REDAC / NAS Ops

Runway Incursion Reduction Program (RIRP)

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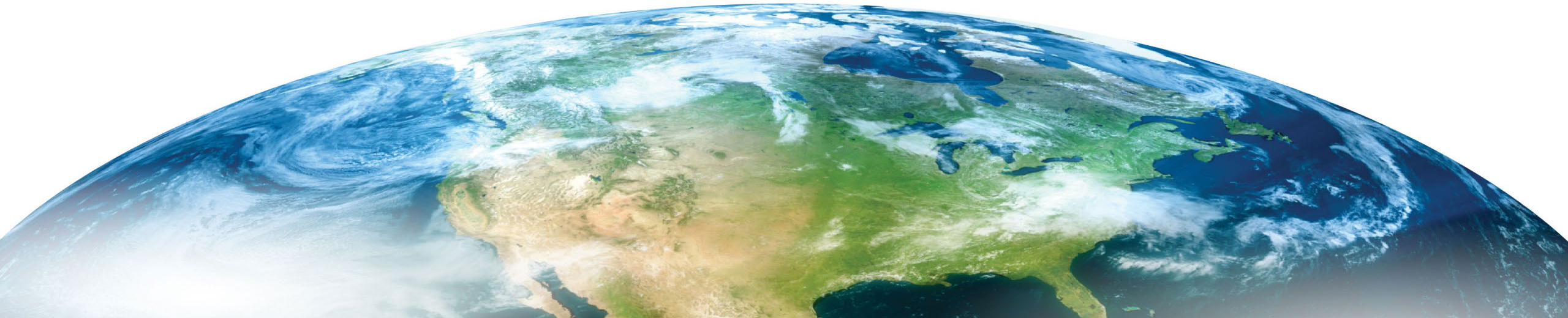
Date: Sep 1, 2020

Review of FY 2020 - 2023 Proposed Portfolio



Runway Incursion Reduction Program (RIRP) Overview

- The objective of the Runway Incursion Reduction Program (RIRP) is to reduce the risk to people and property caused by collisions in the runway environment. The RIRP is focused on providing SAFETY benefits for the FAA.
- The program will research technologies, develop and evaluate prototype systems that can be used to detect the presence of hazards in the Runway Safety Area, and provide alerts to the individual(s) who can take corrective action.
- RIRP success is measured by the completion of the goals identified in the Research Management Plan (RMP) for each prototype activity. Initiatives that successfully complete all the RMP Goals identified are then presented as candidates for acquisition, or presented for AIP-funding eligibility.

Runway Incursion Reduction Program (RIRP) Program Support

Staff

- Sponsor: Giovanni Dipierro, AJI-14 (A)
- Program Manager: Ben Marple, ANG-C52
- Support Contractors: GEMS Inc., Veracity Eng., DOT Volpe Center

Laboratories

- MIT/LL:
  - Safety Logic and Technology Development
  - System Requirements Development
  - Technical Transfer Package Development
- MITRE:
  - Benefit Estimation Methodology
  - Research / Data Mining
  - Human Factors

Runway Incursion Reduction Program (RIRP) Accomplishments in Current FY (20)

- Small Airport Surface Surveillance (SASS)
  - Conducted active Mode-S Surface & Airborne Surveillance Proof of Concept for SASS with refactored SASS software
  - Conducted ATCRBS Surface & Airborne Surveillance Proof of Concept for SASS with refactored SASS software
  - Prepared System Design Document (SDD) and Doxygen code documentation for Technical Transfer preparation to take place in FY21, following November 2020 virtual Industry Day

- Runway Incursion Prevention through Situational Awareness (RIPSA)
  - Developed Screening Information Request (SIR) and Acquisition Package for RIPSA Technical Solicitation

- Surface Taxi Conformance Monitoring (STCM)
  - Conducted proof-of-concept demonstration of STCM capability for pilots using EFB application
  - Conducted HITL testing of STCM capability for pilots using EFB application

Anticipated Research in FY21

- Small Airport Surface Surveillance (SASS)
  - Activities: Conduct SASS Virtual Industry Day in November 2020 to demonstrate Mode-S and ATCRBS Surveillance Proof of Concept; Transfer SASS Technology to Industry for further development
  - Products: SASS software, SASS hardware package specifications, Technical Transfer documentation
- Runway Incursion Prevention through Situational Awareness (RIPSA)
  - Activities: Procure technologies for RIPSA through contract solicitation; conduct vendor site surveys and initiate installation of RIPSA technologies at test site(s)
  - Products: Contract Award(s) for system hardware and vendor engineering support, Site survey reports, Test plans.
- Surface Taxi Conformance Monitoring (STCM)
  - Activities: develop a tower-based STCM prototype with a focus on smaller towered general aviation airports; Conduct HITL testing of STCM capability for tower-based prototype
  - Products: STCM technology prototype for tower use; results of HITL evaluations for the STCM tower-based prototype

Anticipated Research in FY22

- Runway Incursion Prevention through Situational Awareness (RIPSA)
  - Activities: Initiate Operational Testing & Evaluation (OT&E) for RIPSA test system(s)
  - Products: Installed RIPSA test systems, test NCP's, and SRMD's

- Surface Taxi Conformance Monitoring (STCM)
  - Activities: Conduct testing of the combined flight deck and tower prototypes; Technology Transfer of STCM prototypes
  - Products: Technology transfer documentation and prototype software

Emerging FY23 Focal Areas

- Incorporation of Speech Recognition capability and cooperative surveillance into RIPSA technologies for surface safety.

- Wrong Surface Landing Prevention: Using air traffic and cockpit technologies to allow ATC and pilots to detect alignment problems that could result in Wrong Surface Landing (WSL) incidents

Runway Incursion Reduction Program (RIRP)

Research Requirements

- Develop Program Requirements, prototype, test and evaluate potential technologies at candidate airports as identified in the RIPSA report.
- Develop low cost surface surveillance sensor
- Refine concept and develop tools for tower-based and cockpit-based taxi conformance monitoring
- Sponsor: Runway Safety Group (AJI-14)
  POC: Giovanni Dipierro, Manager(A), AJI-14

Outputs/Outcomes

- Products:
- Localized surveillance and annunciation technology test systems at RIPSA candidate airports
- STCM technology prototype for cockpit and tower
- RIPSA operational evaluation reports and system requirements

FY 2023 Planned Research

- Technology Feasibility Assessment for Wrong Surface Landing Prevention
- Market Survey of Speech Recognition capability and cooperative surveillance for integration with RIPSA technologies for surface safety

Out Year Funding Requirements

F&E

FY21	FY22	FY23	FY24	FY25	FY26
$ 3M	$ 3.1M	$ 3.5M	$ 3.5M	$ 3.5M	$5M