



# **AOPA SAFETY SEMINAR**

## **DAC ANNUAL SAFETY REVIEW 2022**

**DAC Safety Department**  
**Jean-Claude Petesch**



# Agenda

1. Accidents and Serious incidents
2. Evolution of traffic and occurrence reporting
3. Top Ten Safety issues
4. Top Ten Safety issues – Luxembourg
5. Occurrence handling at DAC - current status



## Accidents and Serious incidents 2022

0 accidents

1 serious incident – Commercial Air Transport

	Aircraft type	Date	Location	Event	Investigation
<b>Serious incident</b>	Bombardier Global 6000	7.4. 2022	London-Luton	Wingtip strike during go-around	AAIB-UK closed

AAIB investigation closed

- Line training
- Crosswind
- Aircraft configuration: Low wing, high wing sweep:
  - wingtips are very far aft
  - as pitch increases, max. possible roll angle decreases



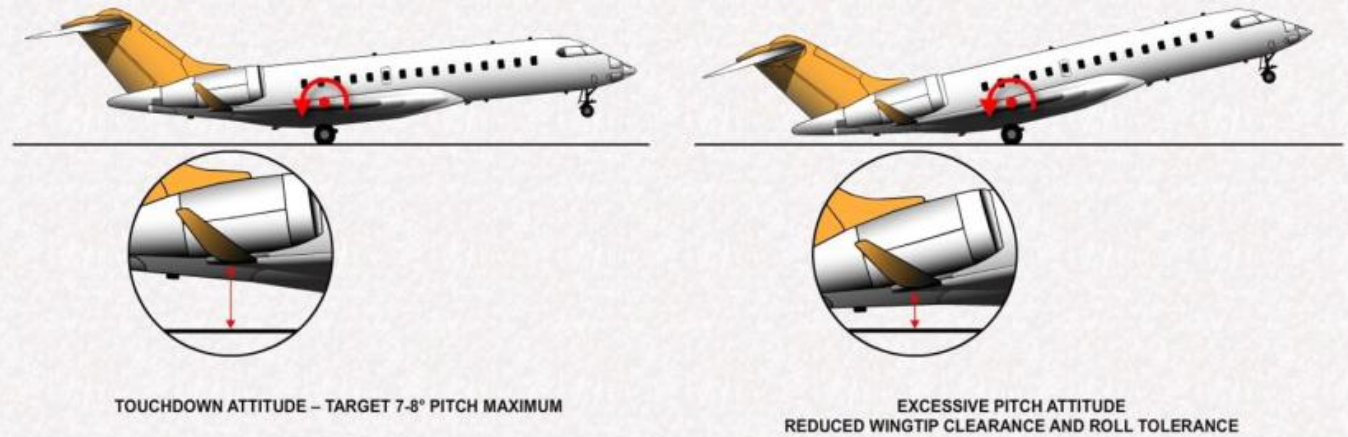
## Accidents and Serious incidents 2022

### Flare to Crosswind Landing

During the flare, the aircraft pitch attitude changes around the center of gravity:

- The wing tips are positioned aft of the center of gravity
- Initially, downwind drift will be minimal but will accelerate while the aircraft remains airborne
- In order to minimize drift, the flare should not be prolonged

As pitch attitude increases in the flare the wing tip gets closer to the runway. At this stage, any roll input from wings level further reduces the clearance between the wing and runway.



