



# ***Aviation Safety Program***

## **Weather Accident Prevention (WxAP) Project Overview**

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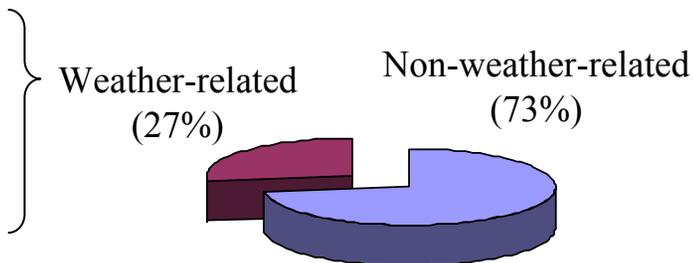
# Weather Safety Benefits Needed



## Aviation Safety Program

41% during cruise

27% due to visual flight operation in instrument flight conditions

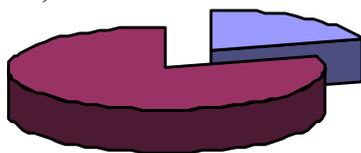


**GA Aviation Accidents 198-1993**  
(22,053 total accidents)

Source: AOPA Air Safety Foundation

Non-Turbulence-related Injuries (67%)

Turbulence Injuries (33%)  
*Ranked #1 for Injuries*



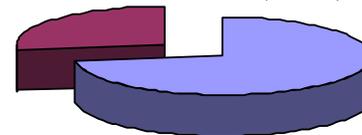
**Commercial Transport Serious Injuries 1990-1996**

Fatal/Non-fatal Accidents

Source: NTSB Data

Weather-related (33%)

Non-weather-related (67%)



**Commercial Carrier Accidents 198-1995**

Source: NTSB

# Project Evolution



**Aviation Safety Program**



*White House Commission on Safety and Security Sets Goal of 80% reduction in fatal accidents within 10 years*

*National Aviation Weather Program Strategic Plan- Office of the Federal Coordinator for Meteorology*

*Aviation Safety Investment Strategy Team*

*National Aviation Weather Initiatives*

*FAA-NASA Memorandum Of Understanding Signed On Aviation Safety*

*Commercial Aviation Safety Team and GA Joint Steering Committee activities initiated*

*FAA-NASA Weather Safety Memorandum Of Agreement*

*NASA-Other Agency Weather Safety Memorandum Of Agreements*

# NASA AvSP Organizational Structure



## Aviation Safety Program

### Aviation Safety Program Office

**Michael Lewis, Director**  
**George Finelli, Deputy Director**  
**Connie Smith, Secretary**  
**Brian Smith, Dep Prog Mgr (ARC)**      **Frank Jones, Asst Tech Mgmt**  
**Jaiwon Shin, Dep Prog Mgr (GRC)**      **Glenn Bond, Senior Prog Analyst**

**AvSPEC**

**1.1**  
**Technical Integration**  
Vincent Schultz (LaRC)

**1.2**  
**Program Integration**  
Michael Basehore (FAA)  
Carrie Walker (Hq)  
Michael Durham (LaRC)

## Programs

## Projects

**2.1**  
**Aviation System Monitoring & Modeling**  
Yuri Gawdiak (ARC)

**2.2**  
**System-Wide Accident Prevention**  
Tina Beard (ARC)

**2.3**  
**Single Aircraft Accident Prevention**  
John White (LaRC)

**2.4**  
**Weather Accident Prevention (WxAP)**  
Ron Colantonio (GRC)

**2.5**  
**Accident Mitigation**  
Douglas Rohn (GRC)

**2.6**  
**Synthetic Vision**  
Daniel Baize (LaRC)

## Elements

**Aviation Weather Information (AWIN)**  
2.4.1  
Paul Stough (LaRC)

**Weather Information Communication (WINCOMM)**  
2.4.2  
Gus Martzaklis (GRC)

**Turbulence Detection and Mitigation (TDAM)**  
2.4.3  
Rod Bogue (DFRC)

# WxAP Project Goals/Objectives/Products



## Aviation Safety Program

### Goal

Develop enabling technologies to reduce weather-related casual factors to accidents by 50% and eliminate turbulence injuries by 90% by year 2007.

