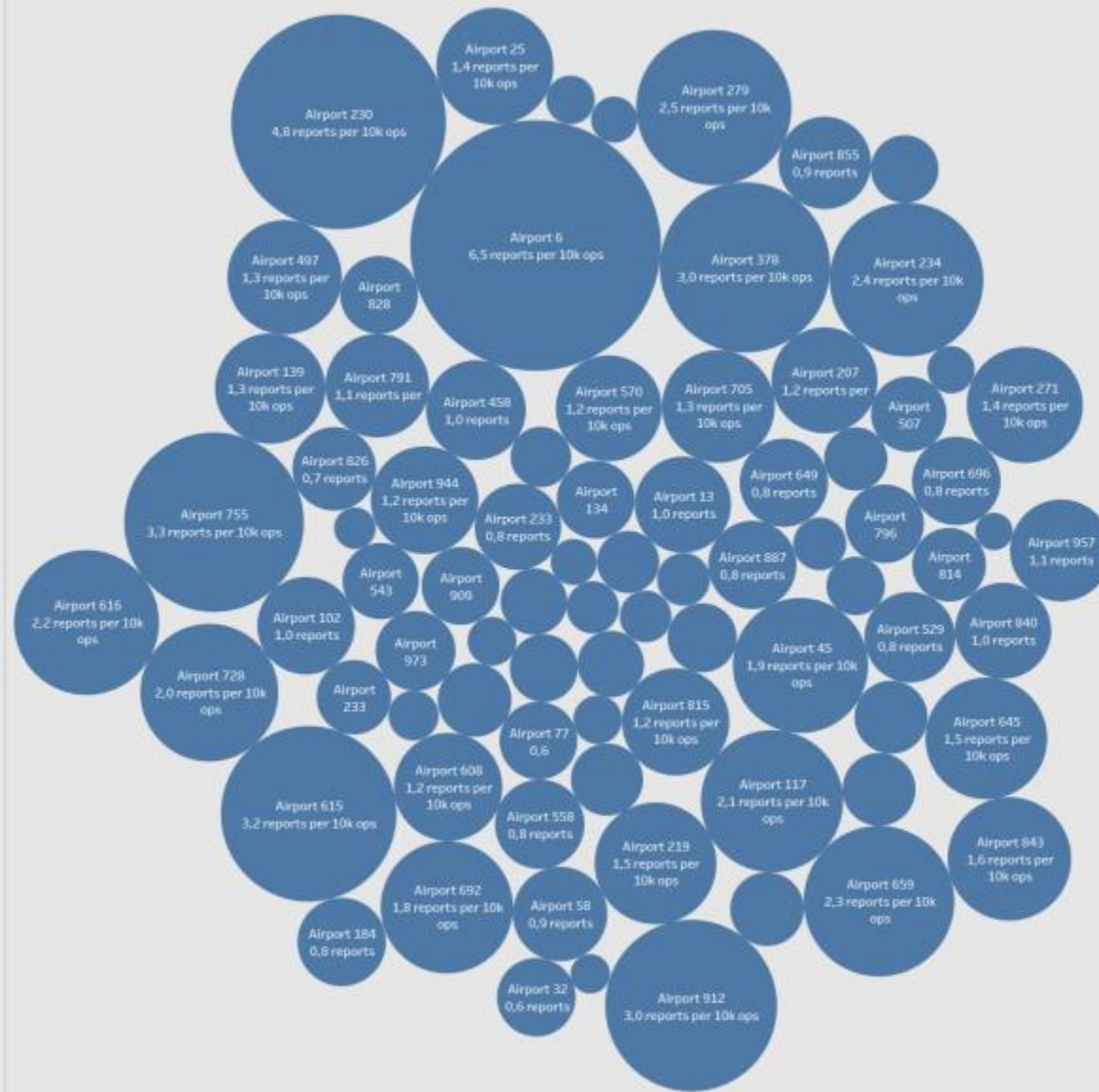Taux de notification incursion sur piste (Janvier 2016 - Septembre 2018)

