

ASRS Program Briefing



Aviation Safety Reporting System



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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, flight attendants, maintenance technicians, and others. Reports submitted to ASRS may describe both unsafe occurrences and hazardous situations. ASRS's particular concern is the quality of human performance in the aviation 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 & recommendations for future aviation procedures, operations, facilities, and equipment



Reporting Incentives

- ▶ Voluntary
- ▶ Confidential
- ▶ Non-Punitive



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 00-46 Issued
- Apr. 1976** Aviation Safety Reporting System (ASRS) Implemented (NASA/FAA)



Documents Governing ASRS Immunity & Confidentiality

- ▶ Federal Register Notice, 1975 & 1976
- ▶ Federal Aviation Regulations Part 91.25
(14 CFR 91.25)
- ▶ FAA Advisory Circular Number 00-46D
- ▶ FAA policy concerning Air Traffic Controllers
regarding ASRS reporting, FAA Order JO 7210.56C



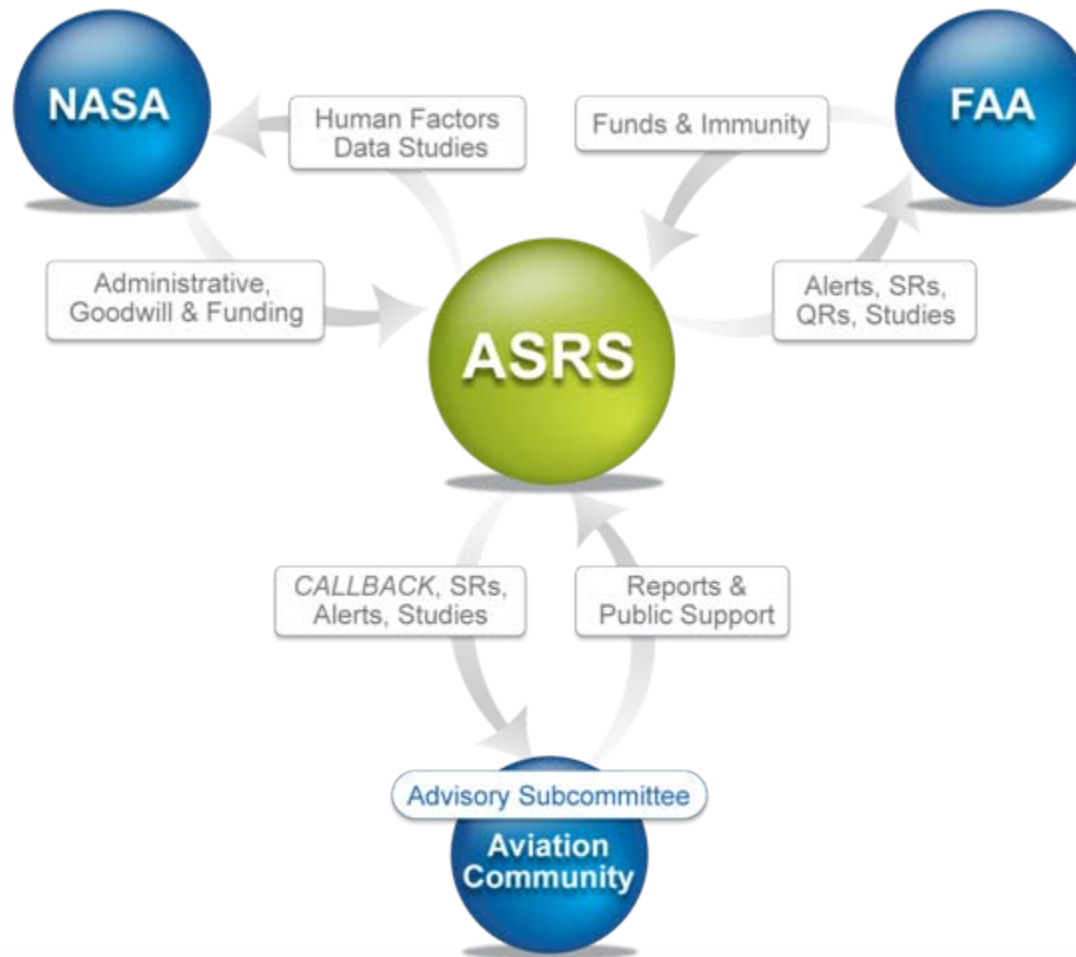
The Immunity Concept

(Paragraph c. FAA Advisory Circular AC No. 00-46D)

