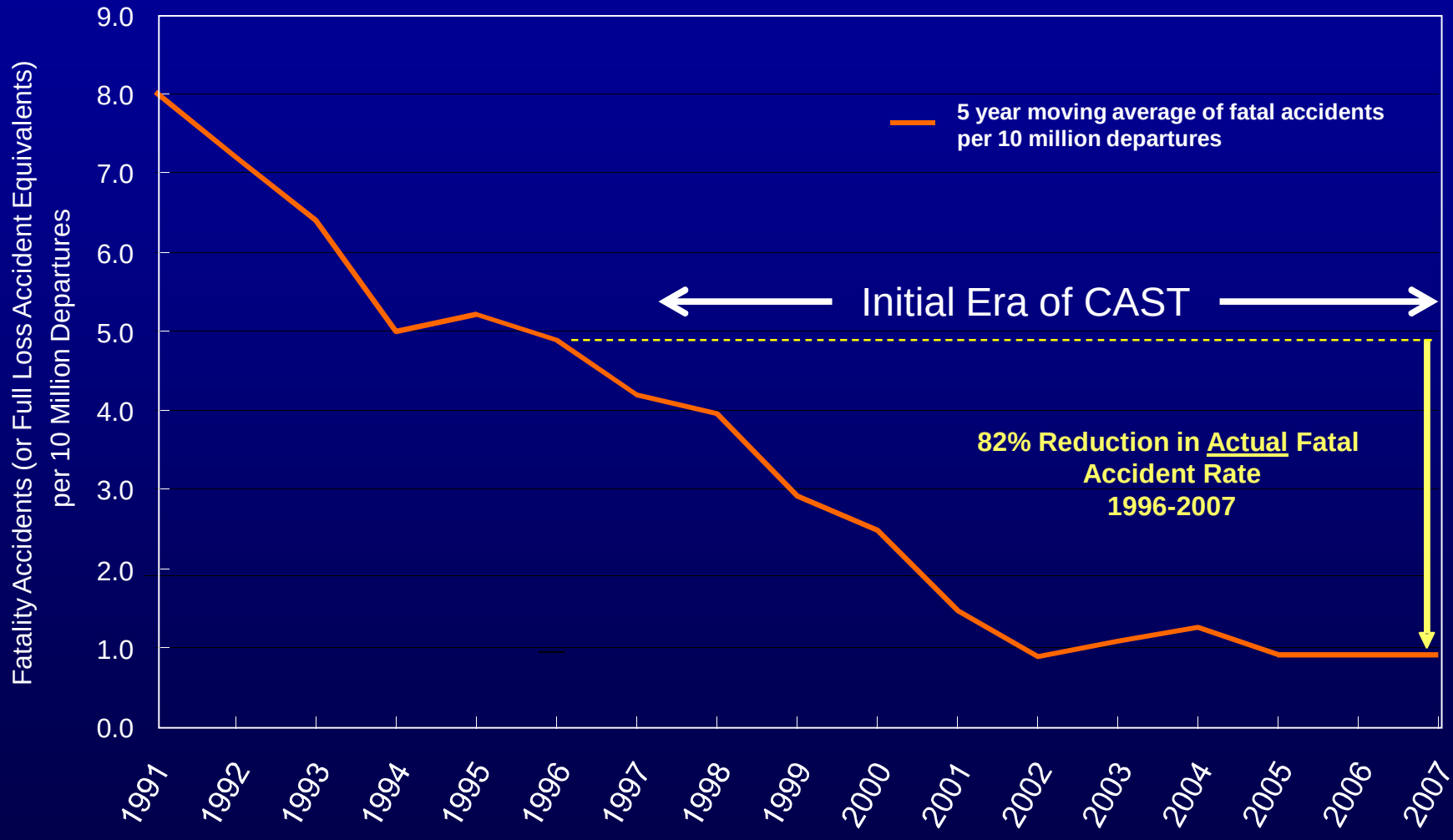
http://www.cast-safety.org/

Historical Fatal Accident Rate
U.S. Commercial Operations



Vision - Mission - Goals

Vision

- **Key aviation stakeholders acting cooperatively to lead the world-wide aviation community to the highest levels of global commercial aviation safety by focusing on the right things.**

