ASRS Program Briefing

Aviation Safety Reporting System

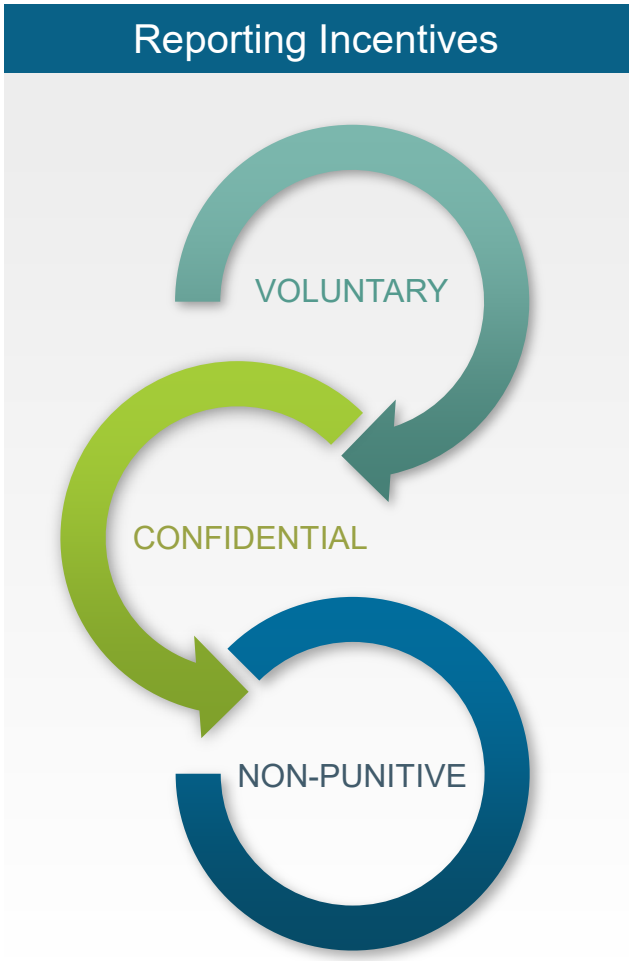
Last Updated: December 2021

ASRS Program Briefing Index

ASRS Program Overview

Concept & Mission

The Aviation Safety Reporting System (ASRS) receives, processes and analyzes voluntarily submitted incident reports from pilots, air traffic controllers, dispatchers, cabin crew, maintenance technicians, UAS crew and others. Reports submitted to ASRS may describe both unsafe occurrences and hazardous situations. Information is gathered from these reports and disseminated to stakeholders. ASRS's particular concern is the quality of human performance in the National Airspace System.



Purpose

- **Identify deficiencies and discrepancies in the National Airspace System**
  - Objective: Improve the current aviation system
- **Provide data for planning and improvements to the future National Airspace System**
  - Objective: Enhance the basis for human factors research and recommendations for future aviation procedures, operations, facilities, and equipment

ASRS Background

WW II	Industry and Military recognized value of voluntary incident reporting
1958	Need for U.S. Incident Data System raised during FAA Enactment Hearings
Oct. 1974	United Airlines incident foreshadowed TWA 514 Accident
Dec. 1974	TWA 514 Accident
Apr. 1975	Study of the National Air Transportation System as a Result of the Secretary's Task Force on the FAA Safety Mission
May 1975	Aviation Safety Reporting Program (ASRP) Implemented (FAA)
May 9, 1975	Advisory Circular 00-46A Issued
Apr. 1976	Aviation Safety Reporting System (ASRS) Established (NASA/FAA)

ASRS Staff

The ASRS Staff is composed of highly experienced pilots, air traffic controllers and mechanics, as well as a management team that possess aviation and human factors experience. ASRS Analysts' experience is comprised of over 600 cumulative years of aviation expertise covering the full spectrum of aviation activity: air carrier, corporate, military, and general aviation; Air Traffic Control in Towers, TRACONs, Centers, and Military Facilities. Analyst cumulative flight time exceeds 175,000 hours in over 90 different aircraft.

In addition, the ASRS Staff has human factors and psychology research experience in areas such as training, fatigue, crew resource management, user interface design, usability evaluations, and research methodology.

Documents Governing ASRS Immunity & Confidentiality

- Federal Register Notice, 1975 & 1976
- Federal Aviation Regulations Part 91.25 (14 CFR 91.25)
- FAA Advisory Circular 00-46F
- FAA policy concerning Air Traffic Controllers regarding ASRS reporting, FAA Order JO 7200.20A

The Immunity Concept

Paragraph 9. c. FAA Advisory Circular No. 00-46F

c. **Waiver of Imposition of Sanction**. The FAA considers the filing of a report with NASA concerning an incident or occurrence involving a violation of 49 U.S.C. subtitle VII or the 14 CFR to be indicative of a constructive attitude. 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:

1. The violation was inadvertent and not deliberate;
2. The violation did not involve a criminal offense, accident, or action under 49 U.S.C. § 44709, which discloses a lack of qualification or competency, which is wholly excluded from this policy;
3. The person has not been found in any prior FAA enforcement action to have committed a violation of 49 U.S.C. subtitle VII, or any regulation promulgated there for a period of 5 years prior to the date of occurrence; and
4. The person proves that, within 10 days after the violation, or date when the person became aware or should have been aware of the violation, he or she completed and delivered or mailed a written report of the incident or occurrence to NASA.

