

# Confidential Safety Incident Reporting: NASA Aviation Safety Reporting System

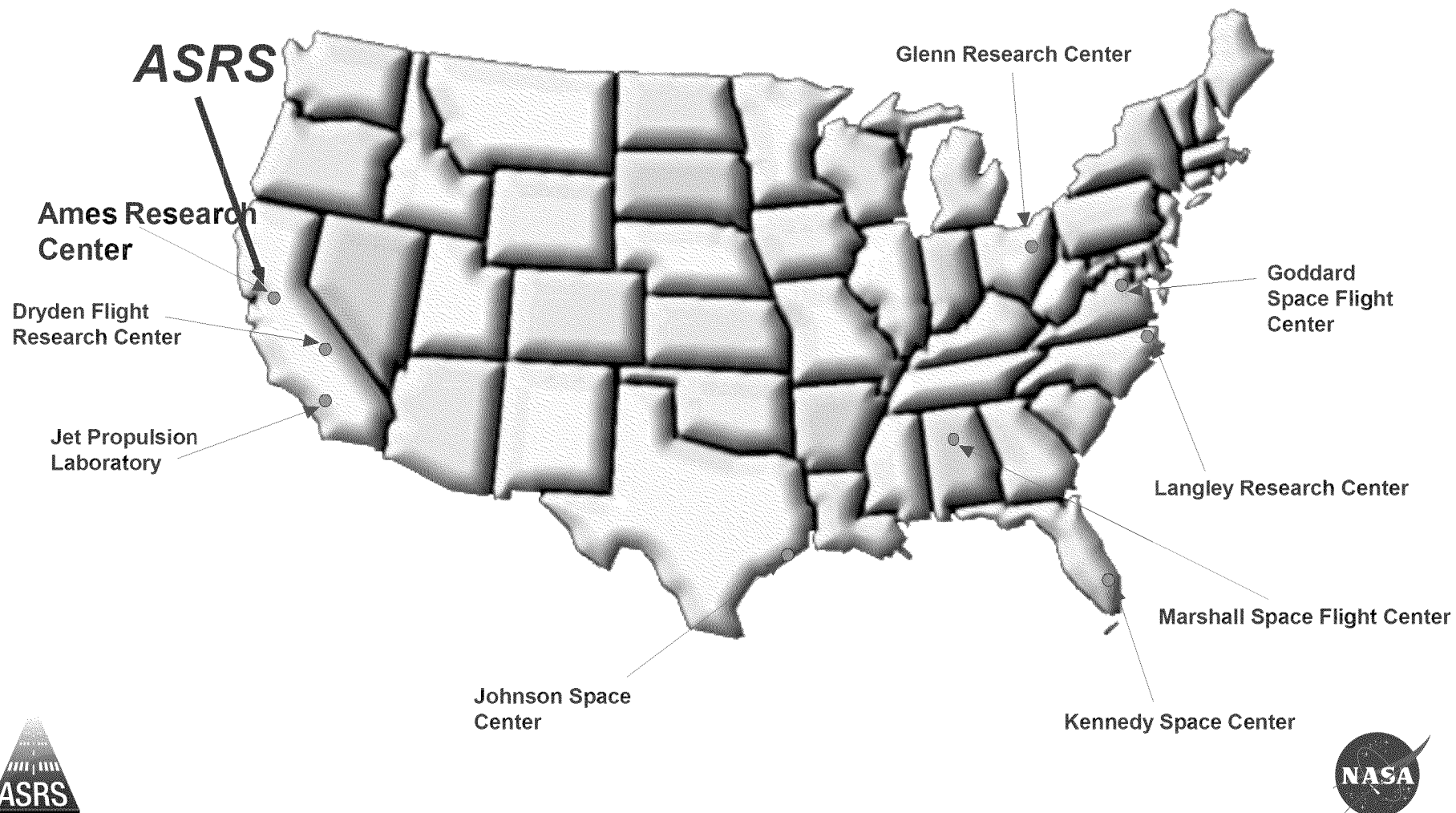
September, 2012

  
**AVIATION SAFETY  
REPORTING SYSTEM**

Linda Connell, NASA ASRS Director  
Human Systems Integration Division  
NASA Ames Research Center

