ANG The Future of the NAS Starts Here

# FAA Office of NextGen (ANG)

## REDAC / HF

Review of FY2022 – 2024 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 program's development, validation, and implementation activities, though there are no formal dependencies to specific programs.

# Enterprise Human Factors Program Support

## People:

- Program Manager: Karl Kaufmann
- Subject Matter Experts: Bill Kaliardos
- Program Support: Carl Berntsen, Evan Harvey, Michelle Perdue, Wendy Parker

## Laboratories:

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

# Current FY22 Accomplishments

- Regional TMU Decision-Making and Coordination Project Final Report Completed
- Human Readiness Levels Project Kickoff
- TBO Human Factors Effects on TMU Kickoff
  - Laboratory Method
  - Cognitive Model Method

# Expected FY22 Research Products

- Human Factors Impacts of Large ATC Displays
  - Visually Induced Motion Sickness and Visual Fatigue Report

# Anticipated Research Activities in FY23

- TBO Human Factors Effects on TRACON – Cognitive Modeling Method
- TBO Human Factors Effects on TMU – Laboratory Method
- Regional TMU Decision-Making and Coordination – Phase 2
- TBO Training Model – Effectiveness Assessment
- Human Readiness Levels

# Expected Research Products in FY23

- TBO HF Effects on TRACON – Cognitive Modeling Method
  - Final report with workload, working memory demand predictions
- 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
  - Study of collaboration and distributed decision-making processes in other domains with recommendations of best practices suitable for FAA adoption
- TBO Training Model
  - Report on effectiveness of traffic manager training enhancement
- Human Readiness Levels
  - Recommendations for application of Human Readiness Levels to FAA systems development and acquisition processes

# Emerging FY24 Focal Areas

- Infocentric NAS
  - Traffic Management
    - New actors
    - More data available to all actors
    - New traffic management entities
      - Interrelationship and coordination between existing and new players
  - Air Traffic Control
    - Fully shared information
      - How to prevent information overload?
    - Intelligent systems-driven decision support tools
      - How will controller tasks change?
      - Trust in automation, complacency, skill degredation

# 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

- HF Assessments, such as to determine operational context, NAS interactions, human actors, human factors risks and opportunities
- Enterprise level HF guidance, such as design/procedure/training recommendations for programs to consider

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## FY 2024 Planned Research

- Continued traffic management collaboration
  - Shared mental models
  - Distributed decision-making
- Analysis of Vision 2035 changes
  - Information needs of controllers
  - Automation expansion effects

## Out Year Funding Requirements

RE&D

| FY22 | FY23 | FY24 |
|---|---|---|
| $0 M | $0 M | $0 M |

F&E

| FY22 | FY23 | FY24 | FY25 | FY26 | FY27 |
|---|---|---|---|---|---|
| $1.0 M | $1.5 M | $1.5 M | $2.0 M | $2.0 M | $2.0 M |