ASRS Stakeholders

Report Processing

Report Intake Overview

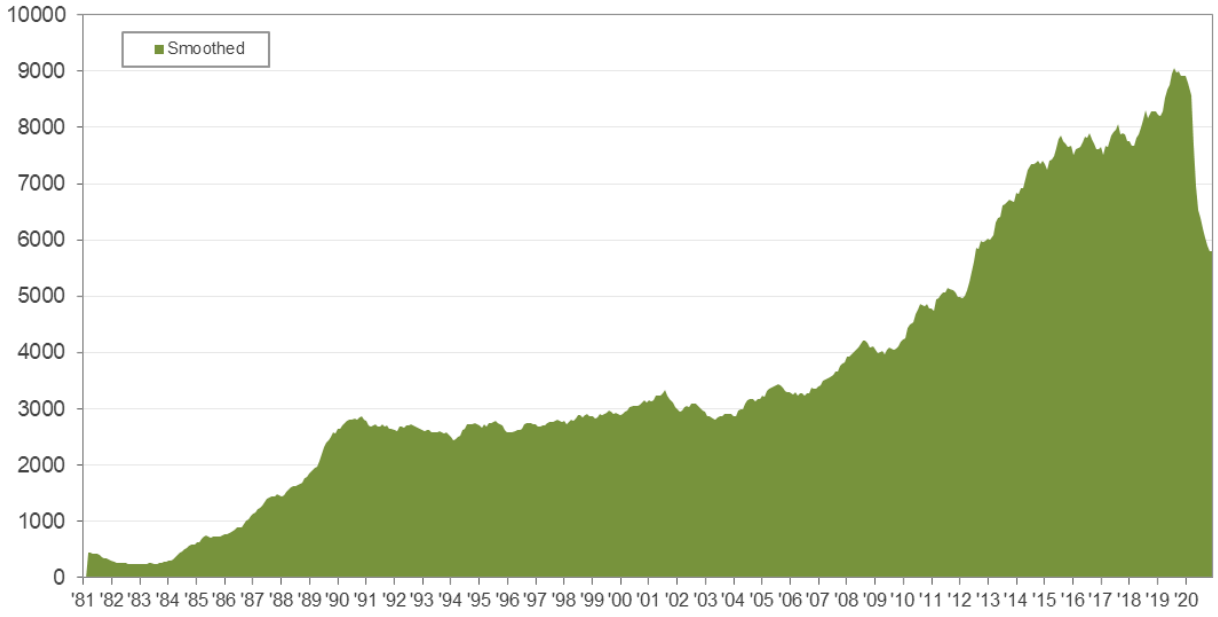
ASRS receives reports from pilots, air traffic controllers, cabin crew, dispatchers, maintenance technicians, ground personnel and others involved in aviation operations.

ASRS's report intake has been robust from the first days of the program, in which it averaged approximately 400 reports per month. In recent years, report intake has grown at an enormous rate. However, the COVID-19 Pandemic caused a decrease in intake. Intake in 2020 averaged about 1,239 reports per week or 5,471 reports per month.

Report Intake Metrics

Monthly Report Intake

(January 1981 – December 2020)

