ANG The Future of the NAS Starts Here

FAA Office of NextGen (ANG)

REDAC / NAS Ops

Review of FY2023 – 2026 Proposed Portfolio

Enterprise Human Factors

BLI Number: 1A12B0/1A11B0

Presenter Name: Tara Gibson, Karl Kaufmann

Date: March 2024

Enterprise Human Factors Overview

What are the benefits to the FAA

- Enterprise human factors research investigates areas that have effects across NAS domains, systems, and programs. The program provides integrated guidance on human performance considerations to concept development teams, validation teams, and/or implementation teams. A primary focus is research that furthers successful integration of systems developed and deployed to enable NextGen concepts.

What determines program success

- Early identification of potential human performance issues and mitigation strategies that can support the usability, acceptability, and safety of NextGen concepts and systems.
- Results provided that can be used to improve individual programs' development, validation, and implementation activities, though there are no formal dependencies to specific programs.

Enterprise Human Factors Program Support

Points of contact

- Program Manager: Karl Kaufmann
- Project Managers: Sabreena Azam, Reshma Kumar, Deborah Shaibe
- Subject Matter Expert: Bill Kaliardos
- Program Support: Lauris Williams, Marlo Allen

Research laboratories

- ANG-E25 Human Factors Branch, Aviation Research Division Research and Development Human Factors Laboratory
- MITRE Center for Advance Aviation System Development (CAASD)

Current Accomplishments in FY24

Final technical reports

- Human factors impacts of large air traffic control (ATC) displays

Draft research reports

- Traffic Management Unit (TMU) regional coordination practices recommendations
- HRL adaptation and implementation opportunities to enhance acquisition management system (AMS) processes

Project kick-offs (new starts)

- National Airspace System (NAS) mental model framework
- Trajectory-based operations (TBO) training methods – low to medium fidelity simulation

International collaboration

- FAA - EUROCONTROL technical interchange meeting on human readiness levels (HRLs), and other shared topics of interest
- SESAR Innovation Days (SID) 2023

Anticipated Research in FY24

Planned Research Activities

- Human Readiness Levels – Phase 3

Expected Research Products

- Human Readiness Levels – Phase 3
  - Specific HRL evaluation activities and criteria suitable for FAA Acquisition Management System (AMS)
  - Recommendations for adopting HRL scale using lessons learned from application of similar scales

https://www.ainonline.com/aviation-news/air-transport/2017-10-18/though-airlines-slow-equip-faa-plans-future-ads-b

Anticipated Research in FY25

Planned research activities

- Training Manager Training Model (TMTM)
  - Part-task training and simulation
  - Deliverable will help identify the methodology used, the content and initial results from the simulation.
- NAS Mental Models
  - Utilizing the Framework developed earlier to identify gaps within TMU and operators understanding.
- Human Readiness Levels (HRLs)
  - Validation of HRLs in FAA Acquisitions and HRLs FAA guidance

Expected research products

- Training Manager Training Model Method (TMTM), Content, and Evaluation Report
- TMTM HITL Evaluation
- NAS Mental Models Gap Analysis Report and Guidance
- HRL Recommendation and Guidance Document

Emerging Focal Areas in FY26

Air Traffic Control (ATC) human factors research

- **Two-way sharing of information in an increasingly integrated information regime**
  - Information overload
  - Decision support tools (DSTs) driven by intelligent systems
  - Controller tasks
  - Automation trust, complacency, reliance, skill degradation, and monitoring

https://www.volpe.dot.gov/our-work/air-traffic-systems-and-operations/air-traffic-management-systems

Enterprise Human Factors

Research Requirements

Provide integrated enterprise HF guidance to:

- Increase the utilization rate of concepts and systems among controllers
- Ensure controller acceptance of concepts and systems
- Increase safety through the mitigation of known human factors risk
- Decrease controller workload through improved tools and techniques

Outputs/Outcomes

- Identify potential gaps in understanding between human and AI. Create a framework on how to address the potential gaps. Guidance document that applies framework to system design.

FY 2026 Planned Research

Air Traffic Control (ATC) human factors research

- Two-way sharing of information in an increasingly integrated information regime
  - Information overload
  - Decision support tools driven by intelligent systems
  - Controller tasks
  - Automation trust, complacency, reliance, skill degradation, and monitoring

Out Year Funding Requirements

F&E

FY24 (Enacted)	FY25 (President's Budget)	FY26 (CIP)	FY27 (CIP)	FY28 (CIP)	FY29 (CIP)
$ 1.5M	$ 2.0M	$ 2.0M	$ 2.0M	$ 2.0M	$ 2.0M