

NASA Aviation Safety Reporting System (ASRS) Program Briefing

Becky Hooley, ASRS Director
Becky.L.Hooley@nasa.gov



**Aviation Safety
Reporting System**



NASA Aviation Safety Reporting System

- NASA ASRS is a **confidential, voluntary, non-punitive** reporting system that receives safety reports from Pilots, Air Traffic Controllers, Dispatchers, Cabin Crew, Ground Ops, Maintenance Technicians, and UAS Operators.
- ASRS welcomes reports describing close-calls, hazards, violations, and safety-related incidents.
- With over 48 years of confidential safety reporting, ASRS has received more than **2.1 million reports** so far (over 120,000 reports received annually).



When in doubt, fill it out! Contribute to aviation safety

<https://asrs.arc.nasa.gov>



The Genesis of ASRS

The crash of TWA Flight 514, on December 1st 1974 was caused by a misunderstanding between ATC and the flight crew.




- Occurred just six weeks after a United Airlines flight had narrowly escaped a similar fate.
- Unfortunately, in 1974, there was no way for the information that had been communicated within United to be shared with the wider aviation community.

The Genesis of ASRS

Creation of NASA's ASRS in April 1976

AC 00-46




U.S. Department
of Transportation
Federal Aviation
Administration

Advisory Circular

Subject: Aviation Safety Reporting Program **Date:** 4/2/76 **AC No:** 00-46F
Initiated by: AFS-200 **Change:**

1 PURPOSE OF THIS ADVISORY CIRCULAR (AC). This advisory circular (AC) provides guidance for the submission of reports under the Federal Aviation Administration (FAA) Aviation Safety Reporting Program (ASRP). The ASRP is a cooperative safety reporting program that invites pilots, controllers, flight attendants (F/A), maintenance personnel, dispatchers, and other users of the National Airspace System (NAS), or any other person, to report to the National Aeronautics and Space Administration (NASA) actual or potential discrepancies and deficiencies in aviation safety. NASA serves as a third party to receive and process Aviation Safety Reports. Examples of operations covered by the program include departure, en route, approach,

“The FAA determined that...effectiveness would be greatly enhanced if NASA, rather than the FAA, accomplished the receipt, processing, and analysis of raw data. This would ensure the anonymity of the reporter...and, consequently, increase the flow of information... Accordingly, NASA designed and administers the Aviation Safety Reporting System (ASRS)”

ASRS Principles

1. VOLUNTARY

When aviation personnel voluntarily submit reports the resulting data are more detailed and descriptive

2. CONFIDENTIAL

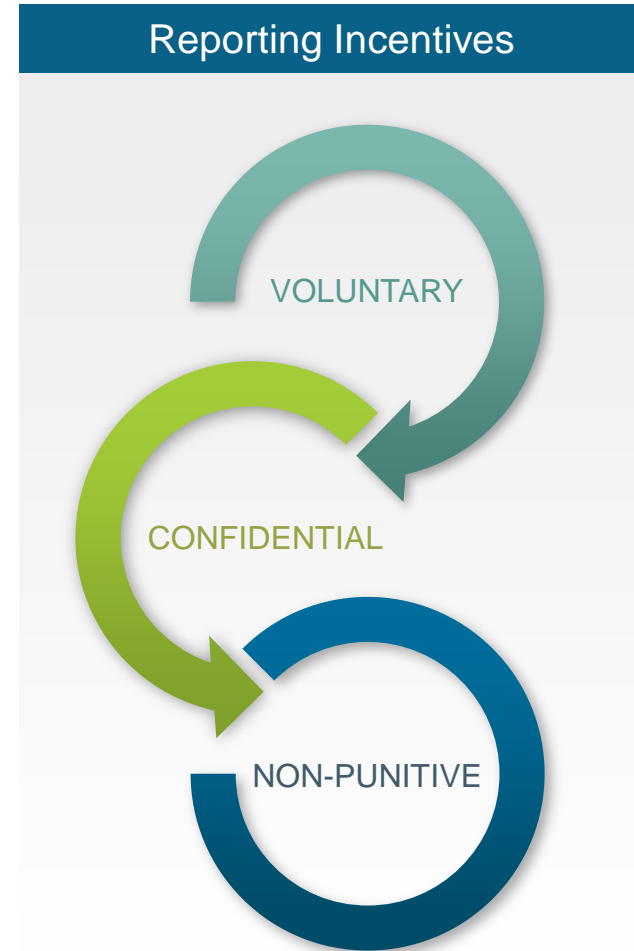
Protection of identity is provided by regulations and by NASA 's de-identification of persons, companies, and other identifying information

3. NON-PUNITIVE

FAA will not use, nor will NASA provide, any qualifying report submitted to ASRS (or information derived therein) for use in disciplinary or other adverse action. (14 CFR 91.25 & AC 00-46F)

4. INDEPENDENT

NASA serves as the independent third-party; separate from employer and regulator

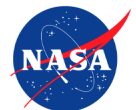


Use Restrictions. The FAA will not use any reports submitted to NASA under the ASRS (or information derived therefrom) in any enforcement action...except information concerning criminal offenses or accidents which are excluded.

Confidentiality. The FAA will not seek, and NASA will not release or make available to the FAA, any report filed with NASA under the ASRS or any information that might reveal the identify of any party involved in an occurrence or incident reported under the ASRS.

Waiver of Imposition of Sanction. The FAA considers the filing of a report with NASA ... to be indicative of a **constructive attitude** towards safety. Such an attitude will tend to prevent future violations. Accordingly, although a finding of violation may be made, neither a civil penalty nor certificate suspension will be imposed if ...

- Inadvertent and not deliberate
- Did not involve a criminal offense, accident or action under 49 U.S.C § 44709, which discloses a lack of qualification or competency
- No finding of any FAA enforcement action within 5 years prior to date of occurrence
- Reported within 10 days of the violation, or first aware of the violation



Federal Aviation Regulation 14 CFR 91.25

Prohibition against use of reports for enforcement purposes

“The Administrator of the FAA will not use reports submitted to the National Aeronautics and Space Administration under the Aviation Safety Reporting Program (or information derived therefrom) in any enforcement action except information concerning accidents or criminal offenses which are wholly excluded from the Program.”



