

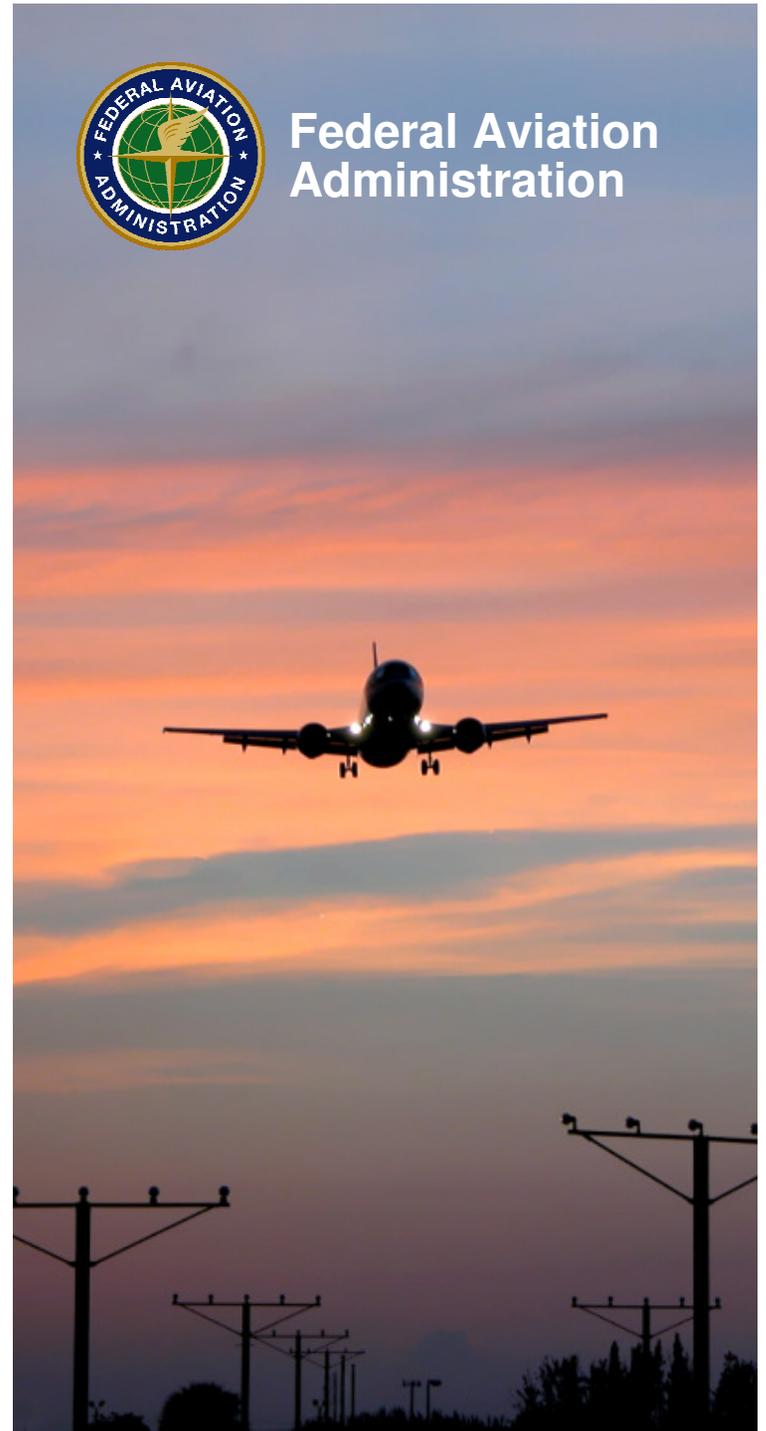
System Safety Management

Center of Excellence for General Aviation

Presented to: COE-GA Public Meeting
By: John Lapointe,
Manager,
Information Systems Section
Date: November 17, 2011