Mission

- **Enable a continuous improvement framework built on the proactive identification of current and future risks, developing mitigations as needed and monitoring the effectiveness of implemented actions.**

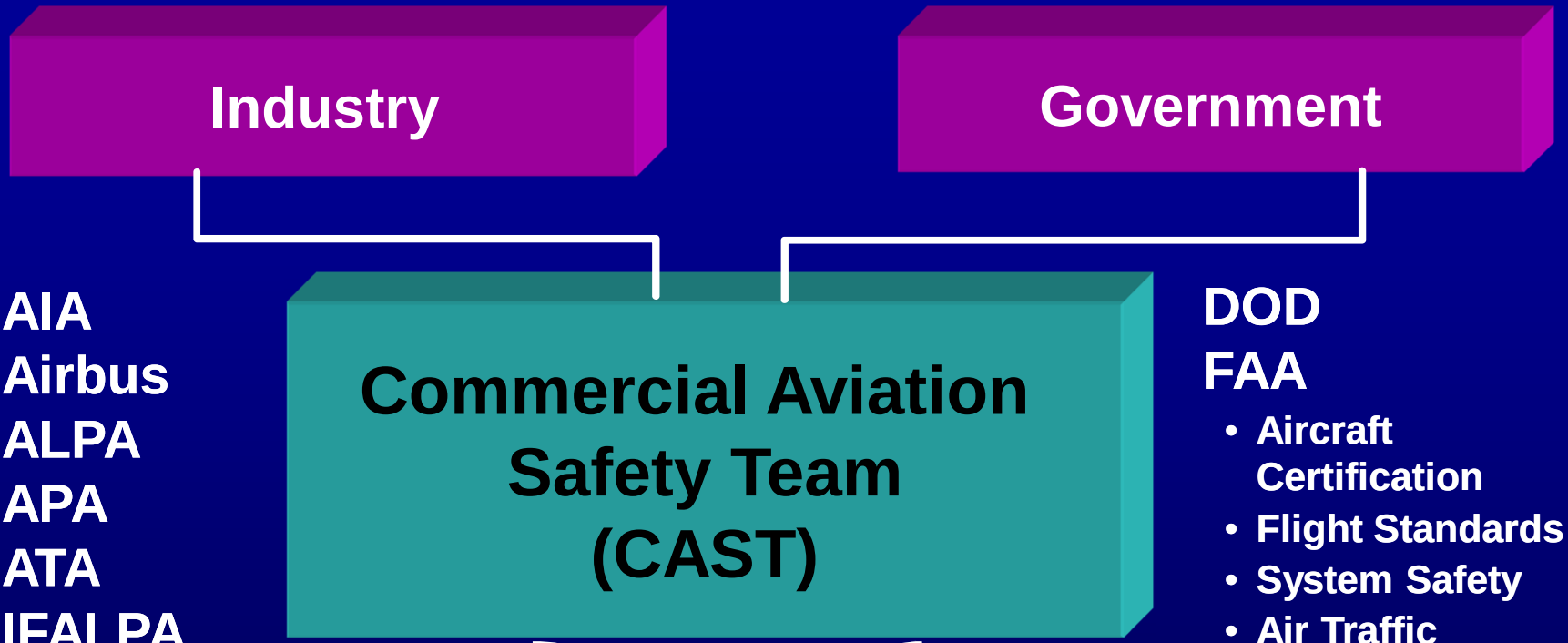
Future Goals

- **Reduce the U.S. commercial aviation fatality risk by at least 50% from 2010 to 2025**

and

- **Continue to work with our international partners to reduce fatality risk world-wide commercial aviation.**