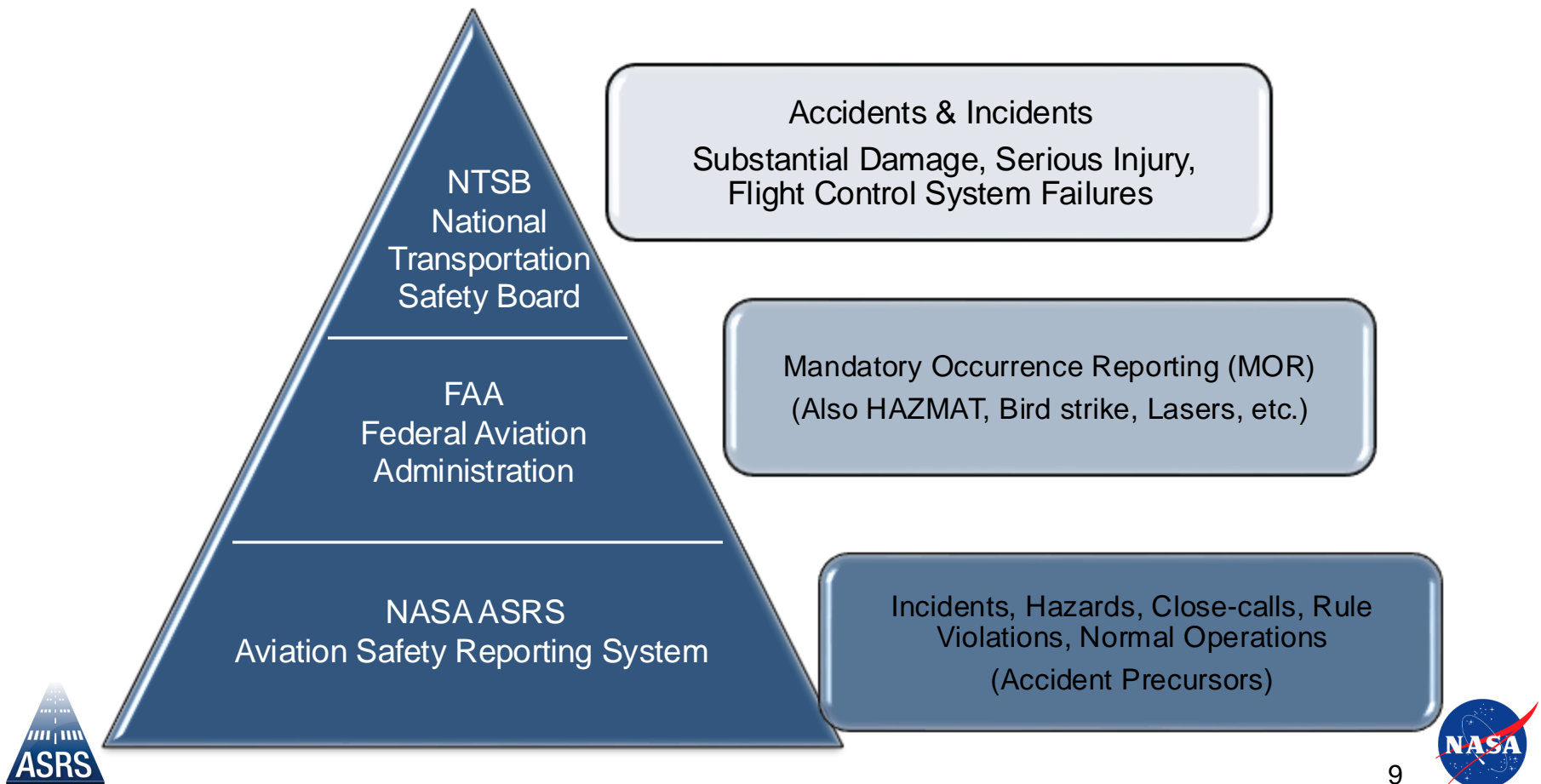
ASRS Government /Industry Partnership

- NASA manages ASRS operations and disseminates safety information
- FAA provides funding and immunity protections to reporters as an incentive to report
- The Aviation Community provides advocacy for reporting, and extracts lessons-learned to improve aviation safety



Safety Reporting in the USA

In the USA, there are many ways to report safety concerns. Information is shared among airlines, ASRS, FAA, NTSB. Reports submitted to ASRS may describe both unsafe occurrences and hazardous situations.

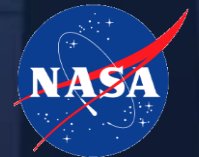




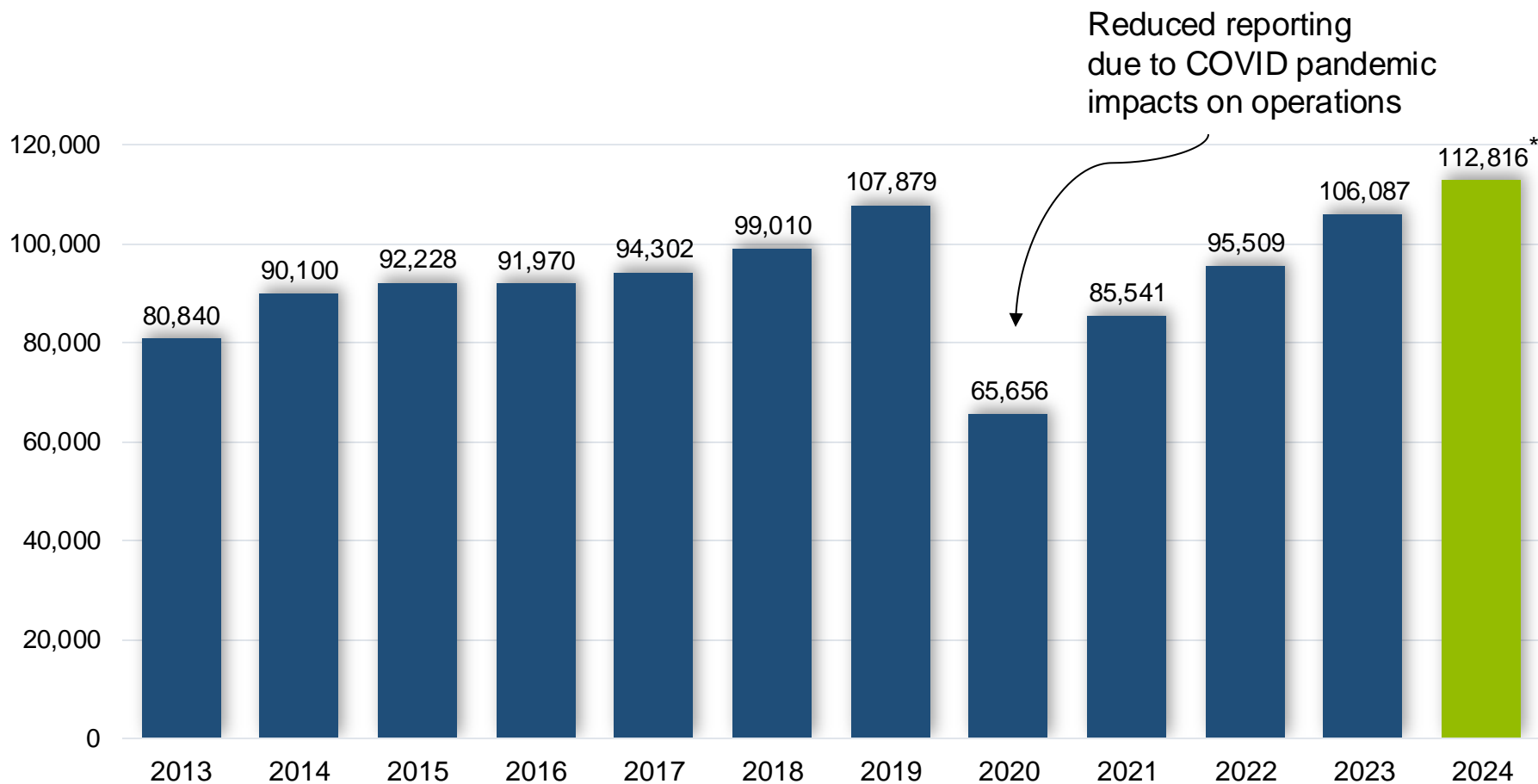
ASRS REPORTING METRICS



**AVIATION SAFETY
REPORTING SYSTEM**



ASRS Report Intake Profile



In 2024, ASRS is forecasting to return to pre-COVID levels with over 130,000 reports