WHAT ARE WE BUILDING,
FOCUS ON THE USE OF ECCAIRS DATABASE

3/ Deep further

Link with each corresponding safety report

WHAT

SE

3/ Deep further

And of course we would d like to make the link with most significant of those events

(depending on the quality of the corresponding information measured previously)
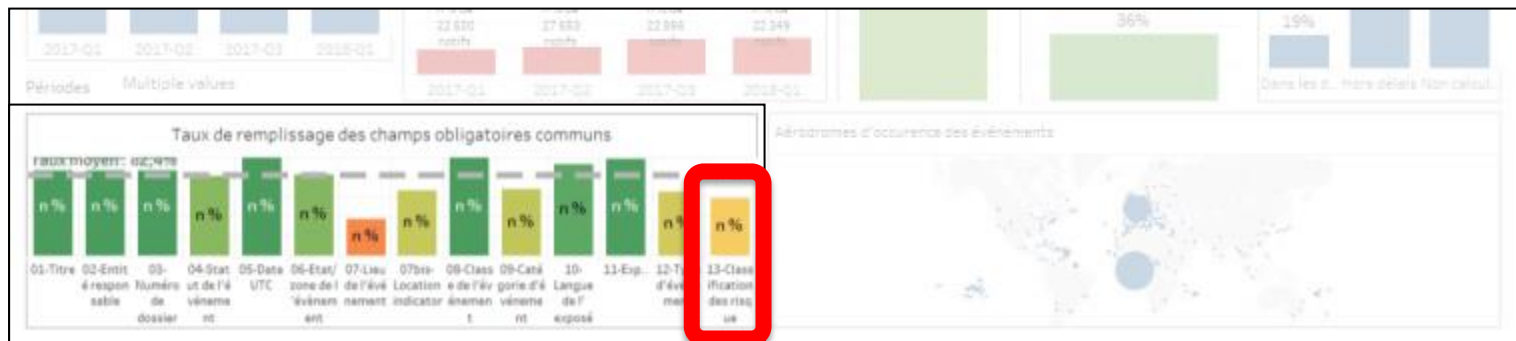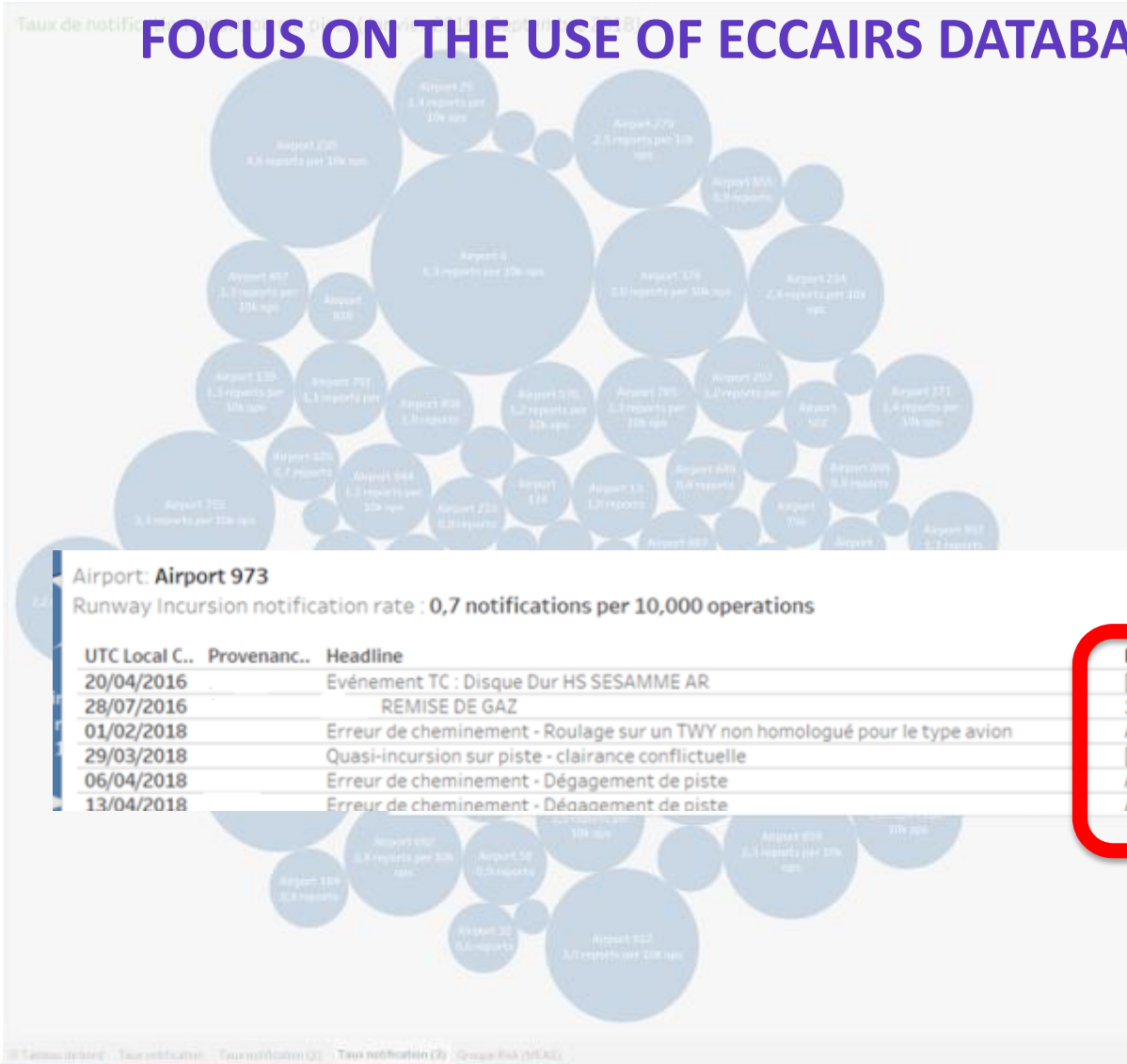
SE

