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Operations and Safety Update

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#IATAAGM

OPERATIONS

- Supply Chain Challenges

SAFETY

- Safety Performance Update
- Accident Reports
- Risk-Based IOSA
- GNSS
- Turbulence

Supply Chain Challenges Remain

Boeing Problems Delay Virgin Australia Aircraft Delivery: Report

Fleets

United expects 102 fewer aircraft deliveries in 2024

Brazil's Embraer sees supply chain bottlenecks hampering 2024 deliveries

Airlines

First Deliveries of New Airbus A321XLR Plane Delayed Again

BUSINESS

Southwest plans to reduce capacity, reevaluate 2024 financial outlook on delivery delays from Boeing

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- During the last year airlines have been facing unprecedented supply chain issues
- These issues are impacting the delivery schedules of new aircraft

3

Delivery Challenges

Due to delays in production ramp-ups, passenger and cargo airlines will receive 11% fewer aircraft in 2024 than they expected just last December. Compared to August last year, the difference is greater – a 17% reduction.

The impact is greatest for North American and European carriers.

Aircraft deliveries (2018-2023) and scheduled orders (2024-2025) by region
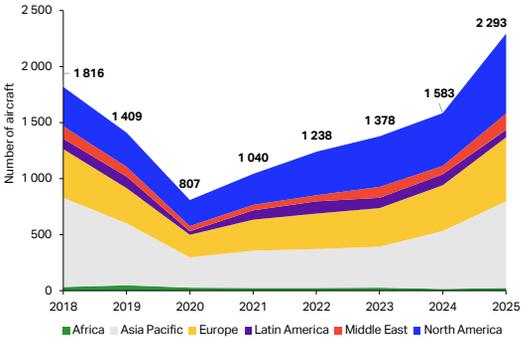
Supply Chain Challenges – Maintenance

Skilled Labor Shortage	Technical Inefficiencies	Poor Forecasting	MRO Demand Spike

Airline concerns

Unable to scale network as planned
Technical Reliability
Rising Costs

Raw Material Availability	Clogged MRO Shops	Strong Parts Demand	Lack of Alternatives

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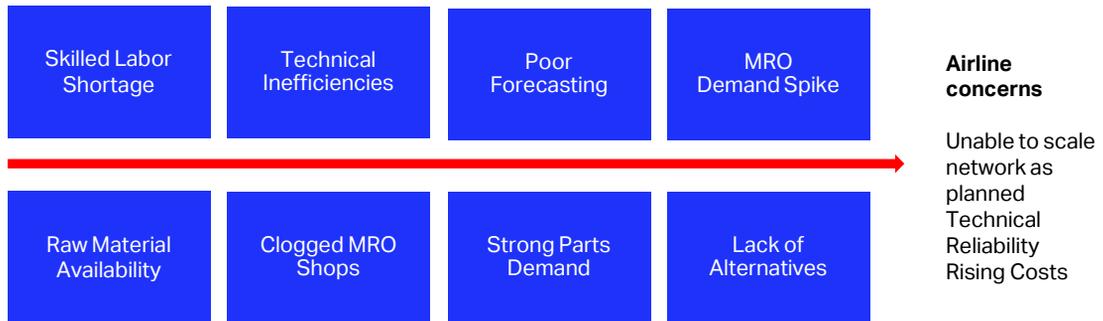
- Maintenance is also a challenge in a complex supply chain affected by:
    - Skilled labor shortages in both the manufacturing and MRO sectors.
    - Technical Inefficiencies: generational overlap, standardization, interoperability, lack of digitalization, regulatory acceptance
    - Poor Forecasting: Poor parts data, complex MRO supply chain
    - MRO Demand Spike: Aging fleets due to delivery challenges, parts makers being pulled in two directions: Do they supply a part to an aircraft manufacturer to build a new aircraft or provide it to an airline that needs a replacement part? Engine teething issues.
    - Raw Material Availability: Geopolitical issues, rerouting supply chains
    - Clogged MRO Shops: Lack of hanger slot capacity, lack of engine overhaul slots, waiting for parts, logistics issues
    - Strong Parts Demand: Low inventory levels, everyone restocking
    - Lack of Alternatives: Few aircraft retirements, few suppliers approved to repair equipment

- This has led to:
    - Airlines unable to scale network as planned
    - Having issues with technical Reliability
    - Raising industry costs

Priorities

1. Adopting and Developing Technical Records Standards
Standardized technical records are crucial for the smooth transfer of aircraft and parts within the industry.