Government, industry and labor collaborate to develop a voluntary, prioritized safety agenda



AIA
Airbus
ALPA
APA
ATA
IFALPA
NACA
Boeing
GE*
RAA
FSF

IATA**
AAPA**
ATAC**
APFA**
ACI-NA**

** Observers

NATCA**
NTSB**
ICAO**

DOD
FAA
- Aircraft Certification
- Flight Standards
- System Safety
- Air Traffic Operations
- Research

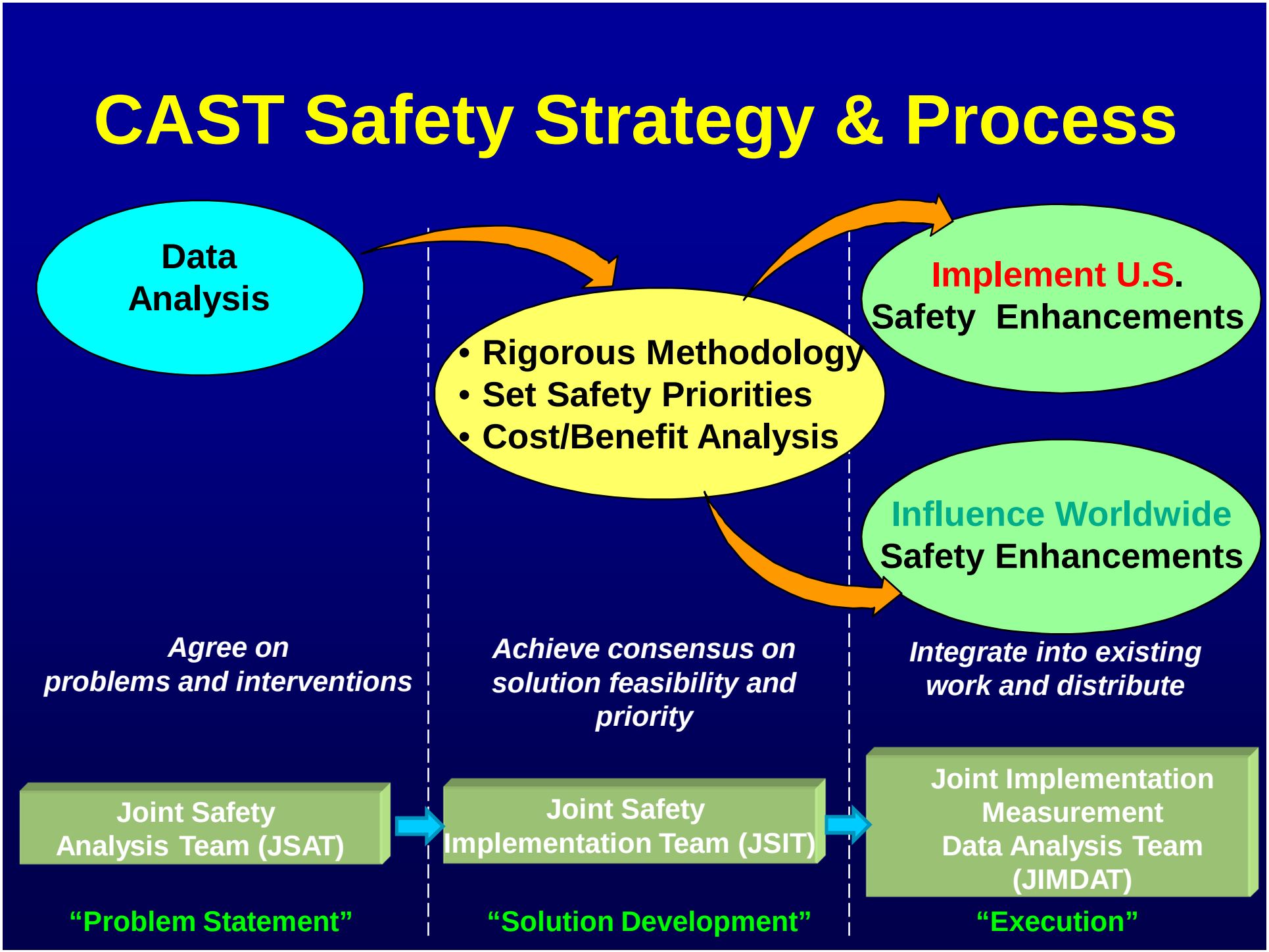
NASA
