

ASRS Program Briefing

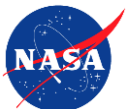


**Aviation Safety
Reporting System**



ASRS Program Briefing Index

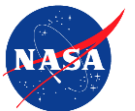
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ASRS Program Overview

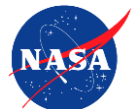
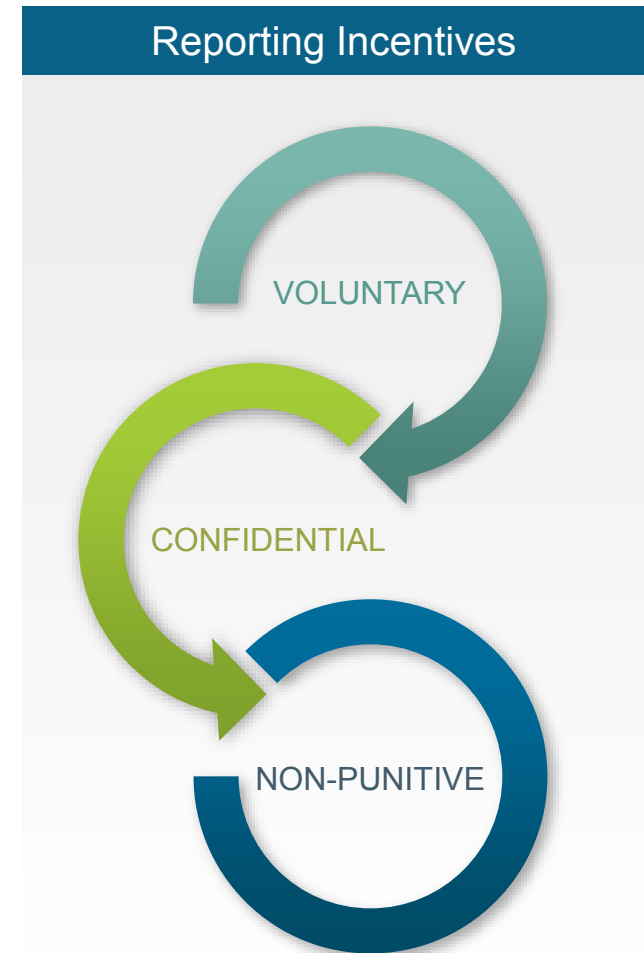


Aviation Safety Reporting System



Concept & Mission

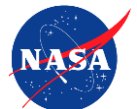
The Aviation Safety Reporting System (ASRS) receives, processes and analyzes voluntarily submitted incident reports from pilots, air traffic controllers, dispatchers, cabin crew, maintenance technicians, and others. Reports submitted to ASRS may describe both unsafe occurrences and hazardous situations. 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

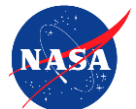
Aviation Safety Reporting Program (ASRP) Implemented (FAA)

May 9, 1975

Advisory Circular 00-46A Issued

Apr. 1976

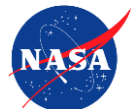
Aviation Safety Reporting System (ASRS) Established (NASA/FAA)



ASRS Staff

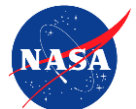
The ASRS Staff is composed of highly experienced pilots, air traffic controllers and mechanics, as well as a management team that possess aviation and human factors experience. ASRS Analysts' experience is comprised of over 600 cumulative years of aviation expertise covering the full spectrum of aviation activity: air carrier, corporate, military, and general aviation; Air Traffic Control in Towers, TRACONs, Centers, and Military Facilities. Analyst cumulative flight time exceeds 200,000 hours in over 50 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 00-46E
- FAA policy concerning Air Traffic Controllers
regarding ASRS reporting, FAA Order JO 7200.20

