CREATION OF A
NATIONAL AVIATION OPERATIONAL
MONITORING SERVICE (NAOMS)

Proposed Phase One Effort

March 5, 1998
Scope of Presentation

- Concept
- Rationale
- Project Team
- Phase One Approach
- Deliverables
A robustly designed survey system for monitoring the safety of the National Aviation System
Goal: Develop a system for conducting statistically robust surveys of aviation operating personnel to measure NAS safety levels, safety trends, and the impacts of new technologies and procedures

- Phase One: Develop the methodological foundation for NAOMS; engage aviation community support
- Phase Two: Conduct a test survey effort of limited scope to prove concept
- Phase Three: Incrementally implement a nationwide survey capability that extends to all interested stakeholder groups
- Phase Four: Spin-off the fully operational capability to an organization(s) committed to operating it on a long-term basis
**NAS Aviation Operational Monitoring Service**

**APPROACH**

**AIR CARRIER PILOTS**

**GENERAL AVIATION PILOTS**

**MILITARY PILOTS**

**CONTROLLERS**

**TECHNICIANS**

**FLIGHT ATTENDANTS**

**OTHERS**

* The survey may be accomplished in writing, or electronically.
Applying established methods from other domains to aviation safety monitoring
Background

- Need for accurate and comprehensive aviation safety data for
  - Aviation policy makers
  - Technology developers

- Data that Measure
  - Safety levels
  - Safety trends
  - Impacts of technological and procedural change
Background (cont.)

- Alternative Data Sources Considered
  - Accident data
  - Voluntary incident data (like ASRS)
  - Mandatory incident data
  - Digital flight data
  - ATC radar tracks

- None of these sources deemed adequate
  - Some lack scope
  - Others lack accuracy or precision
  - Several have uncontrolled / unmeasured biases
  - None have flexibility needed to measure impacts of technological and procedural change

- Conclusion: A New Data Source is Needed
Why Not View the Aviation System Thru the Eyes of Its Operators?

- Operators Include

- Use Rigorous Survey Methods to Gain Their Insights

- Control Accuracy, Precision, and Scope Through
  - Statistical Design / Sample Size
  - Survey Instrument Design

- Analyze Data Using Well-Developed Methods
  - Statistical
  - Epidemiological

- A Powerful, Flexible Data Gathering Solution
A Number of Federal Agencies Use Survey Data to Drive Policy and Investment Decisions
Examples (CDC and NHHS)

- Developmental Disabilities Surveillance Program (MADDSP)
- Fetal Alcohol Syndrome Surveillance and Prevention Effort
- Metropolitan Atlanta Congenital Defects Program (MACDP)
- CDC Office on Smoking and Health
- Behavioral Risk Factor Surveillance System (BRFSS)
Common Characteristics of These Efforts

- Long-term
- Based on survey data
- Measure levels of disease and injury
- Estimate disease and injury trends
- Identify risk factors driving these phenomena
- Employ epidemiological / statistical methods
- Assess the success of
  - Public health policies
  - New medical technologies / approaches
NAOMS will use these proven methods to monitor flight safety and to assess the impacts of new aviation technologies and procedures.
A balanced multidisciplinary group with participation by academe and the aviation community
Team Members

- **NASA Ames Leadership**

- **Contractor Support**
  - Battelle ASRS Program Office
  - Dodd and Associates
  - Battelle Centers for Public Health Research and Evaluation (CPHRE)
- Joint Program in Survey Methodology (JPSM)
  - (U. of Maryland - U. of Michigan - NSF)
  - Naval Postgraduate School (potential)

- **Aviation Community Participation**
  - FSF ICARUS Committee (potential)
Team Strengths

- Aviation domain expertise
- Knowledge of and access to potential participant groups
- Sensitivity to confidentiality and ethical issues
- Statistical and epidemiological expertise
  - Statistical design and sampling strategies
  - Survey instrument design and validation
- Survey facilities and logistical capabilities
Contractor Organization

Loren Rosenthal
ASRS PROGRAM MANAGER
Battelle ASRS

Robert Dodd, PhD
NAOMS PRINCIPAL INVESTIGATOR
Dodd and Associates

Nancy Mathiowetz, PhD
METHODOLOGICAL ISSUES
JPSM

Joan Cwi, PhD
SURVEY DESIGN & LOGISTICS
Battelle CPHRE

Rowena Morrison, PhD
AVIATION DOMAIN EXPERTISE
Battelle ASRS
Battelle’s Centers for Public Health Research and Evaluation (CPHRE)

- **Four Disciplines; One Organization**
  - Research and Evaluation
  - Health services research and epidemiology
  - Surveillance and monitoring
  - Survey operations

- **CPHRE’s Objective: Improve public health through research & evaluation**
  - Information influences policy
  - Use methodologies to find patterns and relationships that influence health and safety outcomes
  - Evaluate how well programs operate
Phase One
Approach

Developing a firm foundation for a System-Wide NAOMS
Phase One Strategy

- Specify Technical Requirements
  - Identify Obstacles to Success
  - Develop Solution Strategies

- Estimate Key Quantities
  - Demographics / Sample Sizes
  - Benefits and Resource Requirements

- Engage the Aviation Community
  - Data Providers
  - Data Consumers

- Plan for Phase Two
Phase One Steps

- Profile participant demographics
  - Summarize in Technical Memorandum

- Develop preliminary statistical design
  - Summarize in Technical Memorandum

- Identify high value survey topic areas
  - Incorporate in a draft survey instrument

- Analyze survey design and validation issues
  - Summarize in Technical Memorandum
  - Refine draft survey instrument
Phase One Steps (cont.)

- Obtain aviation community support and participation thru dialogues
  - Develop a NAOMS presentation package
  - Conduct a NAOMS workshop

- Estimate NAOMS benefits and costs
  - Summarize in a Technical Memorandum

- Develop Phase Two technical strategy
  - Incorporate in a Phase Two Test Survey Project Plan
Deliverables

All of the components needed to undertake a Phase Two Test Survey
Deliverables

- **Technical Memoranda on**
  - Demographics of potential participant groups
  - Preliminary statistical design
  - Survey instrument design and validation approaches
  - Estimated benefits and costs of system-wide NAOMS

- **Draft Survey Instrument**

- **NAOMS PowerPoint Program Presentation**

- **Industry Workshop on NAOMS Initiative**

- **Phase Two Test Survey Project Plan**