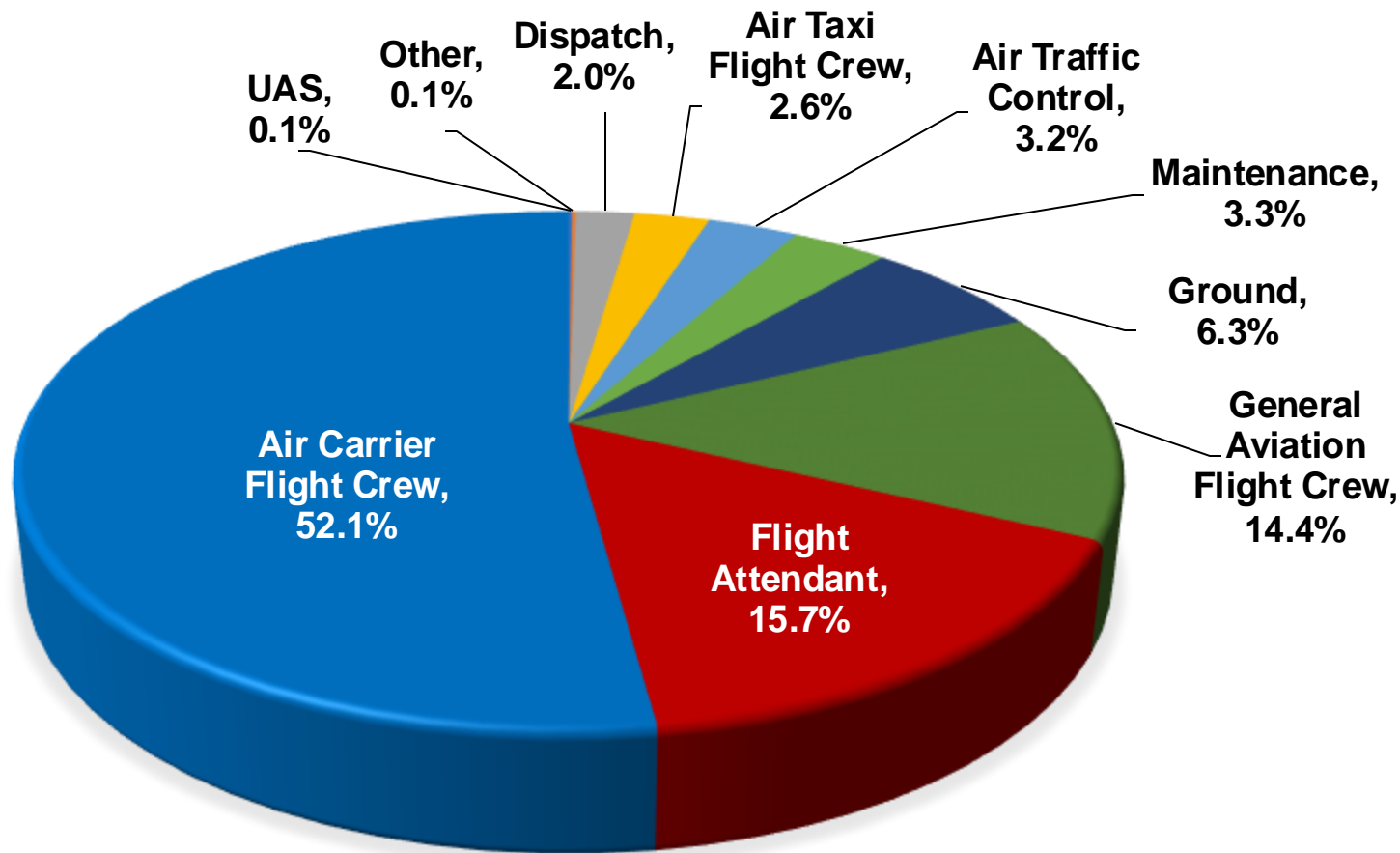


*2024 data includes reports received through October 31st.