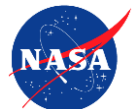


The Immunity Concept

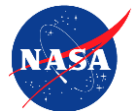
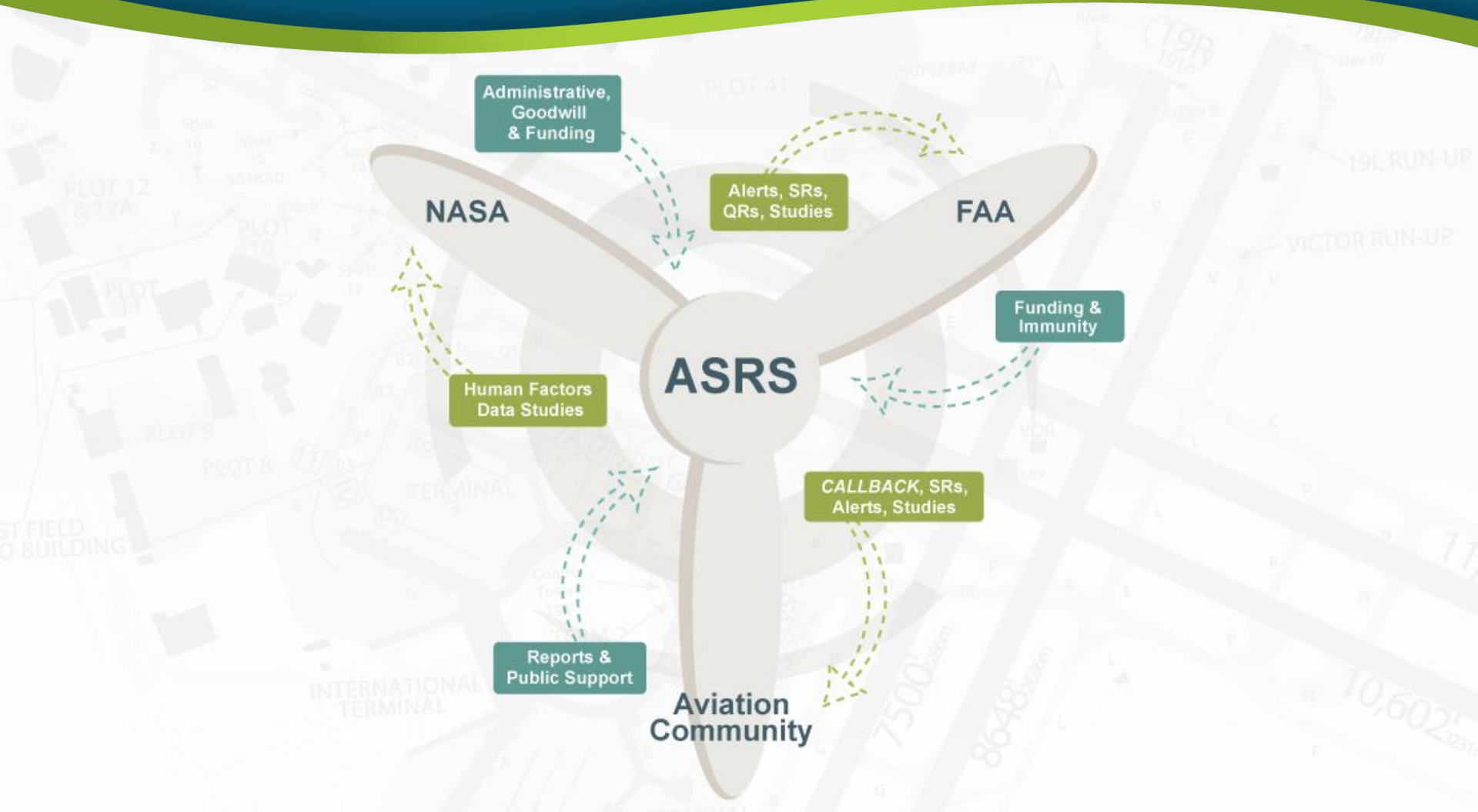
Paragraph 9. c. FAA Advisory Circular No. 00-46E

C. Enforcement Restrictions. 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:

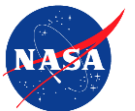
1. The violation was inadvertent and not deliberate;
2. The violation did not involve a criminal offense, accident, or action under 49 U.S.C. § 44709, which discloses a lack of qualification or competency, which is wholly excluded from this policy;
3. The person has not been found in any prior FAA enforcement 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

