

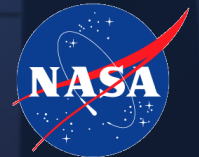


# NASA Aviation Safety Reporting System

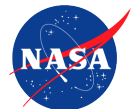
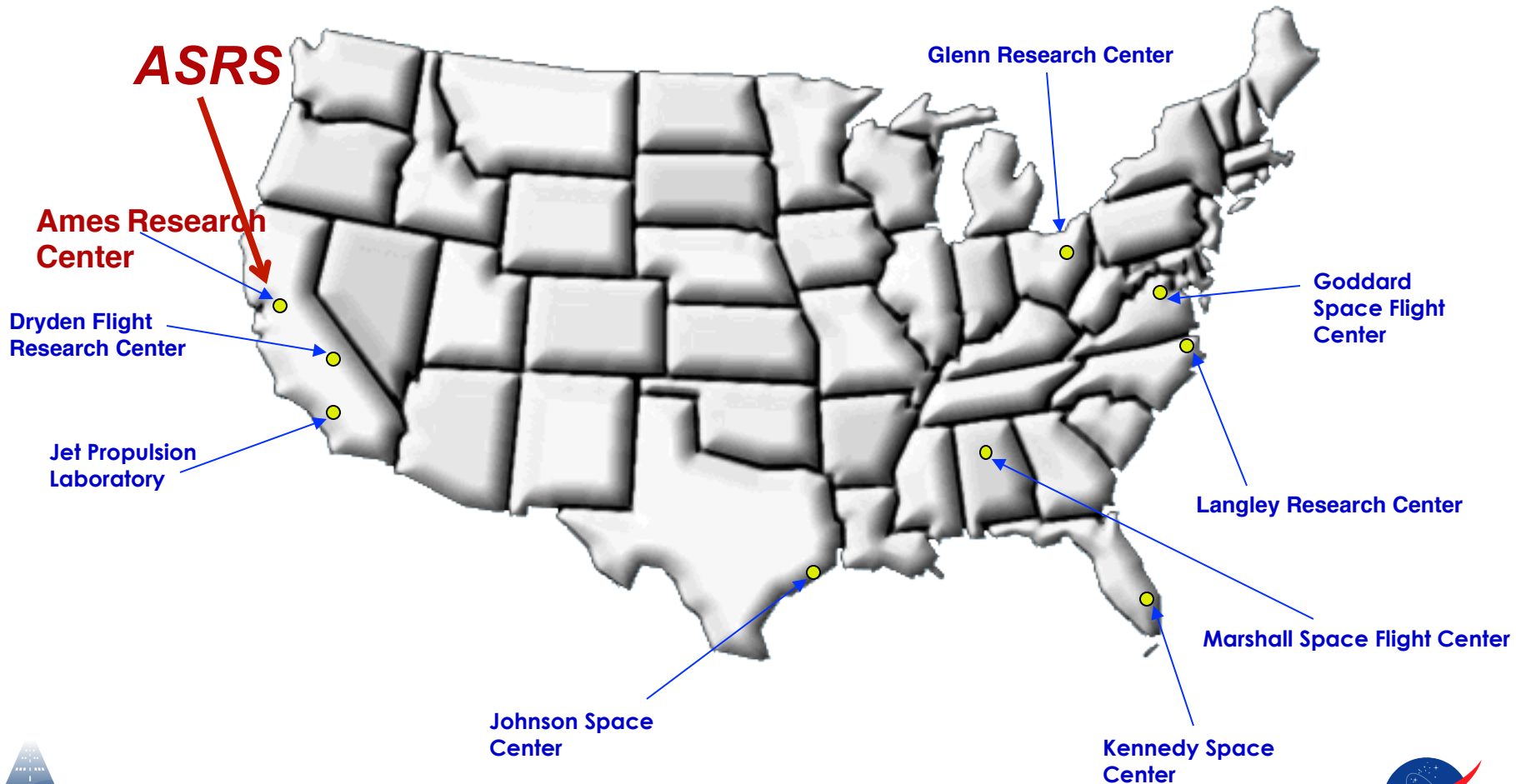
August 9, 2016

**AVIATION SAFETY  
REPORTING SYSTEM**

Linda Connell  
Program Director, NASA ASRS



# NASA Aviation Safety Reporting System



***Moffett Field - Hangar One  
1932***

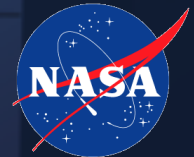




# ASRS History and Background

August 9, 2016

**AVIATION SAFETY  
REPORTING SYSTEM**



# ASRS since 1976



th

**AVIATION SAFETY  
REPORTING SYSTEM**

Anniversary

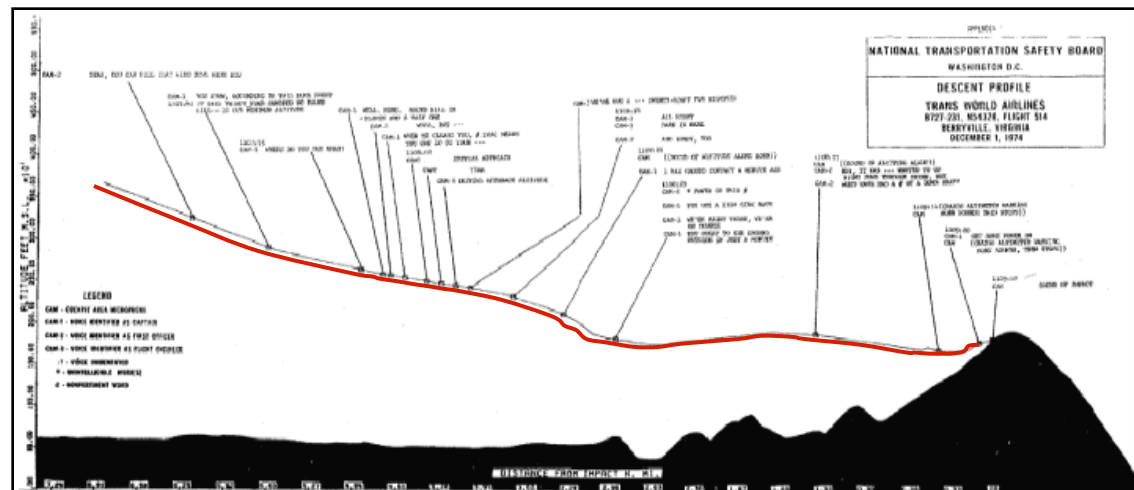
**1976-2016**

**Over 1.3 Million Reports**

# ASRS History

- After a fatal TWA crash in 1974, the investigation revealed that six weeks prior, a United Airlines crew had experienced an identical ATC misunderstanding and narrowly missed the same mountain
- Although the information was shared with FAA at the time, there was no method of sharing the United pilot's experience with TWA and other airline operators
- This solidified the idea of a need for a national aviation reporting program that would enable collection and dissemination of safety information

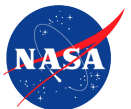
- In April 1976, NASA and FAA implemented the Aviation Safety Reporting System (ASRS)



# FAA and NASA Partnership

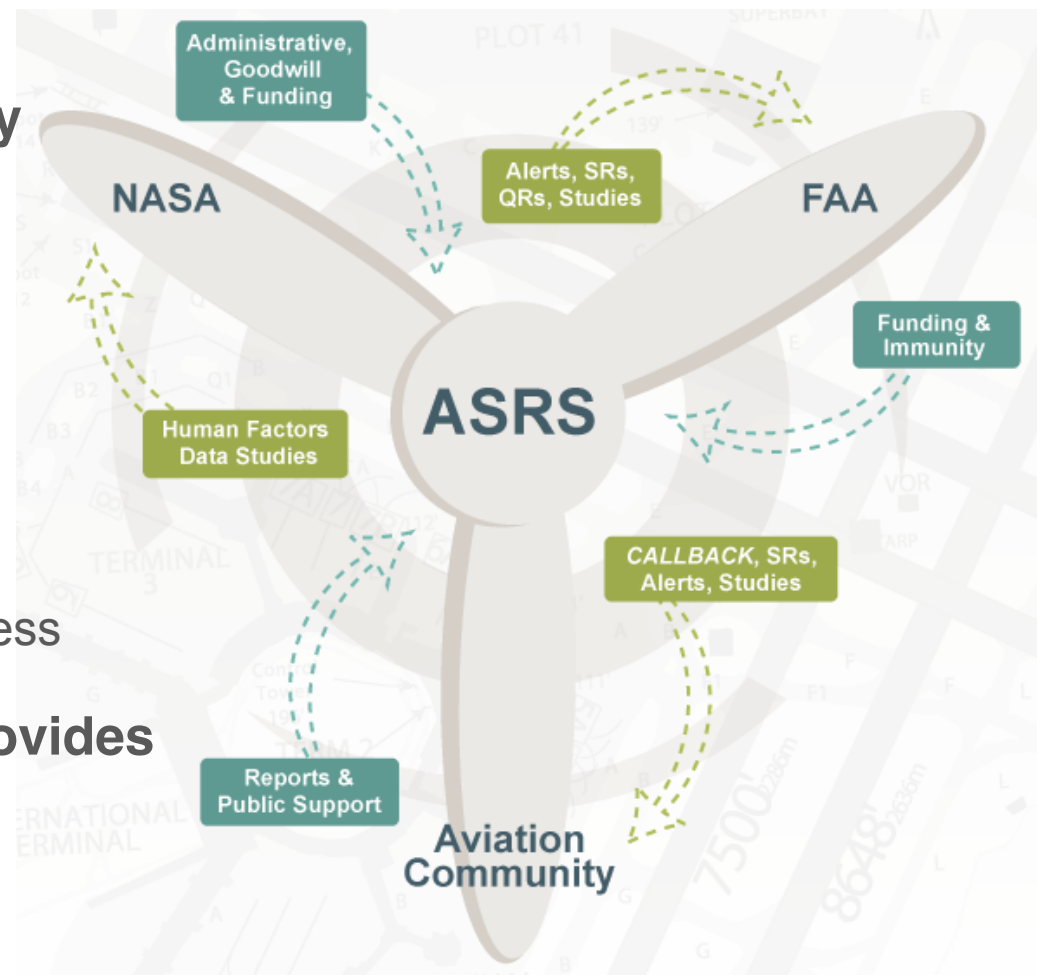
- **MOA signed by Administrators for FAA and NASA**

... To provide information to the FAA and the aviation community to assist them in reaching the goal of identifying and eliminating unsafe conditions to prevent accidents.