### Similar serious incident:

Operator from Luxembourg

Bombardier Global 5000

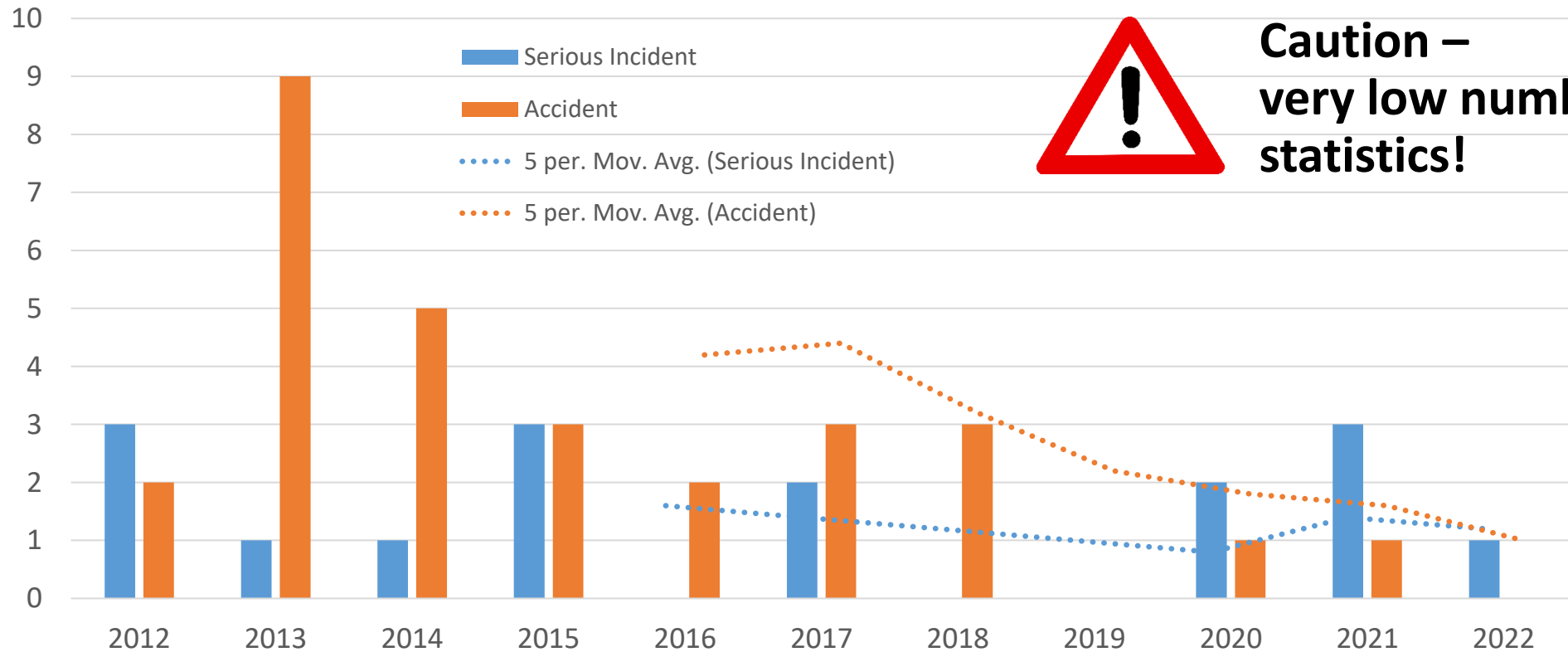
Montichiari (IT), 30.8.2020

- Lack of experience and recency  
(pandemic)



## Evolution of Accidents and Serious incidents

Trend of accidents and serious incidents (5-year moving average)





## Evolution of Accidents and Serious incidents

### Conclusions?

Decreasing trend for accidents...

...not really followed by the trend for Serious incidents

Ratio of Accidents to Serious incidents - less Serious Incidents than Accidents

1 : 0.32 in 2017 (5-year moving average)

1 : 1.2 in 2022 (5-year moving average)