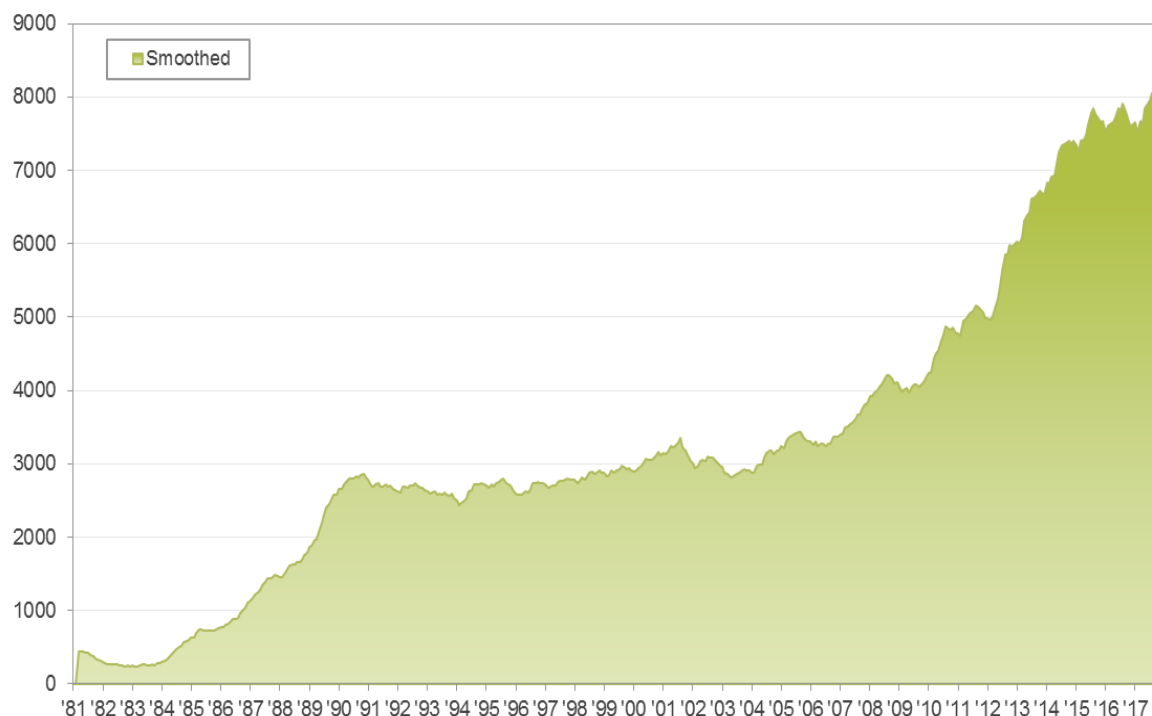
ASRS receives reports from pilots, air traffic controllers, cabin crew, dispatchers, maintenance technicians, ground personnel and others involved in aviation operations.

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. Intake now averages 1,964 reports per week and more than 7,858 reports per month.