# ASRS Gov't/Industry Stakeholders

- **FAA provides reimbursable funding to NASA for ASRS support through Interagency Agreement**
- **NASA provides funding for Director to provide overall management**
  - Assures independence and confidentiality
  - Reinforces role of trust in success
- **The Aviation Community provides support through aviation community advocacy for reporting, feedback, and communications**



# ASRS Principles

## ***VOLUNTARY PARTICIPATION***

*Aviation personnel voluntarily submit reports concerning events related to safety for the purpose of system alerting, understanding and learning*

## ***CONFIDENTIALITY PROTECTION***

*Protection of identity is provided by NASA through de-identification of persons, companies, and any other information*

## ***NON-PUNITIVE***

*FAA will not use, nor will NASA provide, any report submitted for inclusion under ASRS guidelines or information derived therein for use in any disciplinary or other adverse action (14 CFR 91.25 & AC 00-46E)*

## ***INDEPENDENT***

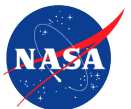
*Necessary for trust building and unbiased dissemination of safety information*



# U.S. Code of Federal Regulation

## Prohibition Against Use of Report 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.” (14 CFR 91.25)**



# FAA Advisory Circular – Limited Immunity



U.S. Department  
of Transportation  
Federal Aviation  
Administration

## Advisory Circular

**Subject:** Aviation Safety Reporting Program

**Date:** 12/16/11

**AC No:** 00-46E

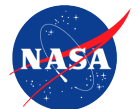
**Initiated by:** AFS-200

**Change:**

- 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.



Aviation Safety Reporting System

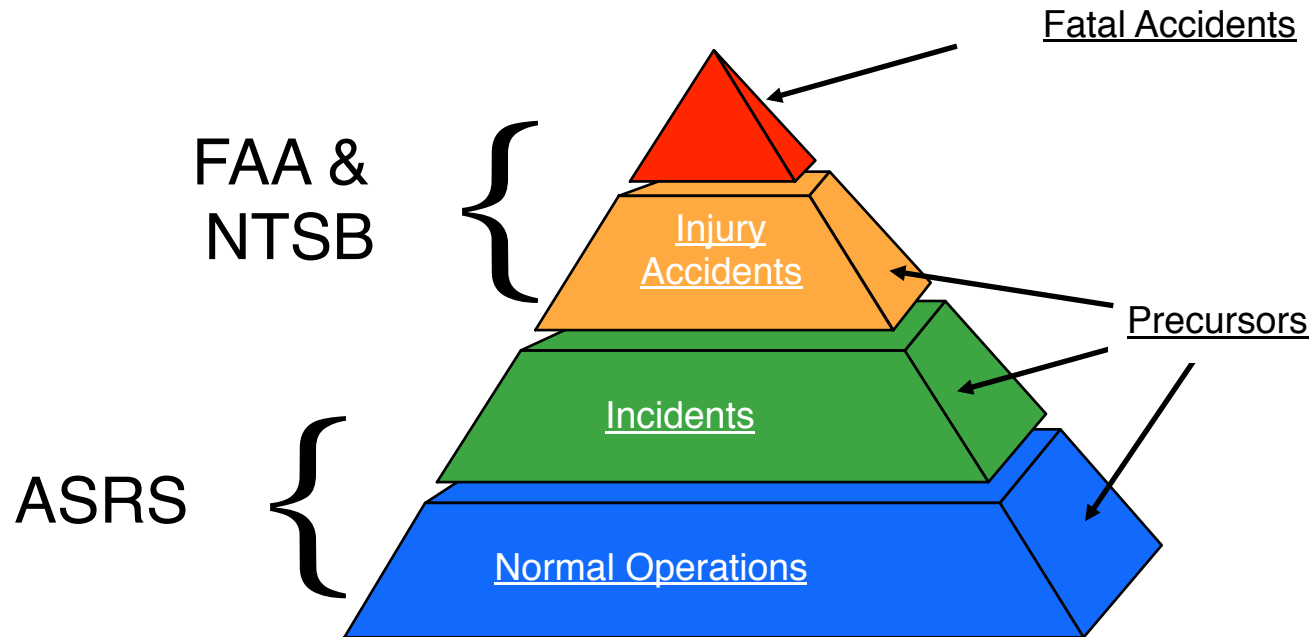


July 2016

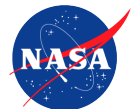
# *What is Safety Reporting?*



# System-Wide Event Occurrences



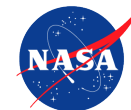
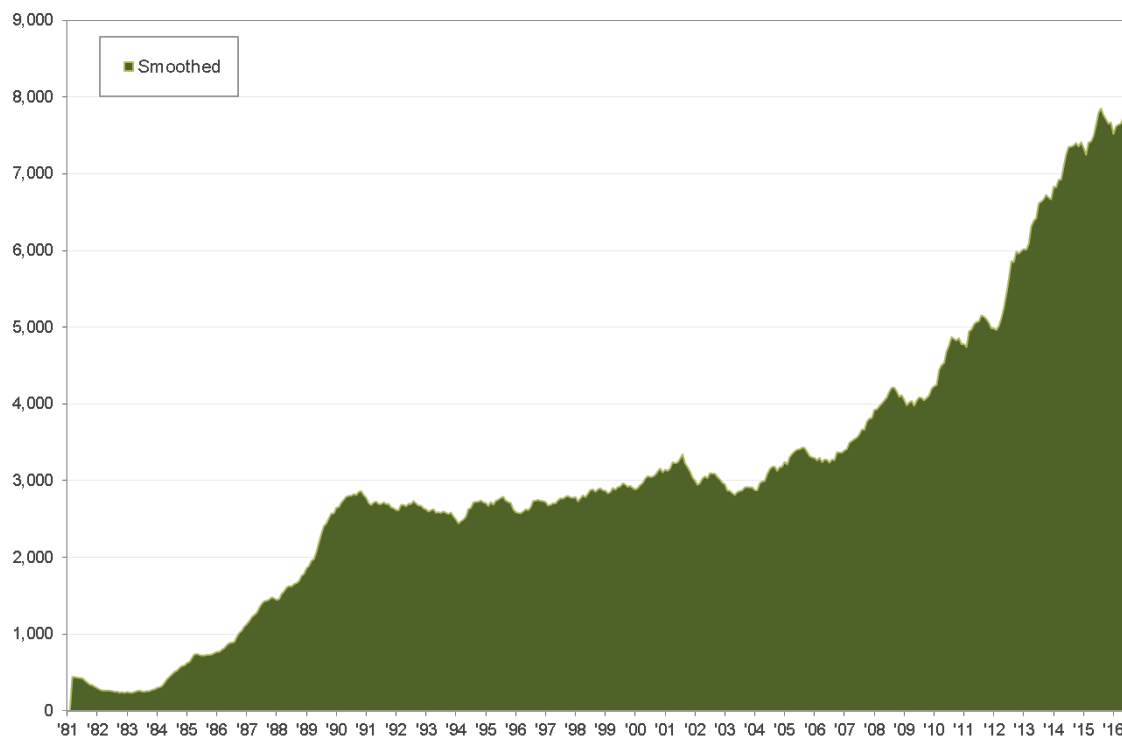
**ASRS is Complementary to  
Other Systems of Reporting**



# ASRS Report Volume Profile

- 40 years of confidential safety reporting
- Over 1,369,649 reports received
- Over 6,200 alert messages issued
- Over 7,800 reports per month, or 378 per working day
- Total report intake for 2015 was 92,228
- Current rate estimate for 2016 is over 93,000