**Caution –  
very low number  
statistics!**



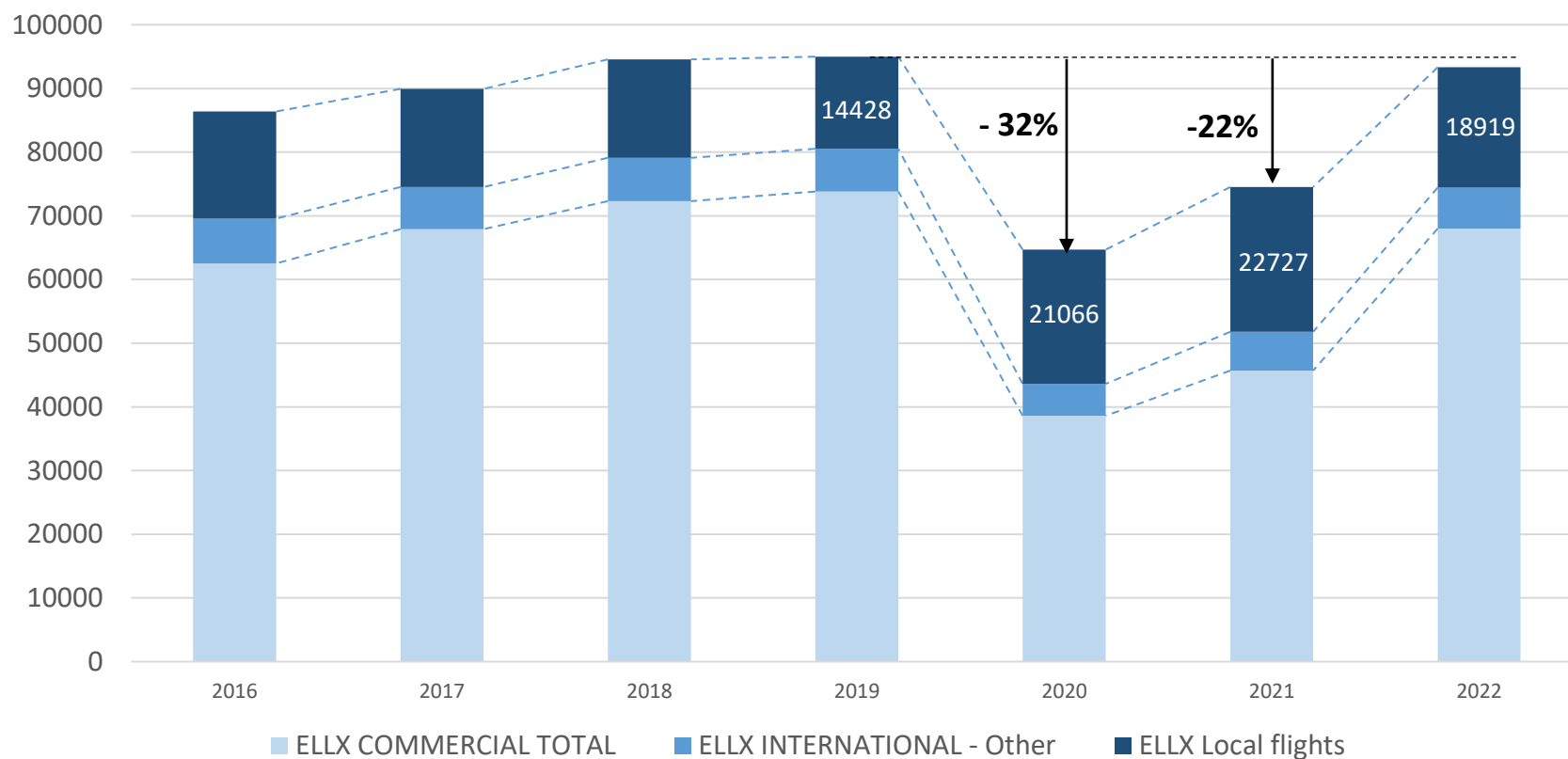
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## Evolution of traffic - ELLX

Number of flights at ELLX 2016-2022



Almost back to 2019 level – but with higher proportion of local (General Aviation) flights