WHAT ARE WE BUILDING,
FOCUS ON THE USE OF ECCAIRS DATABASE

Airport: **Airport 973**
Runway Incursion notification rate : 0,7 notifications per 10,000 operations

UTC Local C..	Provenanc..	Headline	Risk classifica
20/04/2016		Evénement TC : Disque Dur HS SESAMME AR	[2:e+][3:5]
28/07/2016		REMISE DE GAZ	10
01/02/2018		Erreur de cheminement - Roulage sur un TWY non homologué pour le type avion	Absence de cla
29/03/2018		Quasi-incursion sur piste - clairance conflictuelle	[1:C][2:c][3:4]
06/04/2018		Erreur de cheminement - Dégagement de piste	Absence de cla
13/04/2018		Erreur de cheminement - Dégagement de piste	Absence de cla

WHAT ARE WE BUILDING,
FOCUS ON THE USE OF ECCAIRS DATABASE

4/ and back to the usual business

we have to go back to experts (people in charge of oversight) to understand how

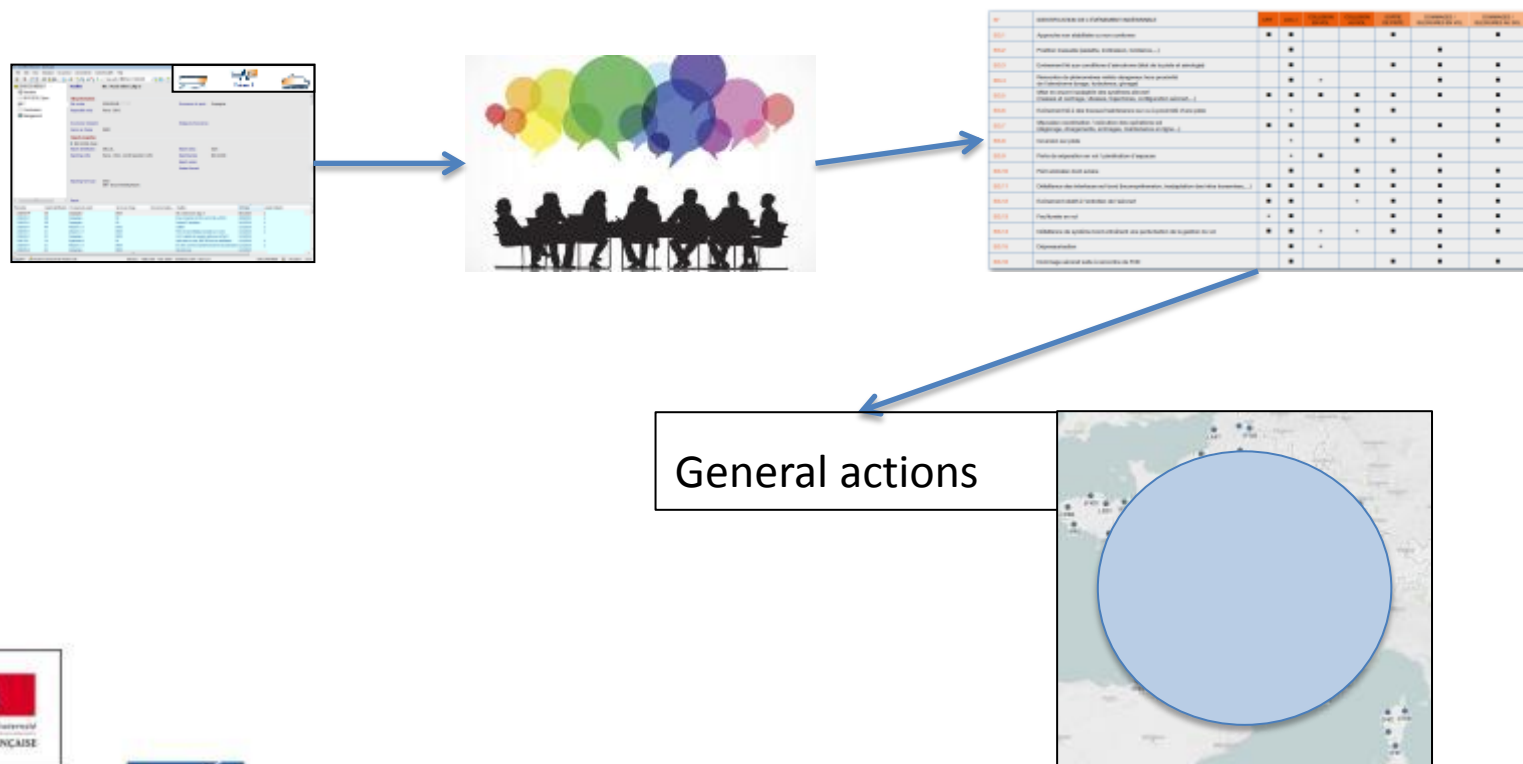organisations use risk classification and what it means,