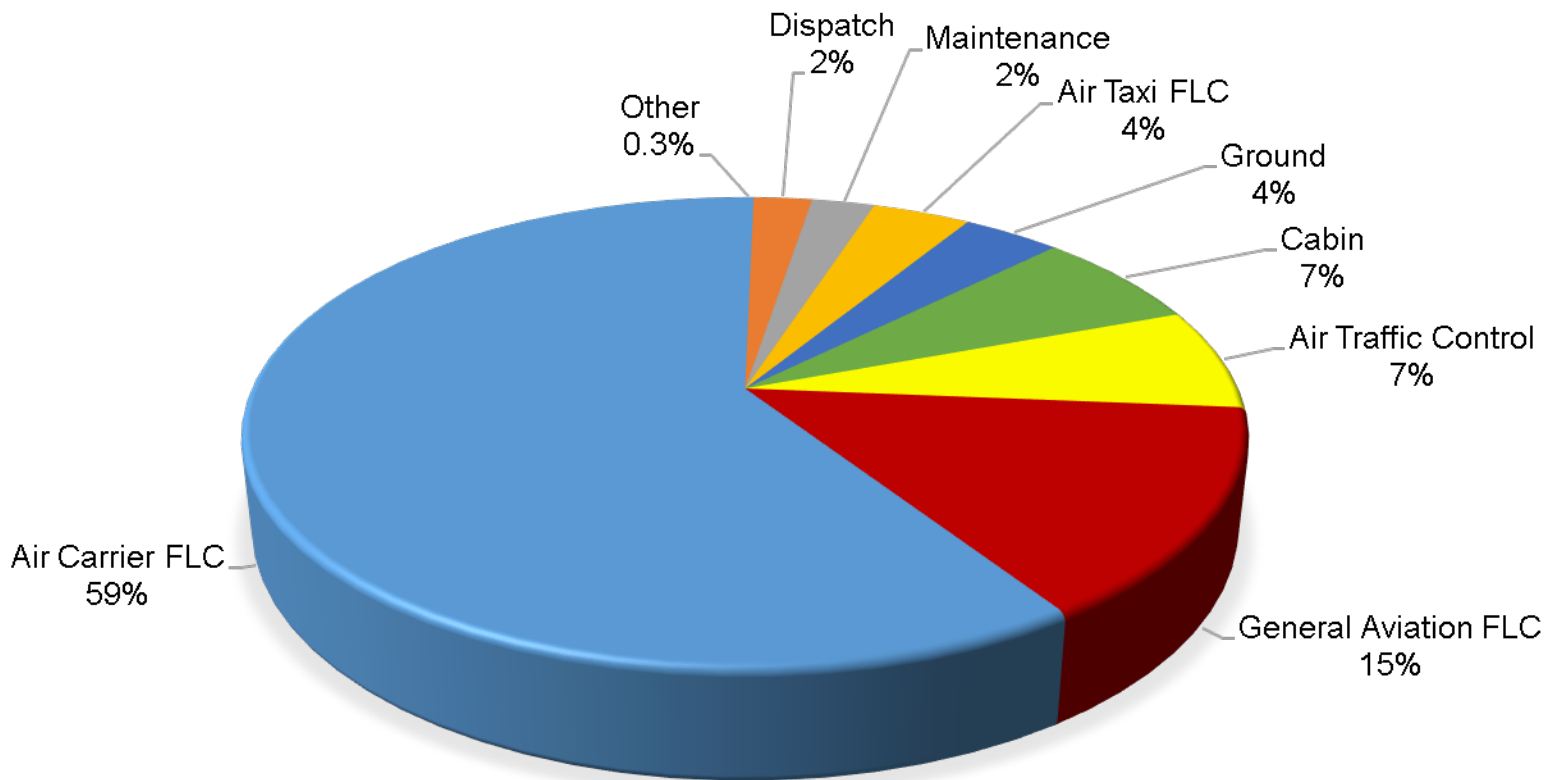
Monthly Intake  
January 1981 – June 2016



# Incident Reporter Distribution

January 2015 – June 2016

## REPORTER DISTRIBUTION



n = 139,047

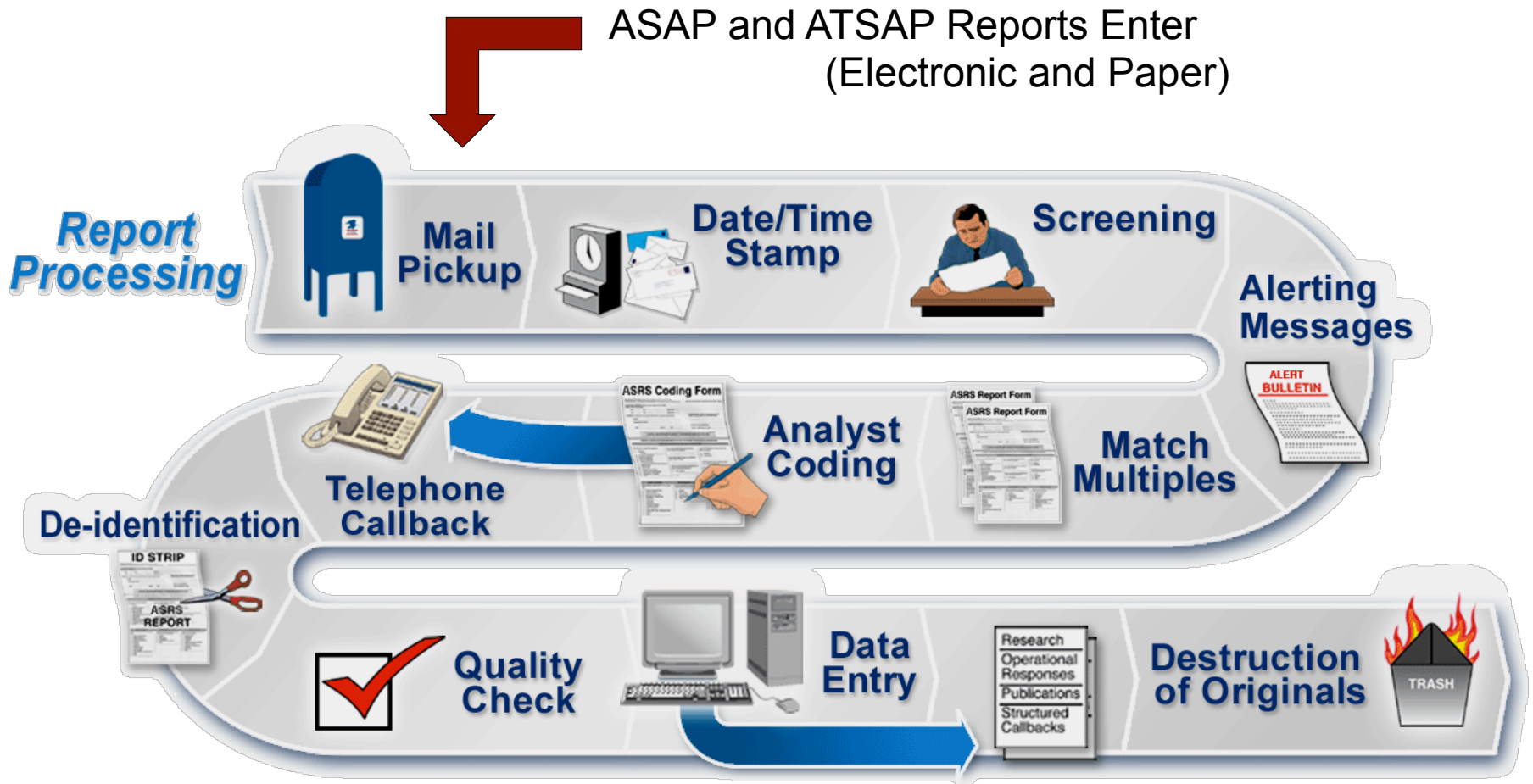


Source: 100% ASRS Report Data

July 2016

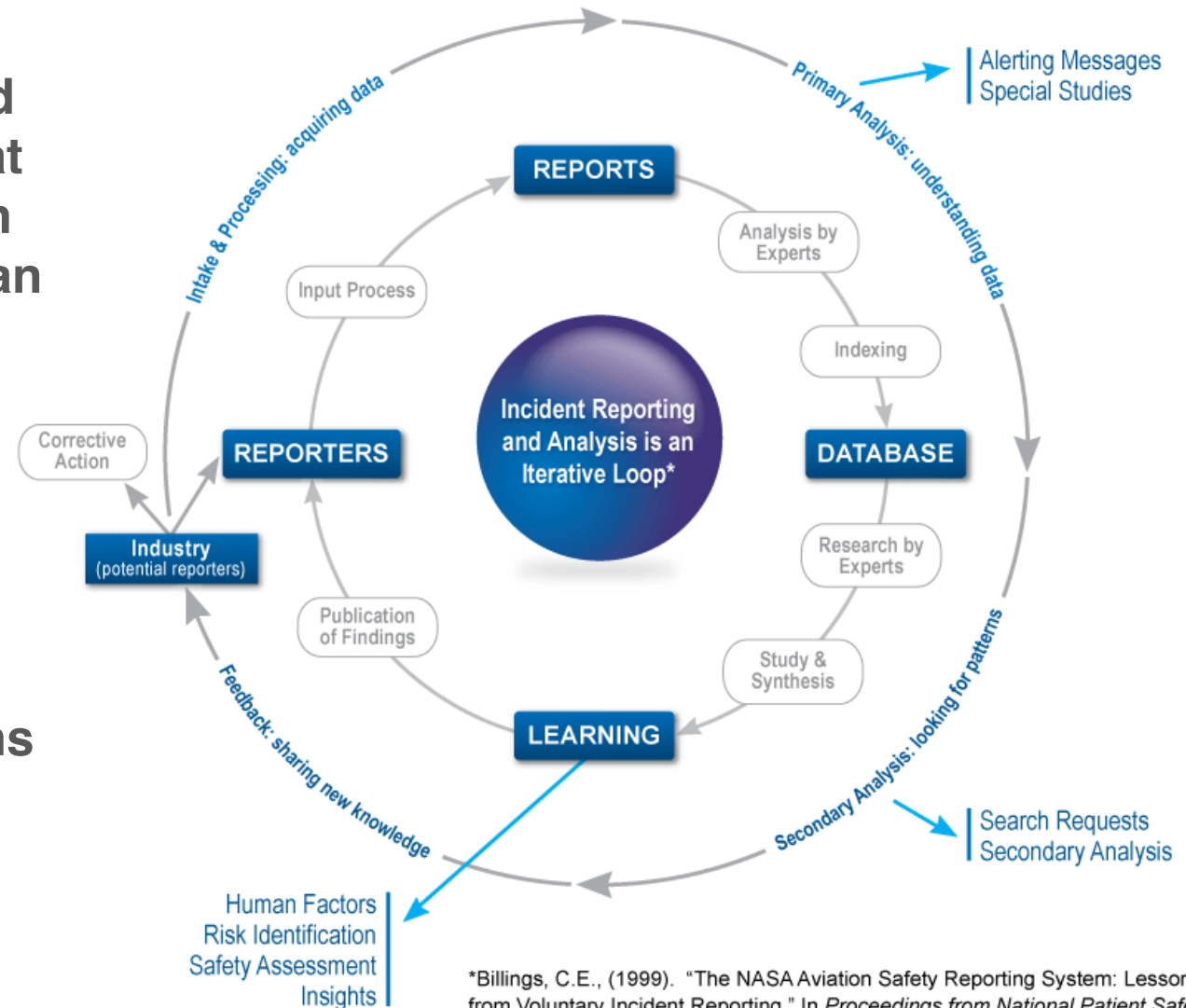


# Report Processing Flow



# Incident Reporting Model

- ASRS is a closed loop process that supports System Safety and Human Factor insights
- Government / Industry are provides information that may result in corrective actions



\*Billings, C.E., (1999). "The NASA Aviation Safety Reporting System: Lessons Learned from Voluntary Incident Reporting." In *Proceedings from National Patient Safety Foundation Conference Enhancing Patient Safety and Reducing Errors in Health Care*.