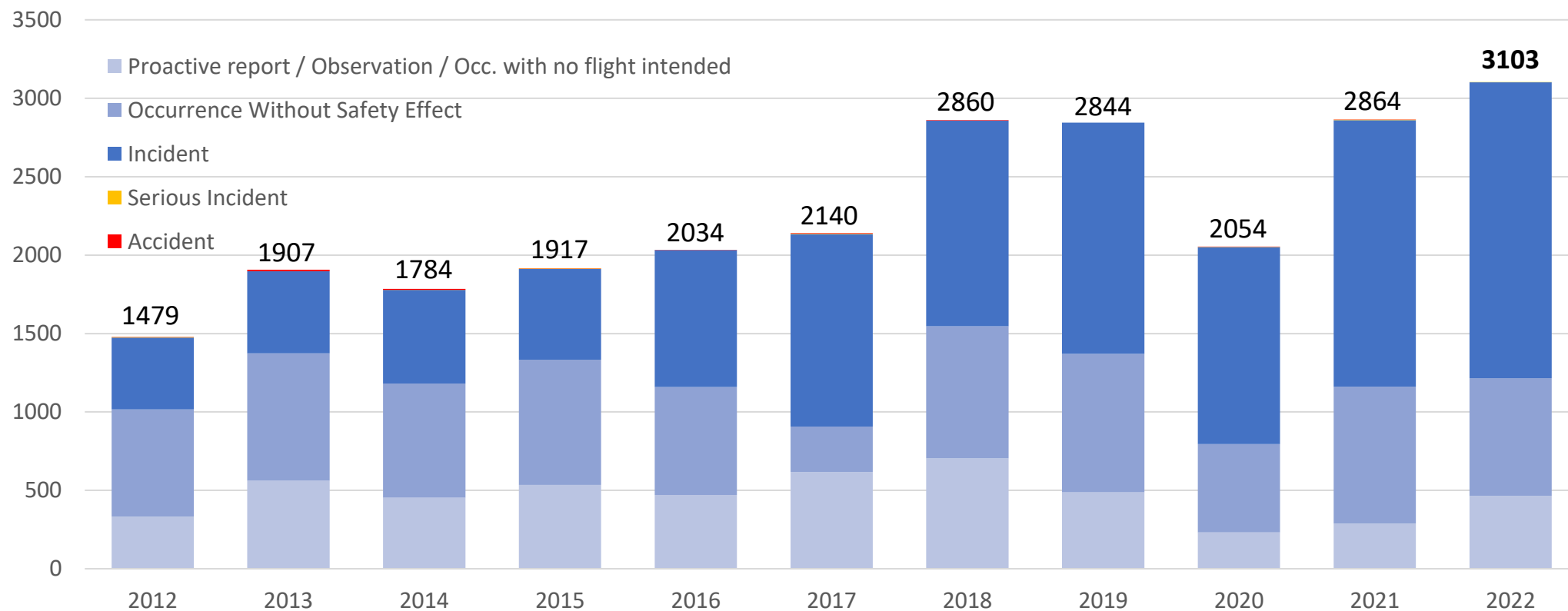
Source data: ANA





## Reports by occurrence class

Occurrences per year





## Reporting

- More than 3000 reported occurrences for the first time!

8 % more reports than in 2019

Commercial air transport - Operators from Luxembourg

- Same number of flights than in 2019
- 17% more flight hours than in 2019



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3. **Top Ten Safety issues**
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## Safety issues acc. ARMS methodology

### ARMS Methodolgy Part 1: Event Risk Classification of each occurrence

#### Question 2

What was the effectiveness of the remaining barriers between this event and the most credible accident scenario?			
Effective	Limited	Minimal	Not effective
50	102	502	2500
10	21	101	500
2	4	20	100
1			

#### Question 1

If this event had escalated into an accident outcome, what would have been the most credible outcome?	
Catastrophic Accident	Loss of aircraft or multiple fatalities (3 or more)
Major Accident	1 or 2 fatalities, multiple serious injuries, major damage to the aircraft
Minor Injuries or damage	Minor injuries, minor damage to aircraft
No accident outcome	No potential damage or injury could occur

Typical accident scenarios
Loss of control, mid air collision, uncontrollable fire on board, explosions, total structural failure of the aircraft, collision with terrain
High speed taxiway collision, major turbulence injuries
Pushback accident, minor weather damage
Any event which could not escalate into an accident, even if it may have operational consequences (e.g. diversion, delay, individual sickness)