2. Improving Transparency and Visibility in Inventory and Supply Chain
Consolidating demand and ensuring visibility in stock levels and the supply chain will help optimize inventory management and reduce shortages or overstock issues.

3. Expanding Parts Repair Capabilities
Increasing the capacity to repair parts and addressing the current repair backlog will enhance efficiency and reduce downtime in the industry.

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Safety

2023 Safest Year for Flying By Several Parameters

	2021	2022	2023	5-Year Average
Accident Count	30	42	30	38
Accident Rate	1.17	1.30	0.80	1.19
Jet Hull Losses	3	7	0	4
Turboprop Hull Losses	5	6	2	4
Fatal Accidents	7	5	1	5
Fatalities on-Board	121	158	72	143
Fatality Risk	0.23	0.11	0.03	0.11
IATA Members	11	13	20	16
IOSA Carriers	14	18	19	20

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- Aviation continues to make progress on safety with several 2023 parameters showing "best-ever" results.

- There were no hull losses or fatal accidents involving passenger jet aircraft in 2023.

- However, there was a single fatal accident involving a turboprop aircraft, resulting in 72 fatalities. There were 37 million aircraft movements in 2023 (jet and turboprop), an increase of 17% on the previous year.

- There were 30 total accidents last year compared to the five-year average of 38

- The all accident rate was 0.8 per million sectors, a reduction compared to the rate of 1.19 accidents for the five years 2019-2023.

- The industry fatality risk improved to 0.03 in 2023 from 0.11 in 2022 and 0.11 for the five years, 2019-2023. At this level of safety, on average a person would have to travel by air every day for 103,239 years to experience a fatal accident.

Safety Fundamentals

Global Standards

Robust Safety Culture

Data Driven Improvements

- In 2024 two high profile accidents in the first month of 2024 show that, even if flying is among the safest activities a person can do, there is always room to improve and make flying even safer.

- The strong safety record is built on:

    - Adherence to Global Standards
    - Cultivation of a Robust Safety Culture
    - Embracing of Innovations and Data-Driven Improvements

IOSA Registry

New airlines continued to join the IOSA registry

Europe
169

China & North Asia
51

Americas
78

433

Asia Pacific
68

Africa & Middle East
67

- IOSA is the global industry standard for airline operational safety —a cornerstone global standard for safety
- 2023 marked 20 years of the IOSA
- It is used by numerous authorities in their regulatory safety programs.
- IOSA registered carriers recorded no hull losses or fatal accidents in 2023.
- Currently 425 operators are on the IOSA Registry, including 100 non-IATA Members.

Strong Safety Record Build on Global Standards
Industry Accident Rate for IOSA Vs. Non-IOSA – 5 Years

2019-2023 IOSA vs. Non-IOSA

Accidents per million sectors

Categories: AFI, ASPAC, CIS, EUR, LATAM/CAR, MENA, NAM, NASIA, World

Legend: IOSA Accident Rate, Non-IOSA Accident Rate
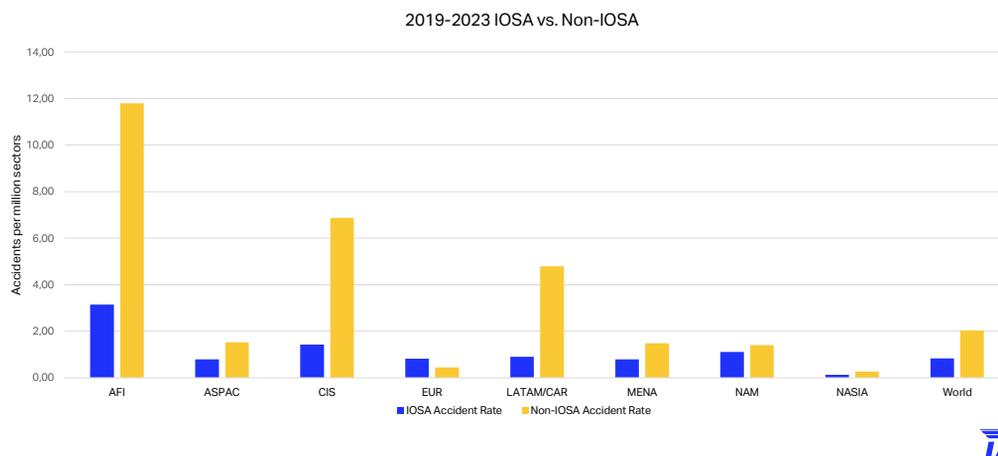
- The 2019-2023 average accident rate of IOSA airlines was zero, almost three times better than the non-IOSA average.
- Since 2005, the all-accident rate for airlines on the IOSA registry is almost three times better than for non-IOSA airlines.
- IOSA works.

