February 2014

Confidential Safety Incident Reporting: NASA Aviation Safety Reporting System

Linda Connell, NASA ASRS Director
Human Systems Integration Division
NASA Ames Research Center
Moffett Field - Hangar One
1932
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)
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.
What is Safety Reporting?
ASRS is Complementary to Other Systems of 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.
ASRS Purposes

**ALERTS**

- Identify Deficiencies and Discrepancies

**PRODUCTS**

- Provide Data for Planning and Improvement
Simplified Event Chain

1. **Operational System**
2. **Human Performance**
3. **Incidents**
4. **Detection & Recovery**
5. **Accidents**
Human Performance Contributions to Errors
March 24, 1989 - The Exxon Valdez runs aground off Alaska, spilling 11 million gallons of Alaska North Slope crude oil.

October 2000 - Oil Tanker runs aground off the Galapagos Islands, endangering fragile ecosystem.
April 26, 1986- Chernobyl Nuclear Power Plant, site of the worst reactor disaster ever. A reactor fire and a massive escape of radioactive materials into the atmosphere.

March 28, 1979- Three Mile Island Nuclear Power Station experiences a partial reactor meltdown.
May 2000 - "Controlled Burn" near Los Alamos, New Mexico consumes over 47,000 acres and destroys 200 buildings.

September 1999 - Mars Climate Orbiter crashes into the planet instead of reaching a safe orbit. The $125 million craft burns up in the Martian atmosphere.
Opss... Forgot to put down the landing gear!
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
Incident Reporting Model

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

ASRS Report Volume Profile

- 37 years of confidential safety reporting
- Over 1,100,000 reports received
- Over 5,550 alert messages issued
- Over 6,700 reports per month, or 322 per working day
- Total report intake for 2012 was 71,540
- Current rate estimate for 2013 is over 80,000
U.S. Aviation Statistics *

- **FAA Aviation Personnel**: 618,707 Pilots, 14,305 Air Traffic Controllers, 21,664 Dispatchers, 314,931 Mechanics, 170,155 Flight Attendants.


**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
Aviation Safety Reporting System

Report Processing Flow

Airline Safety Action Program (ASAP) and Air Traffic Safety Action Program (ATSAP) reports

All reports are routed through a differential processing analysis flow
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 Web Site

- 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
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

February 2014

AVIATION SAFETY REPORTING SYSTEM
International Confidential Aviation Safety Systems (ICASS)

- United States: ASRS (1976)
- United Kingdom: CHIRP (1982)
- Japan: ASI-NET (1999)
- Russia: VASRP (1992)
- South Korea: KAIRS (2000)
- Brazil: RCSV (1997)
- Germany: REC (1999), EUCARE
- Spain: SNS (2007)
- Taiwan: TACARE (2000)
- New Zealand: ICARUS
- South Africa: SASCO

Current Members
Former Members
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
Your Voice Counts!

Patient Safety Reporting System


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)
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
"I'm serious! Watch! I hit the left arrow, the plane banks left, hit the right arrow and ..."
Contact Information:
Linda Connell, NASA ASRS Director
Linda.J.Connell@nasa.gov
(408) 541-2827 ASRS Office
(650) 604-0795 NASA Office

ASRS Website:
http://asrs.arc.nasa.gov