Report Intake Metrics

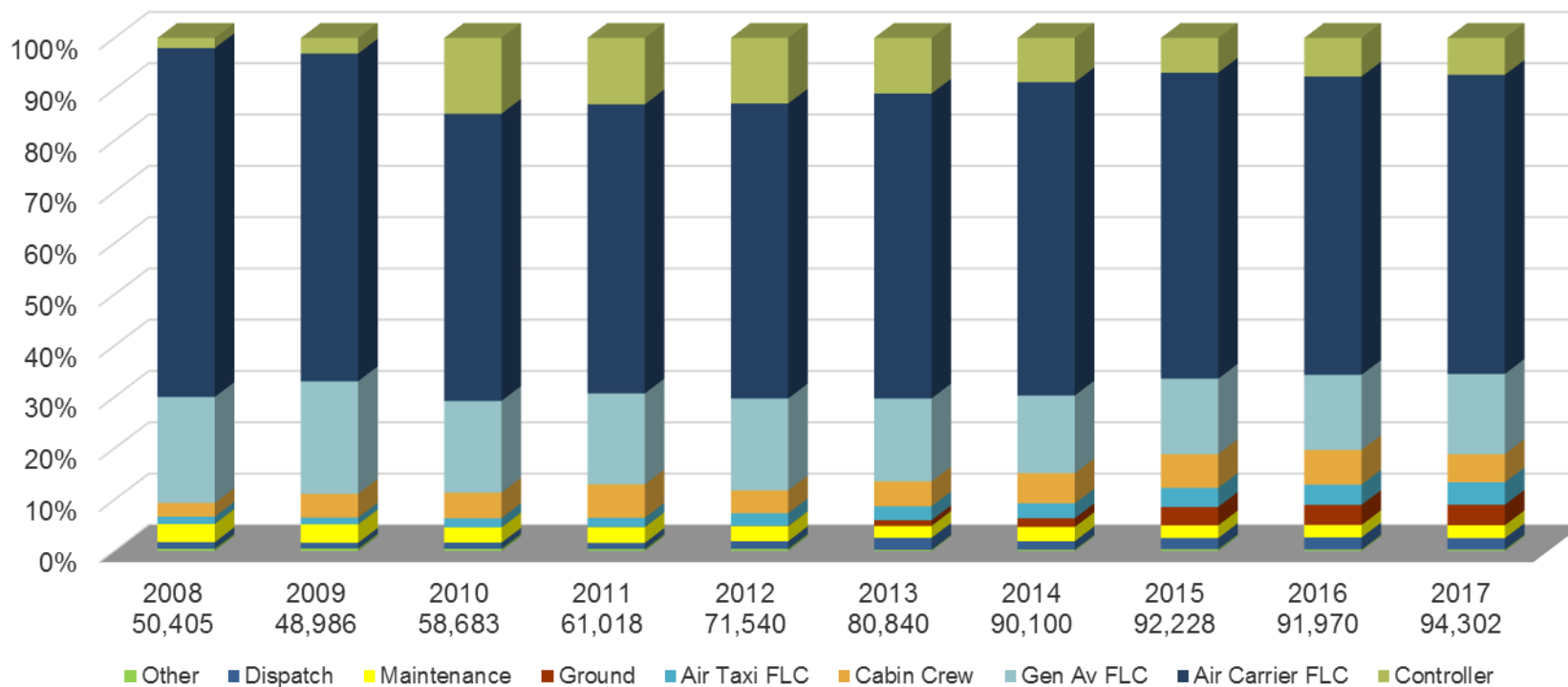
Monthly Report Intake (January 1981 – December 2017)



- Total Program Report Intake = **1,526,728**
- Total Report Intake for 2017 = **94,302**
- Averaging **7,858** reports per month, **377** per working day