EASA (ECAST)
TCC

* Representing P&W and RR

Robust CAST Methodology

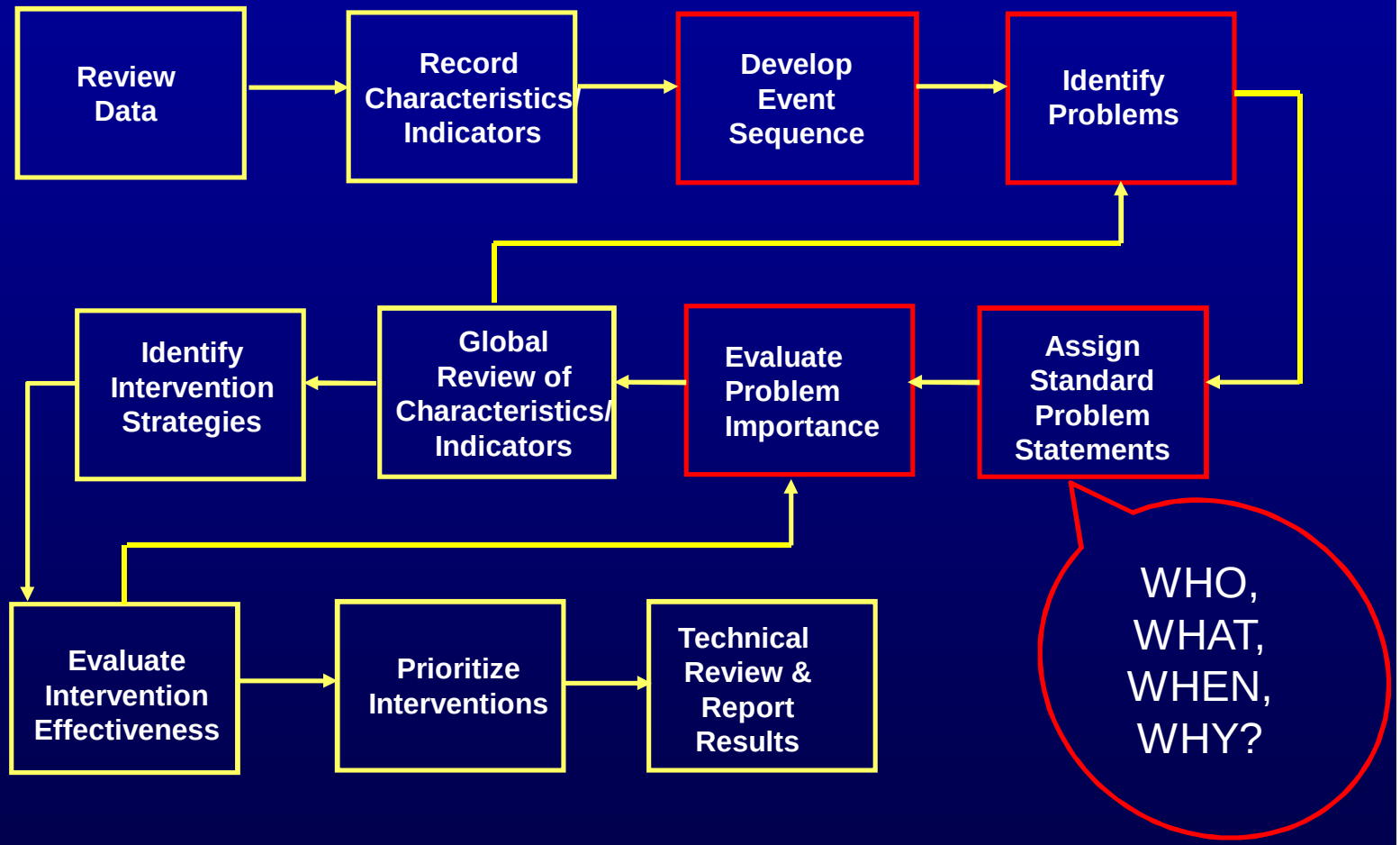
- Detailed event sequence - problem identification from worldwide accidents and incidents
- Broad-based teams (45-50 specialists /team)
- Over 450 problem statements (contributing factors)
- Over 900 interventions proposed
- Analyzed for effectiveness and synergy