### Objectives

**Provide the Flight Deck ATM & AOC  
with Higher Fidelity, More Timely  
Intuitive Graphical Information**

**Detect & Mitigate  
Weather Hazards**

1. Aviation Weather Information technologies and system design guidelines
2. Improved aviation weather hazard characterization, nowcasting, forecasting and graphical product developments
3. Improved Electronic Pilot Reporting technologies and design guidelines
4. Forward-looking turbulence sensor technologies and system design guidelines
5. Control system design techniques for turbulence mitigation

# WxAP Products



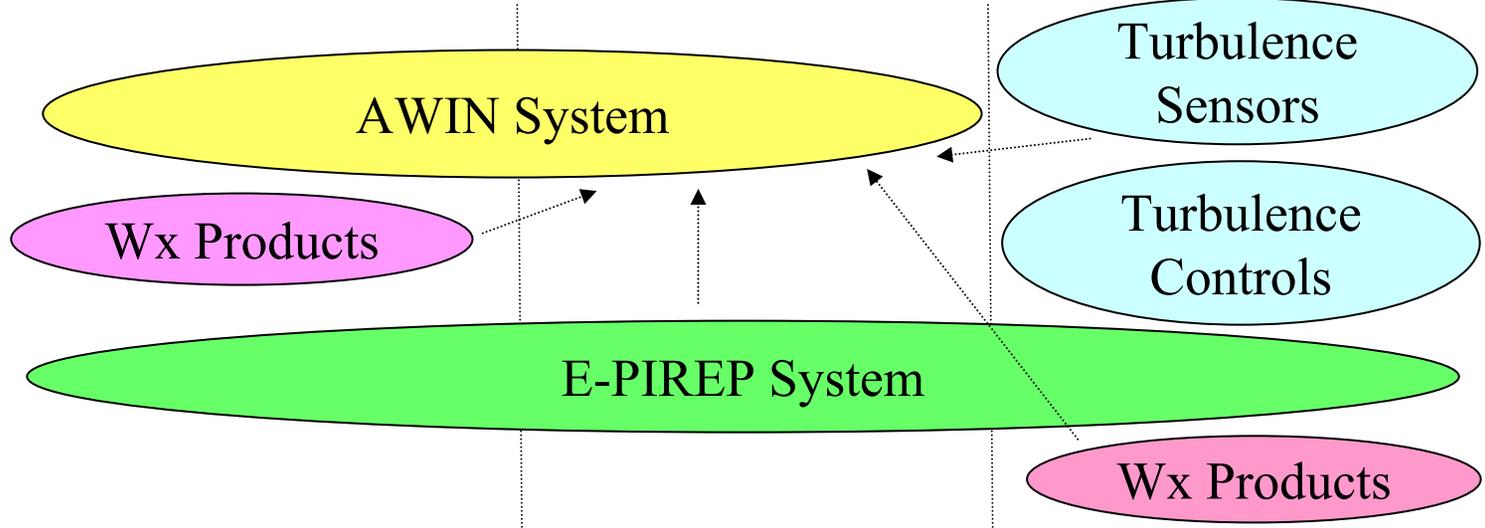
**Weather Accident Prevention  
(WxAP)**  
*Ron Colantonio, GRC*

