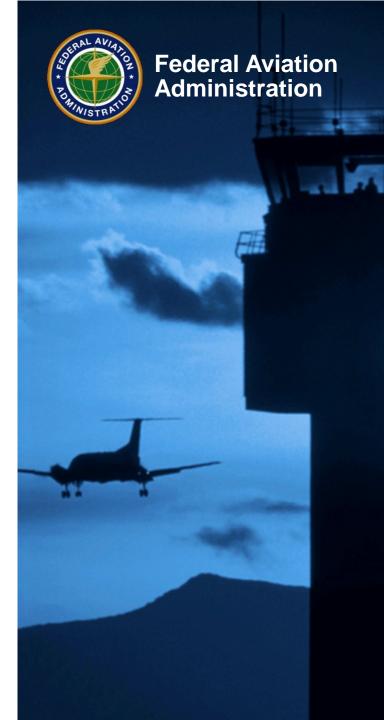# REDAC / NAS Ops

Review of FY 2018 Proposed Portfolio

NextGen ATC/TechOps Human Factors

BLI Number: 1A07A0

Human Factors Division, ANG-C1

March 8 - 10, 2016

Federal Aviation Administration

NextGen ATC/TechOps Human Factors
F&E

What are the benefits to the FAA

This program aims at providing human factors system level guidance to assist with the evolution of the NAS infrastructure and its workforce with a focus on the early phases of the Acquisition Management System (AMS) (i.e., Service Analysis and Concept & Requirements Definition).

What determines program success

Successful transition strategy of Human Factors products.

Identify areas of HF needs early in support of NAS infrastructure and workforce changes. That minimizes safety and adverse operational impacts.

NextGen ATC/TechOps HF Team

Sponsors:
- ANG – NextGen
- ANG-B3 – Enterprise Safety & Information Security
- AJM – Program Management Office
- AJI – Safety and Technical Training
- AJG – Management Services
- AJW – Technical Operations

ANG-C1 Program Management:
- PM - Jerome Lard
- Co-Lead - Stephanie Kreseen
- Task Manager - Dan Herschler
- HF Integration Lead/Task Manager - Bill Kaliardos

Laboratories:
- FAA Civil Aerospace Medical Institute (CAMI)
  - AAM-520 – Carol Manning, Manager
- FAA Research, Development and Human Factors Laboratory (RDHFL)
  - ANG-E25 – Kenneth Allendoerfer, Manager

Anticipated Research in FY16 and FY17

Planned Research Activities

- Integration of HF activities under PBN and Separation Management Portfolios

Expected research Products

- Under review and evaluation with the corresponding Portfolio and Program Managers for these activities

Program Management Activities
(FY14 PLA 00.00.00)

Research Requirement

Description: Program support and Multi-Year Plan Development

Details:
- **Task Manager:** Jerome Lard
- **Performers:** Humanproof
- **PoP:** 4/1/2015 – 3/31/2016

Outputs/Outcomes

Status: In Progress/On Track

Deliverable	Due Date	Status
00.01.00 Updated Multi-Year Program Plan	9/30/2015	B
00.02.00 Monthly IMS Status Updates provided to NLP	Bi-Monthly	G
00.03.00 Quarterly Program Management Reviews (PMR)	Quarterly	G

FY 14/15 Accomplishment / Issues

- ATC/TechOps Multi-Year Plan

- PLA, CIP, RPD, and other planning documents

Out Year Funding Requirements

FY14	FY15	FY16	FY17	FY18
$150,000	–	–	–	–

NAS EA Human Systems Integration Roadmap Harmonization and Support
(FY14 PLA 00.04.00)

Research Requirement

Description: Review all NAS EA Infrastructure and Service Roadmaps to identify key ATC, Tech Ops, and Aviation Industry interdependencies between the HSI Roadmap and other EA Roadmaps. Identify actor-specific impacts due to the introduction of automation and procedures must be thoroughly documented and understood to establish EA human factors dependencies and research requirements. Validate interdependencies with NextGen human factors and domain-specific subject matter professionals. Conduct human factors requirement elicitation sessions with ATC, Tech Ops, and Aviation Industry stakeholders to identify NextGen human factors gaps, potential human factors standardization and policy needs, human factors FAA acquisition support needs, and other/general NextGen human factors needs.