To decide how to interpret it …

Airport: **Airport 973**
Runway Incursion notification rate : 0,7 notifications per 10,000 operations

UTC Local C..	Provenanc..	Headline	Risk classification	Groupe Risque (MEAS)	
20/04/2016		Evénement TC : Disque Dur HS SESAMME AR	[2;e+][3;5]	Non Significatif	
28/07/2016		REMISE DE GAZ	10	Non Significatif	
01/02/2018		Erreur de cheminement - Roulage sur un TWY non homologué pour le type avion	Absence de classific..	Absence de classificatio..	
29/03/2018		Quasi-incursion sur piste - clairance conflictuelle	[1;C][2;c][3;4]	Significatif	
06/04/2018		Erreur de cheminement - Dégagement de piste	Absence de classific..	Absence de classificatio..	
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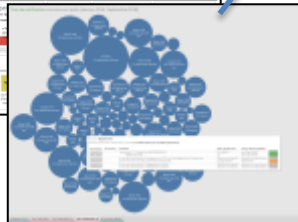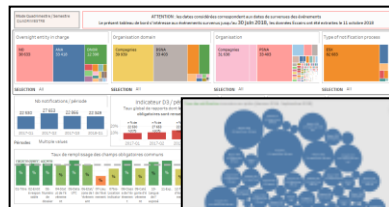5/ in order to conclude on the most relevant actions that must be taken