CAST Safety Strategy & Process



JSAT Process – Subject Matter Expertise

- ALPA/APA
- FAA AIR*
- FAA AFS*
- FAA ATO*
- FAA AVP*
- Airbus
- EASA
- ATA
- AIA
- Boeing
- Transport Canada



*Certification, Flight Standards, Air Traffic, Accident Investigation/Prevention

Joint Safety Implementation Team (JSIT)

- JSIT develops a safety enhancement based on:
  - Technical feasibility of the intervention
  - Resources available
    - Financial impact
    - Capability for operational deployment
    - Schedule of phased implementation
  - Regulatory compatibility of the intervention
  - Sociological aspects
- JSIT prepares a Detailed Implementation Plan ("DIP")

Joint Implementation Measurement Data Analysis Team (JIMDAT)

Measuring the effectiveness of Mitigations

JIMDAT Develops a Prioritization Methodology

- Identifies the most effective solutions derived from all accident categories
- Considers effectiveness vs. resources
- Tests solutions against fatal and hull loss accidents
- Creates draft master strategic safety plan
- Identifies areas for future study/mitigation

Direct Accident Costs
JIMDAT Accident Set (1987 – 2005)

	Part 121	JIMDAT Accident Set (1987 – 2005)	
Injury/Medical/Legal			
Fatality	$5,932,700	1,951	$11,574,697,700
Serious Injury	$1,992,533	243	$484,185,519
Minor Injury	$55,750	545	$30,383,750
Hull Loss			
	Actual Replacement Costs	73	$470 610,000
Maintenance and Repair			
Non-Hull Loss	$3,811,000		$0
Airline Immediate Response			
	$1,000,000	73	73,000,000
Loss of Reputation			
	$150,000,000	49	7,350,000,000
Bereavement			
	$150,000	84	$12,600,000
Site Clearance			
	$1,980,000	73	$144,540,000
			$20,140 016,969
		Total Flight Cycles	**200,016,636**
		$/FC	**$100.70**

Airline Immediate Response:
[once per each Hull Loss Accident]
Crisis management center, passenger information, media information