Incident Reporter Distribution

January 2008 – December 2017



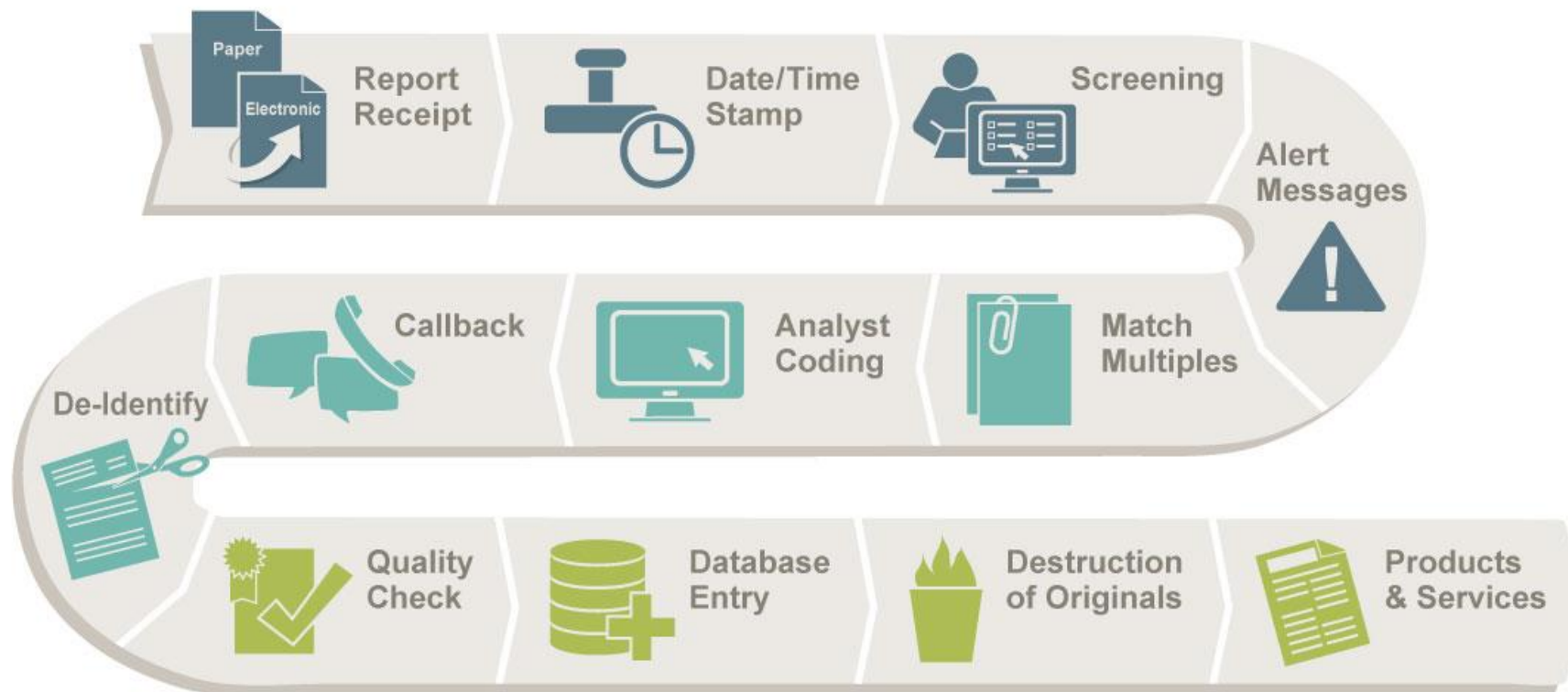
Report Processing Overview

ASRS has securely processed over 1.5 million reports in its 41 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



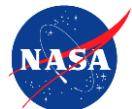
Every report is date and time stamped based on the date of receipt



Two ASRS Analysts “screen” each report within three 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 2017

Significant Items	Quantity
Incident Reports Received	1,526,728
Safety Alert Messages	6,322
Quick Responses	144
Search Requests	7,544
<i>CALLBACK</i> Issues	455
<i>ASRS Directline</i> 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



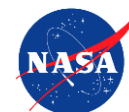
ASRS has no direct authority to directly correct safety issues.
It acts through and with the cooperation of others.



Alerting Subjects

January 2008 – December 2017

Subject	Total
Aircraft Systems	610
Airports Facility Status and Maintenance	376
Other	223
ATC Procedures	201
Airport Lighting and Approach Aids	106
ATC Equipment	93
Hazards to Flight	62
ATC Operations	51
Navigation	35
Aircraft Avionics	26
Aircraft Power Plants	26

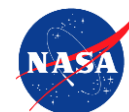


Alerting Responses

January 2008 – December 2017

Response	Percentage
Action taken as a result of the AB/FYI	20%
Action initiated before AB/FYI received	16%
Action initiated in response to AB/FYI but not completed	13%
Issue raised by AB/FYI under investigation	3%
Addressee agrees with AB/FYI but unable to resolve	3%
<hr style="border-top: 1px dashed #000;"/>	
Addressee disputes factual accuracy of AB/FYI	17%
Information in AB/FYI insufficient for action	15%
Addressee in factual agreement but sees no problem	8%
Action not within addressee's jurisdiction	4%
For information only, no response expected	1%

**Total
55%**



Examples of Safety Alerting Success

- **SLC Airport Ramp Charting (FYI 2017-2)**

Airport Official responded and stated "Salt Lake International Airport reviewed our base maps and diagrams and discovered that some of our documents did not reflect the island between taxiways Y and H and H-3. We have updated all our documents and sent those updates to the FAA and our usual charting organizations."