General actions

WHAT ARE WE BUILDING,
FOCUS ON THE USE OF ECCAIRS DATABASE

5/ in order to conclude on the most relevant actions that must be taken

More targeted and relevant actions

INTEGRATED AND COOPERATIVE USE OF THE DATA

This exemple highlights the key aspects of the more « modern » use of data from our french CAA perspective :

- Work with what you have in hands,

- And know what you have in hands,

- Involve all stakeholders, from oversight inspectors to top management

- Move step by step

PERSPECTIVES

The above process focused on safety reports applies whatever the output we are
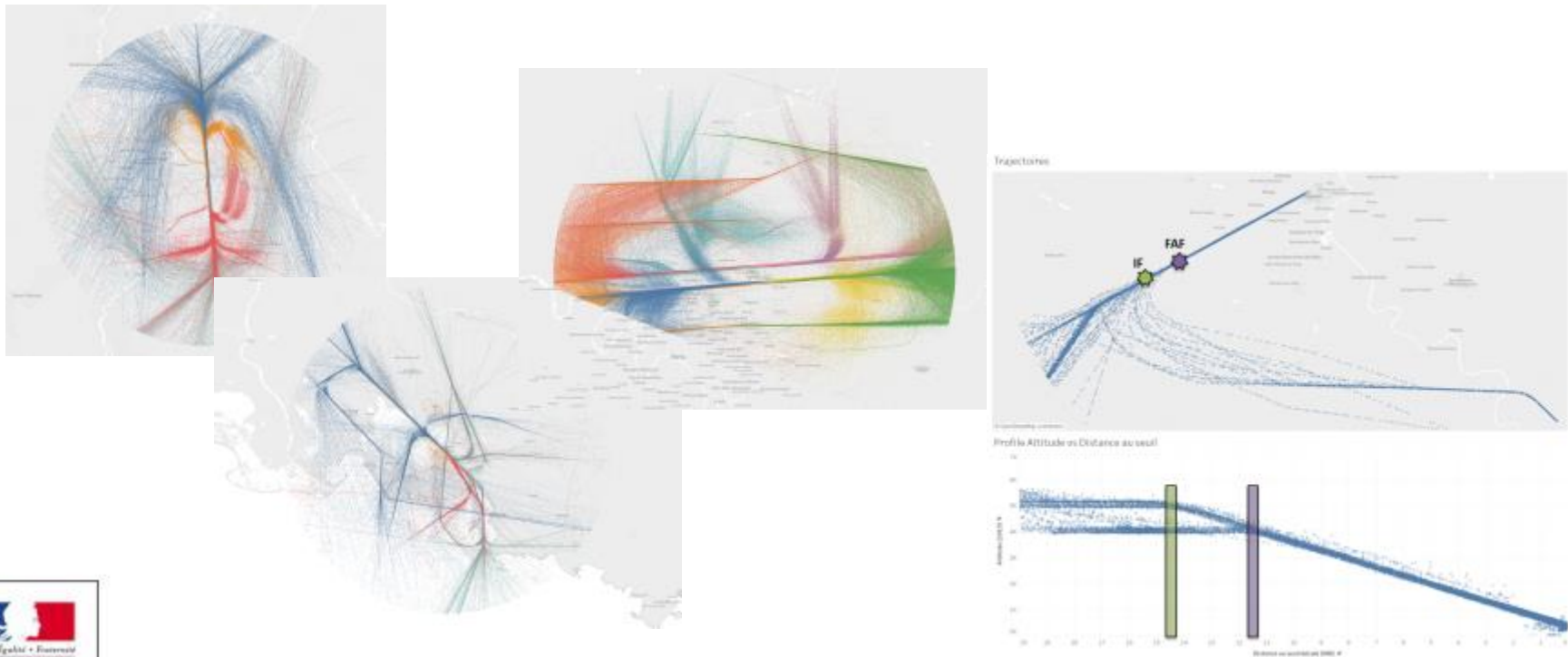
interested in :