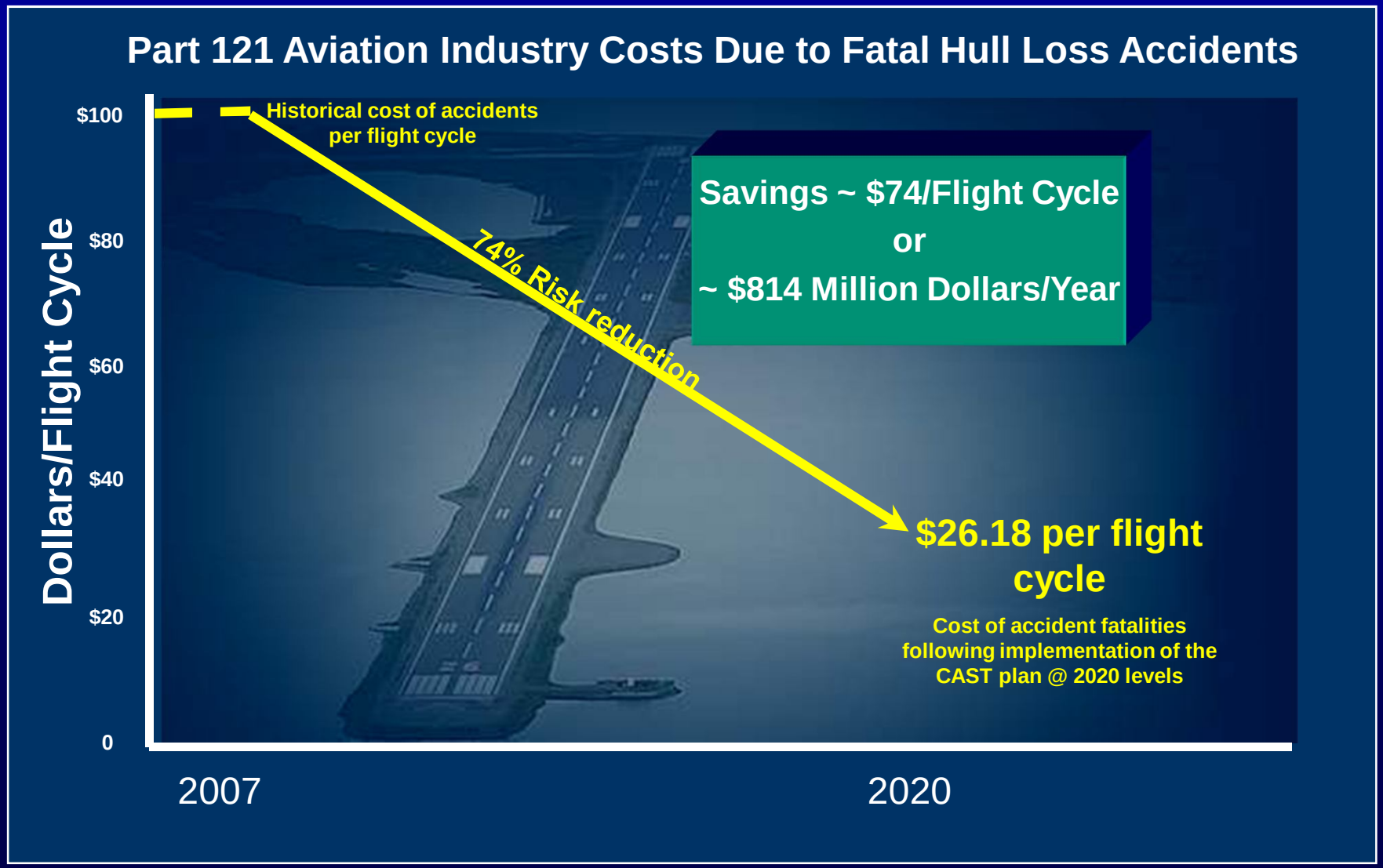
Loss of Reputation:
[once for Accident with consequence >50%]
Society may be more conservative in flying with that airline or on the aircraft type

Bereavement:
[once per Accident]
Notify family members, monitor search and recovery, arrange a memorial service

Site Clearance:
[once per each Hull Loss Accident]

Resource Cost Vs. Risk Reduction

Cost Savings (2010 Dollars)



Current CAST Safety Plan

- **Projected 74% fatality risk reduction by 2020**
  - **Industry and Government implementing plan**
- **61 Completed Safety Enhancements addressing:**
  - **Safety Culture**
  - **Maintenance Procedures**
  - **Flight Crew Training**
  - **Air Traffic Controller Training**
  - **Uncontained Engine Failures**
  - **Terrain avoidance warning system (TAWS)**
  - **Standard Operating Procedures**
  - **Precision Approaches**
  - **Minimum Safe Altitude Warning (MSAW) Systems**
  - **Proactive Safety Programs (FOQA + ASAP)**