Details:

- **Task Manager:** Jerome Lard
- **Performers:** Fort Hill Group
- **PoP:** 7/1/2015 – 10/31/2016

Outputs/Outcomes

Status: In Progress/On Track

Deliverable	Due Date	Status
00.04.00 Final HSI Roadmap	10/31/2016	G

FY 14/15 Accomplishment / Issues

- Final HSI Roadmap integrated in the NASEA Portal during the FY15 update cycle

Out Year Funding Requirements

FY14	FY15	FY16	FY17	FY18
$301,063	–	–	–	–

Guidance for Service Analysis and Concept and Requirements Definition (FY14 PLA 00.05.00 and 00.06.00)

Research Requirement

Description: This work consists of working with the FAA sponsor to develop human factors guidance for use during the early Acquisition Management System (AMS) phases of Service Analysis (SA) and Concept and Requirements Definition (CRD). The resulting output of this effort will be working with the FAA sponsor to update the Human factors Job Aid to enhance the content, information presentation, and usability of the document for SA and CRD phases. This work also includes assisting in coordinating the Quarterly Human Factors Acquisition working Group Meetings.

Details:

- **Task Manager:** Bill Kaliardos
- **Performers:** Humanproof/Engility
- **PoP:** 4/1/2015 – 9/30/2016

Outputs/Outcomes

Status: In Progress/On Track

Deliverable	Due Date	Status
00.05.00 Human Factors Guidance to assist service organizations when preparing Service Analysis outputs and products	9/30/2016	G
00.06.00 Human Factors Guidance to assist systems engineers with Concepts and Requirements Definition Activities	9/30/2016	G

FY 14/15 Accomplishment / Issues

- Human Factors Acquisition Working Group participation

- Drafting HF Job Aid Updates

Out Year Funding Requirements

FY14	FY15	FY16	FY17	FY18
$325,000	-	-	-	-

Summary of HF findings from management, oversight, and advisory groups (e.g., OMB, OIG, GAO, NTSB, REDAC, NRC, TRB)
(FY14 PLA 00.07.00)

Research Requirement

Description: Using semantic services to analyze oversight reports based on a human factors ontology. Outputs would be able to address strategic planning needs, enhance multi-domain/agency coordination to leverage efficiencies and reduce redundant efforts, and allow for mining of GAO Reports, IG Reports, REDAC Recommendations, RTCA Standards, NRC and TRB Reports, and other documentation for human factors specific requirements and research initiatives that need to be addressed.

Details:

- **Task Manager:** Jerome Lard
- **Performers:** Securboration
- **PoP:** 4/30/2016 – 11/30/2016

Outputs/Outcomes

Status: In Progress/On Track

Deliverable	Due Date	Status
00.07.00 Summary of HF findings from management, oversight, and advisory groups (e.g., OMB, OIG, GAO, NTSB, REDAC, NRC, TRB)	11/30/2016	Y

FY 14/15 Accomplishment / Issues

This work has yet to kick-off and represents a Medium Risk from the current Due Date in the PLA. Since the project start has been delayed we will issue an Amendment to push the Due Date back once project starts. Project start estimated for late April/ early May.

Out Year Funding Requirements

FY14	FY15	FY16	FY17	FY18
$250,000	–	–	–	–

Process Development for NextGen Flight Data Presentation/Management (FY14 PLA 01.00.00)

Research Requirement

Description: The purpose of this project is to create a rigorous standard process for developing the presentations of flight information on the primary ATC primary situation displays, such as STARS, and the functions associated with managing flight information. The standard process will help FAA system development and acquisition programs create information presentations that are effective, easy to train, support effective controller decision making, and reduce the likelihood and impact of human error. The research will also provide guidance to system development and acquisition programs on ways to apply the standard process.

Details:

- **Task Manager:** Jerome Lard
- **Performers:** Tech Center
- **PoP:** 6/18/2015 – 10/31/2016

Outputs/Outcomes

Status: In Progress/On Track

Deliverable	Due Date	Status
01.01.00 Prioritization Process for Information Elements to be displayed on the Data Block	10/31/2016	G

FY 14/15 Accomplishment / Issues

- Kick-Off
- Project Plan
- Proposed Standard Development Process for Determining the Presentation and Management of Flight Information on the ATC Primary Situation Display

Out Year Funding Requirements

FY14	FY15	FY16	FY17	FY18
$229,000	–	–	–	–

NextGen HF Guidance on the Display of Information from ATC Time-Based Systems
(FY14 PLA 02.00.00)

Research Requirement

Description: The purpose of this research is to develop and evaluate methods, and provide standard practices for the display and use of time-based information on Air Traffic Control (ATC) displays.