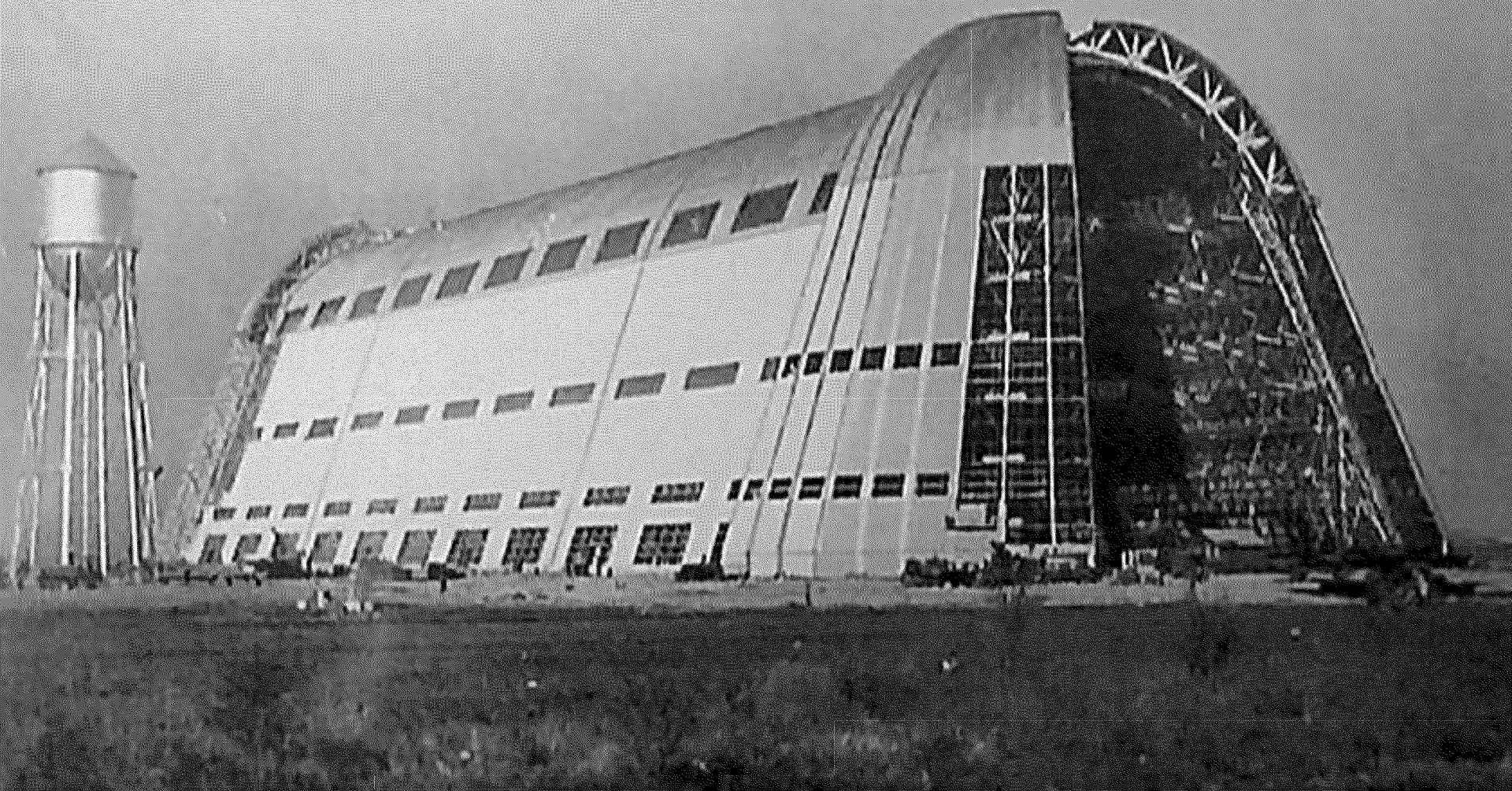


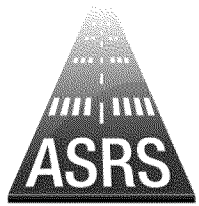
# NASA Aviation Safety Reporting System





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





# ASRS History and Background

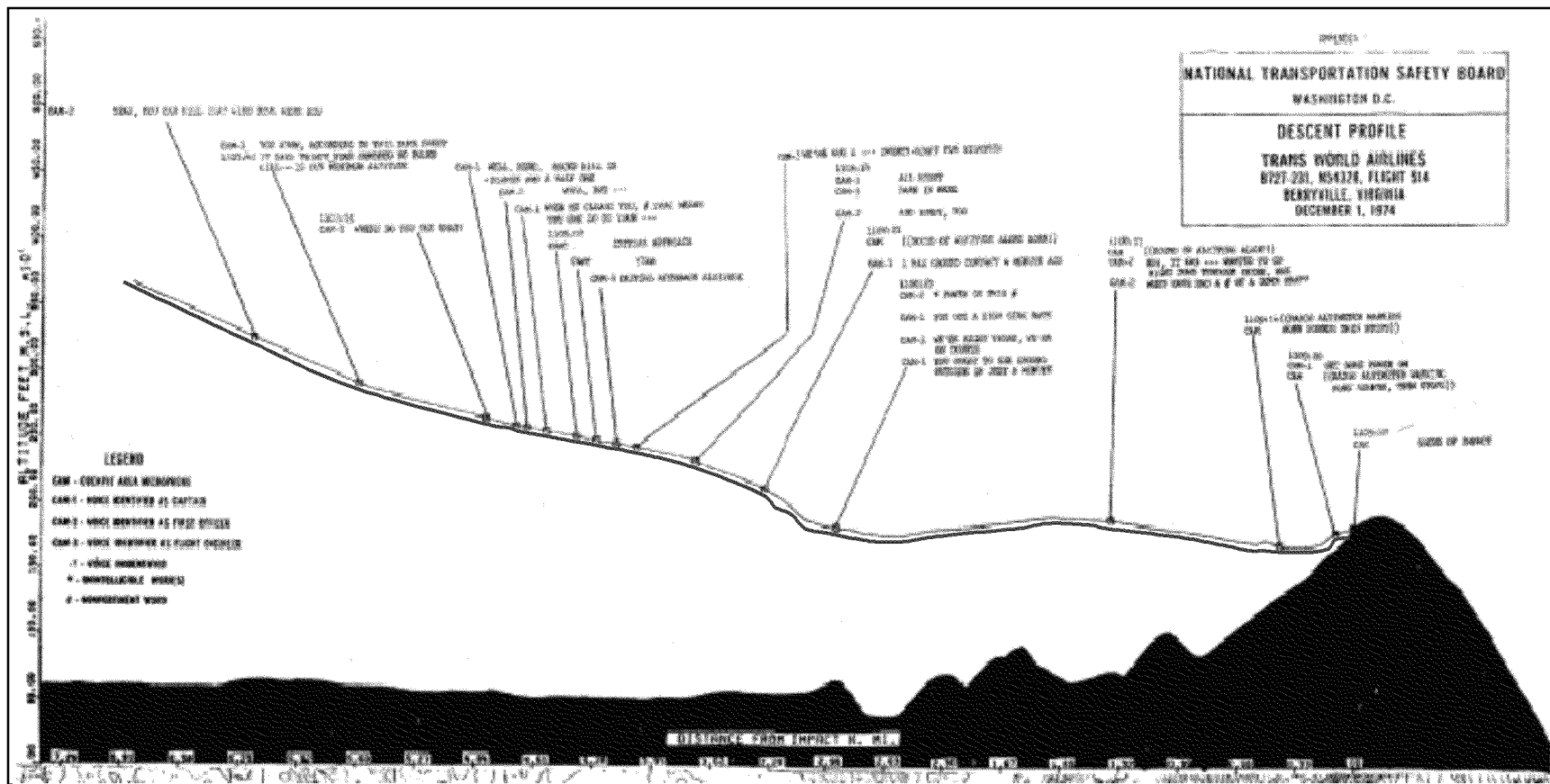
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**AVIATION SAFETY  
REPORTING SYSTEM**