CAST Safety Plan (continued)

22 Committed Safety Enhancements

- Policies and Procedures
- Aircraft Design
- Flight Crew Training (additional aspects)
- Runway Incursion Prevention
- Precision Approaches (additional projects)
- Icing (additional turboprop projects)
- Midair
- Maintenance
- Runway Safety
- Safety culture, policies and procedures

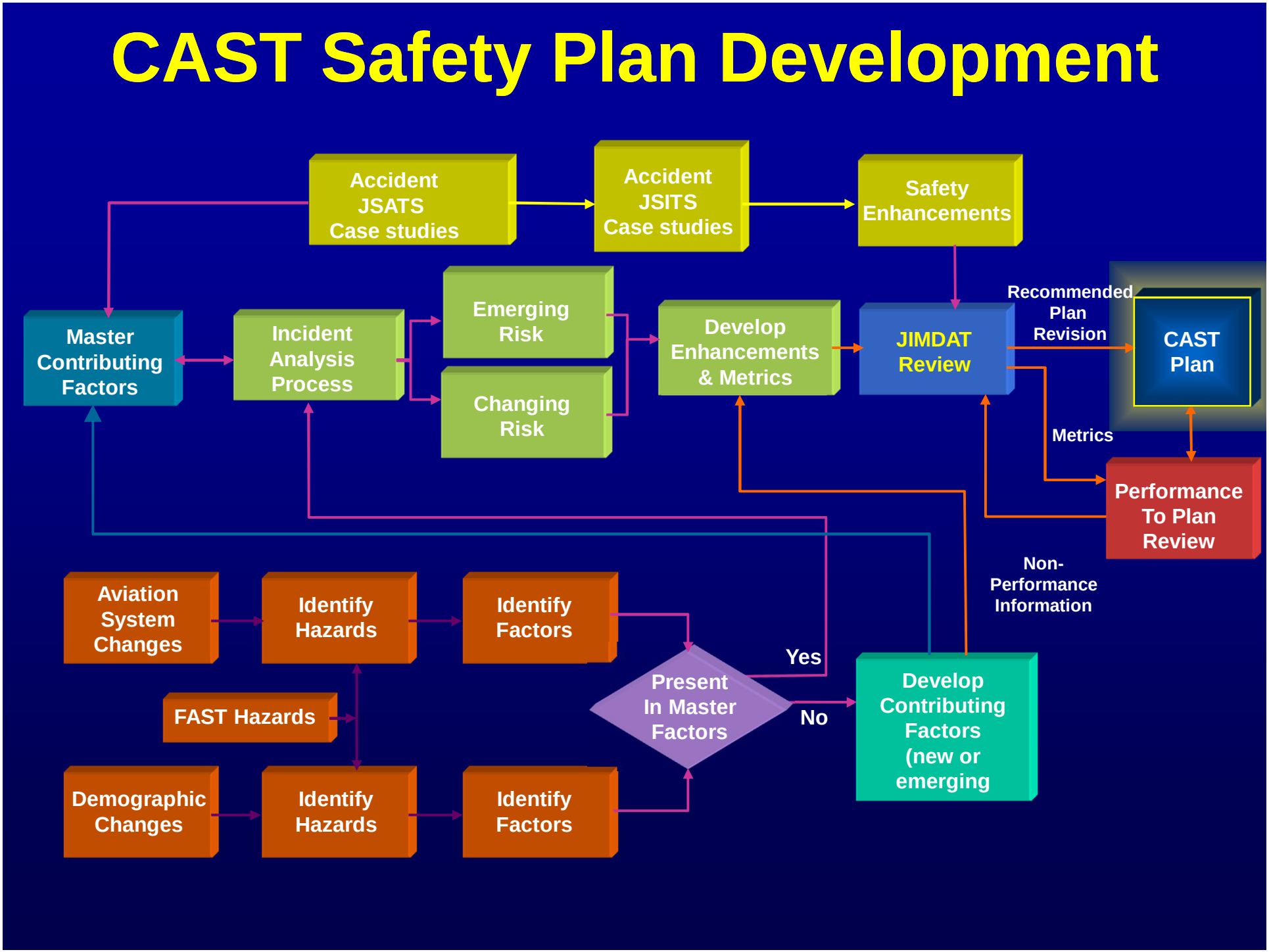
Calculating Potential Benefit of a Safety Enhancing Intervention

