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

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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

People:

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

Laboratories:

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

Current FY23 Accomplishments

- TBO Impact on TMU Cognitive Model Method Final Report
- TBO Impact on TMU Lab Method Interim Report
- Regional TMU Coordination Practices Phase II – Industry Best Practices Report
- Tailored Human Readiness Levels Guidelines Report
- TBO Training Methods Assessment Final Report
- Large Displays HITL

Anticipated Research in FY24

Planned Research Activities

- TBO Human Factors Effects on TMU – Laboratory Method
- Regional TMU Decision-Making and Coordination – Phase 3
- Traffic Manager/Operator NAS Mental Model Analysis
- Human Readiness Levels – Phase 2

Expected Research Products

- **TBO HF Effects on TMU – Laboratory Method**
  - Report on effect of Trajectory Option Sets use in TMUs
  - Report on semi-interactive prototype simulation study with design concept recommendations
- **Regional TMU Decision-Making and Coordination**
  - Recommendations to FAA on adoption of industry collaboration practices
  - Expanded traffic management decision-making model
- **Traffic Manager/Operator NAS Mental Model Analysis**
  - Developing and validating a NAS Mental Model methodology.
- **Human Readiness Levels – Phase 2**
  - 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
  - Anticipated TIM demonstration planned in October and study presentation to SESAR November

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 FY26 Focal Areas

- Air Traffic Control – Info-Centric NAS
  - Two-way shared information
    - How to prevent information overload?
    - Intelligent systems-driven decision support tools
    - How will controller tasks change?
    - Trust in automation, complacency, skill degradation and monitoring.

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
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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 – Info-Centric NAS
  Two-way shared information. How to prevent information overload? Intelligent systems-driven decision support tools. How will controller tasks change? What can be done to create trust between Human and Artificial Intelligence (AI) counterparts.

Out Year Funding Requirements

	FY23 (Enacted)	FY24 (President's Budget)	FY25 (CIP)	FY26 (CIP)	FY27 (CIP)	FY28 (CIP)
F&E	$ 1.5M	$ 1.5M	$ 2.0M	$ 2.0M	$ 2.0M	$ 2.0M