Transition to Risk-Based IOSA

IOSA risk-based audits stiving for continual reduction in accidents through improved audit philosophy

Traditional IOSA

Risk-Based IOSA

IATA IOSA

- Standard audit checklist for all operators in all audits
- Compliance-driven auditing
- Static IOSA reports and forms

- Tailored audit scope focusing on pertinent safety risks
- Maturity assessment for SMS and safety relevant programs
- Digital reporting, risk engine

Focused on reducing the likelihood and severity of accident and incidents in aviation

- IOSA's transition to a risk-based audit model will contribute to raising the safety bar even higher by focusing on pertinent safety risks while maintaining a baseline of safety.
- Under Risk-Based IOSA, audits will be tailored to the airline's individual operating profile and history.
- Additionally, IOSA is introducing a maturity assessment of the operator's Safety Management System (SMS) and other safety critical programs.
- As a result, IOSA will become an even more powerful tool to help airlines and regulators to maintain and improve very high levels of safety performance.
- 42 audits have now been conducted with a new risk-based model. With this, IOSA maintains the strong baseline of 9xx standards with an extra focus on pertinent safety risks for each audited operator.

Status of Accident Investigation Reports

- The accident investigation process is one of our most important learning tools when building global safety standards.

- The requirements of the Convention of International Civil Aviation (Chicago Convention) Annex 13 are clear. States in charge of an accident investigation must:

  - Submit a preliminary report to the International Civil Aviation Organization (ICAO) within 30 days of the accident

  - Publish the final report as soon as possible and within 12 months of the accident.

  - Publish interim statements annually should a final report not be possible within 12 months.

52% of accidents since 2018 lack a final published report

Accidents by Final Report Status * Data source IATA

● Yes ● No

124 (48%)   **132** (52%)
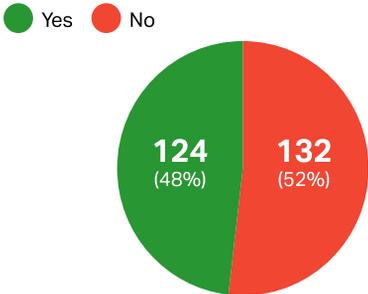
Final Report Status by Year * Data source IATA

● Yes ● No
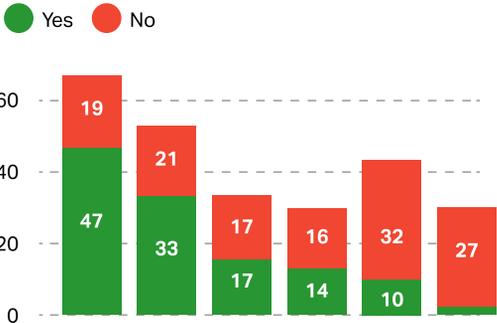
- It is a dereliction of duty that 52% of accidents since 2018 lack a final published report
- Insights to improve safety need our all three of our top tools: audits, data and accident reports.

Safety Leadership
The cornerstone for Safety Culture evolution

| Safety Leadership | Just Culture | Open Reporting | Safety Intelligence | Learning Culture | Safety Improvements | Culture Shift |

A robust Safety Culture delivers a more efficient and resilient business

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- Accident investigations have identified that Safety Culture enhances safety performance and reduces the likelihood of accidents.

- Empirical findings in safety research have identified Leadership as the strongest factor affecting the safety behavior, especially in high-risk sectors, necessary to support safe operations. Safety Leadership in an organization is thus a prerequisite for a positive Safety Culture, enabling open reporting; a just, learning culture; and a successful, and effective, approach to managing safety.

- IATA has developed the Safety Leadership program to bring together these critical elements. It aims, amongst others, at strengthening a Safety Leadership mindset among aviation executives to enable organizational behavior to embed, and effectively implement, a positive Safety Culture.

- This requires a joint, coordinated global effort and collaboration with industry stakeholders from across aviation sectors to evolve the safety DNA in our industry.

- To be successful, efforts must be turned into practical actions.

