ANG **The Future of the NAS Starts Here**

FAA Office of NextGen (ANG)

Full REDAC

Review of FY2022 – 2024 Proposed Portfolio

Enterprise Human Factors

Presenter Name: Tara Gibson

Date: April 14, 2022

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.

ANG The Future of the NAS **Starts Here**

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

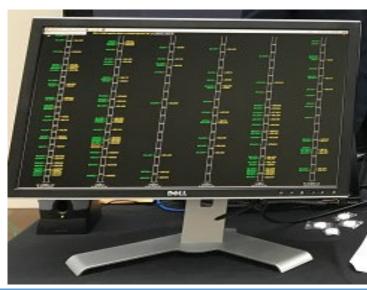- MITRE Center for Advanced Aviation System Development

Briefing Room
Tower Simulator
Aviation Equipment Lab
Pseudo-Pilot

Virtual Reality
Traffic Flow Management

Protyping / Software Dev.
Application Development
Experiment Rooms
Experiment Observation
Pseudo-Pilot 2

ANG The Future of the NAS Starts Here

Current FY22 Accomplishments

- Regional TMU Decision-Making and Coordination Project Final Report Completed

- Human Readiness Levels Project Kickoff

Anticipated Research in FY23

Planned Research Activities

- **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**

ANG The Future of the NAS **Starts Here**

Anticipated Research in FY23

Expected Research Products
- **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

ANG **The Future of the NAS Starts Here**

Emerging FY24 Focal Areas

- ## Infocentric NAS
  - ### Collaborative TFM decision-making
    - New actors
    - More data available to all actors
    - New traffic management entities
      - Interrelationship and coordination between existing and new players
  - ### Air Traffic Control – Vision 2035
    - 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

.

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

ANG The Future of the NAS **Starts Here**