**Aviation Weather  
Information**  
Paul Stough, LaRC

**Weather Information  
Communications**  
Gus Martzaklis,  
GRC

**Turbulence  
Detection &  
Mitigation**  
Rod Bogue, DFRC

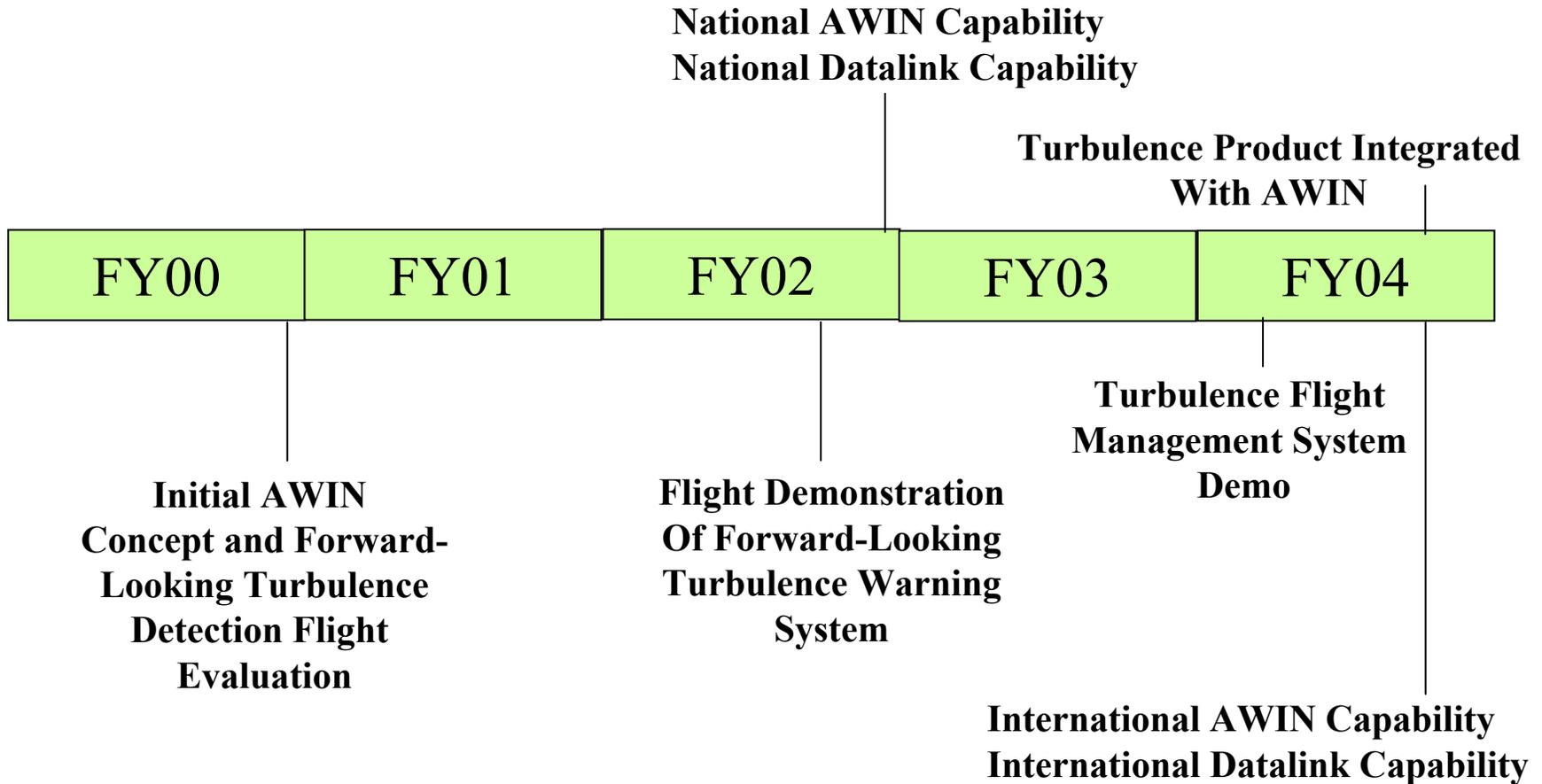
**Products**



# Project Schedule and Milestones



**Aviation Safety Program**



# Product Implementation Strategy



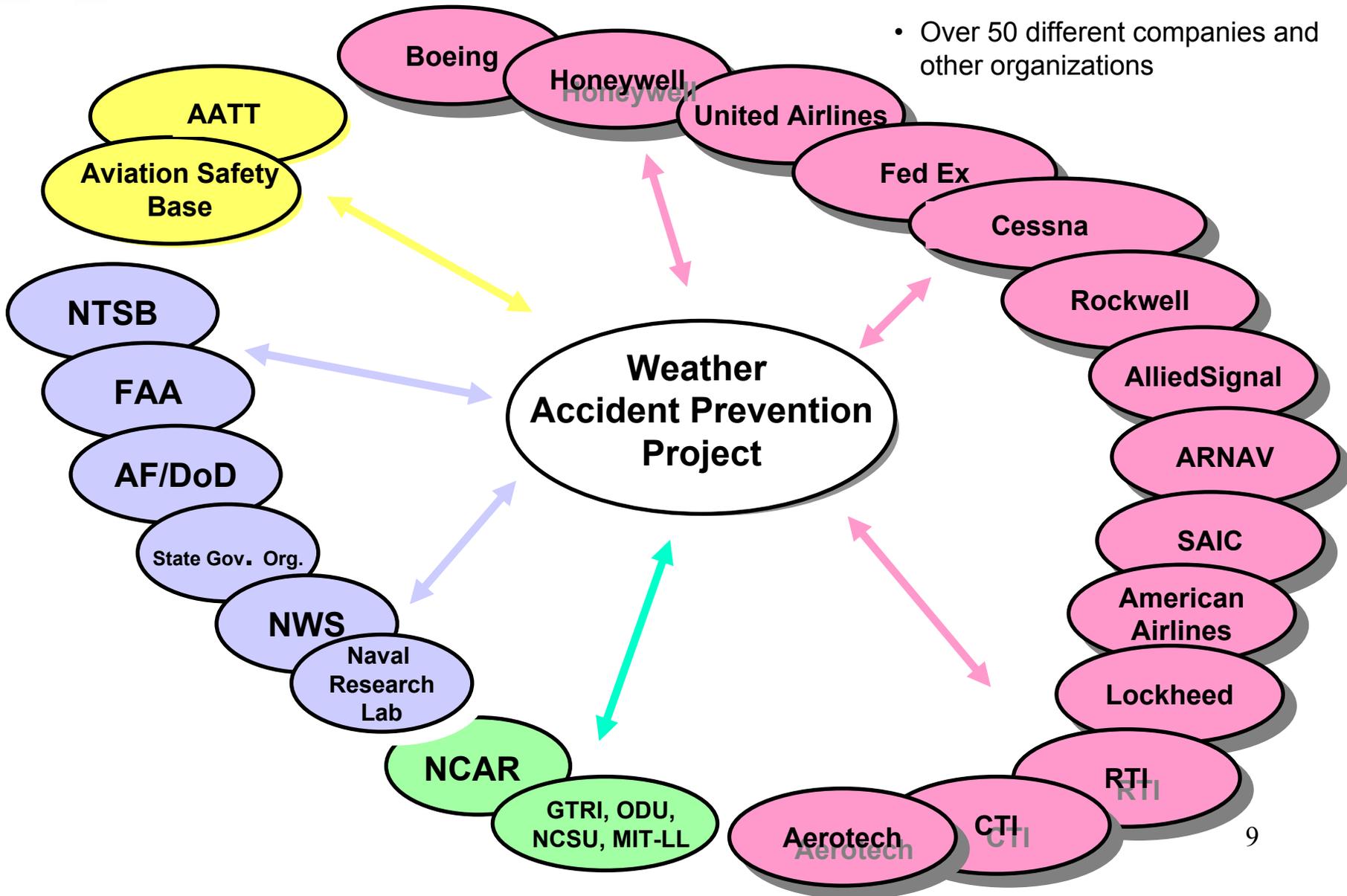
## Aviation Safety Program

- Strong Industry cost sharing through Cooperative Research Agreements (CRA)
- Airline/operator participation in CRAs
- Cost/Market assessment studies funded
- FAA/NASA Working Groups being established
- Participation in Industry/Government working groups dealing with technology and standards development: RTCA, ICAO Joint Safety Assessment/Implementation Teams, etc.
- Strong National Turbulence Research Coalition assisting in defining NASA direction

# Outside Partners



- Over 50 different companies and other organizations



# Project Accomplishments



- Completed AWIN/WINCOMM Phase 1 Cooperative Research Agreements with Phase 2 Agreements ramping up.
- LaRC 757 aircraft preparation nearly complete for Summer 2000 flight experiments of an Initial AWIN, Forward-Looking Detection and Turbulence In-Situ Systems.
- FAA-NASA Weather Safety Memorandum of Agreement in final approval stages.
- NASA participation in FAA-NASA-Industry Joint Safety Assessment and Implementation Teams.

# Project's Next Steps



- Integrate and leverage activities with FAA, NWS and DoD.
- Fine tune NASA plans per stakeholder comments (i.e. THIS REVIEW), requirement studies, joint team recommendation etc.
- Complete initial marketing studies for each product.
- Continue to seek greater participation with aviation user community.