# Aviation Tragedy Leads to Genesis of ASRS

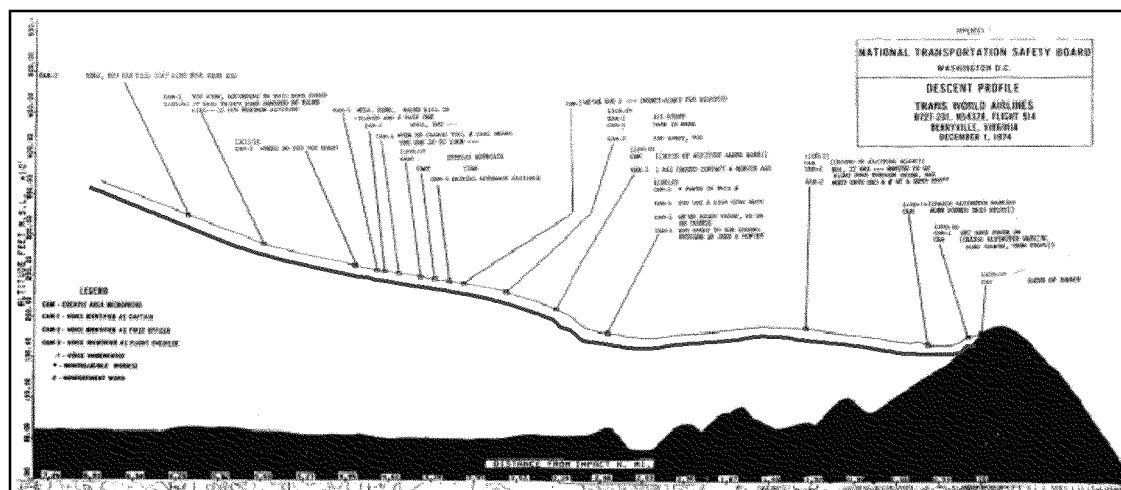


TWA 514, December 1, 1974



# ASRS History

- The ensuing investigation revealed that six weeks prior, a United Airlines crew had experienced an identical ATC misunderstanding and narrowly missed the same mountain.
- 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 national aviation reporting program that would enable information sharing.
- In April 1976, NASA and FAA implemented the Aviation Safety Reporting System (ASRS)



