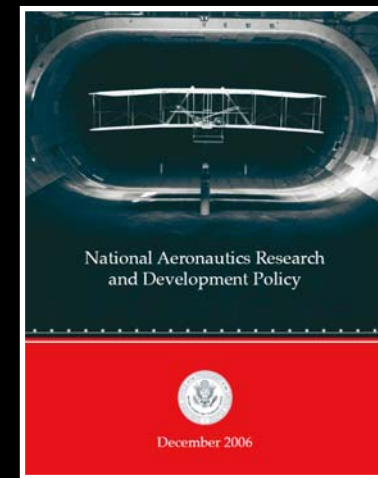


Public meeting of the National
Aeronautics Research and
Development Plan

DRAFT



Safety Coordinating Group

Report and Discussion

30 July 2007

DRAFT

Safety CG Co-chairs:
Herb Schlickemaier, NASA
Pat Lewis, FAA



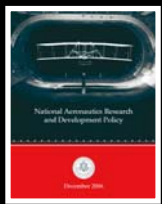
Aviation Safety is Paramount

“Every individual who enters an airport or boards an aircraft expects to be safe. To that end, continual improvement of safety of flight must remain at the forefront of the U.S. aeronautics agenda.”



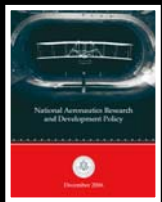
Membership

- Co-chairs:
 - Herb Schlickemaier, NASA
 - Pat Lewis, FAA
- Members:
 - John Siebert, DOD
 - Ken Christensen, DHS
 - Steven Nash, NSF
 - Mike Basehore, FAA
 - Cathy Bigelow, FAA
 - Robert Pappas, FAA



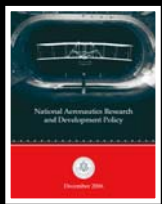
Goals and Objectives

- Theme: “Continual Safety Improvement”
- Supporting objectives by domain and discipline:
 - Domain:
 - Vehicle Safety
 - Cabin-Passenger Safety
 - Airspace-airborne Safety
 - Ground Safety (*e.g., runway and airport safety*)
 - Discipline:
 - Structures & Materials (*inspection and evaluation*)
 - Controls and dynamics (*adaptation*)
 - Sensing (*monitoring and health management*)
 - Verification and Validation (*software and complex systems*)
 - Human-automation integration
- Understand state-of-the-art, direction and develop gap analysis
- Identify normal linkages with other Coordinating Groups



Top Level Goals

- Vehicle Safety
- Cabin and Passenger Safety
- Airspace and Airborne Systems Safety
- Ground Side Safety
- System-wide, proactive identification of safety risks and safety assurance processes



Fundamental Challenges

- Verification and Validation of complex systems
 - Software systems (vehicle level)
 - Systems of systems (airspace level)
- Adaptive systems
 - Learning systems
 - Autonomy
- Application of prognostic tools
 - Data mining
 - Timeliness
- Structures & Materials
 - Modeling new materials
 - Inspection and evaluation
- Human-automation integration
 - Decision-making
 - Autonomy



Outreach

- Participate in NSTC-sponsored outreach:
 - Cincinnati, OH, 11 July
 - Mountain View, CA, 30 July
- Participation in industry-Government safety meetings:
 - Center for General Aviation Research Annual Meeting, Atlantic City, NJ, 6 June 2007
 - Data Mining for Aeronautics, Science and Exploration Systems Conference 2007, Mountain View, CA, 26 June 2007
 - Center for Advanced Materials Annual Meeting, Atlantic City, NJ, 10 July
 - 2007 National Software and Complex Electronic Hardware Conference, New Orleans, LA, 24 July
- Call for White Papers



Call for White Papers

- Articulate the most important aeronautics safety R&D challenges facing our nation
- Identify well-defined technical aeronautics safety goals and objectives (*with numerical targets if appropriate*) by the three timeframes
- Propose promising R&D approaches to advance the future of national aeronautics knowledge and/or capabilities
- Identify fundamental limitations and knowledge barriers
- Identify promising innovations and possible timelines



First Round White Papers Topics

- Loss-of-Control
- Crashworthiness of composites
- Capability to move from pilot-in-the-loop to fully autonomous control systems (UAS)
- High-confidence software systems
- Human-automation integration in complex environments
- Proximity detection systems for rotorcraft
- Flight recording devices for rotorcraft
- Safety management systems for rotorcraft
- Training improvements
- Flight deck human automation integration
- Communications systems improvements
- Improved procedures for pilots in new environment
- Improvements in certification of complex systems
- Health & reliability management
- Safety of air traffic system
- Critical role of software engineering & need for competence in the skill
- Structural health monitoring
- Adaptive controls
- Multidisciplinary Design Optimization
- Transformational advanced systems, aircraft technologies, policies, and procedures in NextGen ConOps
- Secure network-centric avionics architectures and systems for data link and data transfer
- Smaller, lighter and less expensive avionics
- More efficient certification processes for complex systems
- Design, development, and upgrade processes for complex, software-intensive systems, including tools for design, development and V&V
- Use CAST model to drive research requirements
- Complex Systems' analyses & validation
- Data sharing and data mining

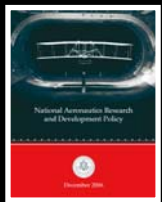


Second Call for White Papers

- 1-3 pages will be considered as input to the Safety Chapter content:
 - Due by 17 August
 - Submit to Aviation Safety: aero.safety@ostp.gov

For more information visit:

www.ostp.gov/nstc/aeroplans



National Aeronautics R&D Policy

Questions?