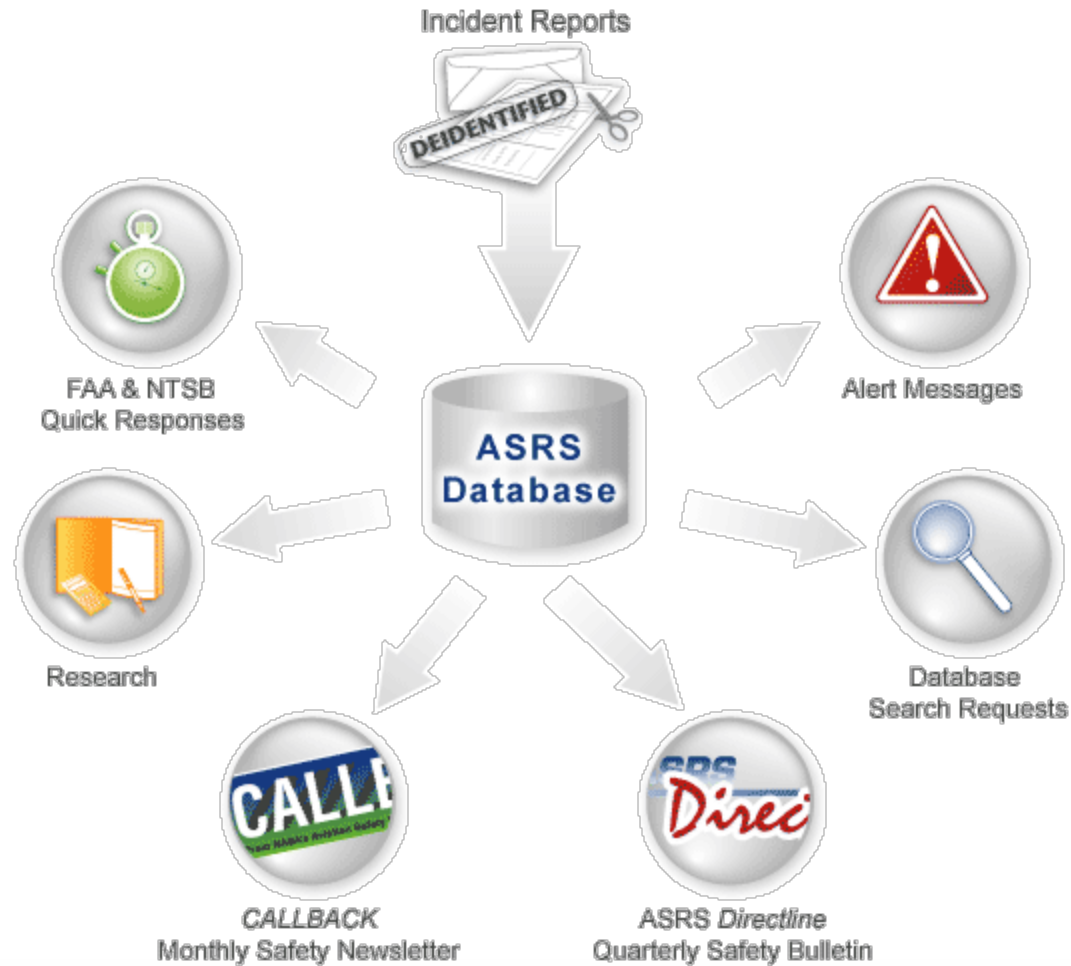
- c. The filing of a report with NASA concerning an incident or occurrence involving a violation of 49 U.S.C. Subtitle IV, or the FAR, is considered by FAA to be indicative of a constructive attitude. Such an attitude will tend to prevent future violations. Accordingly, although a finding of a violation 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, or accident, or action under 49U.S.C. Section 44709 which discloses a lack of qualification or competency, which are 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 VIII, or any regulation promulgated there for a period of 5 years prior to the date of the occurrence; and
 4. The person proves that, within 10 days after the violation, he or she completed and delivered or mailed a written report of the incident or occurrence to NASA under ASRS. See paragraphs 5c and 7b. NOTE: Paragraph 9 does not apply to air traffic controllers.



ASRS Beneficiaries & Providers



ASRS Products & Services



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 200 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 100,000 hours in over 50 different aircraft.

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



ASRS Metrics

April 1976 – December 2010

Significant Items	Quantity
Incident Reports Received	Over 927,104
Safety Alert Messages Issued	5,289
Search Requests	7,356
<i>CALLBACK</i> Safety Bulletins	371
<i>ASRS Directline</i> Issues	10
Major Research Studies	63



Report Processing



Report Intake Overview

ASRS receives reports from pilots, air traffic controllers, cabin crew, dispatchers, maintenance technicians, and a variety of other individuals.