- **Cessna CE680 Nose Gear Steering Cable Anomaly (AB2017:4)**

The FAA (MKC-ACO) office responded and stated "As soon as I received the notification a few days ago, I provided the ASRS report to Cessna to review and provide me a response regarding the Maintenance Manual and whether there is adequate coverage or if further guidance or inspection tasks may be necessary. I just received their response this morning and I have one of our engineers reviewing it along with the attached maintenance manuals to see if we concur with Cessna or if we have further questions."

- **Similar Sounding Close Proximity Fix Names, KLYNE/KLINE (FYI 2017-5)**

FAAARTCC ZOB responded and stated "ZOB has decided to go with changing the KLINE fix name to KLOEE because of the ASRS reports. It appears that KLINE is the end point for V275, will this require rule making action in the FR because of this name change? Besides being used on an airway, KLINE is also used on an RNAV and DP procedure."





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.



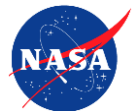
Quick Response Applications

- 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





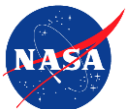
ASRS Database



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 **7,543** Search Requests (SRs) have been directly provided by ASRS Research Staff to various aviation organizations and agencies, as well as individuals through December 2017.

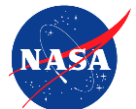


Search Requestors by Organization

January 2008 – December 2017

Organization	Total
FAA	165
Air Carriers	84
NASA	71
NTSB	60
Media	59
Alphabet Groups	47
Miscellaneous Safety Organizations	22
Other	18
Individuals	16

Organization	Total
Research Organizations	14
Student	12
Miscellaneous Government	11
Foreign	9
Aircraft Manufacturers	8
Military	5
Law Firms	3
Educational Institutes	3
DHS	2



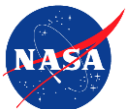
Recent Search Request Samples

- **A380 Wake Vortex Related Incidents (SR 7254)**
 - Completed for the Idaho National Laboratory

- **Cabin and Cockpit Interphone Communication Related Incidents (SR 7256)**
 - Completed for the NTSB

- **Taxiway Approach/Landing Related Incidents (SR7263)**
 - Completed for the FAA (AJV-83)

- **Unmanned Aerial Vehicle (UAV) Related Incidents (SR 7266)**
 - Completed for the NASA



ASRS Database Online

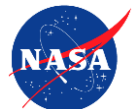
Direct access to search de-identified reports in the ASRS database is available through **ASRS Database Online (DBOL)** at <https://asrs.arc.nasa.gov/search/database.html>.

The screenshot displays the ASRS Database Online search interface. At the top, there are navigation links for 'Begin', 'Results', and 'View'. A 'New Search' button is visible in the top right corner. Below the navigation, there are links for 'New Search', 'Help', 'Contact Support', and 'ASRS Database Items (pdf)'. The main search area is titled 'How To Search:' and includes instructions for using search items. Below this, there are several sections of search filters, each with a plus sign icon to expand the options:

- 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].

Below the filters, there is a section for 'Text: Narrative / Synopsis' with a plus sign icon and a 'Text contains [words]' field. At the bottom, there is a 'Current Search Items:' section which currently shows 'Search is empty.' and two buttons: 'Back' and 'Run Search'.

- Over **1,486** queries are completed each month
- More than **211,170** 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>.

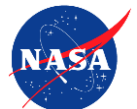
From the ASRS website, ASRS Database Report Sets are downloaded on average over **3,670** times a month, Report Sets were first posted in January 2000.