Safety Leadership Charter

Guiding Principles

1. Lead obligation to safety through words and actions.
2. Foster safety awareness with employees, the leadership team, and the board.
3. Guide the integration of safety into business strategies, processes, and performance measures.
4. Create the internal capacity to proactively manage safety and collectively achieve organizational safety goals.
5. Create an atmosphere of trust, where employees are encouraged and confident to report safety-related information.
6. Establish a working environment in which clear expectations of acceptable and unacceptable behaviors are communicated and understood.
7. Create an environment where all employees feel responsibility for safety.
8. Regularly assess and improve organizational Safety Culture.
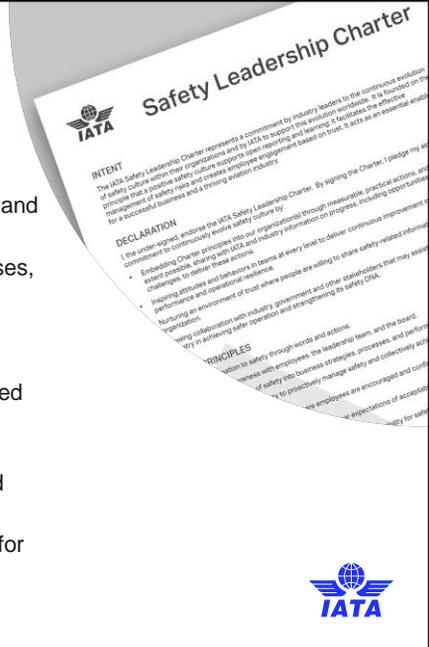
- The Safety Leadership Charter has been developed in consultation with IATA members, and the wider aviation community, to support industry executives in evolving a positive safety culture within their organizations.
- The Charter is geared toward strengthening organizational safety culture through highlighting this critical element as a driver for continuous improvement in safety performance, by proposing commitment to key leadership principles and supporting practical actions.
- By signing the Charter, Executives pledge their commitment to continuously evolve safety culture at their airlines by:
    - Embedding Charter principles into their organization(s) through measurable, practical actions, and, to the extent possible, sharing with IATA and industry information on progress, including opportunities and challenges, to deliver these actions.
    - Inspiring attitudes and behaviors in teams at every level to deliver continuous improvement in safety performance and operational resilience.
    - Nurturing an environment of trust where people are willing to share safety-related information within the organization.
    - Growing collaboration with industry, government and other stakeholders that may assist the aviation industry in achieving safer operation and strengthening its safety DNA.

IATA Safety Leadership Charter Signatories

7

1

9

9

9

5

6

18

73 Airlines

As of May 23

Global Navigation Satellite Systems (GNSS) Interference
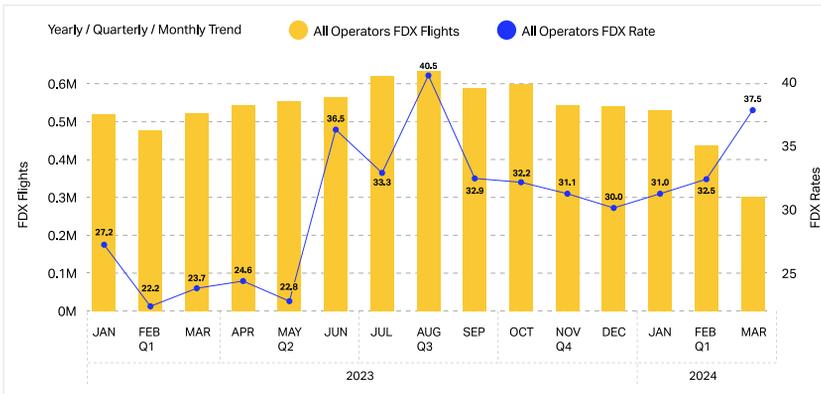
68% increase in GPS signal loss events from the baseline* to the peak in August 2023

The current average number of events is still 40% higher than the baseline*.

*baseline set as Q1 2023

- Global Navigation Satellite System (GNSS) jamming and spoofing incidents have increasingly threatened the integrity of Positioning, Navigation, and Timing (PNT) services across Eastern Europe and the Middle East. Similar incidents have been reported in other locations globally. GNSS is a service based on satellite constellations such as the US GPS and EU's Galileo. Jamming blocks a signal, whereas spoofing sends false information to the receiver on board the aircraft.

- These disruptions pose significant challenges to the broader spectrum of industries which rely on precise geolocation services, including aviation.

- Before May 2023, the average number of GPS signal loss events was 24 events per 1,000 flights.

- Spike in Events:

  1. May 2023: Noticeable increase starts.
  2. August 2023: Peak at 40 events per 1,000 flights.

- Post-Spike Average: After August 2023, the average number of events dropped to 34 events per 1,000 flights.