# Safety issues acc. ARMS methodology

## ARMS Methodology Part 2 : Safety Issue Risk Assessment

- 127 Safety Issues identified
- Introduced in ECCAIRS and ECCAIRS2 by DAC customisation of software
- All occurrences are assigned to one or more Safety issue
- Top 10 Safety Issues identified:
  - By the sum of the ERC Risk Index values of related occurrences for 2022

Question 2				Question 1	
What was the effectiveness of the remaining barriers between this event and the most credible accident scenario?				If this event had escalated into an accident outcome, what would have been the most credible outcome?	
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1				No accident outcome	No potential damage or injury could occur

- Only Safety Issues with Accident severity « Catastrophic » or « Major » considered



## Top Ten Safety Issues 2022

	Safety Issue
1	Fatigue
2	Risk of Mid-Air Collision
3	FOD
4	Windshear
5	Engine failure or problems - multi-engine aircraft
6	Technical - Landing gear
7	Incorrect aircraft setup by crew
8	Unstabilized approach
9	Aircraft deviation from ATC instruction
10	Technical - flight controls



## Top Ten Safety Issues

### Fatigue

- 50% more reports than in 2021 + higher average ERC Risk index
- Possible contribution by longer flight times on average

### Risk of Mid-air collision

- Number of occurrences is higher than in 2021 (+13%) but lower than in 2017-2019
- Average ERC Risk index is much lower than in previous years



## Top Ten Safety Issues

### Windshear

- same number of events as 2020 (highest so far) but lower ERC Risk index

### Aircraft deviation from ATC instruction

- New in Top Ten
- Long-term increasing number of events (trend interrupted by pandemic in 2020 and 2021)
- Almost 2/3 outside of Luxembourg => self-reported by flight crew





## Other notable trends - negative

Overall low numbers but negative trends:

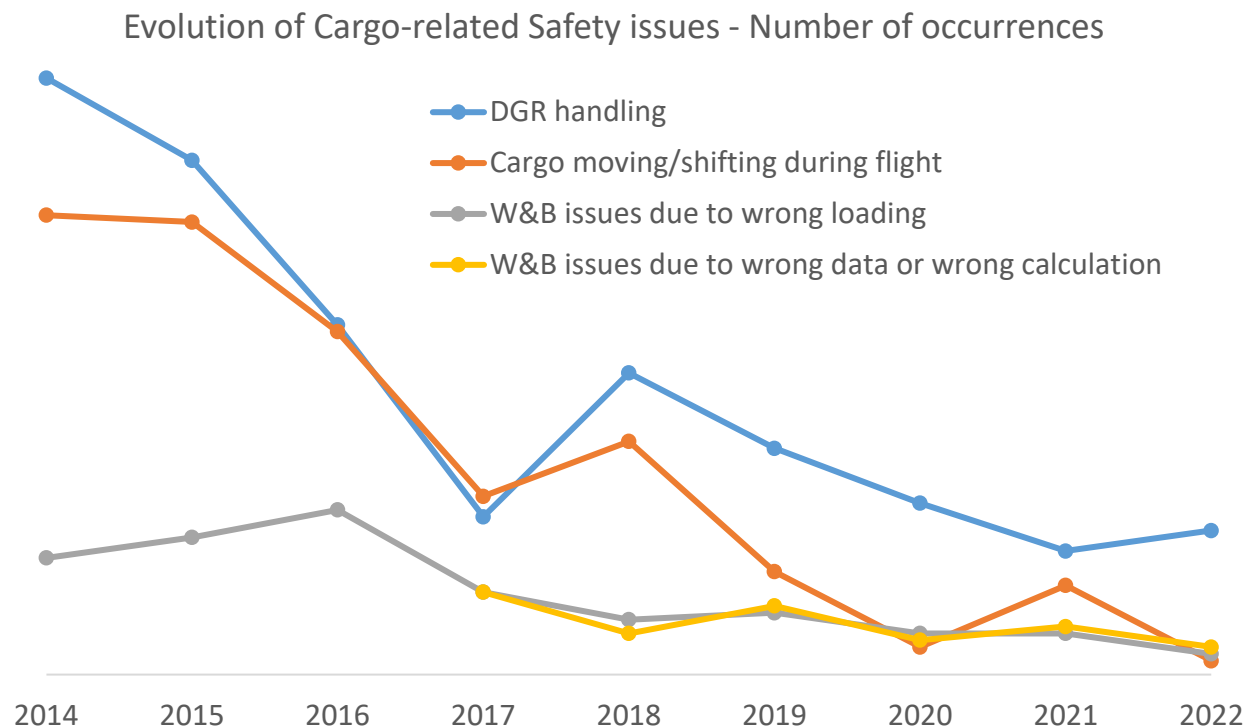
- Hard landing
- Risk of CFIT (Controlled Flight into Terrain)