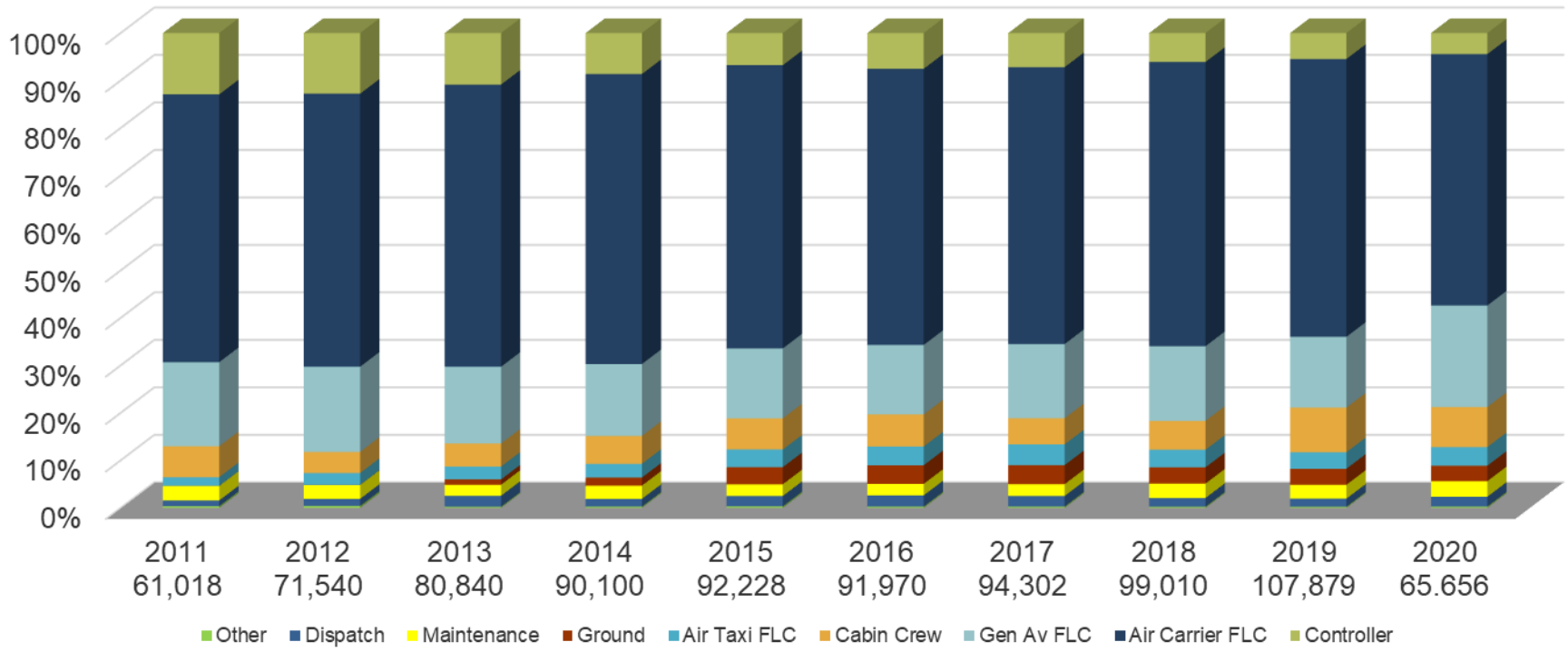


**Reduction in report intake in 2020 is attributed to a reduction in flight operations due to the COVID-19 pandemic*

- Total Program Report Intake = **1,781,647**
- Total Report Intake for 2020* = **65,656**
- Averaging **5,471** reports per month, **265** per working day

Incident Reporter Distribution

January 2011– December 2020

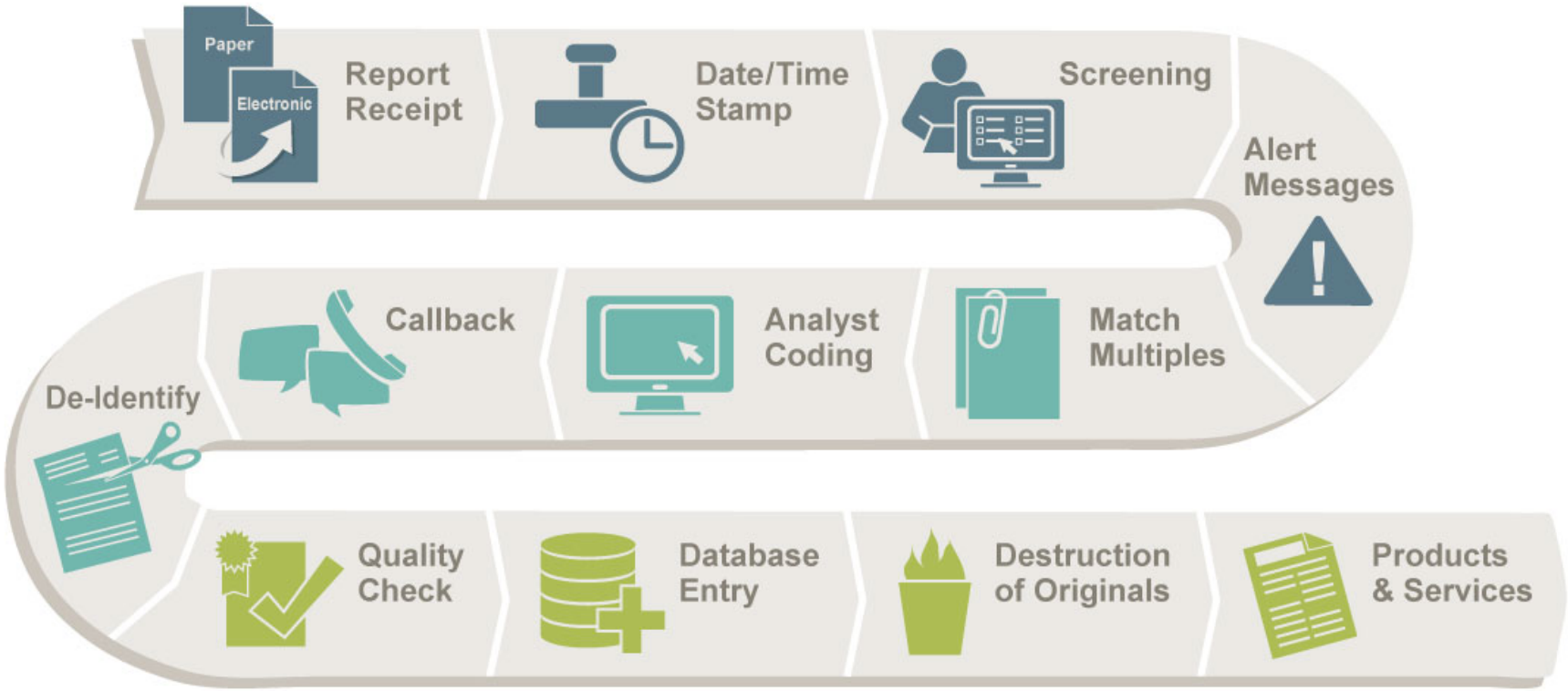


Report Processing Overview

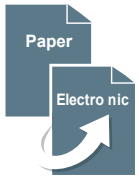
ASRS has securely processed over 1.7 million reports in its 44 year history. The process contains critical elements that ensure each report is handled in a manner that maintains reporter confidentiality while maximizing the ability to accurately assess the safety value of each report. ASRS report processing begins with the receipt of reports through electronic submission or from the post office, and ends with the final coded report entering the ASRS Database.