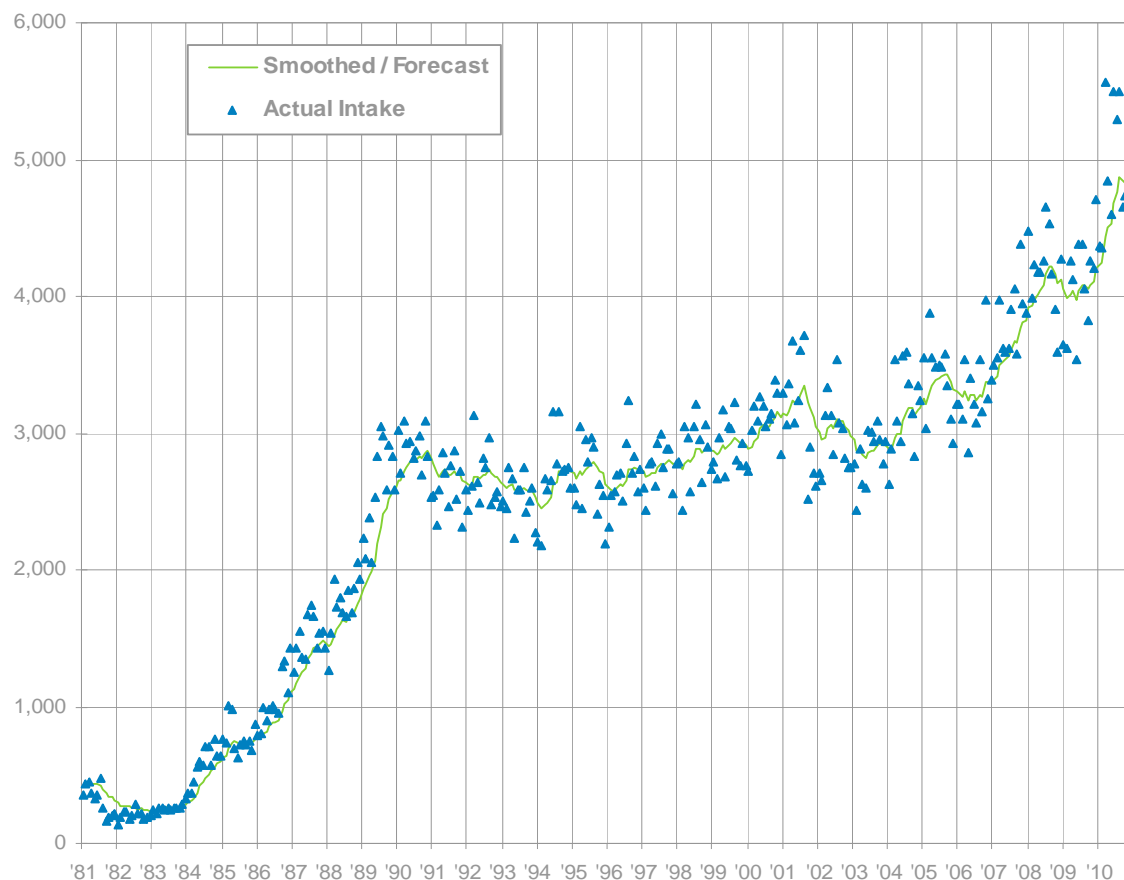
ASRS's report intake has been robust from the first days of the program, in which it averaged approximately 400 reports per month. In recent years, report intake has grown at an enormous rate. Intake now averages 1,222 reports per week and more than 4,890 reports per month.