Federal Aviation
Administration



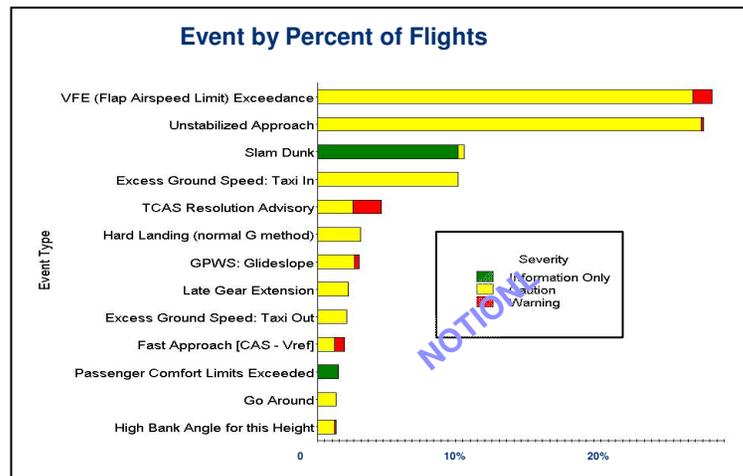
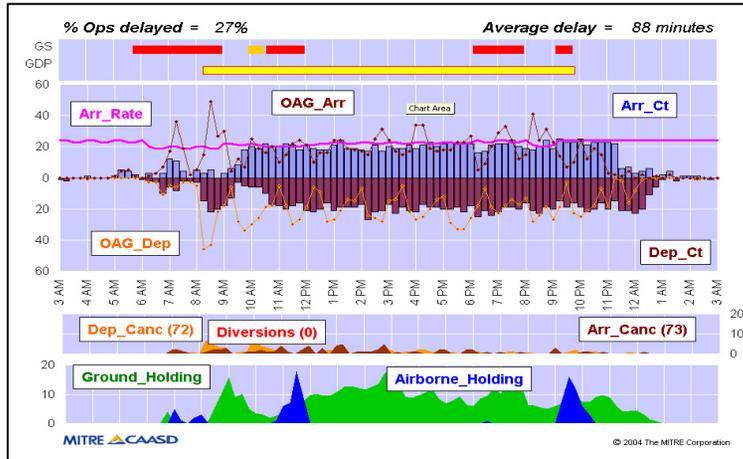
System Safety Management

- Mission:
 - Improve aviation safety for the flying public by conducting research and development. Develop and evaluate technologies, conduct laboratory and field tests, perform analyses and simulations, and provide data to support FAA regulatory, certification and NextGen activities.
- Three Research Areas:
 - Data Sharing and Analysis
 - Safety Analysis of ATO Services
 - Terminal Area Safety



System Safety Management

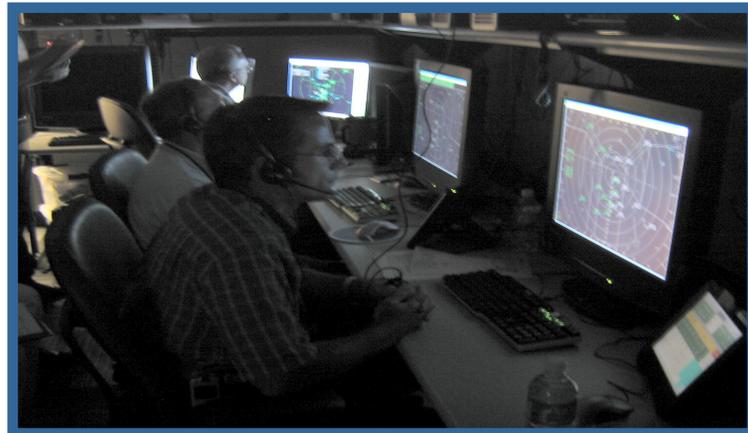
Data Sharing & Analysis



- Develop a suite of tools and capabilities that extracts, analyzes, and shares relevant knowledge from large amounts of disparate safety information. (ASIAS)
- Develop quantitative risk assessment methodology and apply it to support the continued operational safety of aircraft:
 - Aircraft hazard analysis,
 - Risk values for potential unsafe conditions.

