

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*

Concept

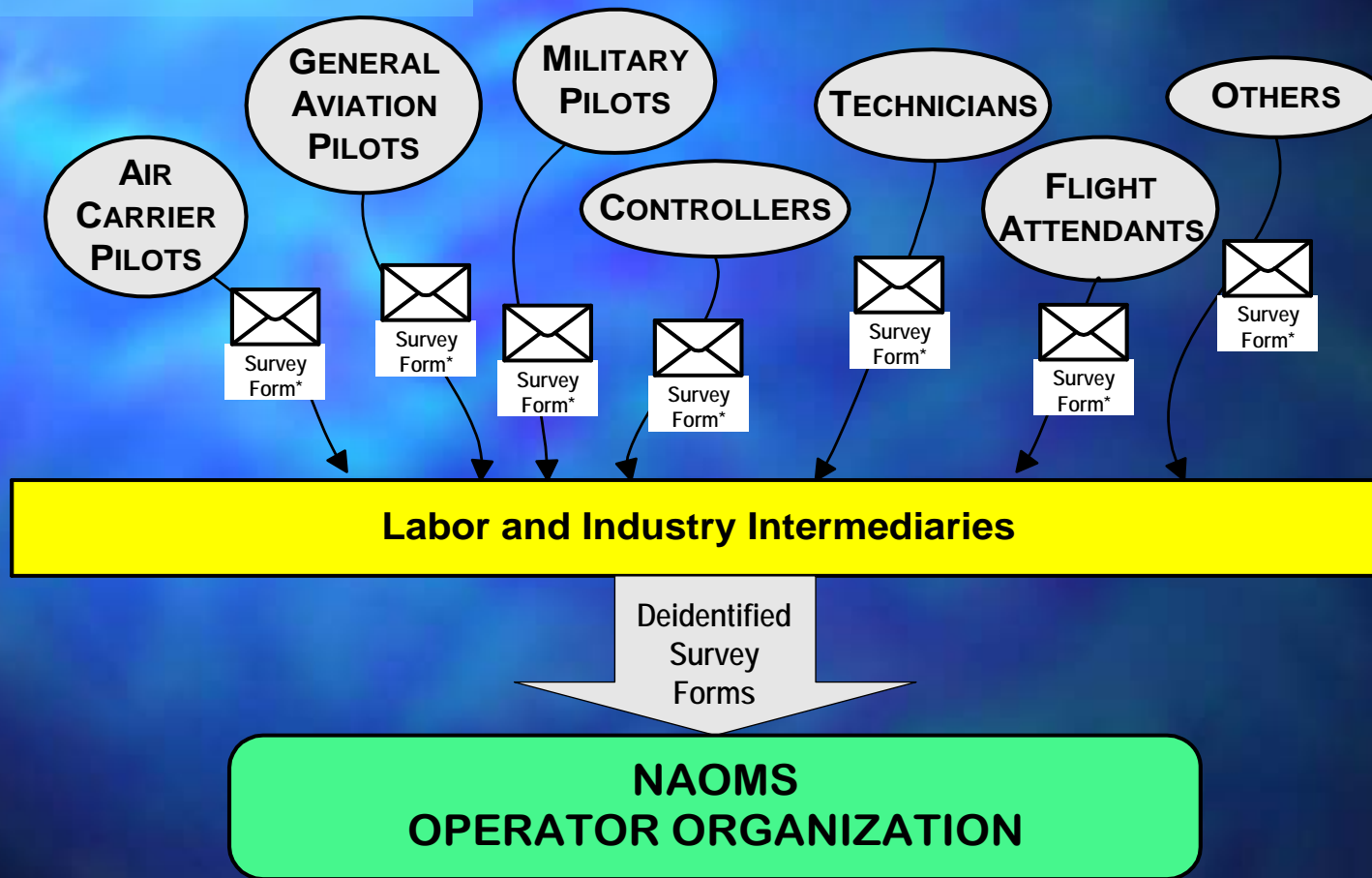
A robustly designed survey system for monitoring
the safety of the National Aviation System

NAS Aviation Operational Monitoring Service (NAOMS)

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



* The survey may be accomplished in writing, or electronically.

Rationale

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**
 - Pilots - Controllers - Mechanics - Flight Attendants - Etc.
- **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

Project Team

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



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**