Monthly Report Intake

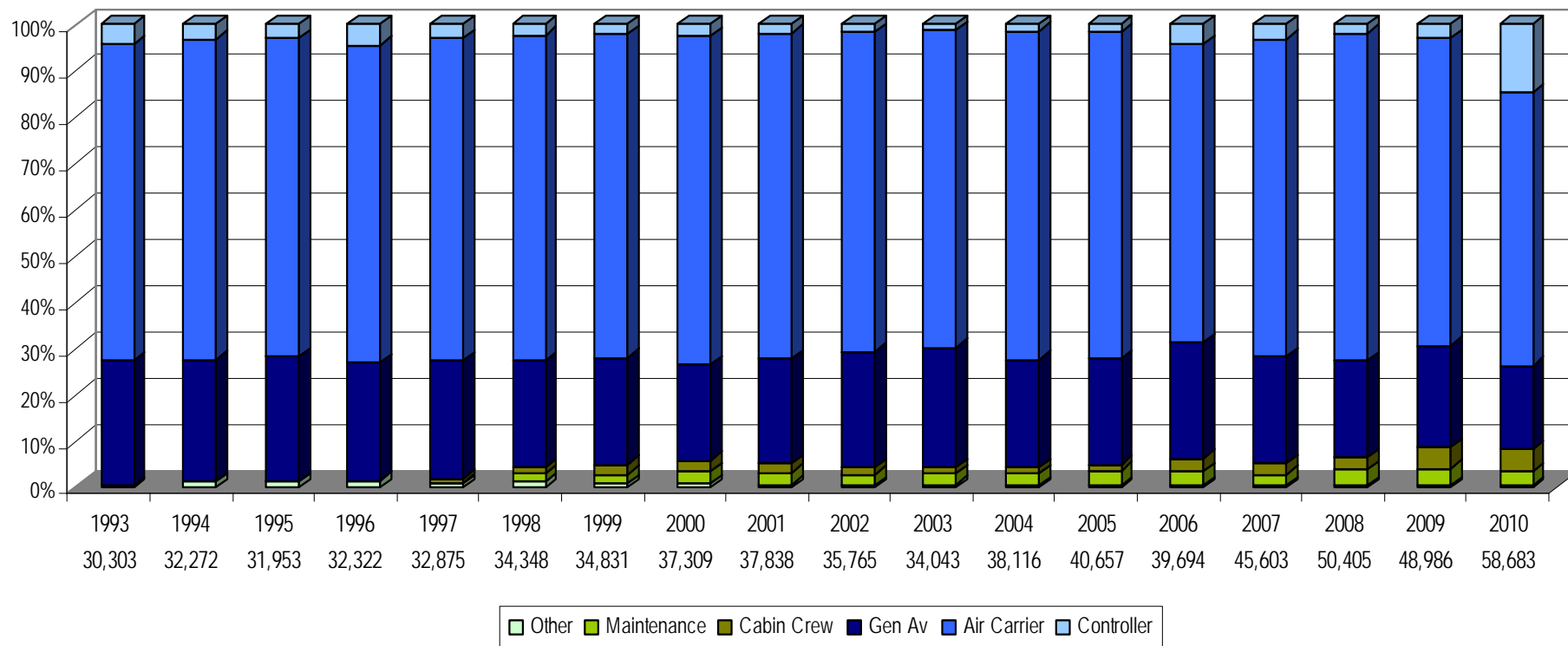
- An increase of 179% since 1988
- Averaging 4,892 reports per month, 190 per working day
- Total Report Intake for 2010 = **58,683**

January 1981 – December 2010



Incident Reporter Distribution

January 1993 – December 2010



Report Processing Overview

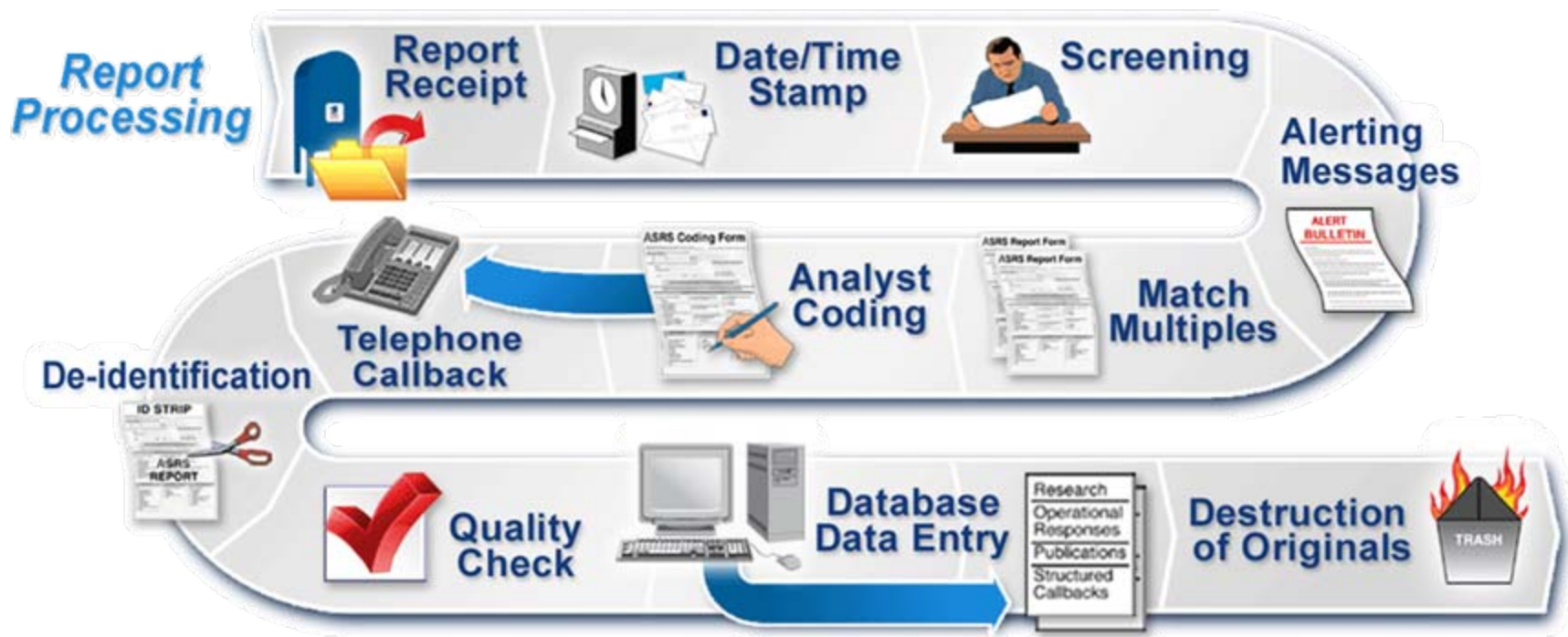
ASRS report processing begins with the receipt of the report from either the post office or electronic submission and ends with the final coded report either entering the ASRS Database or filed. Intermediate steps include:

1. Screening reports for actionable hazards,
2. De-identification of reports to protect reporter confidentiality,
3. Matching multiple reports, and
4. Codification and analysis.

These activities result in the ASRS Database which is widely regarded as one of the world's largest sources of information on aviation safety and human factors.



Report Processing Flow



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 individuals in a position of authority so that they can evaluate the information and take needed corrective actions.

ASRS has no direct correction authority of its own. It acts through, and with the cooperation, of others.



ASRS Alerting Pyramid



Alerting Metrics

January 1999 – December 2010

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Alert Messages Issued	78	87	88	61	115	157	79	75	63	40	30	43
FYI Notices Issue	75	168	190	151	99	147	129	117	279	235	206	222
Response Rate to AB/FYI	35%	26%	24%	25%	28%	36%	32%	35%	49%	46%	38%	34%
Response Rate Non-Manufacturer	75%	42%	32%	32%	38%	82%	45%	55%	64%	55%	26%	36%



Alerting Subjects

January 1999 – December 2010

Subject	Total
Aircraft Systems	968
Airport Facility Status and Maintenance	509
ATC Operations	336
Other	259
ATC Procedures	184
Airport Lighting and Approach Aids	168
ATC Equipment	137
Hazards to Flight	133
Aircraft Powerplants	114
Navigation	70
Aircraft Avionics	57



Alerting Responses

January 1999 – December 2010

Response	Percentage
Action taken as a result of the AB/FYI	28%
Action initiated in response to AB/FYI but not completed	12%
Action initiated before AB/FYI was received	11%
Issue raised by AB/FYI under investigation	6%
Addressee in factual agreement but sees no problem	6%
Addressee agrees with AB/FYI but is unable to resolve	3%
Addressee disputes factual accuracy of AB/FYI	18%
Information in AB/FYI insufficient for action	9%
Action not within addressee's jurisdiction	4%
For information only, no response expected	4%



Examples of Safety Alerting Success

▶ **YIP Airport Operations/Security Manager (FYI 2010-179)**

- A YIP Airport Operations/Security Manager responded and stated N90 TRACON Support Manager for Quality Assurance responded and stated *"I have been given a Safety Notification from your division...regarding poor alignment of our Runway 23L VASI. I just wanted to advise you that our FAA Tech Operations team also received this notification and expedited its correction. It was immediately aligned and Flight Checked on October 28, 2010."*

▶ **Interference on ZOB Frequency 120.45 (FYI 2010-26)**

- A ZOB ARTCC AT Manager responded and stated *"The situation described on this alert was eliminated by replacing 120.45 with frequency 134.65. No further interference has since been reported."*

▶ **CYYC Airside Compliance Coordinator (FYI 2010-43)**

- A CYYC Airside Compliance Coordinator responded and stated *"The alert sent by NASA...provided sufficient detail in the pilot's report of the situation to form the basis for an investigation conducted under our Safety Management System. This incident and the hazard alert have led us to discover several other occurrences of a similar type. As a result, changes to the naming, pavement marking, signage, and publication details of this area have been initiated..."*

▶ **Bethel Airport Manager (FYI 2010-21)**

- An FAA South Region Airport Certification and Safety Inspector responded and stated *"I received your message regarding BET Airport Runway Information Notification Timeliness. Thank you for forwarding it to me... I'm working on bringing BET procedures in line with the other Airports in our region. This report will help me convey the need to modify procedures to the local staff."*



Database Search Requests



Database Search Requests

- ▶ Information in the ASRS Database is available publicly. The ASRS will provide Search Requests to government agencies, members of Congress, aviation safety organizations, and others. ASRS will search its database, download relevant reports, and send to requestor.
- ▶ However, direct access to search de-identified reports in the ASRS Database is now available online through the ASRS website, <http://asrs.arc.nasa.gov/search/database.html>.
- ▶ For your convenience, selected relevant reports on several safety topics are available on the website called ASRS Database Report Sets. (<http://asrs.arc.nasa.gov/search/reportsets.html>)
- ▶ The ASRS Database is also available through the FAA Aviation Safety Information Analysis and Sharing (ASIAS) website at <http://www.asias.faa.gov/> which is updated monthly.