System Safety Management

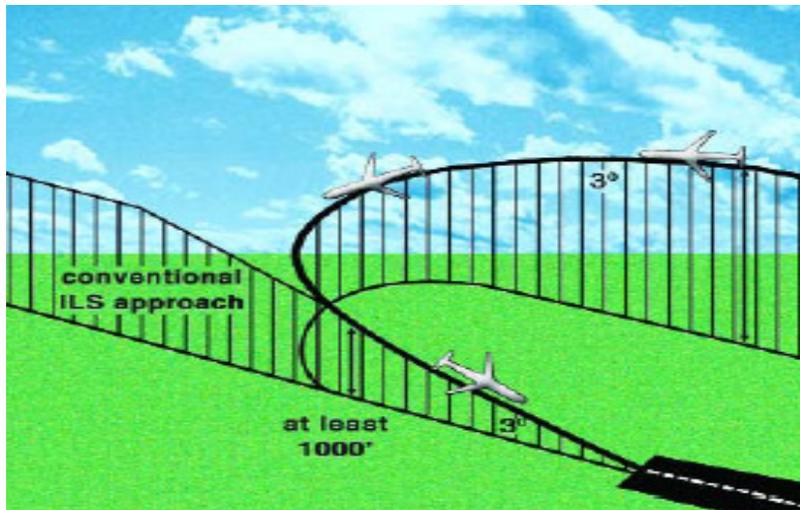
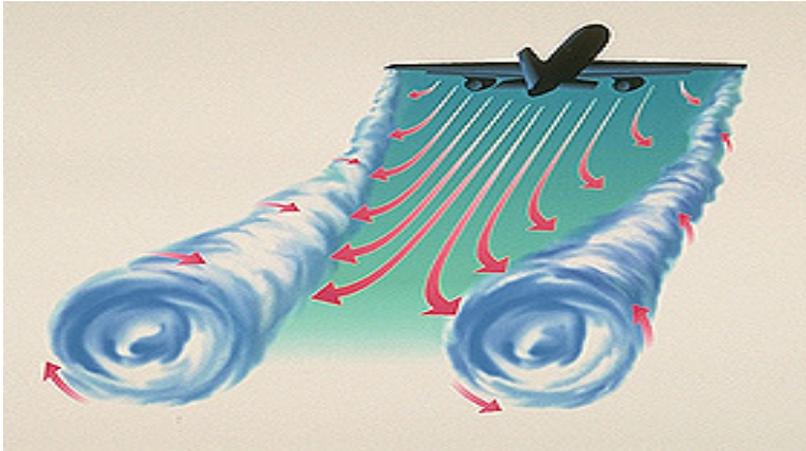
Safety Analysis of ATO Services



- Develop a capability to monitor NAS facility operations as they occur with respect to failures, risk and other off-nominal occurrences.
- Develop a capability that will assess operational safety of NAS Air Traffic Control (ATC) facilities and operations.

System Safety Management

Terminal Area Safety



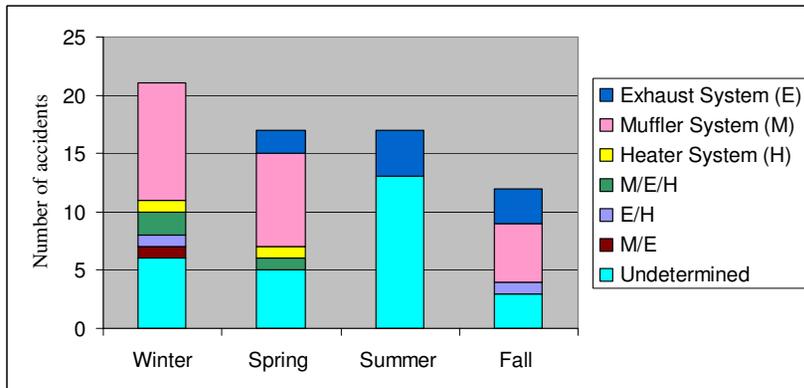
- **Identify and mitigate aircraft and aircrew risks associated with the terminal area.**
 - Improve stall simulation models in support of an expanded set of upset encounter/recovery training requirements.
- **Improve the effectiveness and efficiency in terminal area operations.**
 - Identify limitations and constraints for Performance-based Navigation in the departure and approach phases.
 - Investigate contributing factors that impact aircraft landing performance.
 - Develop methods for real-time reporting of runway slipperiness conditions

