REDAC / NAS Ops

Review of FY 2021 Proposed Portfolio

Enterprise Concept Development

BLI Number: 1A11A

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Enterprise Concept Development

What are the benefits to the FAA

- Validated operational concepts and feedback from stakeholders have led to advancements in research and pre-implementation work to determine the feasibility of advanced concepts and maximize benefits and flexibility for NAS users.
- This program executes research, engineering analysis, demonstrations and evaluations in support of service analysis and strategic planning.

What determines program success

- This program is necessary to assess the feasibility of proposed NextGen capabilities during the early phases of the Acquisition Management Systems lifecycle. The program develops and conducts studies that prove out NAS concepts to ensure feasibility and viability within the NAS.

Enterprise Concept Development/ BLI Number:1A11A
Overview Capabilities

People:

- Program Managers/Portfolio Manager
- Project Managers
- Subject Matter Experts (Operational Research Analysts, Air Traffic Controllers, Human Factors Specialists)

Laboratories:

- Florida Test Bed (FTB)
- NextGen Integration and Evaluation Capability (NIEC)
- William J. Hughes Technical Center

FY18 Accomplishments

- Projects started in FY18 under new Enterprise Portfolio construct.

Vertical Conformance Verification (VCV)

The objective for this capability is to leverage the use of automation to explore how the availability of vertical rate information will improve controllers' ability to monitor aircraft conformance to increase efficiency and capacity in transition airspace. The VCV concept is expected to increase safety and NAS efficiency..

Planned Research Activities

- FY19 - Develop scenarios utilizing VCV in terminal and en route domains. Complete development of vertical procedures and establish aircraft operational performance metrics. Build fast time modeling of VCV scenarios. Domain specific application (i.e. Metroplex/TRACON departures and En route vertical applications)
- FY20 - Complete fast time modeling of VCV scenarios. Complete validation of VCV concept for transition to appropriate domain/s. Complete evaluation of the aircraft performance windows for acceptability into VCV design and procedures. Complete development of initial requirements document for NAS application.
- FY21- No activities currently planned.

Expected Research Products

- Analysis of Aircraft Limitations
- VCV Gap Analysis

Notice to Airmen (NOTAM) Modernization

The objective of NOTAM Modernization is to provide flight critical information on a timely basis that is more current than other regularly scheduled publications can provide. NOTAM information may inform NAS users about a wide range of changing operational environmental factors including time critical delays, corrections or changes to previously published data concerning navigational aids, Airport Traffic Control Towers (ATCT) hours of service changes, surface or airspace changes in hours of operations, Remote Communications Outlet (RCO) status, weather reporting station availability, public airport openings and closings, Aircraft Rescue and Firefighting (ARFF) capability and restrictions, changes in runway characteristics or conditions, NAS lighting systems changes. The currency, availability, accessibility of NOTAMs is necessary for both the efficiency and safety of flight operations across the NAS. The FNS concept is an effort to improve efficiency and safety associated with NOTAM use.

Planned Research Activities

- FY19 - Develop digital data architecture decomposition. Evaluate Federal NOTAM System failure data restoration. Develop NOTAM Modernization Concept of Operations leveraging digital data infrastructure.
- FY20 - No activities currently planned.
- FY21 - No activities currently planned.

Expected Research Products

- NOTAM Current Operations Gap Analysis
- NOTAM Current Technical Gap Analysis
- NextGen Strategic NOTAM Gap Analysis

Space Vehicle Operations (SVO)

The objective of SVO Launch/Re-entry is to evaluate Hazard Risk Assessment and Management (HRAM) capabilities in the terminal and oceanic environments. Additionally, a collaborative data exchange model and timeline for data exchange requirements (including vehicle health data sharing) to support the safe integration and execution of SVO launch and re-entry operations into the NAS.

Planned Research Activities

- FY19 - Create a collaborative data exchange model and establish a realist timeline for data exchange requirements. Develop initial examination of terminal and oceanic capabilities for Hazard Risk Assessment and Management (HRAM).
- FY20 - Develop concept of use document for 4D Compact Envelope for Space Vehicles (Expansion and contraction of debris in protected airspace). Develop functional analysis for 4D Compact Envelope (operational procedures/separation criteria for Space Vehicles in the NAS). Create emerging vehicle “flight plan” (For NAS systems interface compatibility).
- FY21 – Develop concept of use document for hazard volume generation and display on FAA systems, to include off-nominal debris volume. Evaluate viability of hazard area management application on TFMS and ERAM platforms. Create emerging vehicle “flight plan” (For NAS systems interface compatibility).

Expected Research Products

- Complete requirements validation for HRAM application on TFMS and ERAM platforms.

Class E Upper Airspace Management (ETM) Concept Development

The objective of the ETM project is to conduct research, analyze and develop concepts for future operations above FL600 and up to the Karman Line. While current Class E (upper airspace) regulations are predicated on traditional airspace usage, increasing commercial interests and the advent of new technologies present new challenges for the diversified operations within this airspace. ETM is an airspace management concept that describes a vision for future Class E (upper airspace) operations, encompassing a wide range of operational mission characteristics in this airspace; including geostationary, extreme velocity and long duration operations. This will potentially encompass future ETM applications, such as weather monitors, pseudo-stationary internet backbones, unmanned high altitude long endurance vehicles, space vehicles, and hypersonic vehicles. The outcomes of this project will support the initial engineering and system prototype development effort for ETM, leading to future demonstrations to support concept maturity

Planned Research Activities

- FY19 - Deliver ETM Concept of Operations.
- FY20 - No activities currently planned.
- FY21 - No activities currently planned.

Expected Research Products

- ETM Concept of Operations

Emerging FY21 Focal Areas

- **Apply lessons learned from initial TBO to implement Full TBO**
- **Dynamic TBO analysis and modeling**

1A11A – G05A.02-10 - Enterprise Concept Development – F&E

Research Requirement

•This program will validate new concepts and generate information supporting the validity of identified capability shortfalls, future service needs, and capability requirements that will foster increased system capacity, efficiency, and throughput. Validated operational concepts will identify technical and operational requirements (including airspace, procedures, and automation requirements needed to realize the capacity gains.

Outputs/Outcomes

•VCV Analysis of Aircraft Limitations

•VCV Gap Analysis

•NOTAM Current Operations Gap Analysis

•NOTAM Current Technical Gap Analysis

•NextGen Strategic NOTAM Gap Analysis

•Complete requirements validation for HRAM application on TFMS and ERAM platforms

•ETM Concept of Operations

FY 2021 Planned Research

•Develop concept of use document for hazard volume generation and display on FAA systems, to include off-nominal debris volume

•Evaluate viability of hazard area management application on TFMS and ERAM platforms

•Create emerging vehicle “flight plan” (For NAS systems interface compatibility)

• Complete development of initial requirements document for TBO.

•Complete initial concept of use document for TBO.

Out Year Funding Requirements

FY18	FY19	FY20	FY21	FY22
$1.5M	$1.5M	$1.5M	$1.5M	$1.5M