Search Request Metrics

- ▶ Since the inception of ASRS, over 7,356 Search Requests (SRs) have been directly provided by ASRS Research Staff to various aviation organizations and agencies, as well as individuals through December 2010.
- ▶ The activity on the ASRS website for Database Online is over 1,515 completed queries a month.
- ▶ From the ASRS website, over 2,950 Database Report Sets are downloaded a month (Database Report Sets were first posted on January 15, 2000).



Utilization of the Search Request Program

Number of Search Requests Completed per Year January 1998 – December 2010

Year	SR's Completed
1998	391
1999	330
2000	222
2001	151
2002	118
2003	102
2004	140

Year	SR's Completed
2005	127
2006	116
2007	76
2008	76
2009	51
2010	39
Total	1,939



Search Requestors by Organization

January 1998 – December 2010

Organization	Total
FAA	525
Media	219
Alphabet Groups	167
NASA	145
Air Carriers	143
NTSB	114
Students	113
Individuals	105
Research Organizations	90

Organization	Total
Foreign	61
Other	61
Miscellaneous Government	45
Aircraft Manufacturers	40
Educational Institutes	38
Military	36
Miscellaneous Safety Organizations	33
Law Firms	24
DHS	3



Recent Notable Search Requests

- ▶ **Airbus A330 Reports (SR 6977)**
 - For the NTSB Office of Accident Investigation.
 - Follow up to the May 12, 2010 Tripoli, Libya accident.

- ▶ **Air Carrier Flight Crew Related Incidents (SR 6998)**
 - Completed for CBS News.

- ▶ **Passenger Misconduct Related Incidents (SR 6992)**
 - Completed for the Department of Transportation (OIG).

- ▶ **EWR Airport Reports (SR 6994)**
 - For an Air Carrier introducing a new route into EWR. Reports used for pilot training purposes.



Quick Responses



Quick Response Overview

Quick Responses are rapid turnaround data analysis 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 the FAA, NTSB, NASA, and U.S. Congress.



Recent Quick Response Applications

- ▶ An Analysis of Maintenance Personnel Incidents (QR332)
- ▶ An Analysis of FAA Part 121, Part 135 and Part 91 Winter Weather Related Incidents (QR333)
- ▶ An Analysis of FAA Part 121, Part 135 and Part 91 Winter Weather Related Incidents (QR334) *[Update]*
- ▶ An Analysis of Pilot to Controller Communication Incidents (QR335)



CALLBACK



CALLBACK Overview

- ▶ *CALLBACK* is ASRS's award-winning monthly safety bulletin that began publication in 1979. It has an estimated readership of more than 50,000. Over 370 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:

<http://asrs.arc.nasa.gov/publications/callback.html>



CALLBACK is a hit with the Aviation Community

▶ Winner of four major aviation industry awards:

- Flight Safety Foundation (1981)
- Aviation/Space Writers Association (1982)
- Flight Safety Foundation (1987)
- Aviation/Space Writers Association (1992)

▶ Sample reader comments from 2010:

- *“Issue 363 was the best one you guys have ever published. I thought it was just me arguing...over GPS approach procedures!”*
- *“I’ve read your newsletter for years, but this last issue on IFR procedure turns was EXCELLENT. I’m a low time (or part time) IFR pilot who would be too scared to ask for clarification as it might imply that I didn’t know what I was doing. Now, I’ll have no trouble querying ATC on procedure turn vs Straight in. Keep up the good work.”*
- *“First, I love CALLBACK, think it is consistently really well done, and very glad it has been adapted to Internet delivery rather than just being discontinued as a print item. Bravo!... Your main point is of course the overriding one: when in doubt, ask. Better to sound foolish than to get dead!”*
- *“Excellent topic on CALLBACK 369 about EFBs! But, if possible, I would kindly exhort you to publish the GOOD of EFBs now that you have reviewed the Bad and the Ugly already. Keep up the great work you are doing!”*



ASRS Directline



ASRS Directline Overview

- ▶ *ASRS Directline* is another award-winning ASRS publication. Although not currently published, this safety journal had an estimated readership of 20,000. Ten issues have been published since 1991 with an average of three to five articles per issue. All issues are available for download at the ASRS website at:



<http://asrs.arc.nasa.gov/publications/directline.html>

- ▶ The feasibility of producing this publication in the near future is being assessed.

ASRS Research



ASRS Research Focused on Operations and Human Factors

- ▶ 63 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, dating from 1985 to the most recent. Activity is over 2,700 downloads a month.