# ASAP Reporting to ASRS

- **ASAP Reporting**

- 254 Total Programs
- 110 Air Carriers/Operators

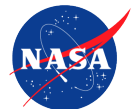
More programs being added continuously

- **Reporting Groups**

- 104 Pilot
- 70 Maintenance
- 47 Dispatch
- 27 Flight Attendant
- 6 Other (Including Ground Crew, etc.)

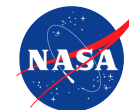
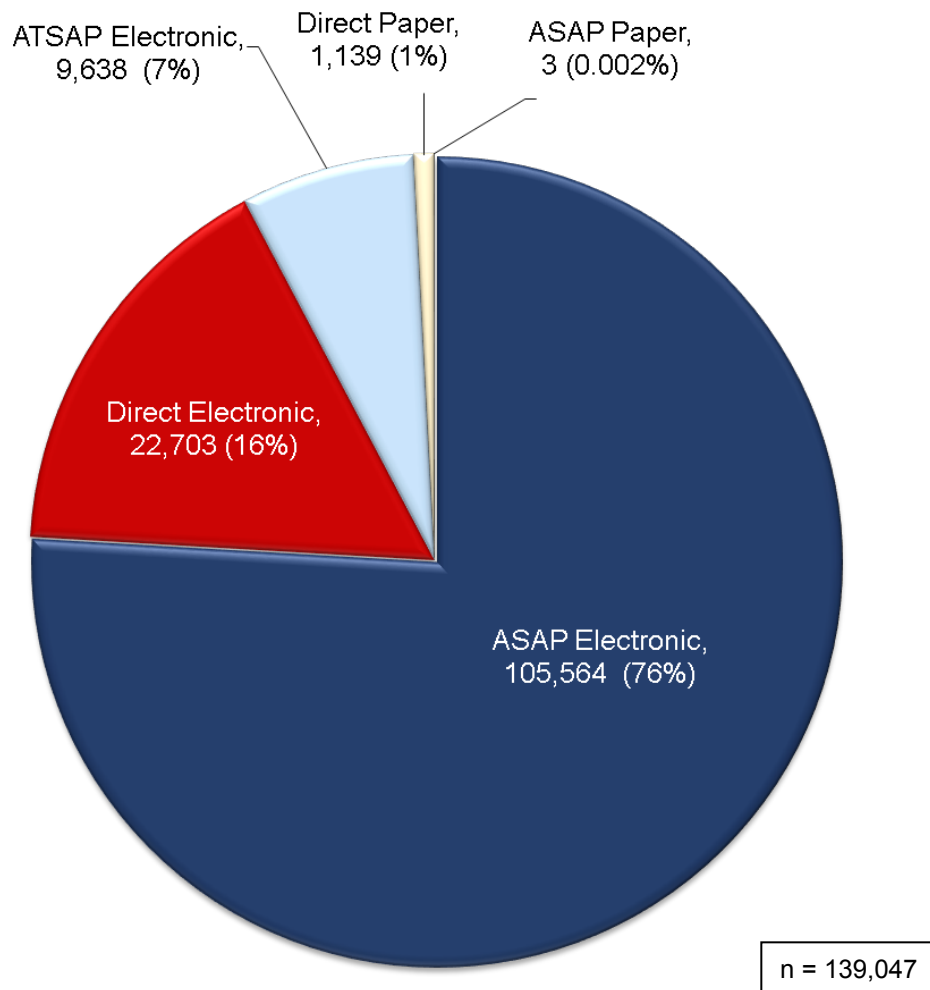
ASRS Electronic Transmission Methodology compatible with numerous software platforms

- **Majority are received through Secure Electronic Data Transmission protocols**
- **Paper form submissions continue to be received at ASRS**



# Report Intake Source (ALL)

January 2015 – June 30, 2016

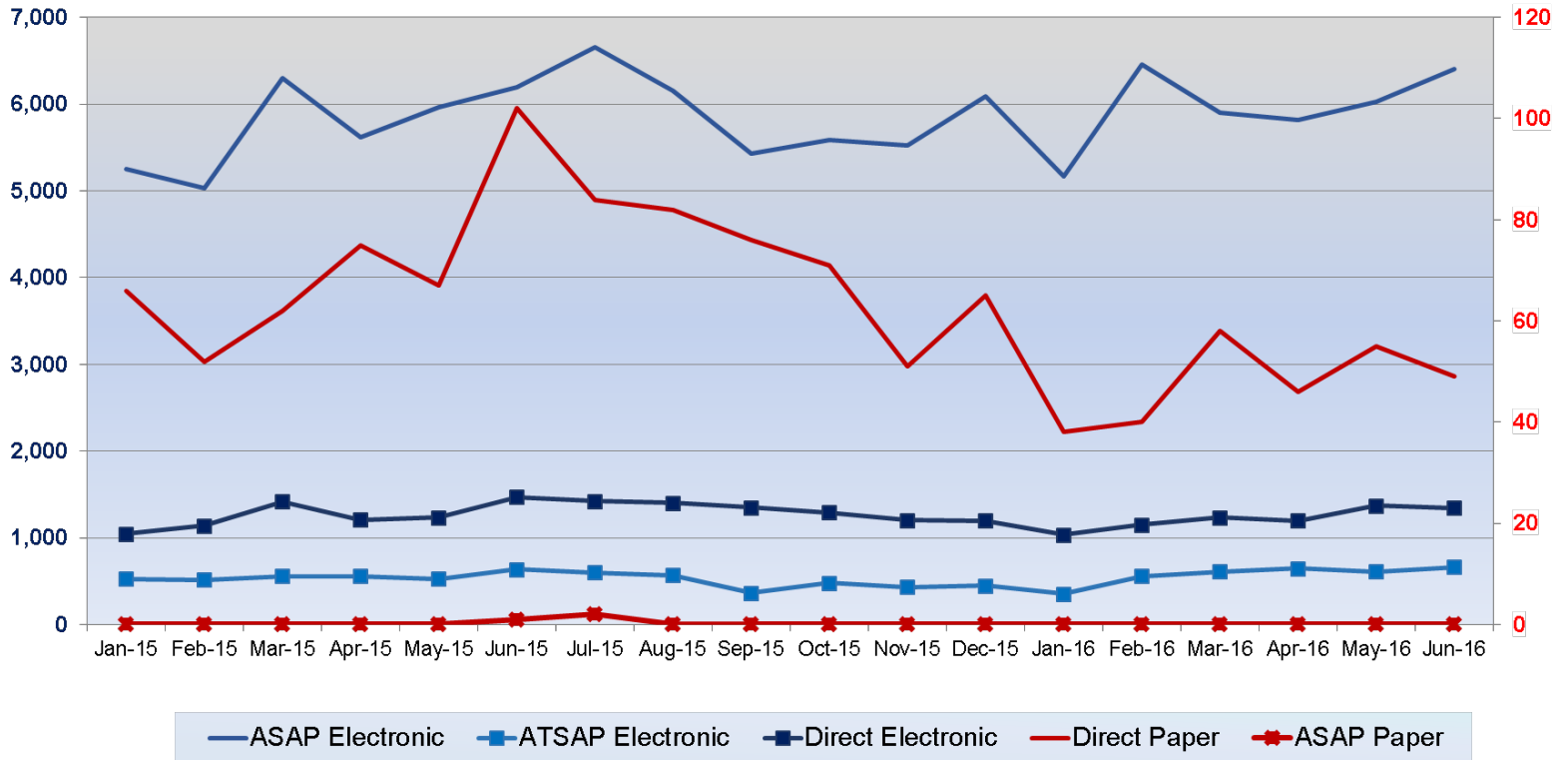


# Report Intake Source Summary

January 2015 – June 30, 2016

Electronic Submissions

Paper Submissions



n = 139,047

July 2016



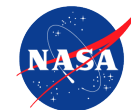
***Identify*** deficiencies and discrepancies in the National Airspace System