Reporter Distribution

January 2023 – December 2023

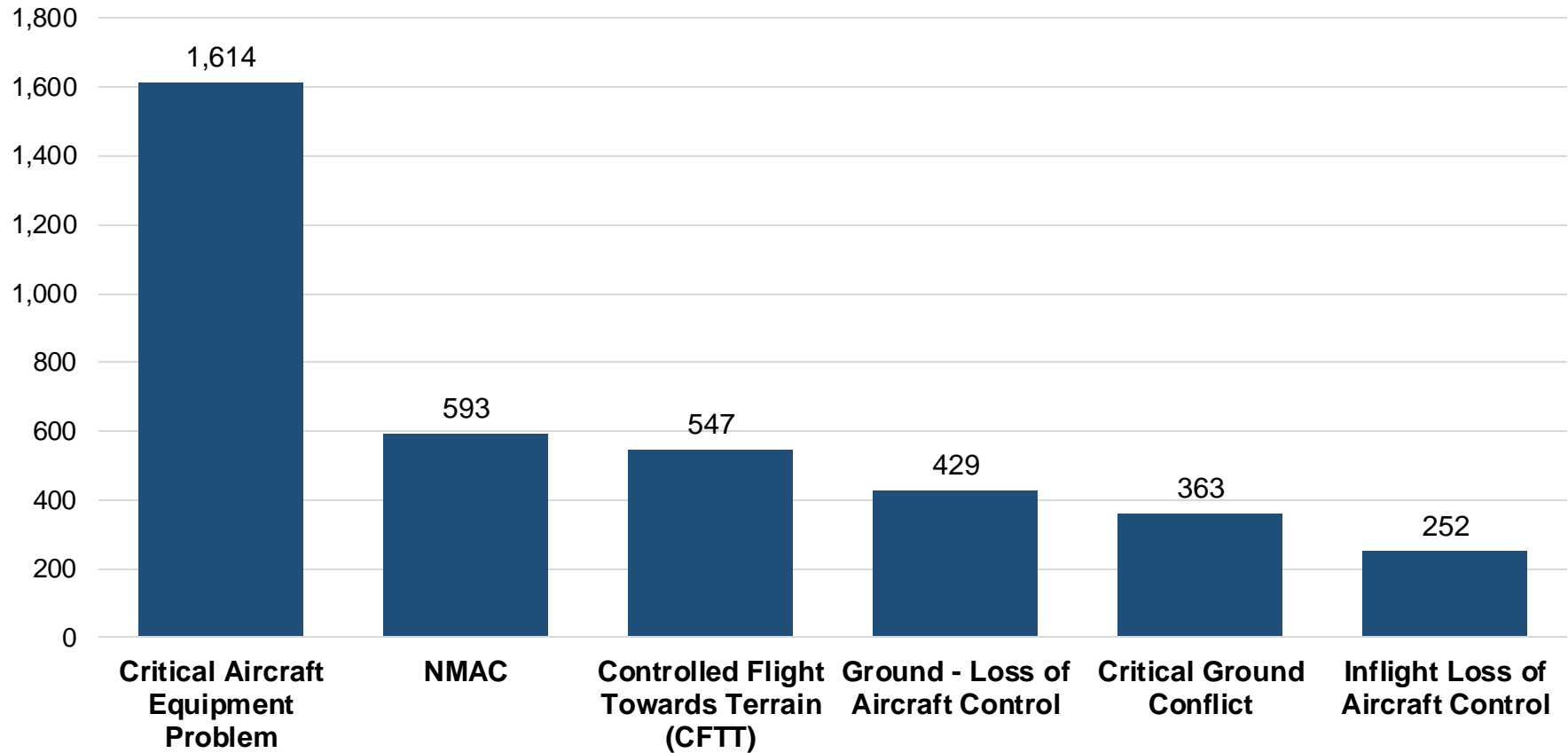


n = 106,087 Reports



ASRS Highest-Priority Safety Topics

January 2023 – December 2023

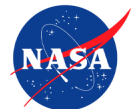


High-Priority “Bold List” Safety Topics

*Categories are not mutually exclusive.



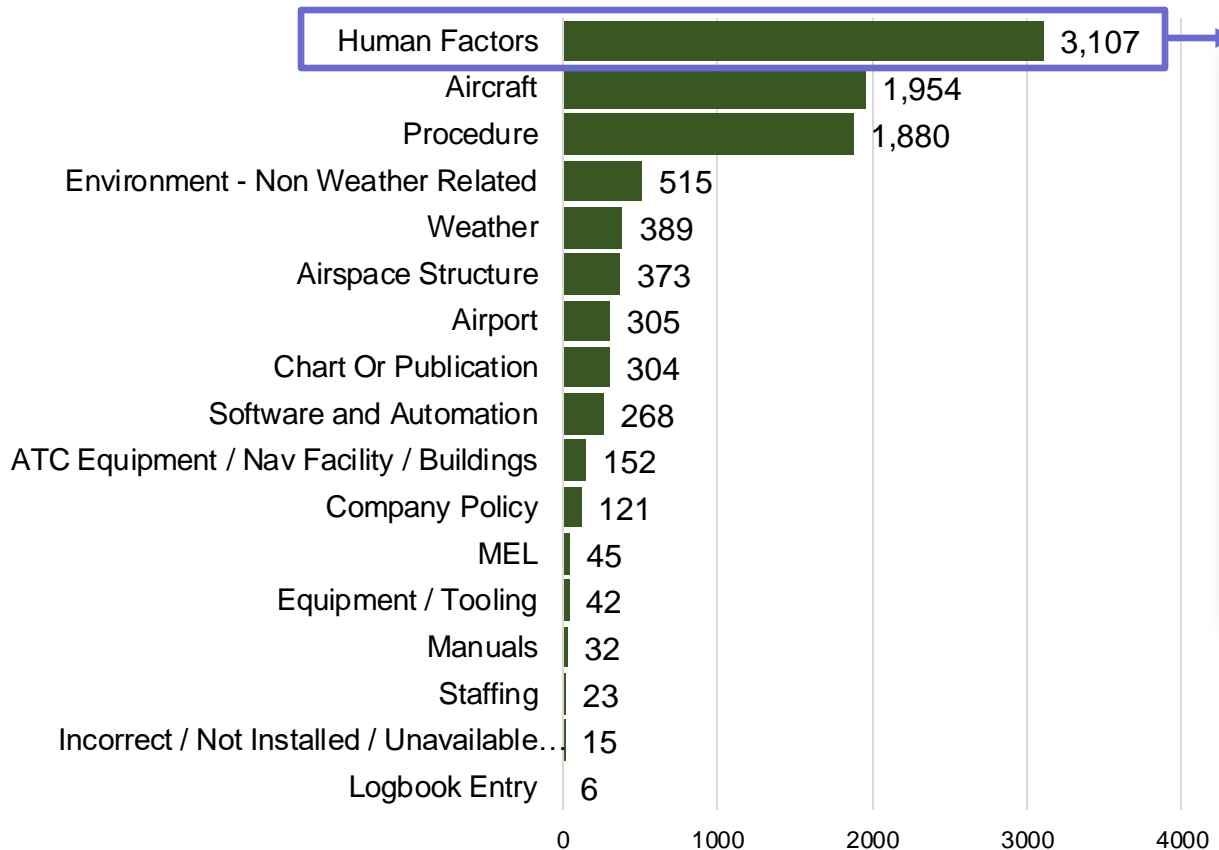
n = 4,564 Records



ASRS Contributing Factors and Human Factors

January 2023 – December 2023

Contributing Factors



Specific Human Factors

- Situational Awareness
- Communication Breakdown
- Workload
- Time Pressure
- Troubleshooting
- Confusion
- Distraction
- Training / Qualification
- Human-Machine Interface
- Other / Unknown
- Fatigue
- Physiological - Other



n = 4,564 Records



ASRS Contributing Factors and Human Factors Communication Breakdown January 2023 – December 2023

Party 1	Party 2	Count
ATC	ATC	73
	Dispatch	1
	Flight Crew	133
	Ground Personnel	4
	Other	2
Dispatch	Dispatch	3
	Flight Crew	5
	Ground Personnel	2
	Maintenance	2
	Other	2
Flight Attendant	Flight Attendant	5
	Flight Crew	6
	Ground Personnel	4
	Maintenance	1
	Other	4

Party 1	Party 2	Count
Flight Crew	ATC	423
	Dispatch	86
	Flight Attendant	19
	Flight Crew	462
	Ground Personnel	174
	Maintenance	69
	Other	84
Ground Personnel	ATC	2
	Dispatch	3
	Flight Crew	8
	Ground Personnel	33
	Maintenance	1
Maintenance	Other	10
	Flight Crew	3
	Ground Personnel	8
	Maintenance	32
Other	6	

n = 1,571 of 4,564 Records

Categories are not mutually exclusive.