Published ASRS Research Projects

Topic	Total
Flight Operations	31
Flight Crew/ATC Interactions	13
Air Traffic and Airspace Design	6
Other Operations	4
Airspace Use	4
Other	5



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.

Because of the success of ASRS, there is also a growing interest in utilizing the ASRS reporting model for application to other disciplines such as medicine, railroad, maritime, security, and others.

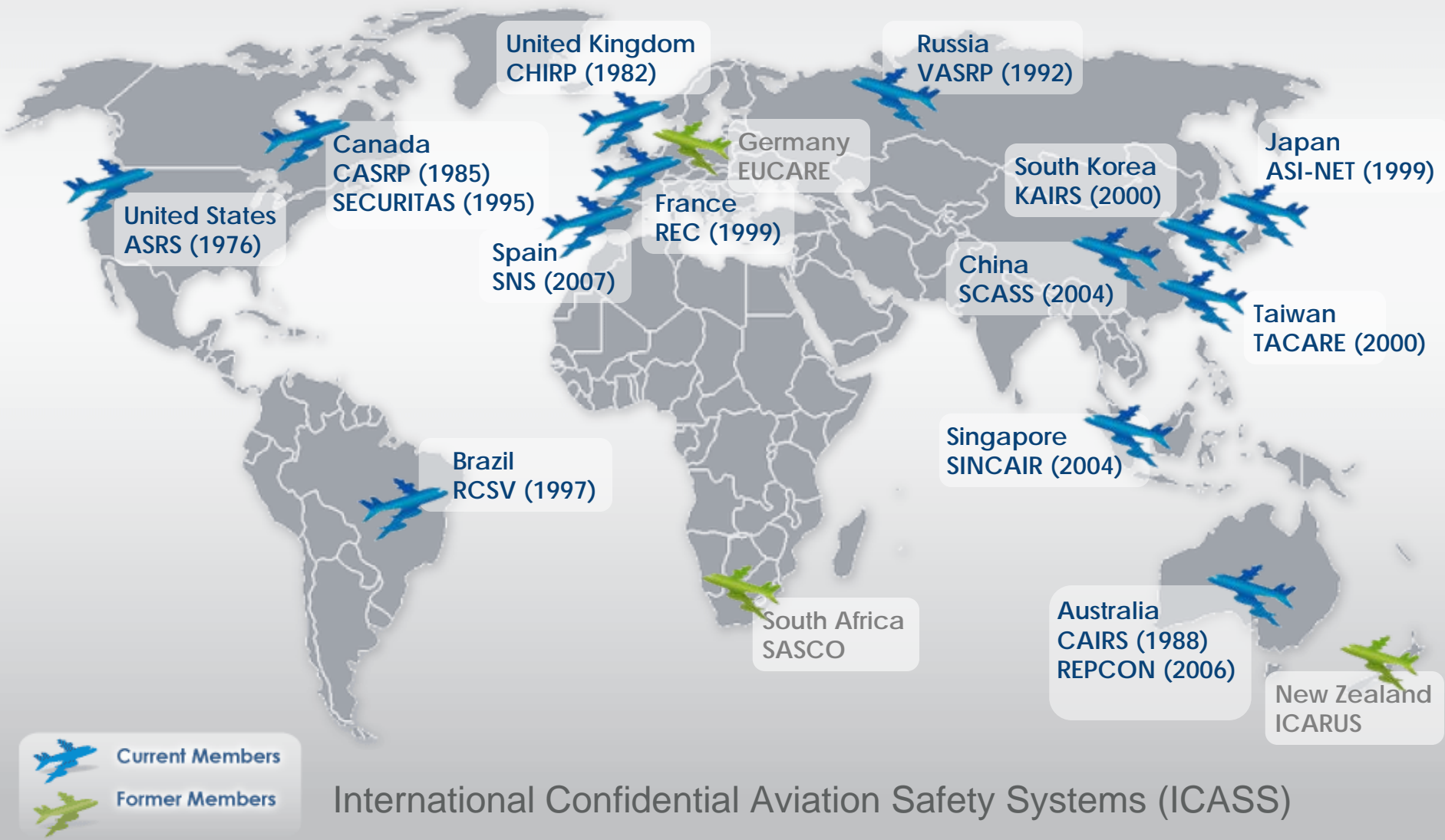


ASRS Model Applied to International Aviation Community

- ▶ **UNITED STATES:** Aviation Safety Reporting System (ASRS) [1976]
- ▶ **UNITED KINGDOM:** Confidential Human Incident Reporting Program (CHIRP) [1982]
- ▶ **CANADA:** CASRP [1985], SECURITAS [1995]
- ▶ **AUSTRALIA:** CAIR [1988], REPorting CONfidentially (REPCON) [2006]
- ▶ **RUSSIA:** Voluntary Aviation Safety Reporting System (VASRP) [1992]
- ▶ **BRAZIL:** Flight Safety Confidential Report (RCSV) [1997]
- ▶ **JAPAN:** Aviation Safety Information Network (ASI-NET) [1999]
- ▶ **FRANCE:** Confidential Environment for Reporting (REC) [1999]
- ▶ **TAIWAN:** TAIwan Confidential Aviation REporting System (TACARE) [2000]
- ▶ **KOREA:** Korean Aviation Incident Reporting System (KAIRS) [2000]
- ▶ **CHINA:** Sino Confidential Aviation Safety System (SCASS) [2004]
- ▶ **SINGAPORE:** SINGapore Confidential Aviation Incident Reporting (SINCAIR) [2004]
- ▶ **SPAIN:** Spanish Safety Reporting System (SNS) [2007]



ASRS Model Applied to International Aviation Community



International Confidential Aviation Safety Systems (ICASS)

ASRS Model Applied to Medical Safety



▶ Patient Safety Reporting System (PSRS)

The PSRS began as a collaboration between the Dept of Veterans Affairs (VA) and NASA Ames Research Center as a contribution to a commitment to quality and safety.

1999 — VA National Center for Patient Safety Established (NCPS)

2000 — Joint Interagency Agreement Signed for Development of NASA/VA Patient Safety Reporting System

2009 — Interagency Agreement ended

2010 — New partners indicate interest in joining the NASA Patient Safety Reporting System



ASRS Model Applied to National Fire Fighting Safety

▶ The National Fire Fighters Near-Miss Reporting System



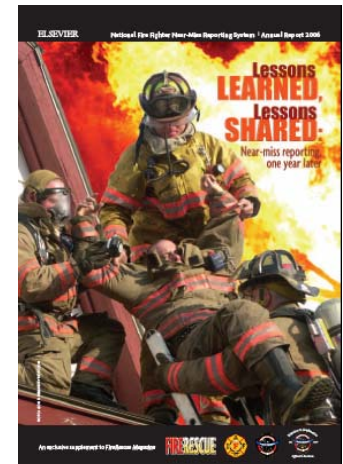
The project is administered by the International Association of Fire Chiefs (IAFC) in consultation with the National Fire Fighter Near-Miss Reporting System Task Force, with the goal to improve fire fighter safety.

2000 — IAFC convenes meeting of aviation, military, government and fire service professionals.