***Provide data*** for planning and improvements to the future National Airspace System



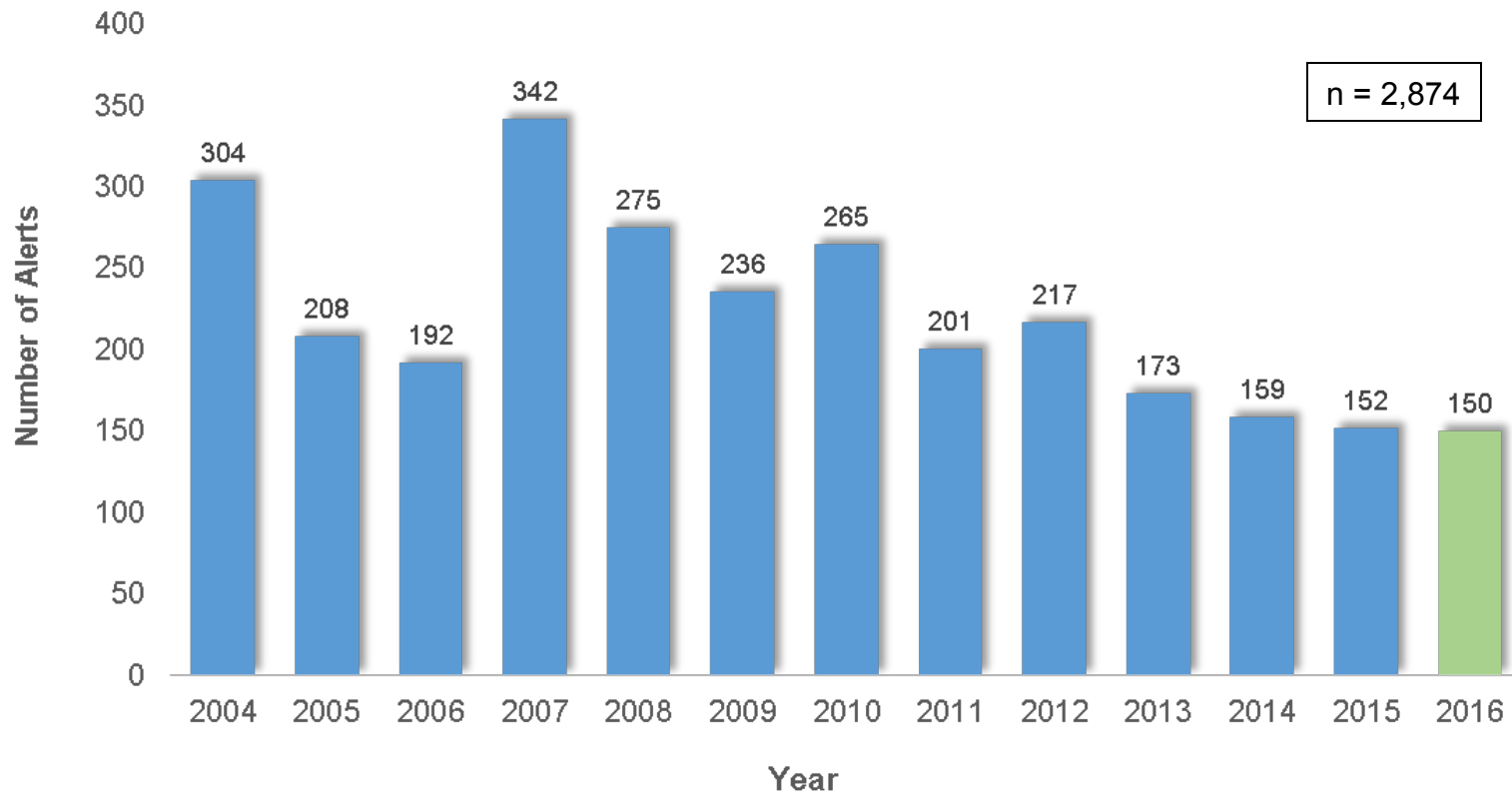
Mandated scope in original Federal Register Notice, FAA Advisory Circulars, FAA/NASA MOA(s) and IAA(s). Largely determines program priorities.

July 2016



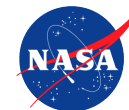
# Safety Alerts

## Messages Issued 2004 – Present



\*2016 data is projected based on alerts issued and currently under process through July 12<sup>th</sup>.

July 2016

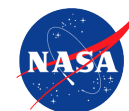
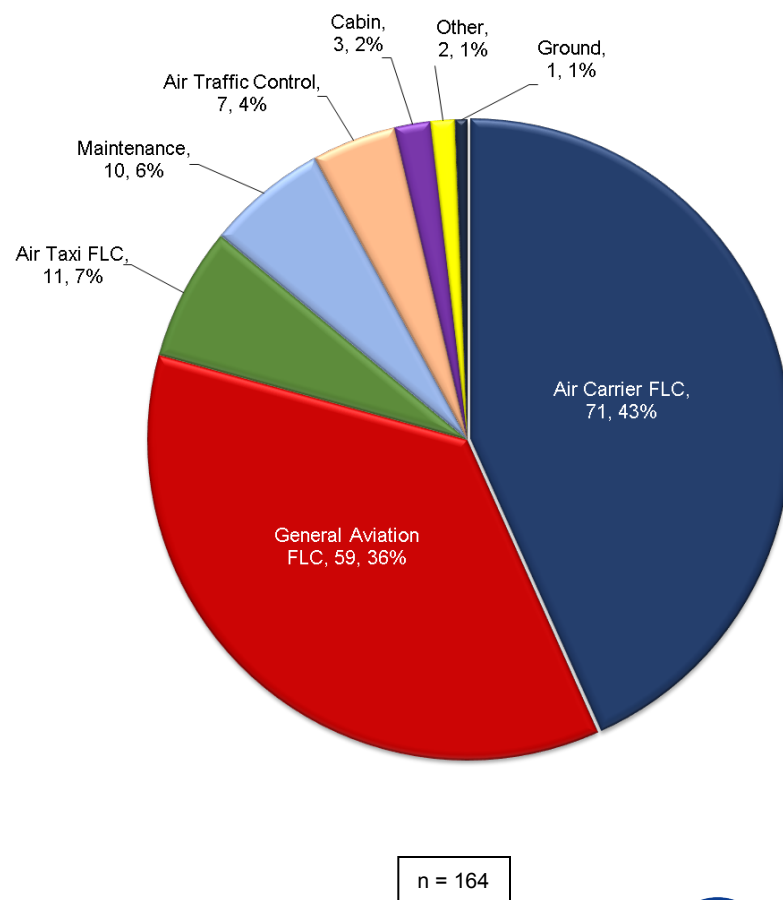
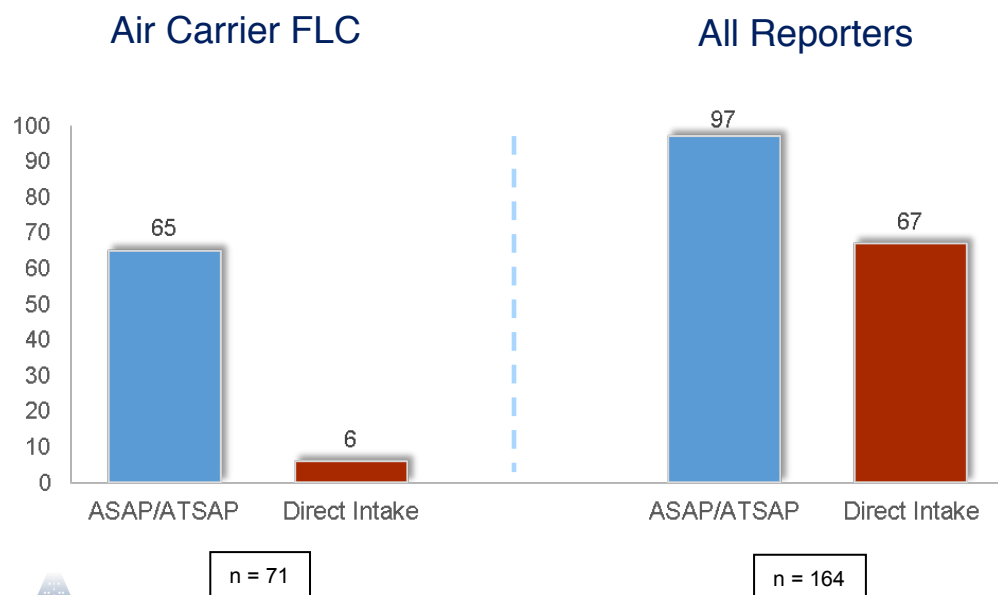


# Alert Messages Reporter Type

January 2015 – June 2016

## ▶ ASRS issued a total of 164 alert messages

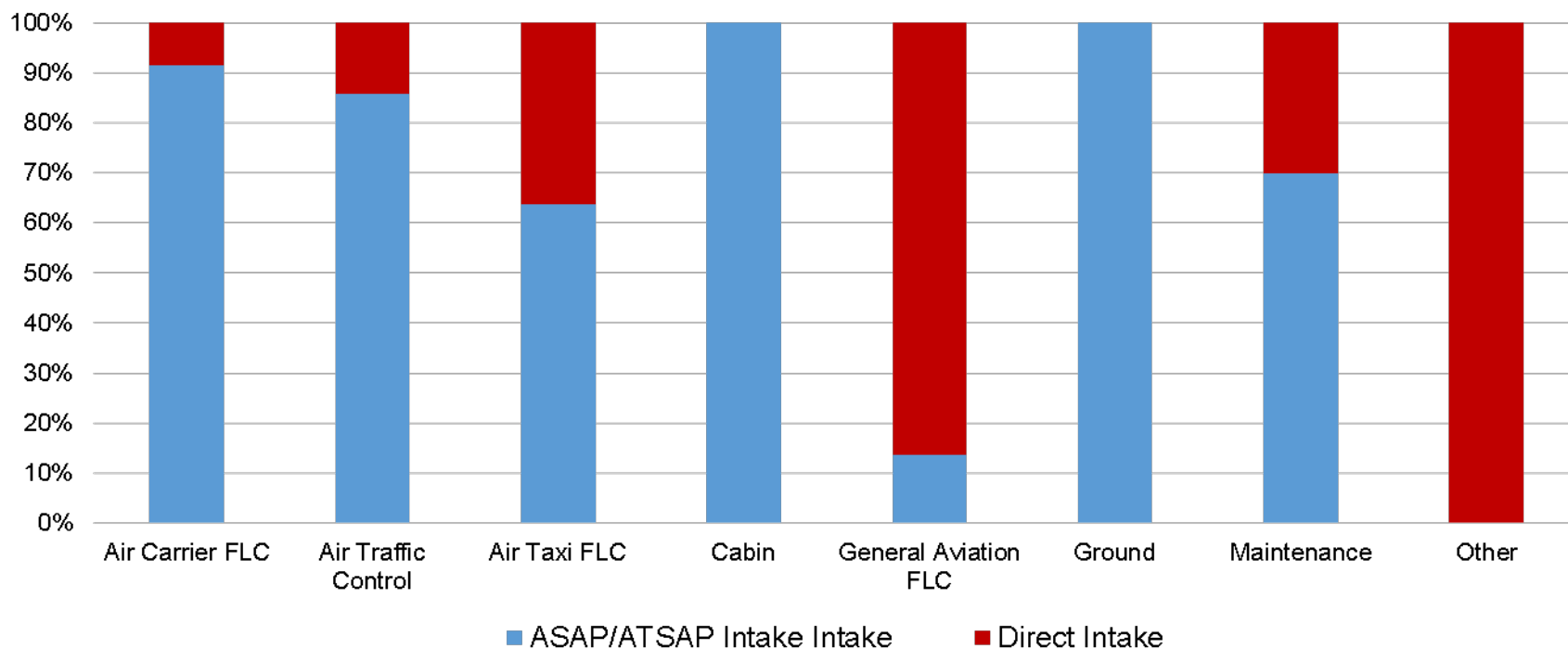
- 59 Alert Bulletins
- 105 For Your Information Notices