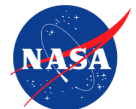


ASRS Coding Example
Each count of one represents communication breakdown between two parties

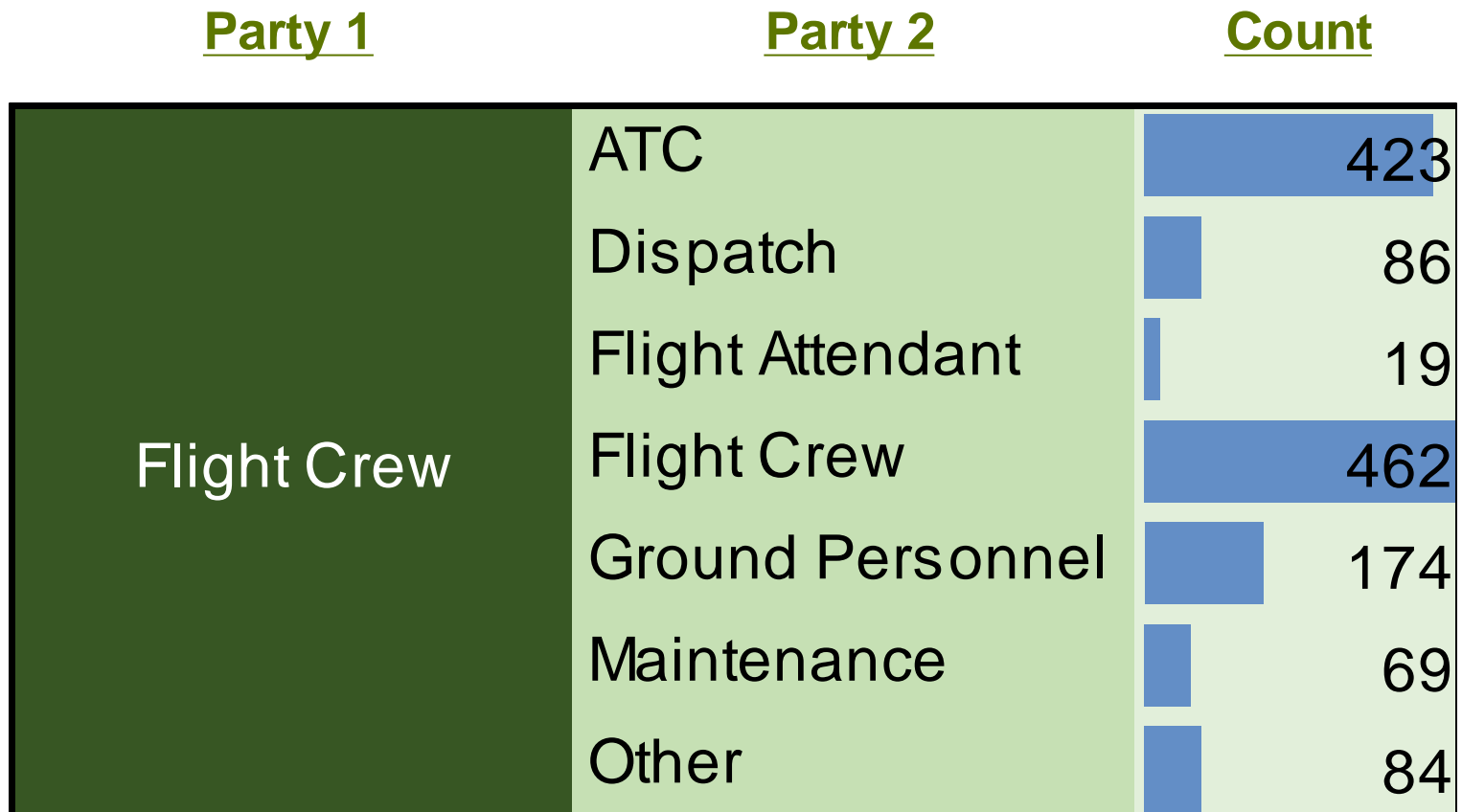
Communication Breakdown

Between And

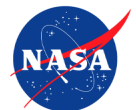
Party 1 Party 2



ASRS Contributing Factors and Human Factors Communication Breakdown January 2023 – December 2023



Categories are not mutually exclusive.