Details:

- **Task Manager:** Jerome Lard
- **Performer:** Tech Center
- **PoP:** 11/20/2015 – 3/31/2017

Outputs/Outcomes

Status: In Progress/On Track

Deliverable	Due Date	Status
02.01.00 NextGen HF Guidance on the Display of Information From Air Traffic Time-Based Systems	3/31/2017	G

FY 14/15 Accomplishment / Issues

- Kick-Off
- Project Plan

Out Year Funding Requirements

FY14	FY15	FY16	FY17	FY18
$234,000	–	–	–	–

Human Factors Guidance for the Display of NOTAMS on Information Display Systems
(FY14 PLA 03.00.00)

Research Requirement

Description: The purpose of this project is to develop a clear understanding of how Notices to Airmen (NOTAMs) are used by air traffic controllers today and how they are expected to be used in the NextGen timeframe. In particular, the project will determine if new features and presentations for NOTAMs that are anticipated for the flight deck domain are applicable to ATC. The project will develop human factors guidance to ensure that changes and enhancements will be effective, support ATC tasks, and follow human factors guidelines and best practices.

Details:

- **Task Manager:** Jerome Lard
- **Performer:** Tech Center/ Securboration
- **PoP:** 9/9/2015 – 11/30/2016

Outputs/Outcomes

Status: In Progress/On Track

Deliverable	Due Date	Status
03.01.00 Guidance for the display of NOTAMs on the IDS	11/30/2016	G

FY 14/15 Accomplishment / Issues

- Kick-Off
- Project Outline
- PMO/AJV coordination and input

Out Year Funding Requirements

FY14	FY15	FY16	FY17	FY18
$480,000	–	–	–	–

En Route/TRACON Common Function Assessment (FY14 PLA 04.00.00)

Research Requirement

Description: The overall objective of this project is to provide human factors guidance on the design and potential implementation of a common set of functions, information elements, user interfaces, and interactions across ARTCC and TRACON controller workstations. This guidance will take the form of a set of requirements and implementation recommendations that will make the workstations in both domains more similar in functionality and design.

Details:

- **Manager:** Jerome Lard
- **Performer:** CAMI/Tech Center
- **PoP:** 7/1/2015 – 4/30/2016

Outputs/Outcomes

Status: In Progress/On Track

Deliverable	Due Date	Status
04.01.00 Develop Implementation Plan and Recommendations for convergence of En Route/ Terminal Functions	4/30/2016	G

FY 14/15 Accomplishment / Issues

- Kick-Off
- SME Interviews
- En Route TRACON Common Function Implementation Report

Out Year Funding Requirements

FY14	FY15	FY16	FY17	FY18
$472,000	–	–	–	–

NextGen Segment Bravo Human Error Conditions Assessment
(FY14 PLA 05.00.00)

Research Requirement

Description: The project team will develop a series of human error mode metrics that describe the human performance risk profile associated with controller operations in the NAS. Identified metrics will be coordinated with NextGen Safety stakeholders to promote the inclusion into the NextGen Safety Assessment process.

Details:

- **Task Manager:** Jerome Lard
- **Performer:** Fort Hill Group
- **PoP:** 7/1/2015 – 12/31/2016

Outputs/Outcomes

Status: In Progress/On Track

Deliverable	Due Date	Status
05.01.00 NextGen Segment Bravo Human Error Conditions Metrics and Baseline Comparison Assessment	12/31/2016	G

FY 14/15 Accomplishment / Issues

- Kick-Off
- Draft NextGen Segment Bravo Human Error Conditions Metrics Assessment

Out Year Funding Requirements

FY14	FY15	FY16	FY17	FY18
$506,325	–	–	–	–

NextGen Alarms and Alerts Management
(FY14 PLA 06.02.00)

Research Requirement

Description: The goal of the effort is to develop guidance for the effective presentation and management of Alarms and Alerts in the ever increasing complexity of the NextGen air traffic environment.

Details:

- **Task Manager:** Jerome Lard
- **Performer:** Humanproof
- **PoP:** 4/10/2015 – 9/30/2016

Outputs/Outcomes

Status: In Progress/On Track

Deliverable	Due Date	Status
06.02.00 Finalize NextGen Alarms and Alerts Guidebook	9/30/2016	G

FY 14/15 Accomplishment / Issues

- Kick-Off
- Alarms and Alerts Management Guidebook White Paper
- SME interview DOSE sessions
- Revised NextGen Alarms and Alerts Taxonomy

Out Year Funding Requirements

FY 13	FY14	FY15	FY16	FY17	FY18
$375,000	-	-	-	-	-

NextGen Controller Alarms and Alerts Implementation Guide (FY14 PLA 06.03.00)

Research Requirement

Description: The specific objectives of this project are:

- To catalog existing ATC alarms and alerts that will continue to be used in the NextGen timeframe and new ATC alarms and alerts that that have been proposed for NextGen systems,
- To develop a method based on human factors principles and best practices for associating alarms and alert presentation characteristics with situation characteristics, such as operational priority and urgency, and usage characteristics, such as the environment in which the alarm or alert occurs

Details:

- **Task Manager:** Jerome Lard
- **Performer:** Tech Center
- **PoP:** 6/18/2015 – 6/17/2016

Outputs/Outcomes

Status: In Progress/On Track

Deliverable	Due Date	Status
06.03.00 Recommended NextGen Alarms and Alerts Association Method	6/17/2016	G

FY 14/15 Accomplishment / Issues

- Kick-Off
- Updated catalog of NextGen Decision Support Tools
- Developing materials for cognitive walkthroughs

Out Year Funding Requirements

FY14	FY15	FY16	FY17	FY18
$244,906	–	–	–	–

Automation and Decision Support Tools
(FY14 PLA 06.04.00)

Research Requirement

Description: The purpose of this project is to create an initial catalog of proposed NextGen DSTs and automated systems, identify instances where controllers will use multiple tools simultaneously, and the address associated risks.

Details:

- **Task Manager:** Jerome Lard
- **Performer:** MIT Lincoln Labs
- **PoP:** 7/31/2015 – 4/30/2016

Outputs/Outcomes

Status: In Progress/On Track

Deliverable	Due Date	Status
06.04.00 Report on legacy NAS vs. NextGen Adverse Event Recovery and System Resiliency Metrics	4/30/2016	G

FY 14/15 Accomplishment / Issues

- Kick-off
- List of NextGen Automation Systems and DSTs
- Report on system resiliency evaluation criteria

Out Year Funding Requirements

FY14	FY15	FY16	FY17	FY18
$90,000	–	–	–	–

PBN Procedures Guidebook
(FY14 PLA 07.00.00)

Research Requirement

Description: The project team will develop a PBN procedure development guidebook that includes relevant guidance for procedure designers, operational and experimental data supporting the recommendations, and examples of recommendations applied to existing RNAV/RNP procedures.

Details:

- **Task Manager:** Jerome Lard
- **Performer:** Fort Hill Group
- **PoP:** 7/1/2015 – 12/31/2016

Outputs/Outcomes

Status: In Progress/On Track

Deliverable	Due Date	Status
07.01.00 NextGen Performance Based Navigation Procedures Development Guidebook	12/31/2016	G

FY 14/15 Accomplishment / Issues

- Kick-Off
- Developed PBN Scenarios for error and hazard mitigation for guidebook

Out Year Funding Requirements

FY14	FY15	FY16	FY17	FY18
$352,753	–	–	–	–

Update to NextGen Mid-Term Strategic Job Analysis for ATCSs
(FY14 PLA 08.00.00)

Research Requirement

Description: The contractor must update the existing NextGen Mid-Term ATCS Job Analysis Data to reflect the impact of NextGen as introduction of new technologies, automation, and procedures by 2020 affect the controller's job

Details:

- **Task Manager:** Dan Herschler
- **Performer:** AIR
- **PoP:** 9/7/2015 - 3/31/2017

Outputs/Outcomes

Status: In Progress/On Track

Deliverable	Due Date	Status
08.01.00 Final NextGen Mid-Term Controller Strategic Job and Training Needs Analysis	3/31/2017	G

FY 14/15 Accomplishment / Issues

- Kick-off
- Updated list of NextGen mid-term Drivers

Out Year Funding Requirements

FY13	FY14	FY15	FY16	FY17	FY18
$425,000	-	-	-	-	-

NextGen Traffic Flow Management Tool Assessment for the Traffic Manager
(FY14 PLA 09.00.00)

Research Requirement

Description: The purpose of this project is to develop a better understanding of human behavior when using the types of decision-support tools planned for the Traffic Flow Management (TFM) domain: recommendation tools that provide users with suggested solutions to problems and "what-if" modeling tools that allow users to examine the likely outcomes of different potential actions and scenarios

Details:

- **Task Manager:** Jerome Lard
- **Performer:** Tech Center
- **PoP:** 11/10/2015 – 10/31/2016

Outputs/Outcomes

Status: In Progress/On Track

Deliverable	Due Date	Status
09.01.00 TM Job and Tool Analysis and Recommendations	10/31/2016	G

FY 14/15 Accomplishment / Issues

- Kick-off
- Project plan
- Targeted literature review draft

Out Year Funding Requirements

FY14	FY15	FY16	FY17	FY18
$329,000	–	–	–	–