NTSB Identification: DCA75AZ005



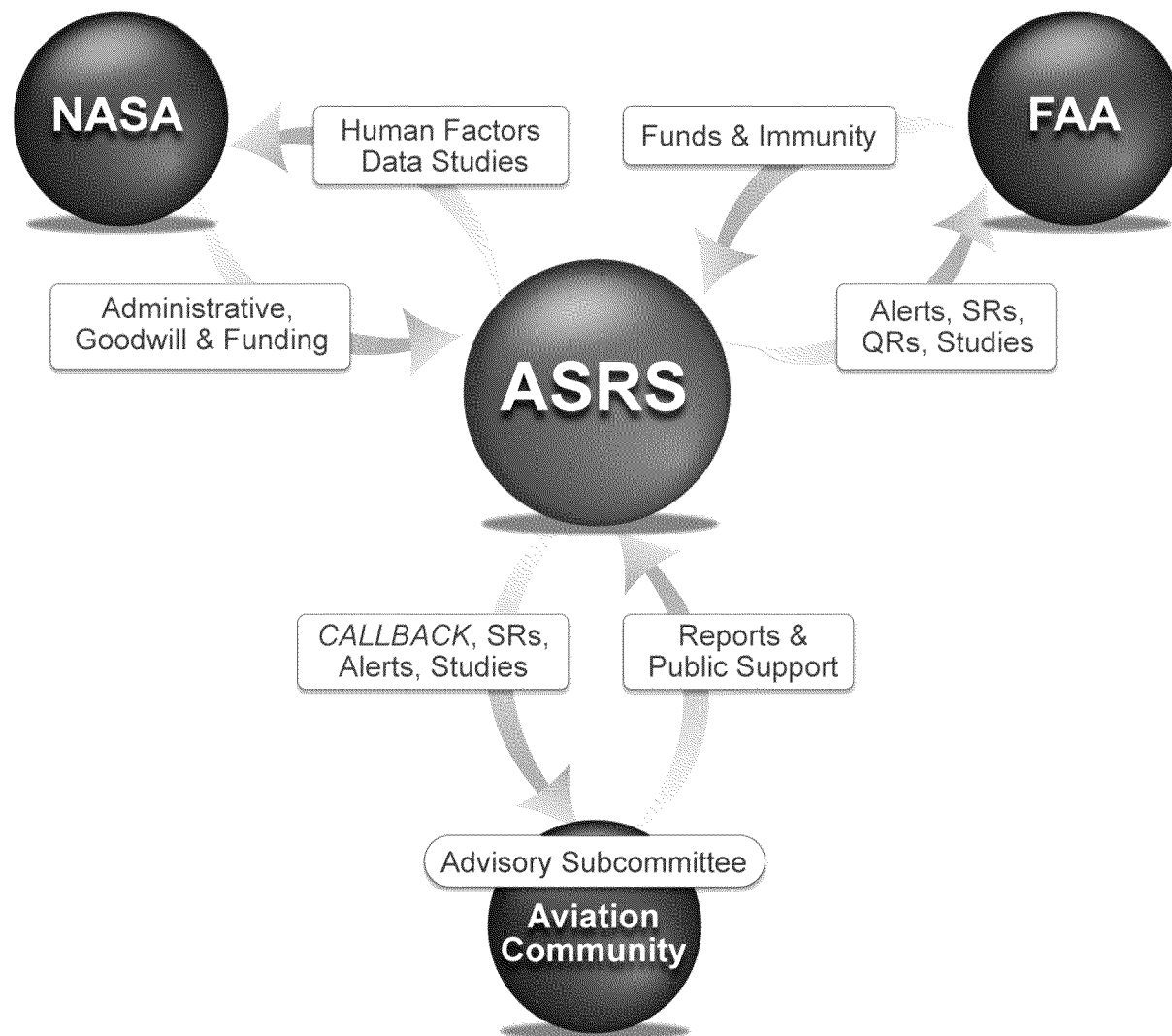
# FAA and NASA Partnership

## 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 Beneficiaries & Providers





# *What is Safety Reporting?*



# 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*

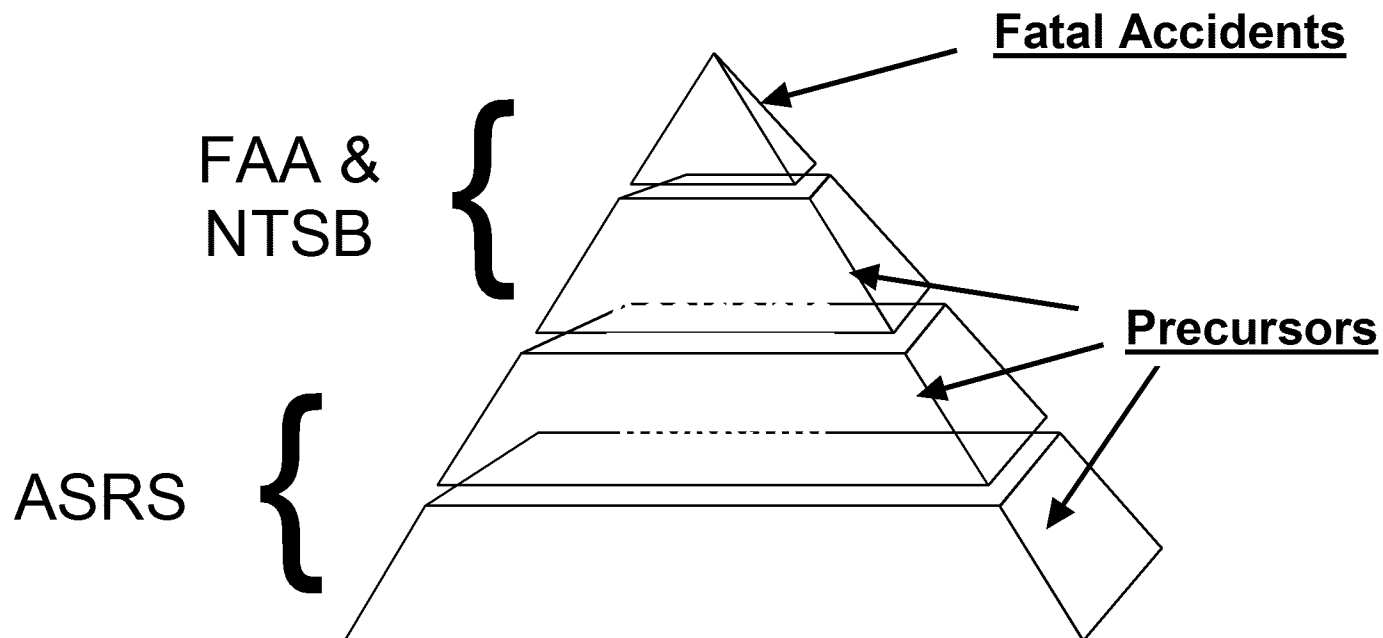
*FAA will not use, nor will NASA provide, any report submitted for inclusion under ASRS guidelines or information derived therein for use in any disciplinary or other adverse action (14CFR91.25 & AC 00-46E)*

## *INDEPENDENT*

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



# System-Wide Event Occurrences

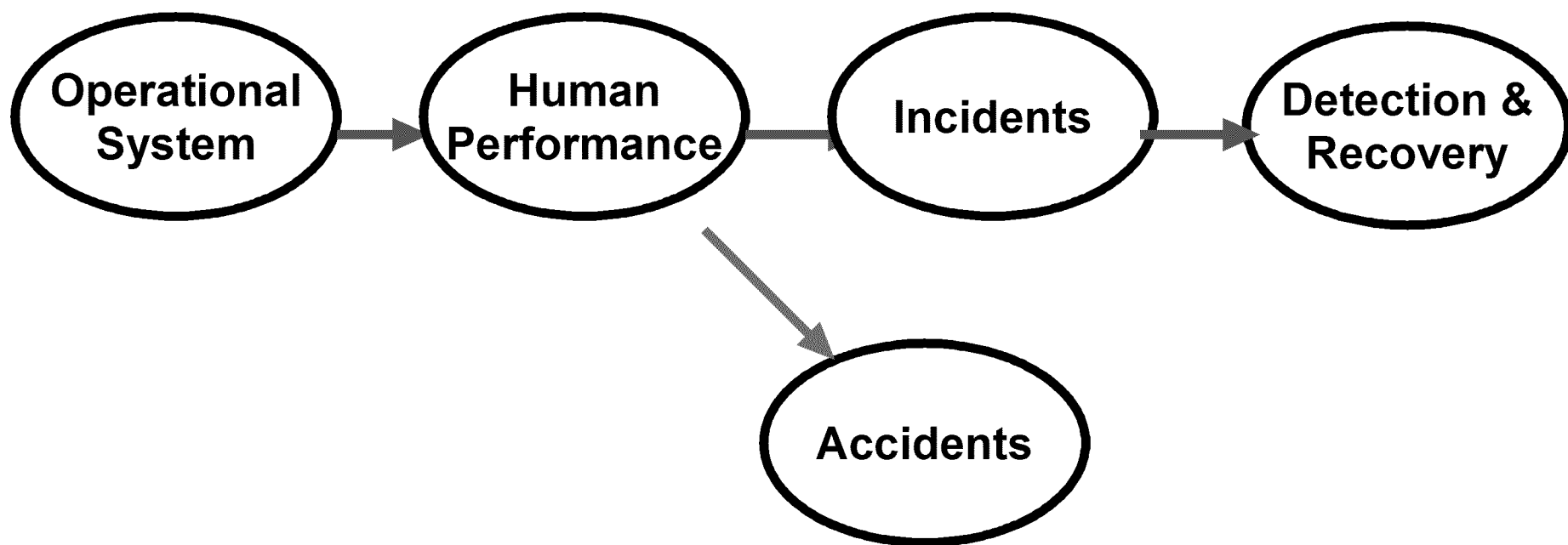


**ASRS is Complementary to  
Other Systems of Reporting**





# Simplified Event Chain



# THE HUMAN FACTOR

## Human Performance Contributions to Errors















# ***Why Safety Reporting is Essential for Safety?***



# 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, independent* reporting system can be used by any person to safely share information