Significant increase:

- Medical issue – passenger: 29 in 2022 vs. 15 in 2019



## Other notable trends - positive



### Cargo-specific Safety Issues

Long-term trend: all decreasing

Main safety issue in cargo-specific domain:

**Dangerous goods**



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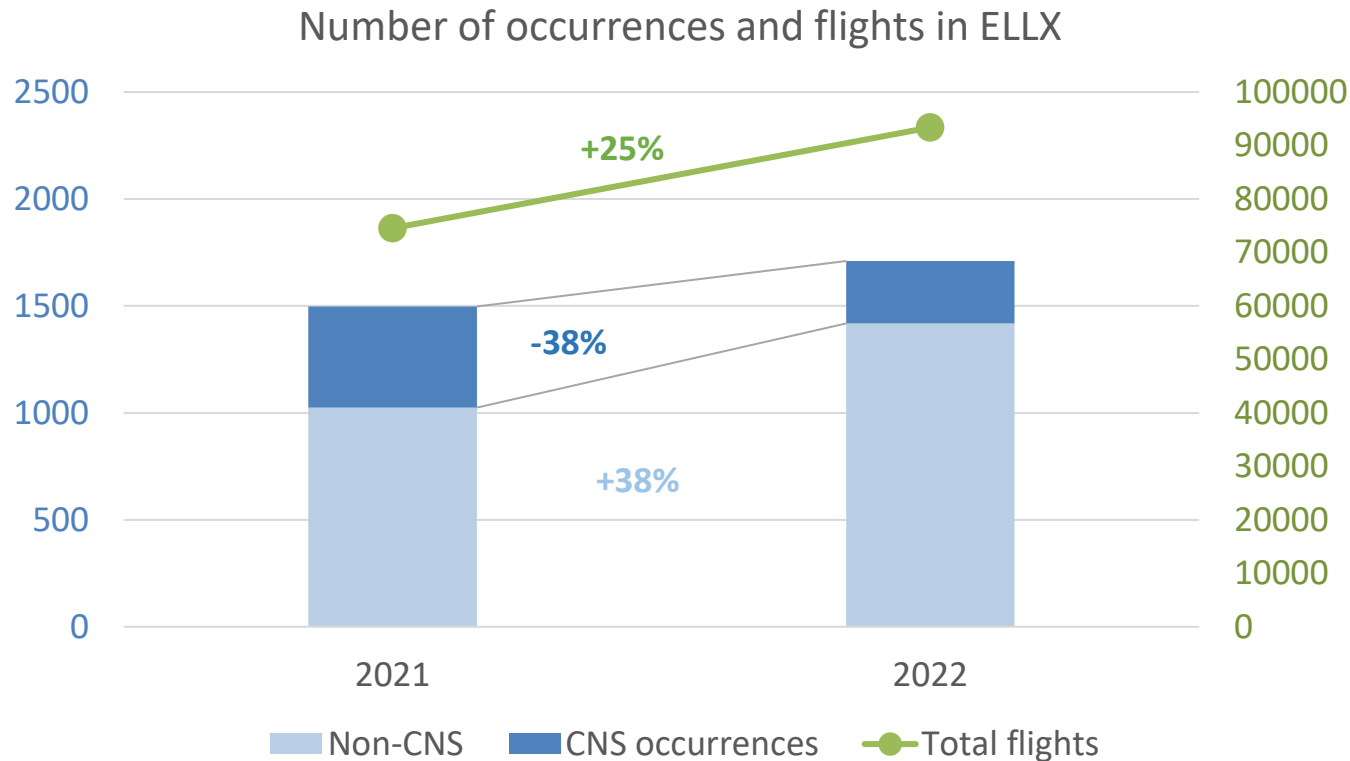
## Top Ten Safety Issues - Luxembourg