Reports sent to the ASRS are widely regarded as one of the world's largest sources of information on aviation safety and human factors.

Report Processing Flow



Report Processing Flow



ASRS paper reports are picked-up daily from the Moffett Field Post Office or are received electronically via website Electronic Report Submission (ERS) or ASAP data transmissions

Every report is date and time stamped based on the date of receipt

Two ASRS Analysts “screen” each report within five working days to provide initial categorization and to determine the triage of processing

ASRS Analysts may identify hazardous situations from reports and issue an Alert Message. De-identified information is provided to organizations in positions of authority for further evaluation and potential corrective actions

Report Processing Flow

ASRS retains high-level categorization of 100% of reports received. Based on initial categorization, multiple reports on the same event are brought together to form one database "record"

ASRS Analysts identify reports that require further analysis and entry into the public ASRS database. During the detailed Report Analysis process, reports are codified using the ASRS taxonomy.

An ASRS Analyst may choose to call a reporter on the telephone to clarify any information the reporter provided. This information is added to the analysis and final record.

To ensure confidentiality all identifying data is removed. After analysis, the Identification (ID) Strip, the top portion of the report, is returned to the reporter. This ID Strip acts as the reporter's proof of submittal. All physical and electronic ID Strip data with the reporter's name, address, date and time stamp is removed.

Report Processing Flow

All reports that receive further analysis go through a Final Check to assure coding accuracy. Quality Assurance checks are also performed for coding quality.

Final coded reports enter the ASRS Database. These de-identified records are then available in the ASRS Database Online, which is available through the ASRS website.

Original reports, both physical and electronic data, are destroyed to completely ensure confidentiality

ASRS uses the information it receives to promote aviation safety through a number of products and services, such as Alert Messages, Search Requests, a monthly newsletter, focused studies and more

ASRS Products & Services

ALERT MESSAGES

Safety information issued to organizations in positions of authority for evaluation and possible corrective actions.

QUICK RESPONSES

Rapid data analysis by ASRS staff on safety issues with immediate operational importance generally limited to government agencies.

ASRS DATABASE

The public ASRS Database Online and data available in Database Report Sets or Search Requests full filled by ASRS staff.

CALLBACK NEWSLETTER

Monthly newsletter with a lessons learned format, available via website and email.

FOCUSED STUDIES

Studies/Research conducted on safety topics of interest in cooperation with aviation organizations.

ASRS Products & Services Metrics

April 1976 – December 2020

Significant Items	Quantity
Incident Reports Received	1,799,274
Safety Alert Messages	6,795
Quick Responses	144
Search Requests	7,591
CALLBACK Issues	491
ASRS Directline Issues	10
Research Studies	64

Alert Messages

Alert Message Overview

When ASRS receives a report describing a hazardous situation, for example, a defective navigation aid, an aircraft system anomaly, a confusing procedure, or any other circumstance which might compromise safe flight – an alerting message is issued using de-identified information provided in the reports.

Alerting messages have a single purpose: to relay safety information to organizations in positions of authority so that they can evaluate the information and take possible corrective actions.

Alert messages are classified as **Alert Bulletins** or **For Your Information Notices**, and may be included in monthly **ASRS Safety Teleconferences**.

ASRS Alerting Pyramid

ASRS has no direct authority to directly correct safety issues.
It acts through and with the cooperation of others.

Alerting Subjects

January 2011 – December 2020

Subject	Total
Aircraft Systems	413
Airports Facility Status and Maintenance	310
ATC Procedures	180
Other	173
Hazards to Flight	85
Airport Lighting and Approach Aids	84
ATC Equipment	84
Navigation	73
ATC Operations	41
Aircraft Avionics	43
Aircraft Power Plants	20

Alerting Responses

January 2011 – December 2020

Response	Percentage
Action taken as a result of the AB/FYI	17.5%
Action initiated before AB/FYI received	17.3%
Action initiated in response to AB/FYI but not completed	15.6%
Addressee agrees with AB/FYI but unable to resolve	5.8%
Issue raised by AB/FYI under investigation	2.4%
Addressee disputes factual accuracy of AB/FYI	14.1%
Information in AB/FYI insufficient for action	11.1%
Addressee in factual agreement but sees no problem	8.6%
Action not within addressee's jurisdiction	5.1%
For information only, no response expected	2.4%

Total 58.6%

Examples of Safety Alerting Success

- **MYL PAPI Out of Service But NOTAM Not Published (FYI 2020-59)**
  A Jeppesen Sanderson Inc., representative responded and stated "...The previous Runway 16 PAPI NOTAM expired without us noticing it about 2 weeks ago. We recently noted the missing NOTAM and have reentered into the NOTAM system."
- **Similar Sounding Fix Names - DRFTR/DRYFT (FYI 2020-124)**
  An FAA (AJV-A) representative responded and stated, "We'll coordinate with ATC and replace one of the fix names."
- **Jeppesen FD Pro User Confusion (FYI 2020-4)**
  A Jeppesen Sanderson Inc., representative responded and stated "This was another interesting one. I did work with our Standards Department and Software Experts. They thought this was a bug in that previous highlighting should disappear when a revised chart displays, as the Reporter indicates. They told me they would look into it, but were not able to provide me time-line."