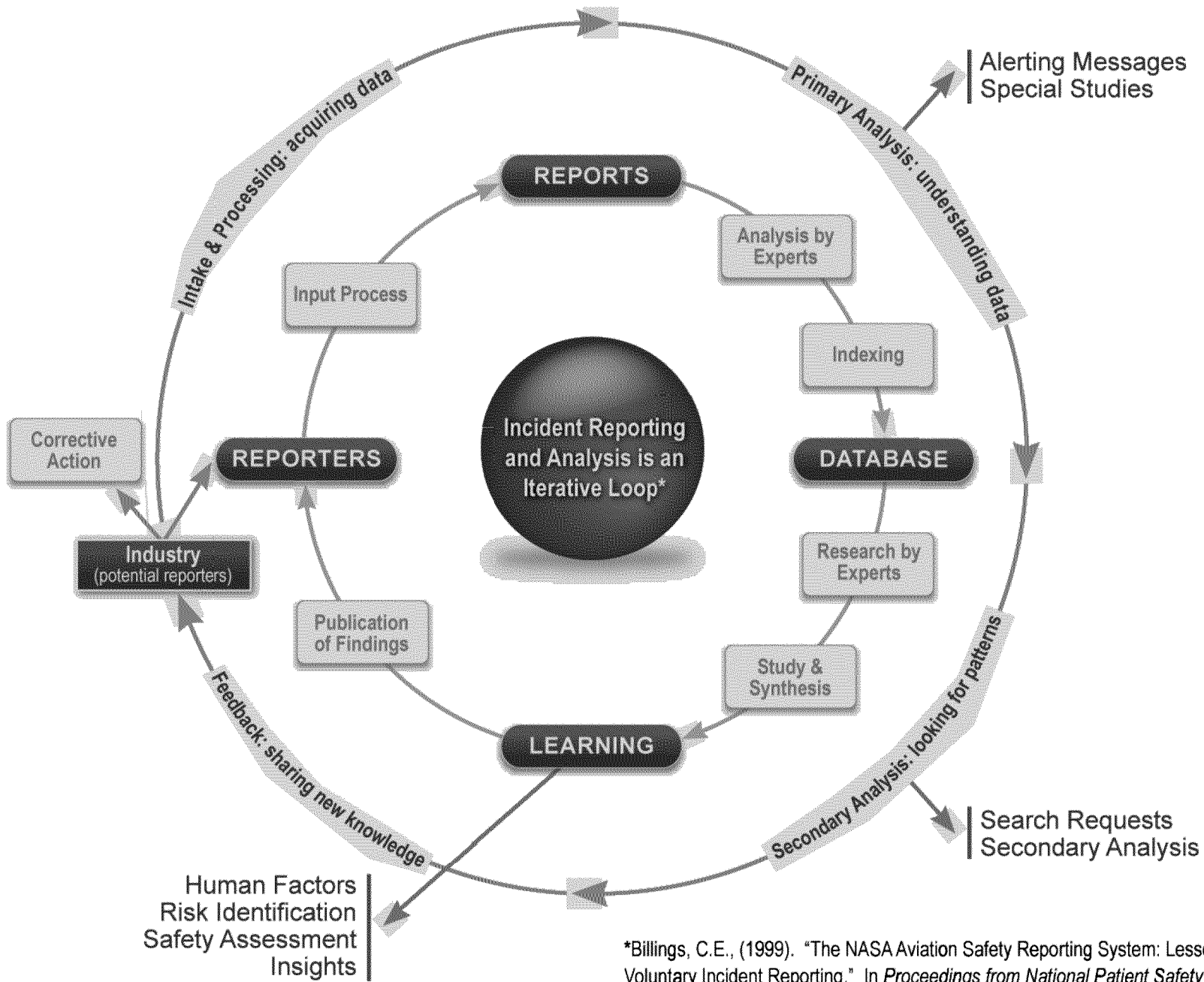


# ASRS Purpose and Mission

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

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



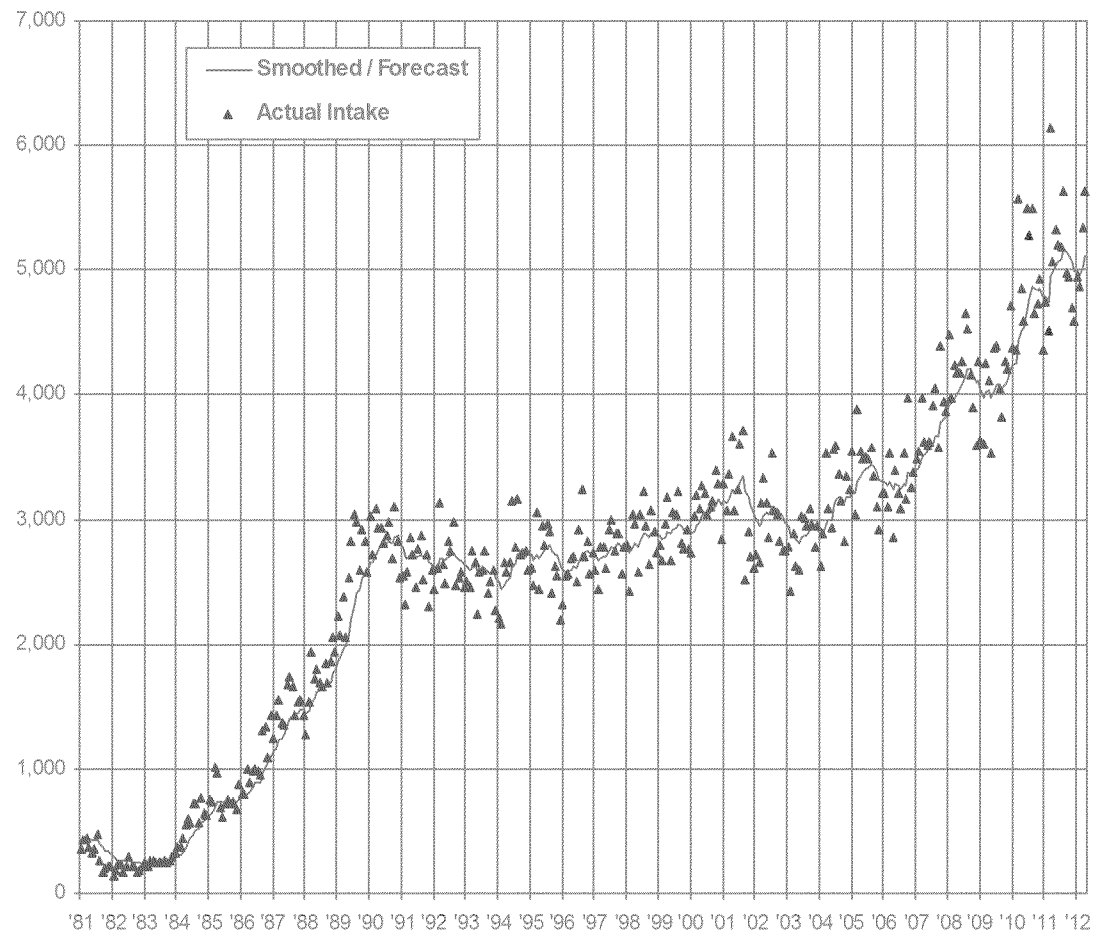


\*Billings, C.E., (1999). "The NASA Aviation Safety Reporting System: Lessons Learned from Voluntary Incident Reporting." In *Proceedings from National Patient Safety Foundation Conference Enhancing Patient Safety and Reducing Errors in Health Care*.

# ASRS Reporting Profile

- ▶ 36 years of confidential safety reporting
- ▶ Over 1,000,000 reports received
- ▶ Over 5,550 alert messages issued
- ▶ Averaging 5,084 reports/mo, 234 per working day
- ▶ TOTAL report intake for 2011 was 61,018
- ▶ 2012 projections to 70,000 reports

Total Intake  
January 1981 – April 2012





# U.S. Aviation Statistics \*

## ■ FAA Aviation Personnel \*

• Pilots	618,707
• Air Traffic Controllers	14,305
• Dispatchers	21,664
• Mechanics	314,931
• Flight Attendants	170,155

## ■ Active Aviation Labor Force \*\*

• Pilots - Commercial/ATP	99,980
• Aircraft Mechanics	35,070
• Flight Attendants	87,190

## Potential Aviation Reporters

TOTAL (Est.) 1,139,795

## Flight Volume \*\*\*

62,000 Flights/Day (Air Carrier, Cargo, Military)