Safety Issue	
1	FOD
2	Fatigue
3	Risk of MAC
4	Engine failure or problems - multi-engine aircraft
5	FDP Issues at ELLX
6	Vehicles cutting off aircraft at ELLX entering/exiting apron
7	Improper installation of parts
8	Windshear
9	Airspace infringement
10	Fuel leak on ground - technical issues (risk of fire)

Green background:  
also in overall Top Ten



## Top Ten Safety Issues - Luxembourg



### Evolution 2022 vs. 2021

More reports overall – but not following the increase in traffic  
=> less reports per 1000 flights

However:

Less CNS-related reports

More other occurrences reported

=> 10% more “other” reports per 1000 flights



## Top Ten Safety Issues - Luxembourg

### Overall CNS issues (Communication, Navigation, Surveillance)

- - 38% vs. 2021, but still 2.5 times higher than before the Surveillance chain upgrade of 2019
- Safety issue “FDP issues” remains in Top Ten
- Safety issue “Radar issues” drops to No.11



## Top Ten Safety Issues - Luxembourg

### **Aerodrome:**

- FOD: related to Runway refurbishment

Most reports by FOD inspection or aerodrome inspection – effective safety barrier, low risk

- Vehicles cutting off aircraft entering/exiting apron

Increasing again after significant low 2016-2020

- + Runway incursions by vehicles – related to runway refurbishment:  
did occur but not often/low risk

Only 1 – no immediate risk of collision



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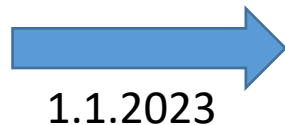


# Occurrence handling at DAC - current status

Question 2				Question 1	
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SEVERITY			CLASSIFICATION									
Potential Accident Outcome	Score	Points	X/9	X/8	X/7	X/6	X/5	X/4	X/3	X/2	X/1	X/0
Extreme catastrophic accident with significant potential fatalities (100+)	X	1000000	1.00E-03	0.01	0.10	1	10	100	1,000	10,000	100,000	1,000,000
			S/9	S/8	S/7	S/6	S/5	S/4	S/3	S/2	S/1	S/0
Significant accident with significant potential for fatalities and injuries (20-100)	S	500000	5E-04	5E-03	0.05	0.5	5	50	500	5,000	50,000	500,000
			M/9	M/8	M/7	M/6	M/5	M/4	M/3	M/2	M/1	M/0
Major accident with potential for some fatalities/life changing injuries (2-19) or major aircraft destroyed	M	100000	1E-04	1E-03	0.01	0.1	1	10	100	1,000	10,000	100,000
			I/9	I/8	I/7	I/6	I/5	I/4	I/3	I/2	I/1	I/0
Single Individual fatality/life changing injury or substantial damage accident	I	10000	1E-05	1E-04	1E-03	0.01	0.1	1	10	100	1,000	10,000
			E/9	E/8	E/7	E/6	E/5	E/4	E/3	E/2	E/1	E/0
Minor and Serious Injury (not life changing) accidents and Minor Damage	E	1000	1E-06	1E-05	1E-04	1E-03	0.01	0.1	1	10	100	1,000
			A	0	A/0							
Score			9	8	7	6	5	4	3	2	1	0
Barrier Score			17-18	15-16	13-14	11-12	9-10	7-8	5-6	3-4	1-2	0
Ref Value			1.E-09	1.E-08	1.E-07	1.E-06	1.E-05	1.E-04	1.E-03	1.E-02	1.E-01	1.E+00
PROXIMITY TOWARDS ACCIDENT OUTCOME												

ARMS (ERC)



ERCS - European Risk Classification Scheme mandatory!