Quick Responses

Quick Response Overview

Quick Responses are rapid turnaround data analysis that are typically accomplished within two to ten business days of the request. They are a high value service directed towards safety issues with immediate operational importance. Quick Responses are generally limited to government agencies such as FAA, DOT, NTSB, NASA, and U.S. Congress.

Quick Response Applications

- An Analysis of Unmanned Aerial Vehicle (UAV) Related Incidents
- An Analysis of NOTAM Related Incidents
- An Analysis of Flight Service Station Related Incidents
- An Analysis of General Aviation ADS-B Related Incidents
- An Analysis of Part 121 Similar Call Sign Related Incidents

ASRS Database

Search Requests

Information in the ASRS Database is available publicly. The ASRS will provide **Search Requests** to members of the aviation community. ASRS will search its database, download relevant reports, and send to requestor.

Since the inception of ASRS, over **7,591** Search Requests (SRs) have been directly provided by ASRS Research Staff to various aviation organizations and agencies, as well as individuals through December 2020.

Search Requestors by Organization

January 2011 – December 2020

Organization	Total
FAA	86
Air Carriers	67
NTSB	56
NASA	54
Media	31
Alphabet Groups	22
Miscellaneous Safety Organizations	13
Foreign	8
Individuals	8

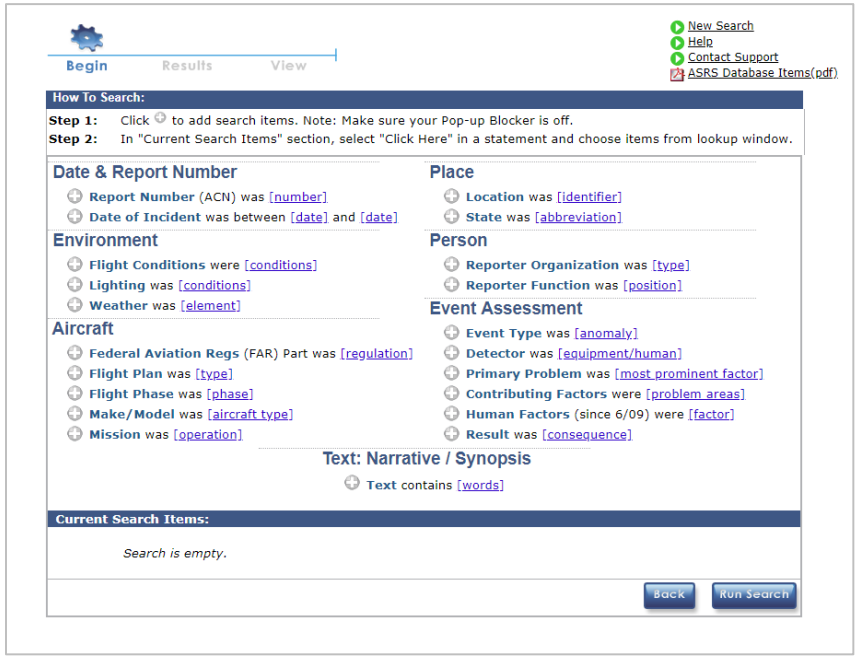
Organization	Total
Miscellaneous Government	7
Other	6
Aircraft Manufacturers	5
Military	4
Research Organizations	4
Student	3
DHS	1
Educational Institutes	1

Recent Search Request Samples

- **B737 MAX 8 Related Incidents (SR 7299)**
  - Completed for the FAA (AVP), Accident Prevention Office
- **Contract Maintenance Related Incidents (SR 7300)**
  - Completed for the FAA (AVP), Accident Prevention Office
- **EMB-135/140/145 Runway Excursion Related Incidents (SR 7307)**
  - Completed for the NTSB
- **NYC Metroplex Reports (SR 7309)**
  - Completed for the FAA (ANG-C1), NextGen Human Factors Division Office

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.



- Over **1,700** queries are completed each month
- More than **287,528** DBOL queries completed since its launch in July 2006

ASRS Database Report Sets

For your convenience, selected relevant reports on several safety topics are available on the website called **ASRS Database Report Sets**. Each report set consists of 50 ASRS Database records, all pre-screened to assure their relevance to the pre-selected topic and are available at https://asrs.arc.nasa.gov/search/reportsets.html.

From the ASRS website, ASRS Database Report Sets are downloaded on average over **2,235** times a month. Report Sets were first posted in January 2000.

ASRS Database Report Sets

2020 Top Ten Report Sets

Report Set Topic	Total Downloads
Unmanned Aerial Vehicle (UAV) Reports	2,570
Passenger Electronic Devices	2,566
Passenger Misconduct Reports	1,658
Flight Attendant Reports	1,648
Cabin Smoke, Fire, Fumes, or Odor Incidents	1,546
Altitude Deviations	1,258
Penetration of Prohibited Airspace	1,168
Air Carrier (FAR 121) Flight Crew Fatigue Reports	1,098
CRM Issues	1,074
Maintenance Reports	1,049

CALLBACK

CALLBACK Overview

CALLBACK, the award winning ASRS monthly safety newsletter, has been published since 1979 in a popular "lessons learned" format. *CALLBACK* presents ASRS report excerpts that are significant, educational, and timely. Occasionally features on ASRS program developments and research are also presented. Over 491 issues have been published and distributed throughout the U.S. and to the international aviation community. All issues since December 1994 are available for download at the ASRS website at:

https://asrs.arc.nasa.gov/publications/callback.html

CALLBACK Distribution and Subscription

- In addition to being published online, *CALLBACK* is distributed by email. Subscription is free and available via the ASRS website.
- The total number of email subscribers for 2020 was over **32,200**
- *CALLBACK* views for 2020 (HTML and PDF) were over **194,500**