Accident Risk Reduction $= f($ **Effectiveness** that an intervention has for reducing the accident rate if incorporated , **Portion of world fleet** with intervention implemented $)$

Was it Effective?

Did we do what we said we would do?

CAST Safety Plan Development



Aviation Safety Information Analysis & Sharing (ASIAS)

- Share voluntarily collected safety data
- Develop tools to make data analysis more efficient
- Identify and access key data sources
- Discover potential aviation safety risks using key data sources
- Transition to Decision Making Based on Analysis of Incident and System Safety Performance Data
- Develop automated information integration capabilities centered on aviation safety risk topics
- Transfer technologies and key data sources into National Archives

ASIAS Enables Various Types of Proactive Safety Analyses

- Known Risk Monitoring
- Vulnerability Discovery
- Benchmarking Opportunity for participating Air Carriers
- CAST Safety Enhancement Assessments
- Directed Studies

Data Sources Supporting ASIAS Studies

Proprietary Data

- ASAP
- FOQA
- ATSAP
- Manufacturers data
- Avionics data

Safety Data

- Aviation Safety Reporting System
- Runway Incursion
- Surface Incident
- Operational Error / Operational Deviation
- Pilot Deviation
- Vehicle or Pedestrian Deviation
- National Transportation Safety Board
- FAA Accident/Incident Data System
- FAA Service Difficulty Reports

ATC Information

- Traffic Management Reroutes and Delays
- Airport Configuration and Operations
- Sector and Route Structure
- Procedures
- Surveillance Data for En Route, Terminal and Airport

Other Information

- Bureau of Transportation Statistics
- Weather / Winds

ASIAS PARTICIPANTS

Air Wisconsin Airlines
AirTran Airlines
Alaska Airlines
American Airlines
American Eagle Airlines
Atlantic Southeast Airlines
Chautauqua Airlines
CitationAir
Colgan Air
Comair
CommutAir
Compass Airlines
Continental Airlines
Delta Air Lines
Empire Airlines
ExpressJet
Frontier Airlines
GoJet Airlines
Gulfstream Int'l Airlines
Hawaiian Airlines
JetBlue Airways
Mesa Airlines
Mesaba Airlines
Miami Air International
North American Airlines
Piedmont Airlines
Pinnacle Airlines
PSA Airlines
Republic Airlines
Shuttle America
SkyWest Airlines
Southwest Airlines
Spirit Airlines
Sun Country Airlines
Trans States Airlines
United Airlines
United Parcel Service
US Airways
USA 3000 Airlines
World Airways

40 Airlines

32 have a FOQA program
40 have an ASAP program

As of 10 November 2011

ASIAS is Governed by Formal Principles

Data used solely for advancement of safety

Non-punitive reporting

Airline data is de-identified

Analyses approved by an ASIAS Executive Board

ASIAS Studies In Progress or Completed

Directed Studies	Runway Safety
	Terrain Awareness Warning System Study
	TCAS Resolution Advisories
CAST Known Risk and Safety Enhancement Effectiveness Monitoring	Risk of Landing Runway Overrun
	Approach and Landing Accident Risks
	Controlled Flight Into Terrain (CFIT)
Airline Benchmarks	Terrain Awareness Warning System Alerts
	Unstabilized Approaches
	TCAS Resolution Advisories

Success relies on collaboration between voluntary safety programs.

http://www.cast-safety.org/