Completed GA Research Activities

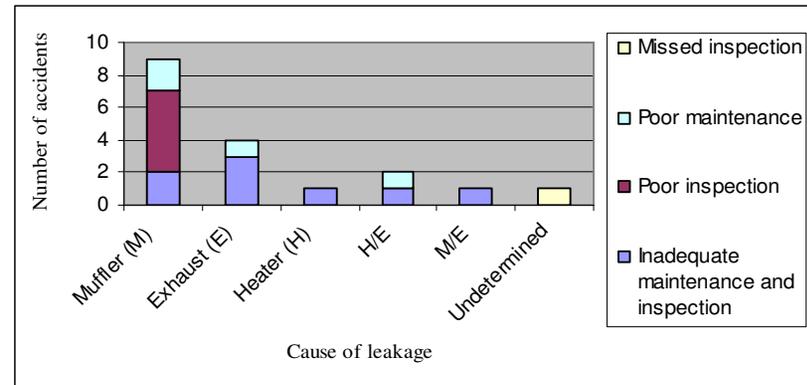


Carbon Monoxide Detectors in GA Aircraft

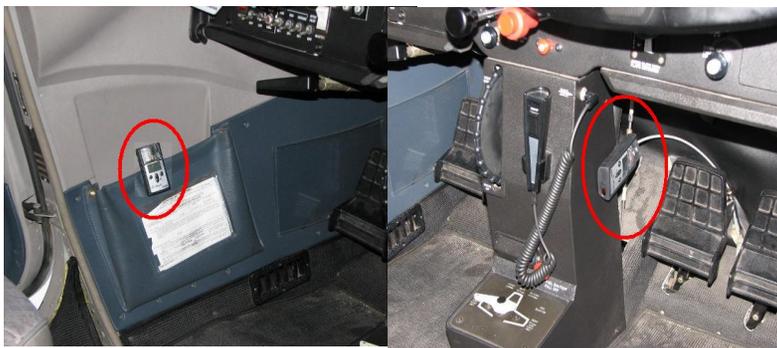
Seasonal Distribution of CO-related Accidents and Causes



Inspection and Maintenance Issues for CO-related Cases



Consider Detector Placement



CO exposure occurs on the ground and in the air

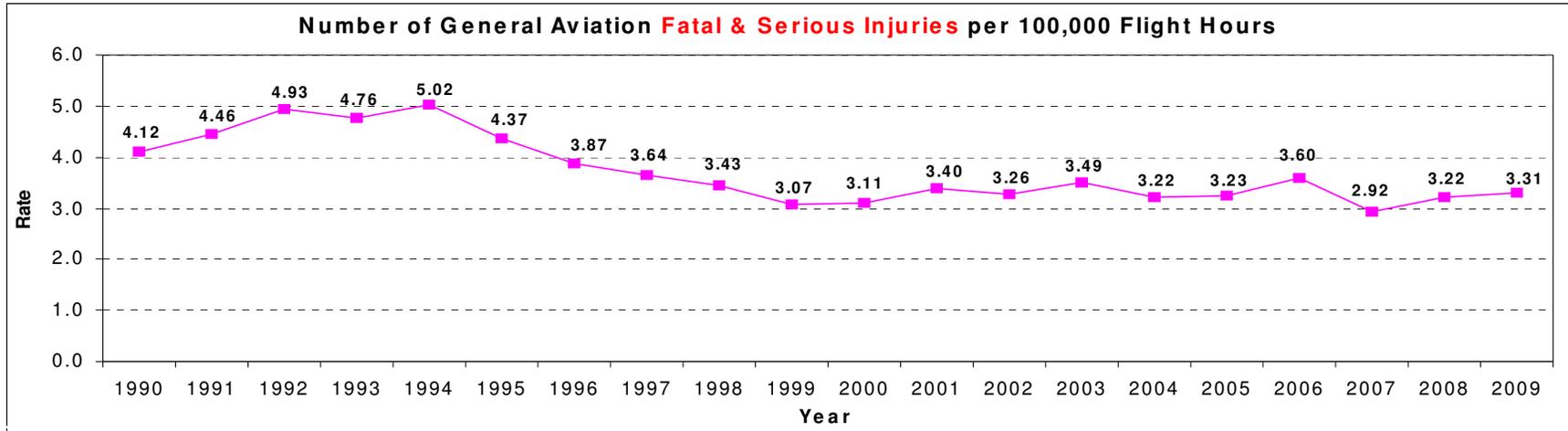
- Majority below 10ppm, well below FAA standard of 50ppm
- CO exposure on the ground occurs when windows are opened

Instrument panel was the best CO detector location among those tested

- Lowest number of false alarms and false negatives when threshold set at 35ppm to detect CO \geq 50ppm in the cabin

Best practices in exhaust system inspection & maintenance

ASIAS GA – Analysis of GA Events



Comparison of primary fatal causes among the 5-year periods

Primary Cause	1982-1987	1988-1992	1993-1997	1998-2002	2003-2007
Airspeed	3	2	2	2	1
Aircraft Control	9	3	1	1	2
Clearance	7	8	4	5	3
VFR Flight into IMC	1	1	3	3	4
Altitude/Clearance	10	10	5	4	5
In-flight Planning/Decision	2	4	9	6	6
Airspeed (VS)	8	5	8	7	7
Preflight Planning/Preparation	4	7	10	10	8
Visual Lookout	5	6	6	8	9
Fluid, Fuel	6	9	7	9	10

GA Research is ongoing...