CALLBACK

From NASA's Aviation Safety Reporting System

ASRS

Issue 485 June 2020

The COVID-19 CONFRONTATION

In the world of aviation, "It was the best of times, it was the worst of times,"[1] almost overnight. The COVID-19 virus has challenged and continues to change the face of aviation across the globe. As problems surface and solutions take shape, issues seem to contort daily. Today's most volatile concerns may soon become irrelevant. What is current today may be different tomorrow, and temporary policies or procedures may quickly become obsolete. The most current information and latest developments in the U.S. aviation response to COVID-19 may be found on the FAA website.[2]

Many COVID-19 induced changes are predictable. Contamination and disinfecting problems, scarcity of supplies, the lack of relevant procedures, and other difficulties posed by social distancing appear obvious. Not so evident are complications rooted in the obvious but discovered only as one problem begets another. They can also present as unanticipated side-effects of operating equipment in an unfamiliar manner as the result of an individual or industry response to combat the virus.

As air traffic is severely curtailed, ASRS reporting has declined as well, although not to the same extent. ASRS has received COVID-19 reports over the past several months, identifying both obvious and less conspicuous problems encountered by aviation professionals. We expect more in coming months and well into the future, and we invite the reader to explore additional COVID-19 related incidents as they become available in the ASRS Database Online.[3]

This month, *CALLBACK* presents a few COVID-19 reports for rumination that may not fall clearly into the obvious category. Now, in early stages of restoring economies, as aviation evolves and guidance, procedures, and regulations adapt, we ponder what changes will come next, which ones will linger, and how well aviation will fare.

Letting Your Guard Down

This air carrier Captain discusses a simple, but significant incident and the seductive threat that contributed to the event. Empty skies and airplanes induced by COVID-19 were factors.

■ *I am submitting this report to address two things: (1) My crew accepting a takeoff clearance when ATC called us by the wrong callsign, and (2) A general lack of alertness that I am seeing on the line as a result of these extremely irregular times.*

We were number 1 at the hold short [line]… We were the only aircraft out there. Nobody else was in line or even within 500 yards of the runway. ATC issued a takeoff clearance for the runway, and the callsign was very similar to ours. My First Officer (FO) accepted the clearance (reading back the correct callsign), and off we went. In retrospect, I believe that ATC referred to us as Company XXX (not YXX). This became clear to me when he said it again and corrected himself while switching us to Departure. There was no doubt in my mind that the clearance was intended for us, because we were the only ones there… I still should have clarified it. The takeoff was uneventful.

I believe that a factor in this event is the fact that all of us are becoming a little too complacent with [few] people on each flight and virtually no other traffic around us. Every flight is starting to feel like that delayed 2 a.m. departure, where the usual tension of flying aircraft tends to go away with direct clearances that, [otherwise], never happen and communications that are a bit too relaxed. We are letting our guard down at a time when we can ill afford it.

I should have stopped and asked the Controller to clarify. Even though I was 100 percent sure that the clearance was intended for us, I let my guard down. Verify that clearance was for Company XXX. He says, "Oops, sorry." We read it back, and off we go. If we weren't the only ones there, or the field was more complicated or congested, that could have bitten us. As a group we need to rededicate ourselves to being careful and methodical in our flying. Our airline and our industry are already hanging on by a thread. I can't imagine a worse time to add an accident to the mix. Nothing changes just because the aircraft or the airport or the sky is virtually empty. We need to do things the right way – the professional way. Anything less leaves our Company and our futures to chance.

Uncharted Performance

Missed level-off altitudes and RAs are predictable in a lightly loaded aircraft. This air carrier Captain experienced another type of problem, albeit less anticipated.

CALLBACK Topics

2020 *CALLBACK* Topics Covered

- Airmanship and Automation
- COVID-19
- Ground Operations
- Interactive Situational Resolutions
- Late Clearance Changes
- Maintainer Related Incidents
- MEL Missteps
- Pilot Proficiency
- RNAV (RNP) Approaches
- VFR Flight Into IMC
- Winter Weather

Issue 482, March

Issue 488, September

Issue 490, November

Aviation Community Feedback

Sample Reader Comments from 2020

"ASRS Callback is my favorite aviation publication. The reports are always relevant - and the summaries and headlines are extremely well written, creative, and often entertaining. An excellent example is "If the Nozzle Fits" in the December 2019 Callback. This…should be required reading for ALL pilots because it describes the same situation which very recently resulted in a fatal accident…It's not always practical or convenient to supervise the fueling of the airplane - but the consequences of mis-fueling certainly warrant it. Thanks again for a great publication."

"Issue 477 has an article titled Quietly Left Holding the Bag. The event took place in my sector. The Local Safety Council (LSC) agreed with the co-pilot's interpretation of the instructions. We will bring this to that area's attention to be sure this is not a more widespread issue."

"I've been reading Callback for over 20 years and have submitted a few reports over that time. ASRS, Callback and your safety efforts over the years have probably saved lives but we rarely know that."