ASRS Database Report Sets

2017 Top Ten Report Sets

Report Set Topic	Total Downloads
Unmanned Aerial Vehicle (UAV) Reports	9,966
Passenger Electronic Devices	4,605
Flight Attendant Reports	2,311
Cabin Smoke, Fire, Fumes, or Odor Incidents	2,107
Passenger Misconduct Reports	1,507
Maintenance Reports	1,477
Cockpit Resource Management (CRM) Issues	1,384
Air Carrier (FAR 121) Flight Crew Fatigue Reports	1,196
Altitude Deviations	1,091
Bird or Animal Strike Reports	1,048



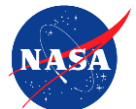


CALLBACK

CALLBACK Overview

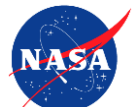
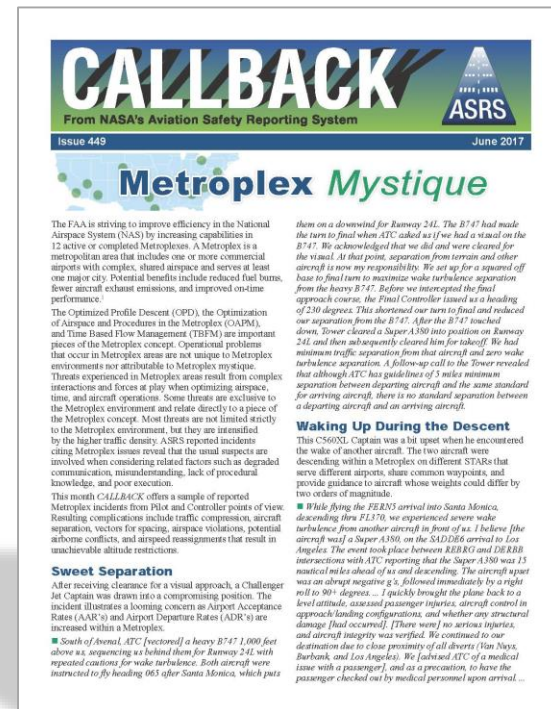
CALLBACK, the award winning ASRS monthly safety newsletter, has been published since 1979 in a popular “lessons learned” format. *CALLBACK* presents ASRS report excerpts that are significant, educational, and timely. Occasionally features on ASRS program developments and research are also presented. Over 455 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

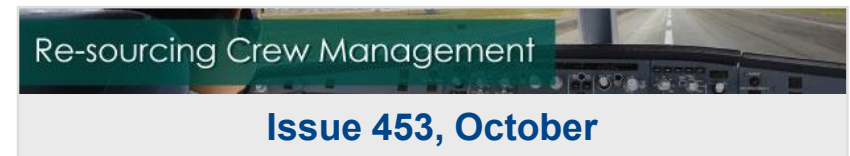
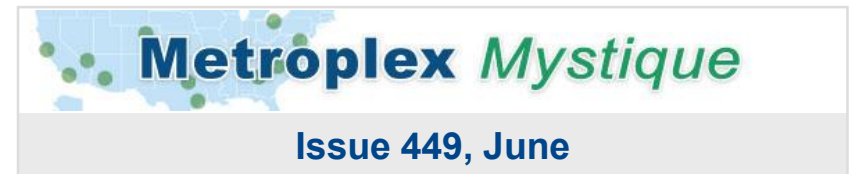
- In addition to being published online, **CALLBACK** is distributed by email. Subscription is free and available via the ASRS website.
- The total number of email subscribers for 2017 was over **29,000**
- CALLBACK** views for 2017 (HTML and PDF) were over **217,500**



CALLBACK Topics

2017 CALLBACK Topics Covered

- Communication
- Complacency
- Crew Resource Management
- Interactive Situational Resolutions
- Maintenance Issues
- Metroplex Incidents
- Pilot Weather Reports (PIREPs)
- RNAV Problems
- Unusual Encounters
- Weather Hazards
- Windshear Encounters



Aviation Community Feedback

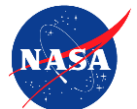
Sample Reader Comments from 2017

"I teach an SMS course and would like to share this issue of CALLBACK as an example of safety reporting."