- Risk portfolio updates

- Audit preparation

- Topic of interest

- Case studies

PERSPECTIVES

And whatever the type of data we are using,

as for instance ADS-B data

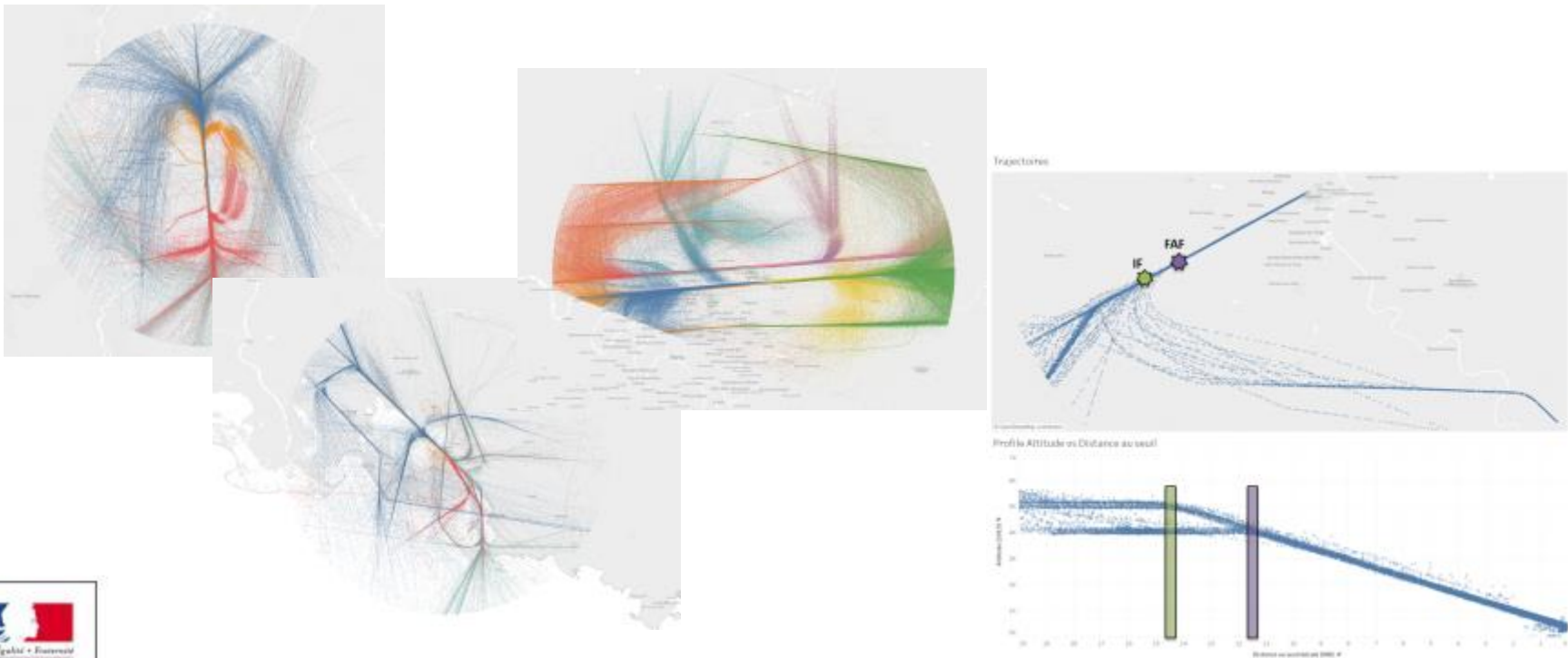Experiment conducted in 2018, based on a one month of 3 ADS-B data samples

PERSPECTIVES

Caution : the one event investigation temptation as a first step

Main goal : analyse trends (use of QFU, ratio of non compliant approaches, …)

Key advantages : no reporting culture bias & general overview (even if gaps still exist)

But important technical barrier to handle the data

PERSPECTIVES

The holy grail of data sources does not exist

Need to figure out how to correlate many data sources.

Moving from indivudual safety report analysis toward comprehensive risk evaluation.

iStars UserGroup
Meeting 1
dec. 2018

Towards a more data guided risk evaluation process

Paul-Emmanuel Thurat

French safety management coordination office
Head of commercial air transport division

paul-emmanuel.thurat@aviation-civile.gouv.fr