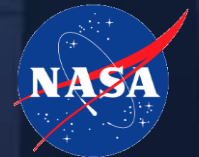




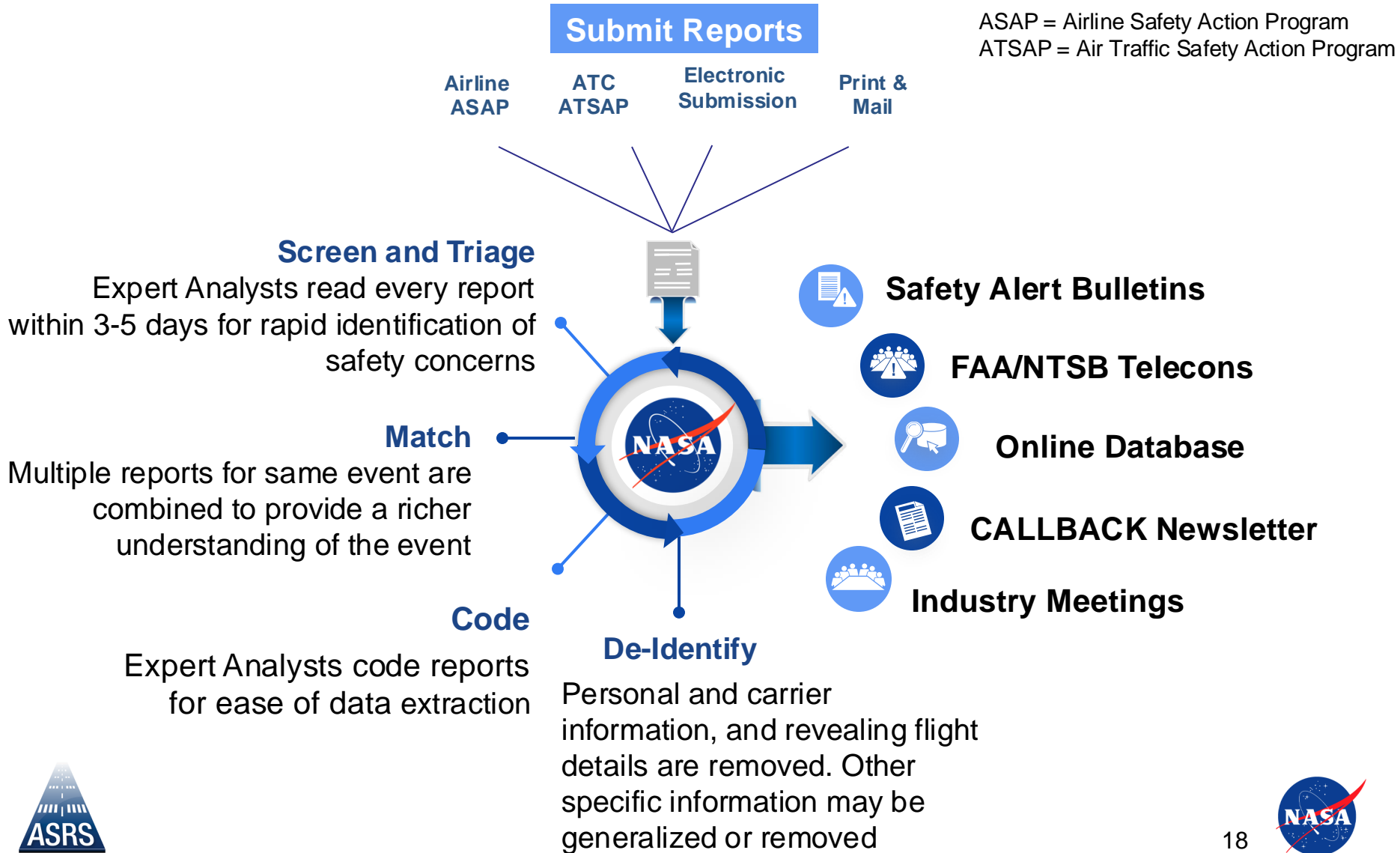
PROCESSES AND PRODUCTS



AVIATION SAFETY REPORTING SYSTEM



The Life of an ASRS Report



ASRS Safety Products



2,068,784 Incident Reports Received

7,436

Safety Alert
Messages



7,632

Custom
Search
Requests



357,607

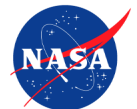
Database
Searches

CALLBACK
Issues

527



(April 1976 – December 2023)



ASRS Database Online

Direct access to search de-identified reports in the ASRS database is available through **ASRS Database Online (DBOL)** at <https://asrs.arc.nasa.gov/search/database.html>.

How To Search:

Step 1: Click + to add search items. Note: Make sure your Pop-up Blocker is off.

Step 2: In "Current Search Items" section, select "Click Here" in a statement and choose items from lookup window.

Date & Report Number

- + Report Number (ACN) was [number]
- + Date of Incident was between [date] and [date]

Environment

- + Flight Conditions were [conditions]
- + Lighting was [conditions]
- + Weather was [element]

Aircraft

- + Federal Aviation Regs (FAR) Part was [regulation]
- + Flight Plan was [type]
- + Flight Phase was [phase]
- + Make/Model was [aircraft type]
- + Mission was [operation]

Place

- + Location was [identifier]
- + State was [abbreviation]

Person

- + Reporter Organization was [type]
- + Reporter Function was [position]

Event Assessment

- + Event Type was [anomaly]
- + Detector was [equipment/human]
- + Primary Problem was [most prominent factor]
- + Contributing Factors were [problem areas]
- + Human Factors (since 6/09) were [factor]
- + Result was [consequence]

Text: Narrative / Synopsis

- + Text contains [words]

Current Search Items:

Search is empty.

Back Run Search



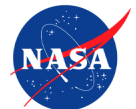
1,938+

Queries completed each month



375,045+

Queries completed since DBOL launch in July 2006



ASRS Safety Alerting Program

Report Submitted
to ASRS



ASRS Issued Safety Alert

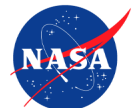


Corrective Action

Synopsis: A320 Maintenance Technician reported that the incorrect part was listed in the Illustrated Parts Catalog (IPC) and needs to be corrected and updated. The installation of the incorrect part as instructed in the current IPC could lead to possible malfunction of the aircraft's thrust reverser system.

ASRS Report # 2022066

Airbus Response: “Having checked the diagrams referenced in the ASRS report, and also further to follow up with the supplier of the identified affected engine nacelle and diagram, we can confirm that the orientation of the shown backshells in the referenced documentation does not accurately reflect the installation on the aircraft. We have therefore taken steps to update the referenced documentation, which will be updated for the May 2024 revisions.”



CALLBACK Safety Newsletter

- **CALLBACK** is a monthly publication - distributed by email and all issues are available on our website
- We encourage sharing and re-distribution
- Subscription is free and available via the ASRS website.



33,200+

Total number of email subscribers for 2023



741,822+

CALLBACK views for 2023 (HTML and PDF)



Aviation Safety Reporting System

CALLBACK
From NASA's Aviation Safety Reporting System
Issue 535 August 2024

Physiological Factors IN AVIATION

This month, *CALLBACK* continues its informal survey of ASRS's Human Factors (HFs) with a brief look at physiological incidents in aviation. "Aviation Physiology deals with the physical and mental effects of flight on air crew personnel and passengers." Effects can be subtle or overt, but are almost always detrimental. Well known effects include hypoxia, decompression sickness, and spatial disorientation, while some less recognized are self-imposed stress, sensitivity to noise, and physical fitness.

Humanly speaking, physiological effects are produced by the body's inability to fully adapt to hostile, unnatural environments that aviation can impose. Changes in barometric pressure, considerable variation in temperature, acceleration and high velocities in three dimensions, and rotation around three axes are key elements in generating physiological events. Aircraft systems designed to mitigate harsh environments can play a part. A system-sustained, safe environment may deteriorate to one less tolerable during a system failure, which can then reintroduce original hazards to passengers and crews. Moreover, a failed system, itself, may subject aircraft occupants to its own peculiar hazards. Physiological effects can also affect other HFs, such as confusion, distraction, fatigue, or situational awareness.

This month, we feature reported incidents where a significant physiological effect was experienced. Note the physical and mental effects described, the extent to which operations could have been affected, and any possible mitigations.

Part 91 – Degrees of Disorientation

This PA-28 private pilot gained some real-time experience and likely discovered valuable personal insight to combat disorientation while in the throes of sensory illusion.

- *Yesterday's weather presented challenging conditions, even with 10 miles of visibility and clouds ranging from 5,000 to 6,000 feet at times. I was on an IFR flight plan.... As I ascended to 9,000 feet, I encountered icing issues, making it difficult to maintain my assigned altitude. I deviated by 200 to 300 feet to navigate around clouds. Approaching the mountains, before I encountered thick clouds, ATC requested that I stay at 9,000 feet. Upon entering the clouds, I realized my aircraft was in an unusual attitude, with a 40-degree deviation in...attitude, and airspeed was nearing the yellow*

zone. My heading was also off by 40 degrees.... Despite ATC's instructions to turn, I communicated my struggle to maintain control of the plane. I regained visual contact within 30 seconds, and the Controller directed me to maintain the current heading. Concerned about my disorientation and staying on course, I eventually corrected my heading.... Worried about fuel, I descended earlier than planned. Reflecting on this experience, I am disappointed in my performance and ability to handle flying through actual IMC. Recognizing the need for improvement, I have scheduled additional actual IFR practice with my instructor...to enhance my skills and confidence in challenging conditions.

Part 91 – An Ounce of Prevention

A C172 Flight Instructor succinctly provides some sound aviation observations and philosophy on navigation, training, dependency, and disorientation.