27,178 Flights/Day (General Aviation)



\* July 2012 FAA Certification Database  
\*\* 2011 Bureau of Labor Statistics  
\*\*\* RITA Statistics



# System Recognition for Effectiveness

- US News and World Report 2006 praises system
  - FAA credited for a positive, proactive approach to safety

**THE WINNER'S CIRCLE**

Management gurus Jeffrey Pfeffer and Robert Sutton give these companies kudos for using hard evidence to profit and grow

DAVITA. Facility managers at this health services company, which runs 1,200 dialysis centers in 41 states, take house school University, learn what what hasn't ganization-sics to budg scheduling, some of the tent, highes in the indu

HARRAN'S. C the compan

the casino in 1998 and began running experi-ments that challenged the industry's conventional

website, Yahoo! can run controlled experiments to constantly evaluate cus-tomer tastes. Small tweaks matter, the company has discovered: By moving the search box from the side of the page to the center, Yahoo! found it could pro-

to spot successes and fail-ures. "Every day, every hour, every minute, they're adjusting in real time," says Pfeffer.

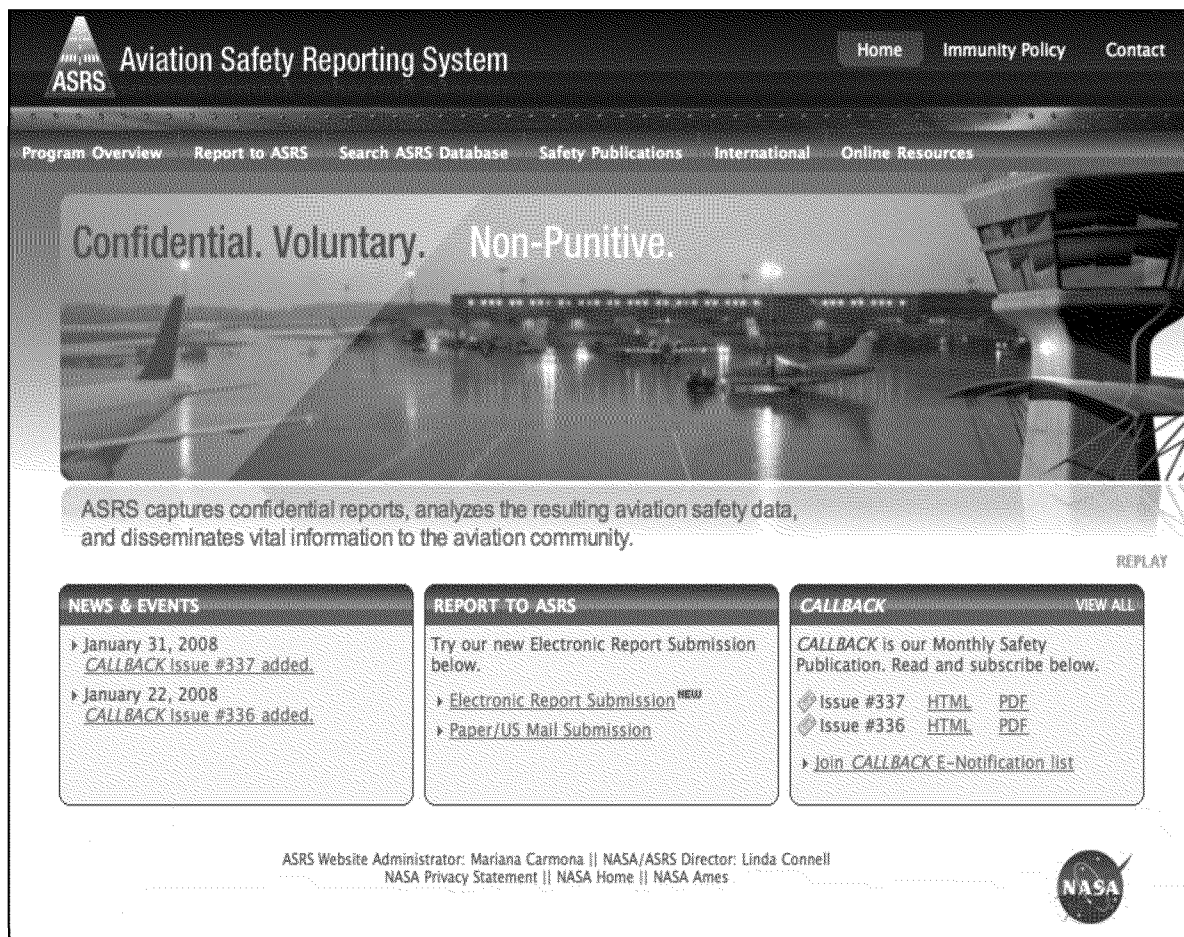
FEDERAL AVIATION ADMINISTRATION. Proof that government agencies don't