## Occurrence handling at DAC - current status

### Transition to ECCAIRS2 software

- National database successfully migrated in Sep. 2023 (>26000 occurrences)
- Access granted to reporting organisations
- Entry of reports:
  - Manual upload of reports by individuals and (small) operators on webportal: ongoing
  - Automatic upload of reports by (big) operators:
    - test phase ongoing - for technical validation
    - for feedback on reporting quality



## Occurrence handling at DAC – ECCAIRS2 setup

<i>Report types</i>	<b>OR Original report</b>	
	<b>Draft</b>	<b>Submitted</b>
<i>Actions</i>	Fill in report	
	Modify report	Modify report
	Submit	Update - Add investigation/ conclusions

<i>Access rights</i>	<i>Registered reporter: Read &amp; Write Access</i>
	<i>DAC: read only</i>





## Occurrence handling at DAC - current status

### **ECCAIRS2 Access rights for external users**



- All users: Possibility to save drafts – not visible to DAC until “submitted”
- All users: Access to own “OR – Original reports” – read & write
- All users: Attachments allowed! (pictures, charts, documents,... – *without personal details please!*)
- Organisations: 1 or more “administrators” to manage the organisation’s users



https://aviationreporting.eu

Contact

# ECCAIRS 2

REPORT AN OCCURRENCE SAFETY RECOM

## Report an Occurrence

Help play your part in making flying safer. Report your occurrence to your competent National Aviation Authority here.

### What is ECCAIRS 2?

ECCAIRS 2 is a digital platform established for stakeholders in collecting, sharing, and analysing aviation information. ECCAIRS stands for the European Coordination Centre for Accident and Incident Reporting Systems.

### Why reporting is important?

Safety Reporting plays an essential role in aviation safety by enabling the identification of appropriate actions through the prompt analysis of safety data.

Aviation News

https://e2.aviationreporting.eu/reporting

# ECCAIRS 2 - SRIS 2

## Report an Occurrence

Only a few clicks away from reporting your occurrence

### Sign in to ECCAIRS

Welcome to ECCAIRS, please enter your credentials below to start reporting

username

password

**SIGN IN TO ECCAIRS**

Forgot your password

Don't have an account?

- Register your organisation  
to register your organisation, please contact your Competent Authority via the contact form (select "Request Access")
- Register as an individual user

### Report an occurrence without registration

You will still be able to consult the report you sent via a confirmation notification you will receive after submission

**CLICK HERE TO BEGIN**



# Reporting

## 2 separate reporting obligations:

Type	Report to...	In Luxembourg	Deadline	How to report
Accident Serious incident	State of occurrence	AET Administration des enquêtes techniques	ASAP	In Luxembourg: AET Permanence Tel. 2478 4404
Accident Serious incident Incident Latent condition	State that issued your licence	DAC Direction de l'aviation civile	Mandatory reports: 72h Voluntary reports: no deadline	<a href="http://www.aviationreporting.eu">www. aviationreporting.eu</a>



## Preview - accidents and Serious incidents 2023

1 accident - parachuting

1 serious incident – Commercial Air Transport

	Aircraft type	Date	Location	Event	Investigation
<b>Accident</b>	Parachute	15.4. 2023	Noertrange	Hard landing outside landing zone	none
<b>Serious incident</b>	Boeing 747	14.5. 2023	Luxembourg	Landing gear separation on landing	AET - ongoing

Parachuting accident: 1 serious injury

Notification received late



**Thank you for your attention!**

**Any questions?**