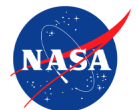
- *I found myself grappling with disorientation as a pilot, leading to a descent of 400 feet. The loss of GPS navigation compounded the challenge, prompting me to execute three successive 360-degree turns in a bid to regain situational awareness. This incident highlighted the imperative for comprehensive pilot training in spatial orientation and underscored the critical role of dependable navigation systems. It serves as a poignant reminder of the ongoing need for continuous skill development to navigate unforeseen challenges during flight.*

Part 91 – Classic Hypoxia

This Super King Air corporate crew chronicles a system failure, then describes in detail the hypoxia that followed. From the Captain's report:

- *We picked the plane up from Maintenance at ZZZ. The aircraft was in for a phase inspection as well as various other maintenance items, including a landing gear overhaul. We departed ZZZ on an IFR flight.... Approximately 15 minutes into the flight, climbing through FL230 for FL240, we noticed a R BLEED FAIL light on the Master Caution Panel. Per manufacturer's Emergency Memory Items Checklist, I reached over to the bleed air panel and switched the right bleed air to the OFF position. At this*

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UAS Safety in Sight

- ***UAS Safety In Sight*** is an Unmanned Aircraft System (UAS) specific publication distributed by email.
- Subscription to *UAS Safety In Sight* is free and available via the ASRS website.



1,100+

Total number of email subscribers as of 2024

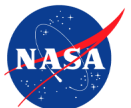


11 Issues

Published to date



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How are ASRS Reports Used?

Common Examples

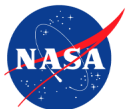
FAA	
Wake Encounters	Long-term study to assess wake vortex encounters and assess the impact of changes to dynamic separation criteria
HAZMAT	Understand types of incidents and contributing factors for outreach, education
Airport Operations	Provide compilation of reports of airport ramp light issues in the U.S. (SR 7343)
5G Interference	Continued monitoring of impact of deployment of 5G C-Band on flight operations
NTSB	Participation in NTSB Roundtable to review industry-wide safety issue of runway incursions, their contributing factors, and additional mitigations to reduce frequency To inform accident investigations , looking at precursor events to shed light on possible human factors involvement
Airlines	To educate pilots about new routes (Share local folklore about airport ops)
Equipment Manufacturers	Provide compilation of reports on B737 AUTO SLAT and SPD LIM Fail Related Incidents (SR 7343)
Airports	To address confusing signage, faded paint/markings, inadequate markings for construction
Chart Manufacturers	To identify and correct discrepancies between chart and actual airspace/airport ; Rectifying missing or confusing charting

ASRS Current Safety Issues

Low Altitude Events

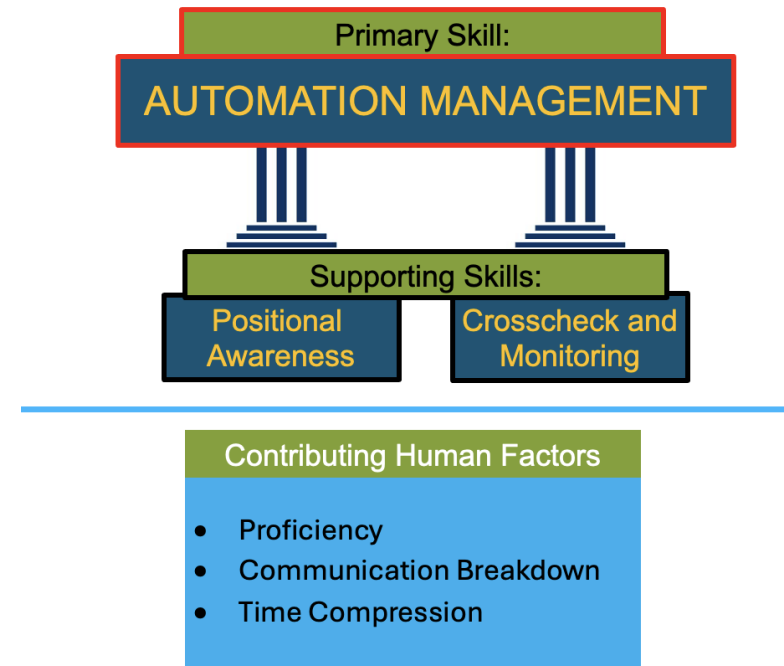
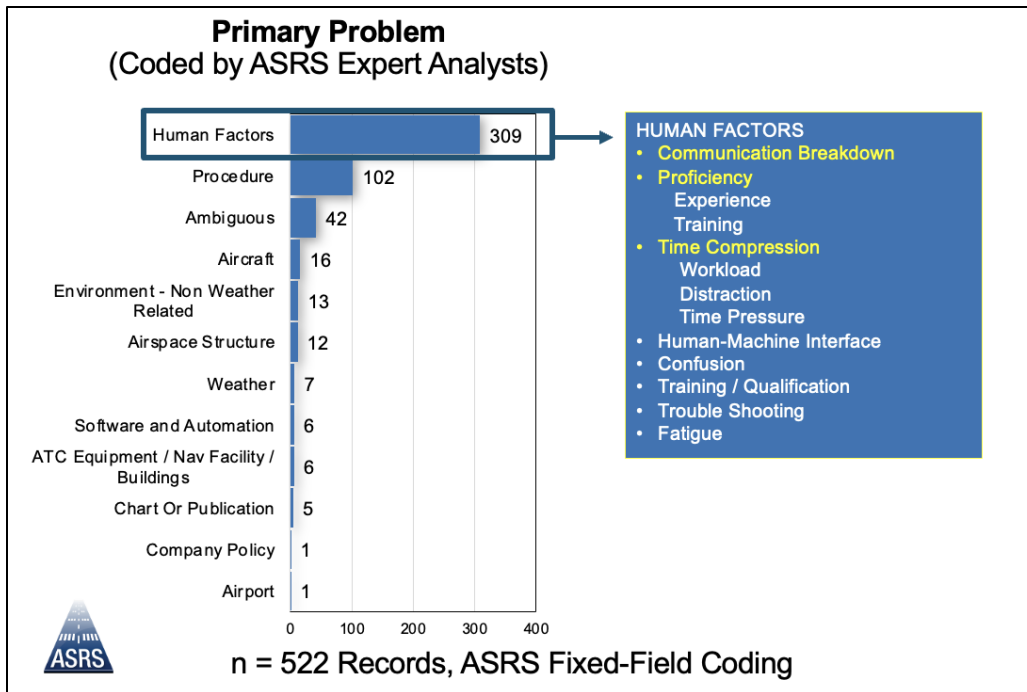
Reconfiguration of ATC N90 TRACON