# Alert Message Originated by Source

January 2015 – June 30, 2016

## Alerts by Intake Source and Reporter Distribution



n = 164



# Safety Alerts (Alert Bulletin & FYI Notices)

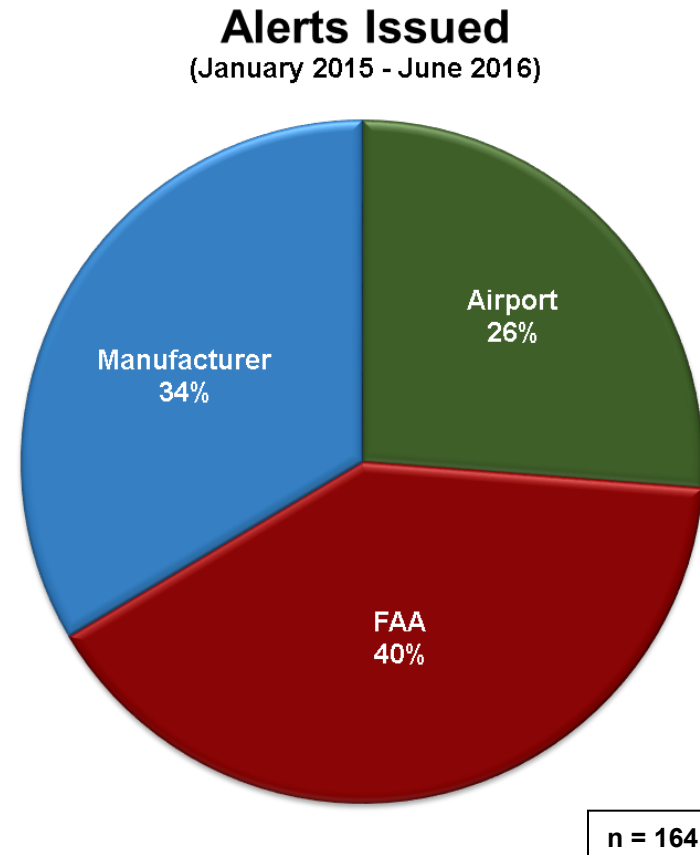
*Messages Issued 2006 – 2015*

- ASRS issued 2,212 Alert Messages from Jan 1, 2006 to December 31, 2015
  - Approximately One Alert Message per working day
- A total of 939 responses were received
  - 42% total response rate
  - FAA responded to 325 alerts (35% of all responses)



# ASRS Alert Message Recipients

- Alerts generate responses from one or more of the recipients
- Alerts often identify an anomaly that was not detected by other means
- FAA AFS and AVP receive every Safety Alert

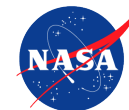


# Alert Responses

(2006 – 2015)

Response	Percentage
T. Action taken as a result of the AB/FYI	21%
B. Action initiated before AB/FYI received	15%
I. Action initiated in response to AB/FYI but not completed	11%
N. Addressee agrees with AB/FYI but sees no problem	7%
U. Issue raised by AB/FYI under investigation	5%
H. Addressee in factual agreement but is unable to resolve	3%
<hr/>	
W. Addressee disputes factual accuracy of AB/FYI	22%
Q. Information in AB/FYI insufficient for action	12%
C. Action not within addressee's jurisdiction	3%
F. For information only, no response expected	1%

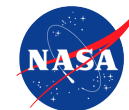
62%



# Alert Response Metrics – Non-Manufacturer

January 2006 – December 2015

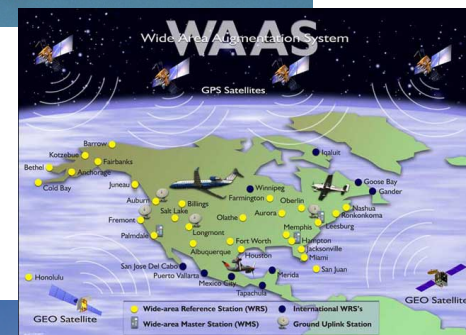
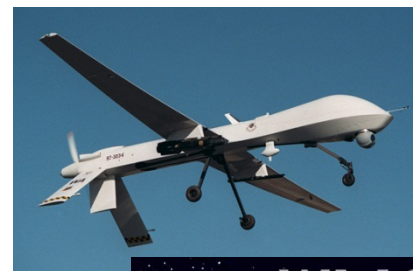
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<b>Alert Messages Issued</b>	75	63	40	30	43	50	40	44	50	75
<b>FYI Notices Issued</b>	117	279	235	206	222	151	177	129	109	117
<b>Response Rate to AB/FYI</b>	35%	49%	46%	38%	34%	29%	27%	28%	48%	49%
<b>Response Rate Non-Manufacturer</b>	55%	64%	55%	26%	36%	38%	25%	37%	59%	58%



# Emerging Issues Watch-list Topics

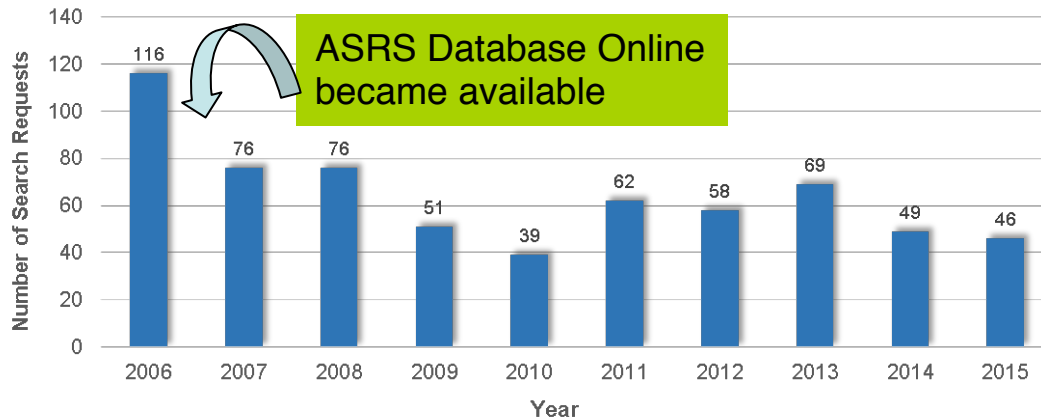
- ▶ There are currently 3 topics on the Yellow Tag Watch List: UAS, GPS, and Solar Tower Array Glare

Watch-list Topic and Report Counts		
Topic	Count Q2 2016	Cumulative Totals
UAS	33	265
GPS	13	121
Solar	1	12



# Direct to ASRS for Database Analysis Requests

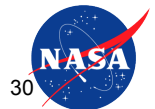
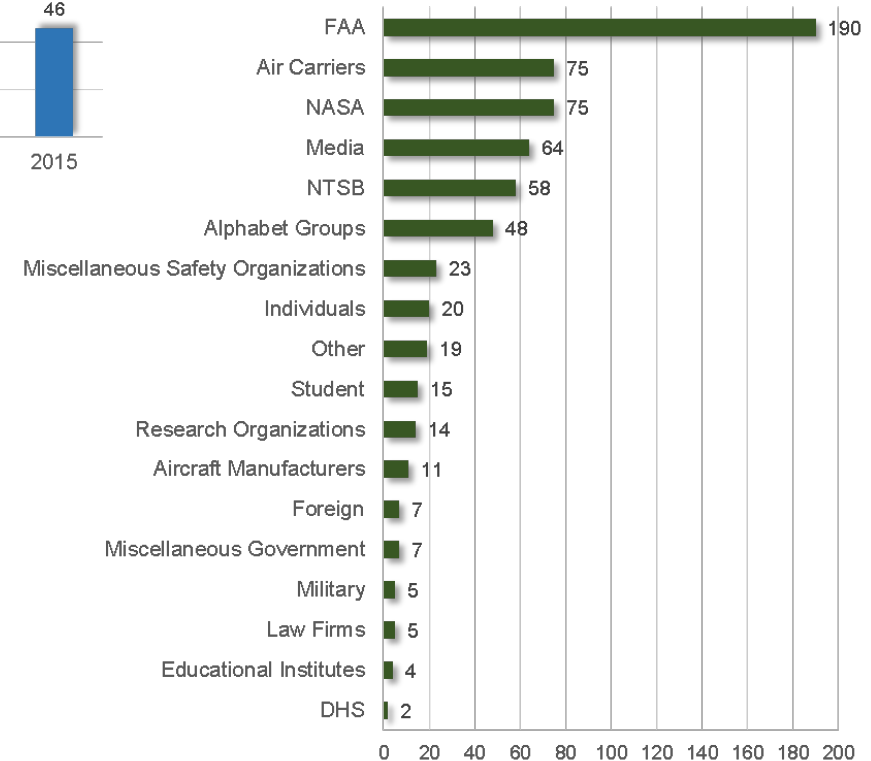
## 2006 – 2015