18

Majority of GNSS Incidents in Europe

Distribution of GPS Signal Loss Incidents by Region (Jan 2023 – Mar 2024)

for   EUR   MENA   CIS   ASPAC   AFI   NASIA   NAM
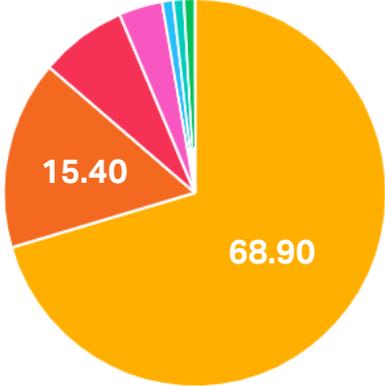
- **EUR* (Europe)**: 68.9%
- **MENA (Middle East and North Africa)**: 15.4%
- **CIS (Commonwealth of Independent States)**: 7.2%
- **ASPAC (Asia-Pacific)**: 3.6%
- **AFI (Africa)**: Less than 1%
- **NASIA (North Asia)**: Less than 1%
- **NAM (North America)**: Less than 1%

*Incidents in Europe are predominantly occurring in Eastern Europe; these have escalated since the onset of the Russia-Ukraine conflict.

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GNSS Priorities

Safeguards manage GNSS incidents, but four priorities can further mitigate risk:

1. **Data Collection and Sharing:** Coordinated efforts are crucial for collecting and sharing GNSS safety-related data.

2. **Guidance and Procedures:** Aircraft manufacturers should provide universal guidelines on handling GNSS incidents.

3. **Alerting:** Will inform the relevant stakeholders about incidents

4. **Retention of Traditional Navigation Systems**: Maintaining traditional navigation systems is essential

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- To counter this, we need:
  - Data Collection and Sharing: Coordinated efforts are crucial for collecting and sharing GNSS safety-related data. This approach enhances situational awareness and response strategies.
  - Guidance and Procedures: Aircraft manufacturers should provide universal guidelines on handling GNSS incidents. This ensures uniform responses across the aviation sector.
  - Alerting: will inform the relevant stakeholders (airlines, ANSPs, manufacturing industry and airports) about attacks
  - Retention of Traditional Navigation Systems: To counter GNSS disruptions, maintaining traditional navigation systems is essential. They provide a reliable backup, ensuring ongoing operation and safety.

Severe Turbulence is Rare

- Turbulence can be an uncomfortable and unpleasant experience and we were all shocked by the recent incident involving the Singapore Airlines flight.

- Sever turbulence is rare however according to the FAA it is the leading cause of injuries to cabin crew and passengers in non-fatal accidents.

- A study found that the average amount of light turbulence in the atmosphere would rise by 59 percent, while light-to-moderate turbulence would increase by 75 percent. At the other end of the scale, moderate-to-severe turbulence would increase by 127 percent, while severe turbulence would increase by 149 percent. *(Study focused on how wintertime transatlantic clear-air turbulence would change at around 39,000 feet if the atmosphere contained twice as much CO2 *P. Williams, 2017)*

- Pilots use weather forecasts to anticipate and avoid turbulence when needed. However, these can be inaccurate, weather radars cannot detect clear air turbulence.

Airlines requested IATA to be a global turbulence data consolidator
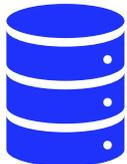
Existing turbulence data is often not shared

Fragmented data pools limit benefits
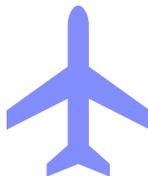
Airlines need to see beyond their own data to mitigate turbulence

Importance of global data coverage
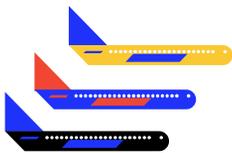
Turbulence Aware

2400+
Reporting Aircraft

21
Airlines feeding
data to the Platform
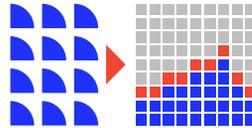
12
Service Providers
signed to **integrate**
data

150+M
Turbulence Reports
received

**The more airlines contributing data to
Turbulence Aware the more effective it is**

- IATA launched Turbulence Aware in 2018 to help airlines mitigate the impact of turbulence.
- The platform pools anonymized turbulence data from thousands of flights operated by participating airlines
- Although not a panacea, the real-time, accurate information enables pilots and dispatchers to choose optimal flight paths
- The more airline contribute to Turbulence Aware the more effective it is

Questions