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.

EE6 U.S. NEWS &



# 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." and a background image of an airport tarmac. 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" listing dates and "CALLBACK" issue additions; "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". A "REPLAY" link is also visible. At the bottom, there is a footer with contact information for the ASRS Website Administrator and NASA/ASRS Director, along with a NASA logo.

- ▶ 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>



# ASRS Database Online (DBOL)

ASRS Database Online (DBOL) Search Interface

Navigation: [Begin](#) | [Results](#) | [View](#)

Links: [New Search](#), [Help](#), [Contact Support](#)

**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]

**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]

**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 [word(s)]

**Current Search Items:**

Buttons: [Back](#) | [Run Search](#)

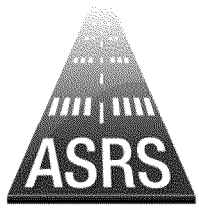
- ▶ DBOL launched August 23, 2006
  - Over 70,000 total online queries completed to date
  - Over 20,966 queries completed in 2009
- ▶ Fixed field and text search capability
- ▶ Data formats (export)
  - MS Word, Excel, CSV, HTML
- ▶ Experts version (DBOL II) being proposed



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







# ASRS Model Applied to Aviation & Other Industries

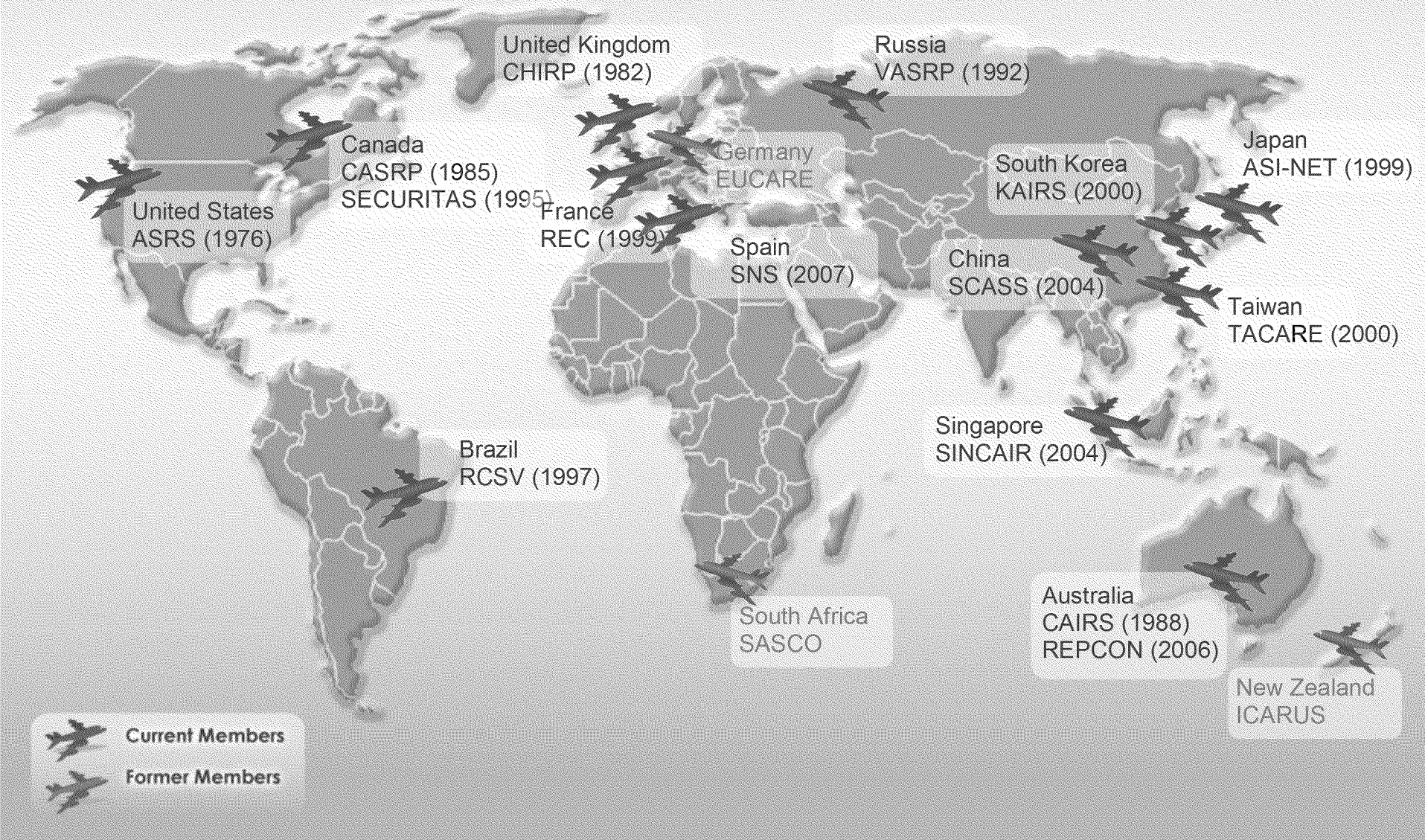
September, 2012

**AVIATION SAFETY  
REPORTING SYSTEM**





# International Confidential Aviation Safety Systems (ICASS)



# ASRS Model Applied to Other Industries

- **Confidential Close Call Reporting System (C3RS)**