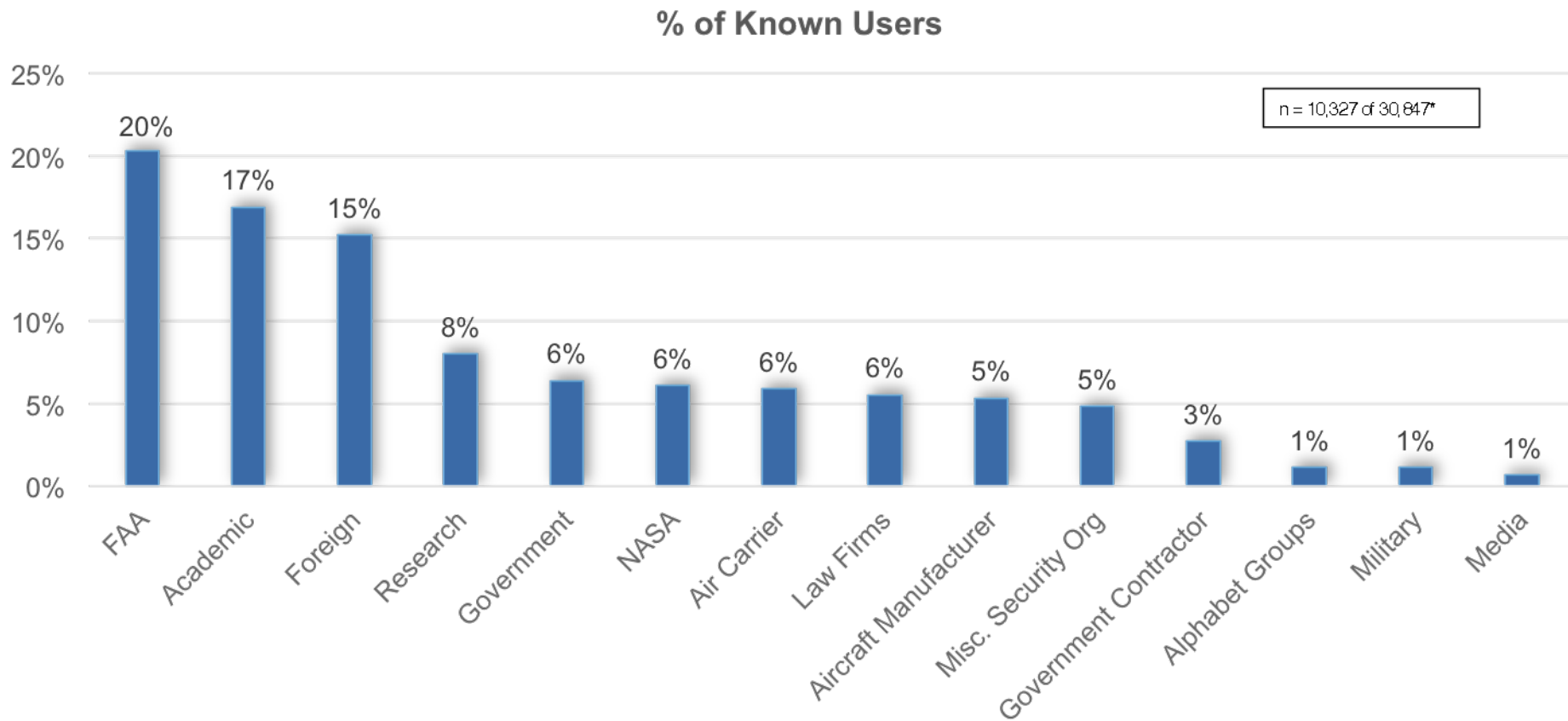
- **FAA is the most frequent requestor of specific data searches**
- **All requests are completed within 14 calendar days**

n = 624

Search Requests by Organization



# Sampling of Website Database Online Access (One Month Snapshot of Activity)

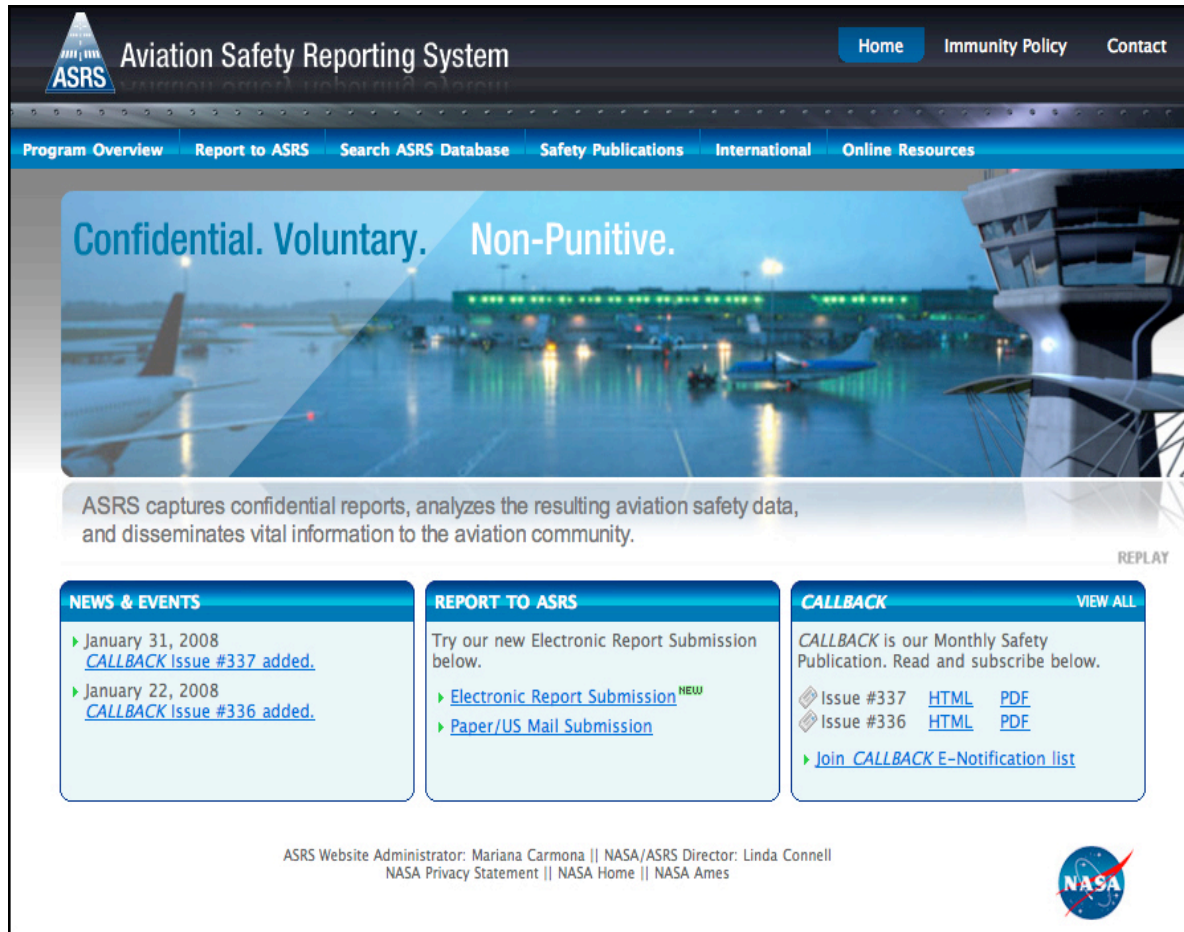


\*A total of 20,514 User Types were Other/Individuals/Unknown.

July 2016



# ASRS Web Site



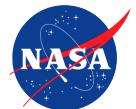
The screenshot shows the ASRS website homepage. At the top left is the ASRS logo. The main header reads "Aviation Safety Reporting System" with navigation links for "Home", "Immunity Policy", and "Contact". Below this is a secondary navigation bar with links for "Program Overview", "Report to ASRS", "Search ASRS Database", "Safety Publications", "International", and "Online Resources". The main content area features a large banner with the text "Confidential. Voluntary. Non-Punitive." over a background image of an airport tarmac at night. Below the banner is a paragraph: "ASRS captures confidential reports, analyzes the resulting aviation safety data, and disseminates vital information to the aviation community." There are three main content boxes: "NEWS & EVENTS" with two entries from January 2008, "REPORT TO ASRS" with links for "Electronic Report Submission" and "Paper/US Mail Submission", and "CALLBACK" with links for "Issue #337" and "Issue #336" in HTML and PDF formats, plus a link to "Join CALLBACK E-Notification list". At the bottom, there is a footer with contact information for the website administrator and director, a NASA logo, and a "REPLAY" button.