And will continue

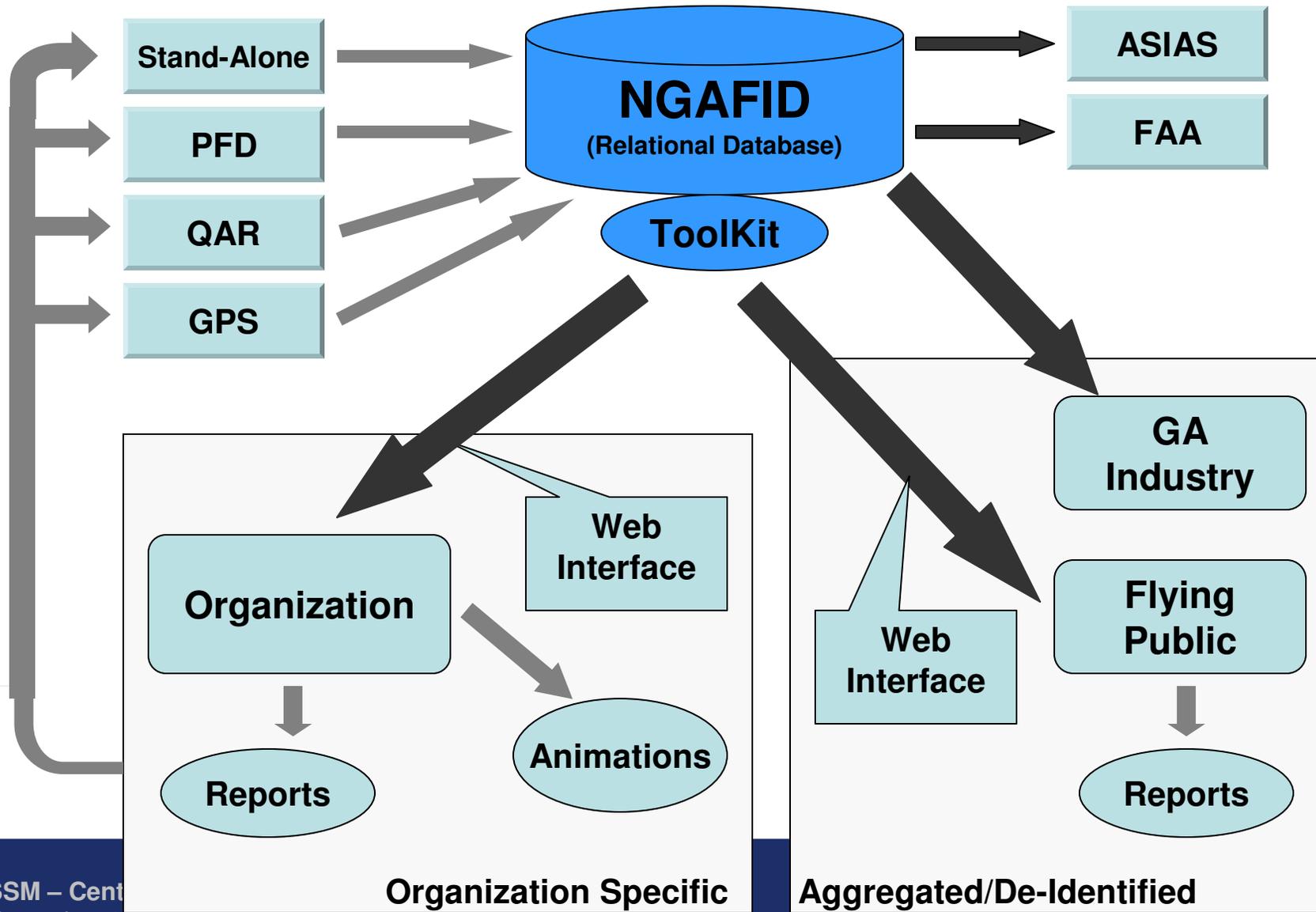
Focus on data-driven/information sharing initiatives

ASIAS-GA: Safety Management System

- SMS Approach To GA – Completed Activities
 - Conduct Literature Search
 - Conduct Exploration of Databases & Data Collection Tools
 - Initiate Development of Framework for Non Punitive GA System Safety Governance
- Conduct ASIAS-GA Risk Identification – Ongoing Activities
 - Use FDM data
 - Conduct GA Survey
 - Define, develop, test and validate safety metrics
 - Conduct two proof of concept studies



GA Flight Data Monitoring Research Overview



Potential/future GA Research

- **Tools for collecting/analyzing all types of GA data.**
- **Additional GA safety studies by type of operations, e.g, risk identification, hazard assessment, and risk mitigation.**
- **Studying impediments to data sharing, identify issues and determine mitigating strategies.**
- **Fusing data safety with operational data, e.g., ADS-B and ASDE-x.**