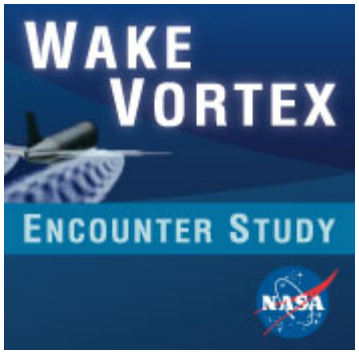
Focused Studies/Research

Focused on Operations and Human Factors

- 64 Research Studies and Special Papers Published
  - **Operations:** Deviations, De-Icing/Anti-Icing, Rejected Takeoffs, Clearances, Weather Encounters, Landing Incidents, Runway Transgressions, TCAS II, Crossing Restrictions, etc.
  - **Human Factors:** Communication, Memory, Confusion, Time Pressure, Judgment, Training, Crew Performance, Flight Crew Monitoring, etc.
  - **Confidential Reporting:** ASRS Reporting Model, Case for Confidential Reporting, Development of ASRS, Cross Industry Applications, etc.
- Research agendas are developed in collaboration with government and industry safety organizations
- There are over 30 ASRS Research Papers available to download on the ASRS website

Focused Study – Wake Vortex

Wake Vortex Encounter Study

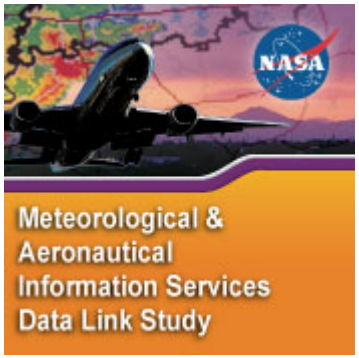


In cooperation with the FAA, ASRS is currently examining Wake Vortex Encounter incidents reported to ASRS. ASRS began this study in 2007 and will continue through 2021. At present the Wake Vortex Encounter Study includes all airspace within the United States, enroute and terminal. In quarterly reports, the ASRS documents event dynamics and contributing factors underlying unique wake vortex encounter incidents.

A sampling of the factors to be analyzed includes reporters' assessed magnitude of wake encounter, aircraft spacing, aircraft type, runway configuration, and consequences from the encounter.

Focused Study – AIS Data Link

Meteorological and Aeronautical Information Services Data Link Services and Applications Study



In cooperation with the FAA, ASRS conducted a study focused on meteorological and aeronautical information services (AIS) via data link. ASRS gathered reports of incidents that occurred while pilots were utilizing weather or AIS information in the cockpit (textual and/or graphical) obtained via data link (including ACARS) or other sources on the ground or in the air.

Some factors analyzed included type of weather data received, cockpit display utilized, software or applications used to receive meteorological information, and end user graphical interface issues.

ASRS Model Applied

ASRS Model Applied

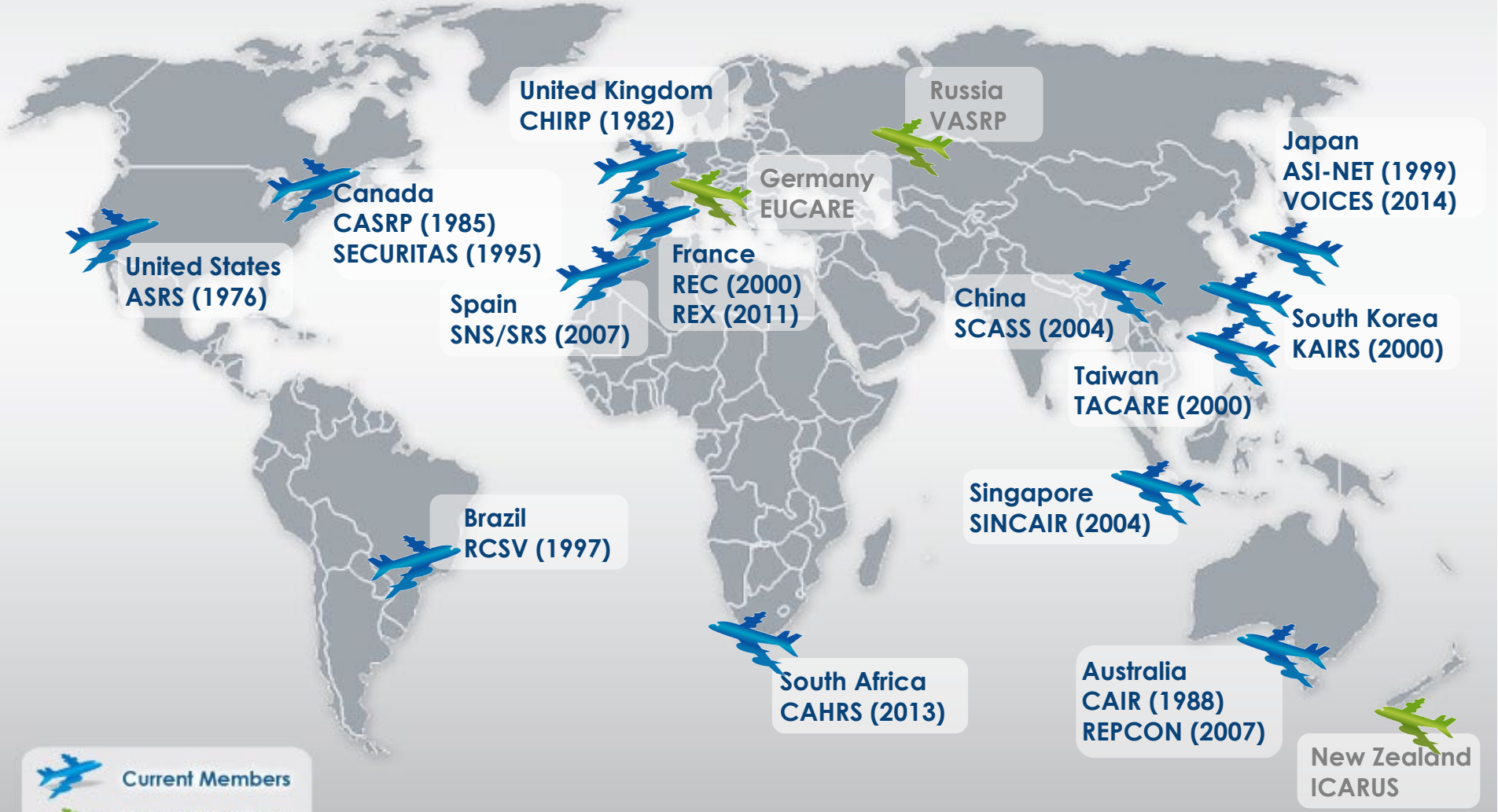
The ASRS model is utilized internationally in the aviation community. The International Confidential Aviation Safety Systems (ICASS) Group promotes confidential reporting systems as an effective method of enhancing flight safety in commercial air transport and general aviation operations.