- ▶ Launched October 2007
  - Over 10 million sessions in 2008
- ▶ File an ASRS Report
  - Electronic
  - Print and Mail
- ▶ Database Online
- ▶ ASRS Publications
- ▶ Program Information
- ▶ Immunity Policies



<http://asrs.arc.nasa.gov>  
Aviation Safety Reporting System

July 2016



# ASRS Database Online (DBOL)

**How to Search:** ASRS Database Items (Taxonomy)

**Step 1:** Click + to add search items.  
**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]

**Place**

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

**Environment**

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

**Aircraft**

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

**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 [word(s)]

Current Search Items:

Back Run Search

- ▶ DBOL launched August 23, 2006
  - Over 70,000 total online queries completed to date
  - Over 20,966 queries completed in 2009
- ▶ Fixed field and text search capability
- ▶ Data formats (export)
  - MS Word, Excel, CSV HTML
- ▶ Experts version (DBOL II) being proposed



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

Aviation Safety Reporting System

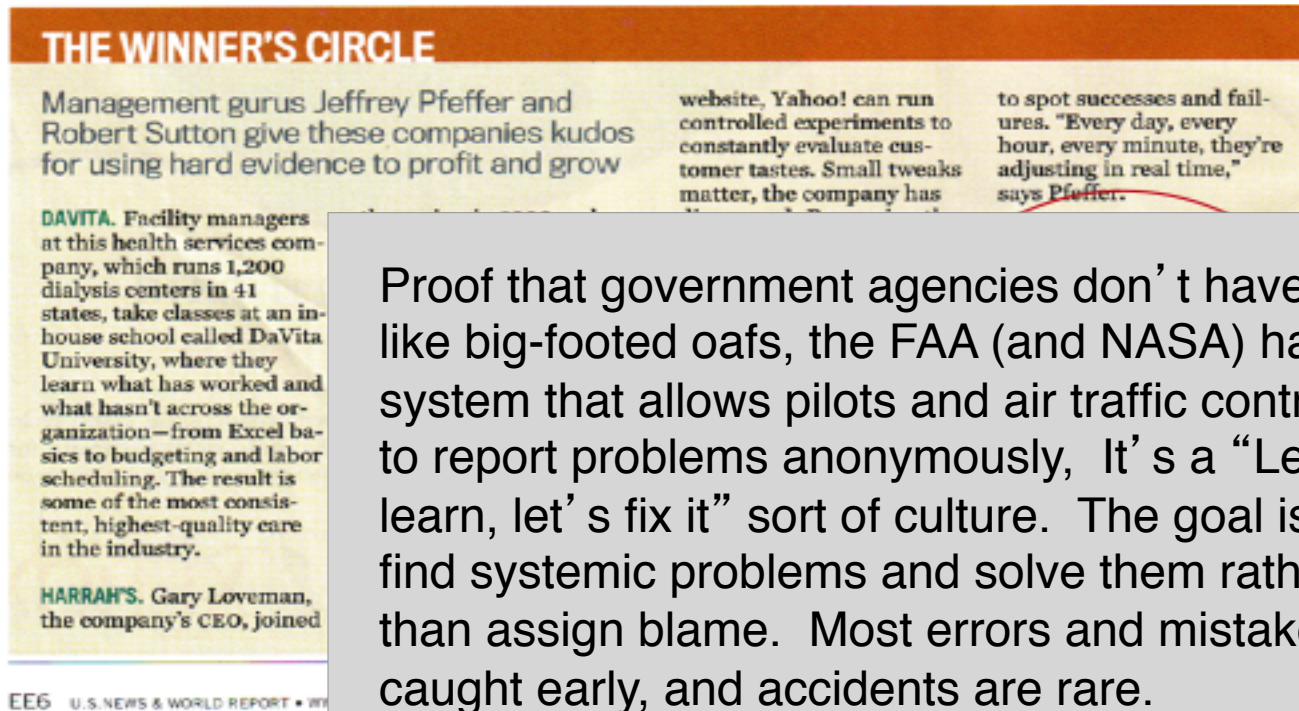
July 2016



# System Recognition for Effectiveness

## US News and World Report 2006 praises system

- FAA credited for a positive, proactive approach to safety



Proof that government agencies don't have to act like big-footed oafs, the FAA (and NASA) has a system that allows pilots and air traffic controllers to report problems anonymously, It's a "Let's learn, let's fix it" sort of culture. The goal is to find systemic problems and solve them rather than assign blame. Most errors and mistakes are caught early, and accidents are rare.

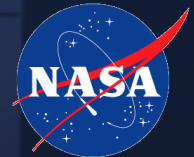




# ASRS Model Applied to Aviation & Other Industries

August 9, 2016

**AVIATION SAFETY  
REPORTING SYSTEM**



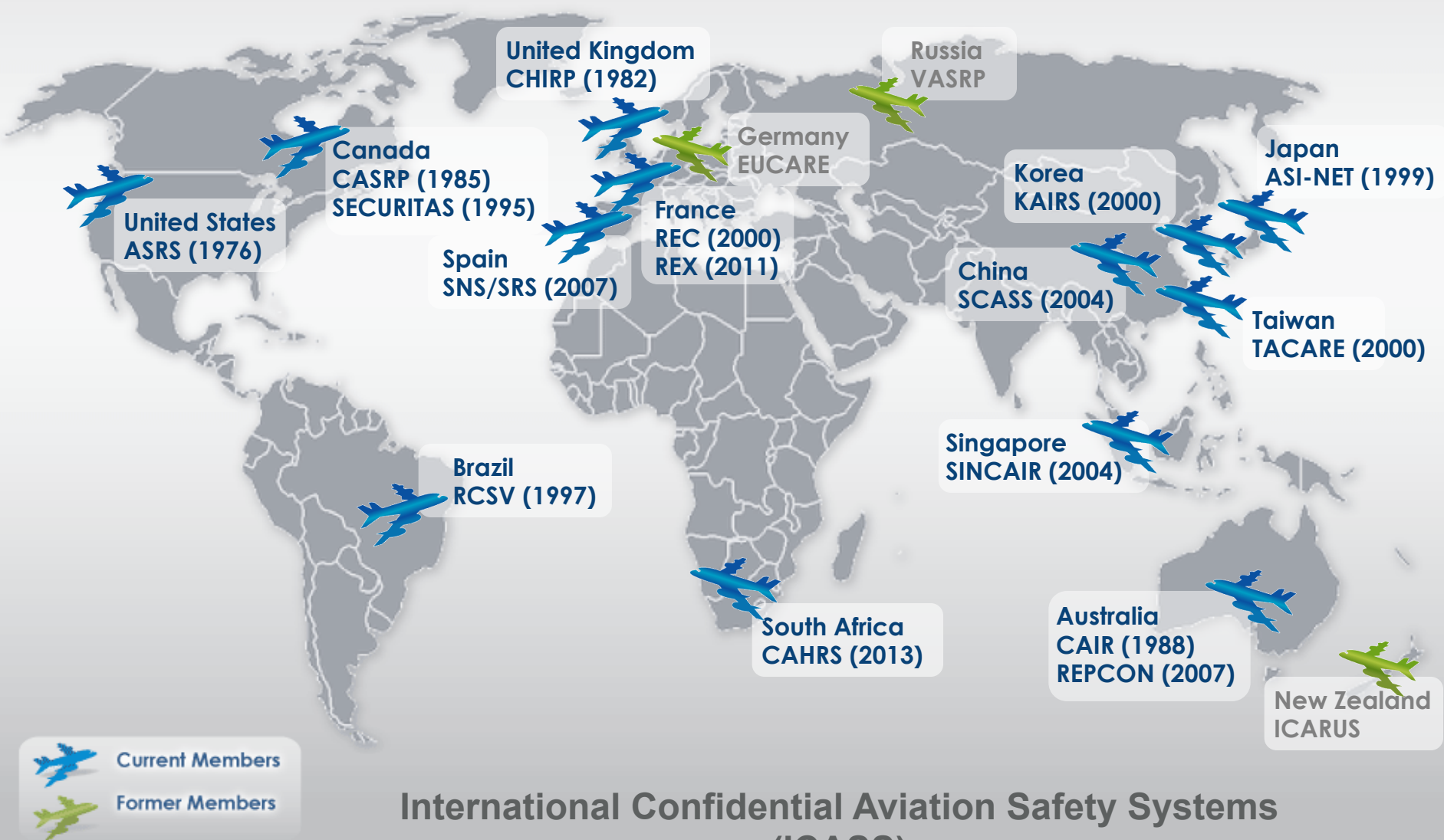


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INTERNATIONAL CONFIDENTIAL  
AVIATION SAFETY SYSTEMS

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# ICASS 2015 Membership



International Confidential Aviation Safety Systems (ICASS)

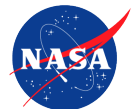
# NASA ASRS and Federal Railroad Administration Interagency Agreement signed on May 21, 2010



## Confidential Close Call Reporting System in the U.S Railroad Industry



Aviation Safety Reporting System



July 2016

# Unique Aspects of ASRS Confidential Reporting Model

*System-Wide Perspective* - capability to identify hazards identified by aviation personnel and match reports from all segments of aviation community

- ASRS was catalyst for recent FAA focus on Teterboro Departures

*System-Wide Alerting* - both national and international capability to provide ASRS Alert Messages to industry and government

*Data Processing through Aviation Expert Analysts*

- ASRS Office staff include Aviation Expert Analysts with a combined total of 380 years of experience in aviation (air carrier pilots, corporate pilots, general aviation pilots, air traffic control, and maintenance)
- Experts read and review 100% of reports and reliably code information to databases

*Comprehensive and Time Tested Coding Taxonomy*

- Fixed Field Codes combined with Narrative Text yields qualitative data for further secondary analysis techniques (Perilog, special studies, focused analytic techniques, etc)



# Unique Aspects of ASRS Confidential Reporting Model

## *Strong Immunity and Legal Provisions*

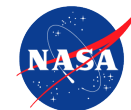
- Federal Law specifically addressing ASRS (14 CFR 91.25)
- FAA Advisory Circular 00-46E
- ASRS Addressed by Congress in 1980' s

## *Information Sharing* - both nationally and internationally with industry and government

- Database Search Requests, Database Publically Available, Topical Studies, Structured Telephone Callback Studies, Collaborations with Industry and Gov' t (FAA, NTSB, NASA, TSA, etc.)
- Largest source of airline ASAP data collected in central location

## *National and International Reputation*

- ASRS Recognized Model for Proactive Contribution to Safety Process
- ASRS Model Being Utilized by Other Domains for Safety Improvements



# CONTACT INFO

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ASRS Program Director  
[Linda.J.Connell@nasa.gov](mailto:Linda.J.Connell@nasa.gov)  
(408) 541-2827

