

FY 2018 Flight Deck/ Maintenance/System Integration Human Factors



Federal Aviation
Administration

A11.G

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To: REDAC Human Factors Subcommittee

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Avionics & New Technologies (A11G.HF.2)

Research Requirement

- FAA needs development and update of human factors regulatory and guidance material on evolving flight deck technologies including ADS-B, Electronic Flight Bag (EFB), and moving maps.
- Focus is on human factors/pilot interface issues such as colors, symbols, fonts, labels, workload, situation awareness, errors, etc. as technology changes.

Sponsor POC: C. Swider, AIR-130

Research POC: R. Bolinger, ANG-C1

Sponsor Outcome

- Develop and update regulatory and guidance material (i.e., specific rules, ACs, TSOs, Handbooks, etc.) for specific systems (e.g., ADS-B, Electronic Flight Bags (EFBs), moving maps) and documents that provide more general guidance for all flight deck displays (e.g., AC 25-11, AC 23.1311).

Critical Milestones

- Research plan to investigate the effects of CDTI/airport moving map display compellingness on pilot attention, alerting, field of view and workload.
- Analysis of safety reports for EFBs/PEDs/tablets to discover issues and trends.
- Update the *Human Factors Considerations in the Design and Evaluation of Flight Deck Displays and Controls*.

Contract Funding (\$K)

Request	Request	Planned	Target	Target
FY16	FY17	FY18	FY19	FY20
\$1,000	\$403	\$1,349	\$1,250	\$1,300

Source: FY16 – FY16 AVS Briefing Matrix posted on the AVS RE&D Management System KSN; FY17 – President's Budget Submission; FY18-20 – AVS programmed funding levels and out-year cost estimates.



Advanced Vision Systems – EFVS, EVS, SVS, and DVS, HUD, HMD- Certification and Operational Approval Criteria (A11G.HF.4)

Research Requirement

- Human factors research is needed to provide a basis for Flight Standards to evaluate and issue operational approvals for Advanced Vision Systems, HUD, and HMD as a part of the FAA's existing approval process.

Sponsor POC: T. King, AFS-410

Research POC: R. Bolinger, ANG C-1

Sponsor Outcome

- Increase safety, efficiency, capacity, and throughput during low visibility conditions using advanced vision systems, head-up displays, and head-mounted displays.
- Enable more flight operations to occur in low visibility conditions with less ground infrastructure while maintaining an appropriate level of safety during approach, landing, taxi, and takeoff operations.

Critical Milestones

- SVS simulation measuring baseline performance.
- Identification of minimum training and currency requirements for SVS proficiency.
- Simulation to evaluate the performance contribution of HUD use.
- Research plan for pilot performance with CVS.

Contract Funding (\$K)

Request	Request	Planned	Target	Target
FY16	FY17	FY18	FY19	FY20
\$600	\$1,400	\$1,550	\$2,050	\$1,250

Source: FY16 – FY16 AVS Briefing Matrix posted on the AVS RE&D Management System KSN; FY17 – President's Budget Submission; FY18-20 – AVS programmed funding levels and out-year cost estimates.

Maintenance Human Factors to Support Risk-Based Decision Making (RBDM) and Maintenance Safety Culture (A11G.HF.10)

Research Requirement

The requirement is structured into five complementary phases to support effective risk-based decision making in maintenance.

1. Methods for inspectors, to support evaluation and enhancement of safety culture in maintenance (Safety Culture).
2. Methods for Inspectors that operationalize risk-based decision making (including usability assessments and human factors design for the interface of real time data collection) (Risk-based Decision Making (RBDM)).
3. Methods that support integration of SMS and HF by improved collection and use of HF- related voluntary data (SMS-Human Factors Integration).
 - Methods for analyzing human error in General Aviation maintenance (GA Maintenance Error); and Continuing evaluation of the impact of AFS R&D (R&D Impact).

Sponsor POC: T. Schaver AFS-301

Research POC: K. Avers, AAM-500

Critical Milestones

- Report documenting methods used to develop, evaluate, and enhance safety culture in aviation and other industries.
- Report documenting review and categorization of support tools for risk-based decision making
- Report documenting what human factors issues should be integrated into SMS
- Report documenting the types of HF errors involved in general aviation accidents and incidents

Sponsor Outcome

The research supports the regulation requiring Part 121 airlines and others to implement a Safety Management System.

The R&D also supports top AVS and AFS priorities to deliver outputs including:

- Focus attention and resources to interventions that pose the highest risk
- Increased integration of mx human factors-related risk into comprehensive SMS programs and
- Methods to analyze and address maintenance human factors error in GA.

Contract Funding (\$K)

Request	Request	Planned	Target	Target
FY16	FY17	FY18	FY19	FY20
\$ -	\$ 800	\$500	\$1,200	\$ -

Source: FY16 – FY16 AVS Briefing Matrix posted on the AVS RE&D Management System KSN; FY17 – President’s Budget Submission; FY18-20 – AVS programmed funding levels and out-year cost estimates. A “\$ -” indicates no requirement submitted/planned.

FY15-FY18 Core Flight Deck Research Requirements Overview

	FY 2015	FY 2016	FY 2017 (planned)	FY 2018 (proposed)
Enhancing Aviation Safety Through Advanced Procedures, Training & Checking Methods, to Include Loss of Control Detection, Avoidance, and Recovery	◆	◆	◆	
Avionics & New Technologies	◆		◆	◆
Advanced Vision Systems (EFVS, EVS, SVS, and CVS), Head Up Displays (HUD), Head Mounted Displays (HMD): Certification and Operational Approval Criteria	◆	◆	◆	◆
Fatigue Mitigation in Flight Operations		◆	◆	
Maintenance Human Factors to Support Risk-Based Decision Making and Maintenance Safety Culture			◆	◆
Human Factors R&D for Improved Rotorcraft Operational Safety		◆		
General Aviation Safety Improvement Research – A Multi-Method Approach to Accident Reduction	◆			