International Civil Aviation Organization (ICAO) has revised Annex 13 – Accident Prevention and created Annex 19, Chapter 5, which addresses member states establishing a voluntary incident reporting system.

ASRS Model Applied to International Aviation Community

- **UNITED STATES:** Aviation Safety Reporting System (ASRS) [1976]
- **UNITED KINGDOM:** Confidential Human Incident Reporting Program (CHIRP) [1982]
- **CANADA:** Confidential Aviation Safety Reporting Program (CASRP) [1985], SECURITAS [1995]
- **AUSTRALIA:** CAIR [1988], Report Confidentially (REPCON) [2007]
- **BRAZIL:** Confidential Flight Safety Report (RCSV) [1997]
- **JAPAN:** Aviation Safety Information Network (ASI-NET) [1999], VOICES Reporting System [2014]
- **FRANCE:** Confidential Events Reporting System (REC) [2000], REX [2011]
- **TAIWAN:** Taiwan Confidential Aviation Safety Reporting System (TACARE) [2000]
- **SOUTH KOREA:** Korea Aviation hindrance Reporting System (KAIRS) [2000]
- **CHINA:** Sino Confidential Aviation Safety System (SCASS) [2004]
- **SINGAPORE:** Singapore Confidential Aviation Incident Reporting (SINCAIR) [2004]
- **SPAIN:** Safety Occurrence Reporting System (SNS) [2007]
  Safety Reporting System – SEPLA (SRS) [2007]
- **SOUTH AFRICA:** Civil Aviation Hazard Reporting System (CAHRS) [2013]

ASRS Model Applied to International Aviation Community



ASRS Model Applications

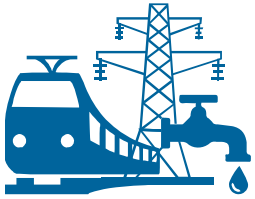
Because of the success of ASRS, the ASRS reporting model is also being applied to other disciplines such as railroad, medicine, security, firefighting, maritime, law enforcement, and others.

RAIL

MEDICINE

SECURITY

FIREFIGHTING



PUBLIC UTILITIES

MARITIME

STRUCTURAL ENGINEERING

ASRS Summary

ASRS Summary

ASRS is a highly successful and trusted program that has served the needs of the aviation community for over 44 years. It is available to all participants in the National Airspace System who wish to report safety incidents and situations.

The ASRS identifies system deficiencies, and issues alerting messages to persons in a position to correct them. It educates through its newsletter *CALLBACK*, participation in government and industry meetings, and through its research studies. Its database is a public repository which serves the needs of the FAA and NASA, and those of other organizations world-wide which are engaged in research and the promotion of safe flight.

Advantages of the ASRS Model

- System-Wide Perspective
- System-Wide Alerting
- Data Processing through Expert Analysts
- Comprehensive and Time Tested Coding Taxonomy
- Strong Immunity and Legal Provisions
- Information Sharing on Aviation Safety
- National and International Reputation

Why Confidential Reporting Works

- When organizations want to learn more about the occurrence of events, the best approach is simply to ask those involved
- People are generally willing to share their knowledge if they are assured
  - Their identities will remain protected
  - There is no disciplinary or legal consequences
- A properly constructed *confidential*, *voluntary*, *non-punitive* reporting system can be used by any person to safely share information
- Confidential reporting systems have the means to answer the question *why* - why a system failed, why a human erred
- Incident/event data are complementary to the data gathered by other monitoring systems

Thank You

- **Contact the NASA ASRS Director**
  - Becky L. Hooey– Becky.L.Hooey@nasa.gov

- **Additional Information & Resources**
  - Confidentiality & Incentives to Report
    https://asrs.arc.nasa.gov/overview/confidentiality.html
  - Immunity Policies
    https://asrs.arc.nasa.gov/overview/immunity.html
  - Requesting ASRS Data
    https://asrs.arc.nasa.gov/search/requesting.html