Operations at Non-Towered Airports



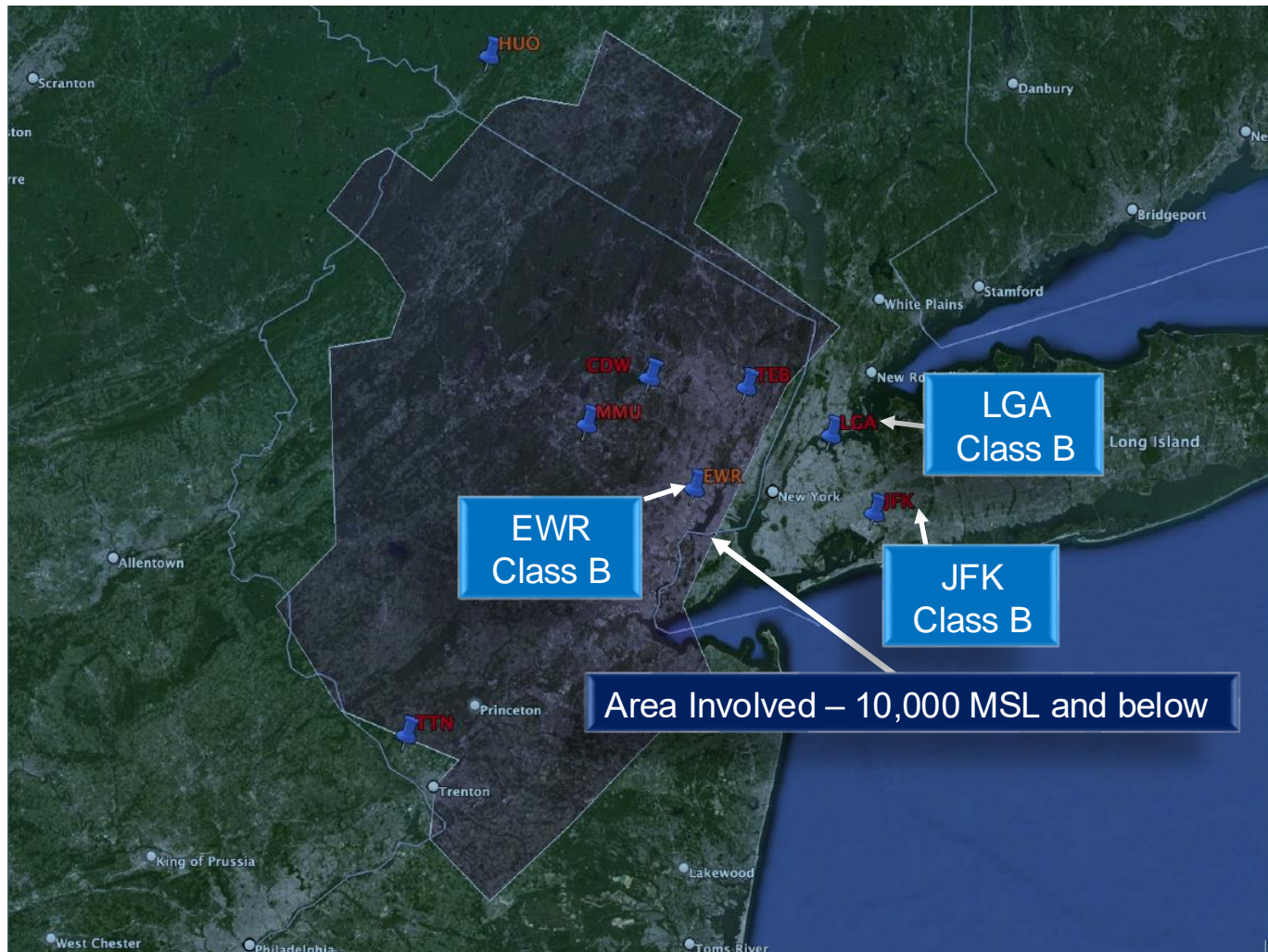
Low Altitude events

- Reports describe low altitude events in 2024
- Reported events spanned 119 unique airports
- Majority occurred in Daylight VMC



ATC Reconfiguration

Background: On July 28, 2024, PHL TRACON was assigned to control the EWR area. This was previously controlled by N90 TRACON.



ATC Reconfiguration

Issues and concerns expressed in ASRS reports

- Controllers that previously used in-person communication to facilitate traffic coordination are no longer in same room
 - Timeliness of inter-facility coordination for point outs/hand-offs in complex airspace resulting in loss of separation and airborne conflicts
 - ATC personnel adapting to changes in ATC equipment configuration used to coordinate movement of flights across different airspaces
- Controllers experienced stress resulting from physical relocation and adapting to new facility, in turn impacting work performance
- Pilots received clearances that added workload and complexity to an already challenging flight environment

Operations at Non-Towered Airports

- ASRS analysis showed a majority of interactions among aircraft involved a Near Mid-Air Collision or Ground Conflict
- Most incidents resulted in pilots taking evasive action to avoid a collision
- Issues related to interaction between Turbojet and Non-Turbojet aircraft
 - Aircraft power performance differences
 - Different levels of pilot experience
 - Schedule pressure (Turbojet) versus recreational flight operations
 - Passengers on larger aircraft

Aircraft Operation Types	Total Count*
Personal	584
FBO	245
Corporate	64
Air Carrier	40
Air Taxi	20
Military	12
Government	10
Other	22

n = 875 Records



More Information at ASRS Website

The screenshot shows the top of the ASRS website. On the left is the ASRS logo, a triangle with the letters 'ASRS' inside. To its right is the text 'Aviation Safety Reporting System'. Further right is a search bar containing the URL 'https://asrs.arc.nasa.gov'. On the far right are two buttons: 'Home' and 'Contact Us'. Below this is a navigation bar with several menu items: 'Program Information', 'Report to ASRS', 'Search ASRS Database', 'Publications/Studies', 'International', and 'Online Resources'. The main banner features a night-time photograph of an airport tarmac with a control tower on the right. Overlaid on the left side of the banner is a blue diagonal shape containing the text 'Confidential. Voluntary. Non-Punitive.' Below the banner is a paragraph of text.

Aviation Safety Reporting System <https://asrs.arc.nasa.gov> Home Contact Us

Program Information Report to ASRS Search ASRS Database Publications/Studies International Online Resources

Confidential. Voluntary. Non-Punitive.

ASRS captures confidential reports, analyzes the resulting aviation safety data, and disseminates vital information to the aviation community.

A blue button with white text that says 'Submit a NASA ASRS Safety Report'. Below the button is a photograph of a large commercial airplane on a tarmac.

Submit a NASA ASRS Safety Report

UAS Safety In Sight

Stay connected and sign up for the ASRS UAS/Drone newsletter highlighting emerging topics.

- ▶ [Subscribe to UAS Safety In Sight](#)
- ▶ [Read Previous Issues](#)

A graphic with a green background and a white border. It features a photograph of a hazmat vehicle and the text 'HAZMAT Safety' in white.

HAZMAT Safety

A graphic with a blue background and a white border. It features a photograph of a drone and the text 'DRONE Safety' in white.

DRONE Safety

CALLBACK

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CALLBACK is a free safety newsletter in a popular "lessons learned" format.

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