  - Railroad Safety Reporting System was modeled after ASRS
  - Under development at NASA ASRS through collaboration with Federal Rail Administration and Volpe National Transportation System Center
- **Fire Fighters Near Miss Reporting System**
  - Launched August, 2005 was modeled after ASRS
  - Development Task Force included FAA and NASA ASRS
- **Patient Safety Reporting System (PSRS)**
  - Dept of Veterans Affairs requested that NASA develop a medical reporting system modeled after the ASRS with external, independent, voluntary, confidential, & non-punitive features
  - FAA and NASA were highlighted in the Institute of Medicine (IOM) report, “To Err is Human” in 2000 which was launched nationwide concerning patient safety efforts.



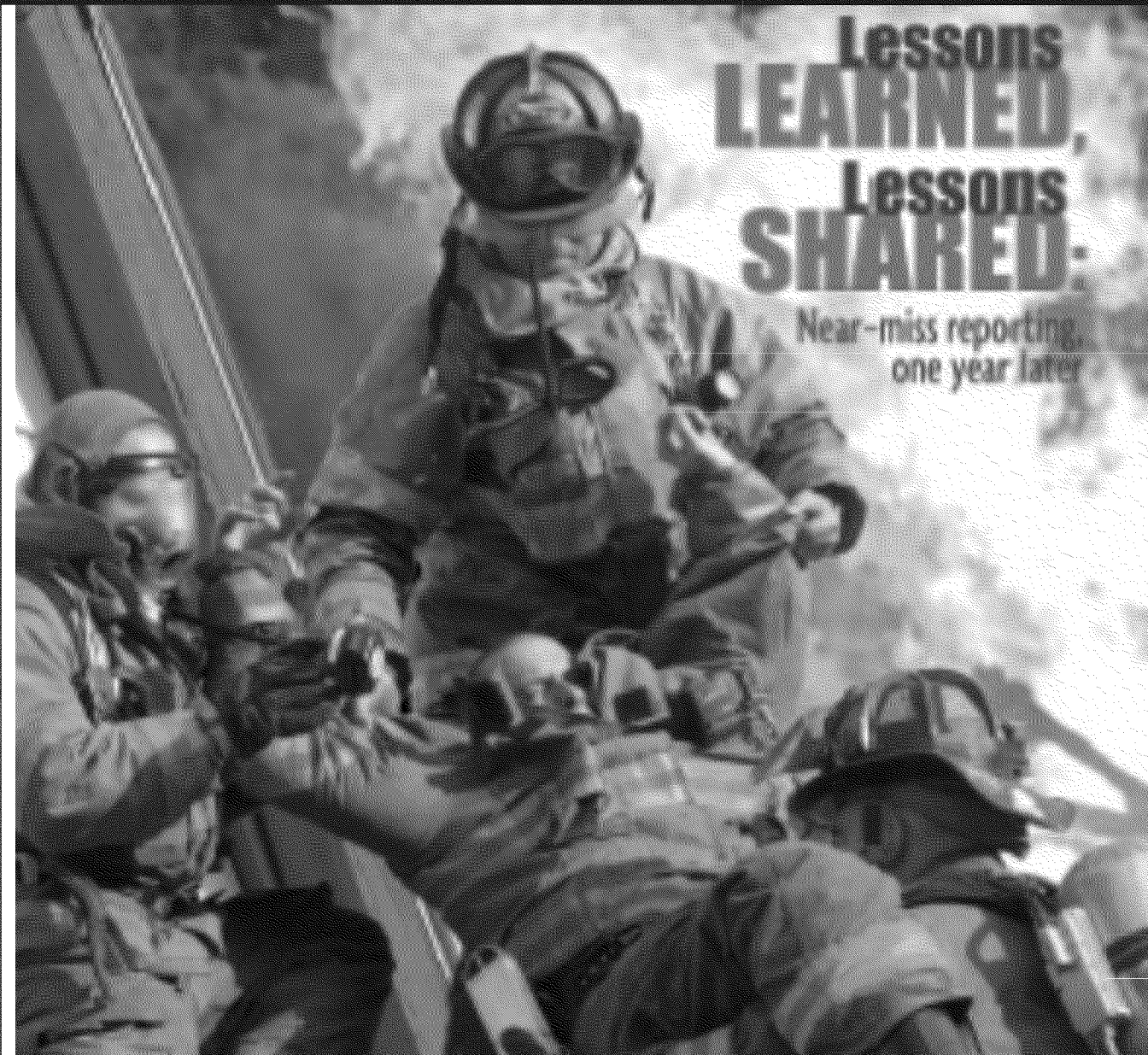
NASA ASRS and Federal Railroad Administration  
Interagency Agreement signed on May 21, 2010



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







# Lessons LEARNED, Lessons SHARED:

Near-miss reporting,  
one year later

An exclusive to firefighters in Firehouse Magazine

FIREHOUSE



*Your Voice Counts!*



**Patient Safety  
Reporting System**

**See It. Report It.  
Make a Difference.**

**VOLUNTARY • CONFIDENTIAL • NON-PUNITIVE**



PSRS is a cooperative program between VA and NASA.





# 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 00-46D
- 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



# Close to Home by John McPherson



"I'm serious! Watch! I hit the left arrow, the plane banks left, hit the right arrow and ..."

## Contact Information:

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(408) 541-2827 ASRS Office

(650) 604-0795 NASA Office

## ASRS Website:

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