"As a long-time pilot wanting my landings and takeoffs to come out even, I have read CALLBACK nearly from its inception.... This I know: Reading accounts from contributors to the ASRS program has enhanced my knowledge and awareness of aviation safety significantly. And this has helped me apply effective and practical behaviors and techniques in the conduct of my piloting duties."

"This is a GREAT edition. I have over 25 years of aviation safety experience and yet, I still make...rookie mistakes."

"I have been an avid reader of NASA ASRS [CALLBACK] since early in my primary flight training. I have found this system to be invaluable in helping me keep up to date on the "gotchas" that occur for pilots of all levels of experience."



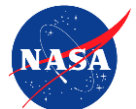


Focused Studies/Research



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



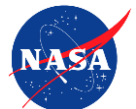
Focused Study – Wake Vortex

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 2018. 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.

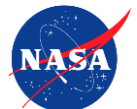
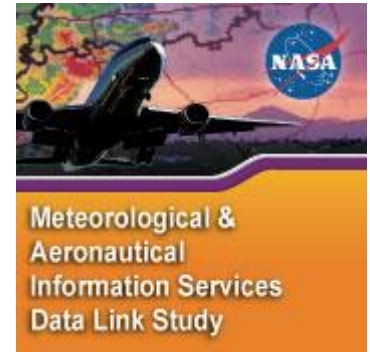


Focused Study – AIS Data Link

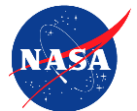
Meteorological and Aeronautical Information Services Data Link Services and Applications Study

In cooperation with the FAA, ASRS is conducting a study focused on meteorological and aeronautical information services (AIS) via data link. ASRS is gathering 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 to be analyzed include type of weather data received, cockpit display utilized, software or applications used to receive meteorological information, and end user graphical interface issues. In March of 2012 an interim report was published and is available on the ASRS website. (https://asrs.arc.nasa.gov/docs/rs/64_ASRS_Meteorological_AIS_DataLinkStudy.pdf)



ASRS Model Applied



ASRS Model Applied

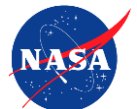
The ASRS model is utilized internationally in the aviation community. The International Confidential Aviation Safety Systems (ICASS) Group promotes confidential reporting systems as an effective method of enhancing flight safety in commercial air transport and general aviation operations.

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



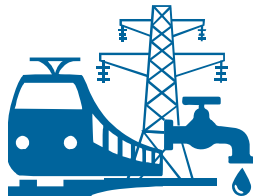
MEDICINE



SECURITY



FIREFIGHTING



PUBLIC UTILITIES



MARITIME



STRUCTURAL
ENGINEERING



ASRS Model Applications

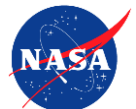
Confidential Close Call Reporting System (C³RS)

2010 to present

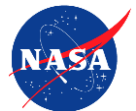
C³RS is a partnership between participating railroad carriers, railroad labor organizations, NASA, and the Federal Railroad Administration (FRA) designed to improve railroad safety by collecting and analyzing reports which describe unsafe conditions or events in the railroad industry.

NASA uses the expertise it has gained from developing and managing the successful Aviation Safety Reporting System (ASRS) to administer the C³RS program. The program is based on the same guiding principles of being *voluntary*, *confidential* and *non-punitive*.

To learn more about C³RS visit <https://c3rs.arc.nasa.gov>



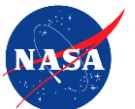
ASRS Summary



ASRS Summary

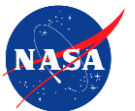
ASRS is a highly successful and trusted program that has served the needs of the aviation community for over 42 years. It is available to all participants in the National Airspace System who wish to report safety incidents and situations.

The ASRS identifies system deficiencies, and issues alerting messages to persons in a position to correct them. It educates through its newsletter *CALLBACK*, its journal *ASRS Directline* 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.



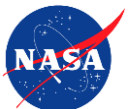
Advantages of the ASRS Model

- 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 Safety/Security
- 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>