2004 — Advisory Task Force convened to oversee development of near miss program (focus groups, beta testing).

2005 — National launch of the National Fire Fighters Near-Miss Reporting System

2009 — Record breaking 1,000 reports received



ASRS Model Applied to Railroad Safety



▶ Confidential Close Call Reporting System (C³RS)

A Confidential Close Call Reporting System to improve railroad safety: C³RS is a partnership between railroad carriers, railroad labor organizations, NASA, and the Federal Railroad Administration (FRA).

- 2002** — FRA forms Close Calls Steering Committee to study value of a close call reporting system for the railroad industry
- 2003** — FRA conducts the Close Calls Human Factors Workshop
- 2005** — Close Calls Steering Committee signs FRA sponsored C³RS Demonstration Project MOU
- 2007** — Bureau of Transportation Statistics starts accepting reports
- 2008** — Release of H.R. 2095: Rail Safety Improvement Act of 2008
- 2010** — NASA C³RS Pilot Site Initiated
- 2011** — NASA C³RS Began Receiving Reports



ASRS Summary



ASRS Summary

ASRS is a highly successful and trusted program that has served the needs of the aviation community for over 30 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 FAA and NASA's needs and those of other organizations world-wide which are engaged in research and the promotion of safe flight.



Advantages of the ASRS Model

- ▶ Reports are received directly from frontline staff (first hand reporting, unfiltered)
- ▶ All reports matched for same event (i.e. pilot, ATC, mechanic and air carriers, GA, corporate)
- ▶ Evaluation and analysis conducted by expert aviation analysts
- ▶ Rapid de-identification process protects the person reporting and third party references (proper names and names of facilities), but preserves safety message
- ▶ All reports are evaluated for hazardous events and potentially hazardous situations and distributed through various feedback processes



Advantages of the ASRS Model

- ▶ Protection needed for those reporting. ASRS provides:
 - Confidentiality - ASRS processes and procedures protect reporters, ultimately anonymous
 - Non-punitive system - Limited immunity provided through law and regulatory guidance
- ▶ Ease of reporting
 - Secure internet submission
 - Paper based
- ▶ In-house aviation expertise provides credibility and instant rapport during outreach efforts
- ▶ Feedback through products and results to those reporting encourages future reporting



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 for your efforts in aviation safety,
and for your interest in, and support of,
ASRS - it is appreciated.**

