

REDAC/NAS Ops



Next**GEN**

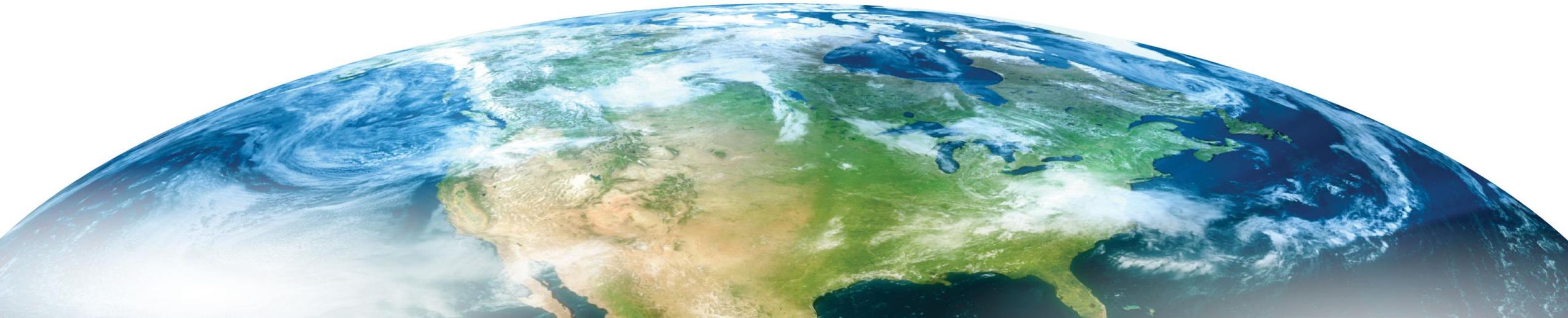
***NextGen – Wake Turbulence
(Wake R,E&D)***

BLSI Number: A11.n

Presenter Name: Jillian Cheng

Date: 17 March 2021

***Review of FY 2021-2023
Proposed Portfolio***



Wake R,E&D Overview

What are the benefits to the NAS Users in the post COVID Era?

Wake R,E&D's assessment of aircraft wake encounter risk – at all flight levels - provides the information to develop ATC wake risk mitigations that will enable fewer flight delays/cancellations and reduced inflight operating costs. This benefit comes (even now for air cargo) from these Wake R,E&D analysis and assessment products:

- Wake generation and resistance to wake encounter assessments of new aircraft types entering service in the NAS
- Wake risk mitigation solutions for specific airport/airspace ATC operations
- Aircraft wake generation/encounter data bases, modeling and analyses

What determines program success?

- No increase in the reported wake encounters per flights in the NAS
- Increased Airport Arrival Rates set by ATC when forced to go to IFR operations
- ATC able to mitigate wake encounter risk when separating en route aircraft at distances less than 5 NM



Wake R,E&D Project Support

People:

- Jillian Cheng, Project Manager
- Other federal resources: AIR Wake CSTA, AFS-400 and Volpe Center
- Contract support SMEs: wake modeling and analysis experts; ATC systems, operations and analysis experts; GA, and air carrier pilot experts

Laboratories/R&D Centers:

- MIT/LL
- Volpe Center
- FOQA Data Centers



Current FY21 Accomplishments

- Developed wake risk assessments for aircraft types slated to begin operating in the NAS (~34 assessments 1st Qtr. FY21)
- Progressed in the development of candidate Absolute Wake Encounter Metrics for use in evaluating safe separations between aircraft
- Continued the collection of aircraft wake tracks at SFO and JFK airports
- Completed updates to refine methodologies for wake separation recommendations
- Applied the previously developed statistical wake encounter screening utility (SU) to archived Flight Operational Quality Assurance (FOQA) data from flights into and out of the Newark International Airport. The number of low level (not reportable) wake encounter statistics from the SU matched the suspected, but never before confirmed, incidence of these low level wake encounters.



Wake R,E&D Anticipated Research in FY21

Planned Research Activities:

- Develop wake risk assessments for aircraft types operating in the NAS (~ 90 evaluations for FY21)
- Assess requested airport/airspace ATC operations to develop wake risk mitigation solutions that will address specific operational constraints
- Continue to develop candidate Absolute Wake Encounter Metrics for use in providing safe, flight capacity efficient separation recommendations for aircraft types operating in the NAS
- Continue collection of aircraft wake tracks at SFO and JFK airports
- Continue use of FOQA archive Screening Utility to gather additional statistics on the frequency of low-level (non reportable) wake encounters around major US Airports

Expected Research Products:

- Wake risk assessments for new aircraft types and for aircraft types requested by ATC for evaluation
- Wake risk mitigation recommendations to safely enable more flight capacity in capacity constrained airspace
- Wake separation updates to inform the RECAT project's pairwise separations for its use in developing current and future ATC DST's wake separation adaptation parameters



Wake R,E&D Anticipated Research in FY22

Planned Research Activities:

- Develop wake risk assessments for aircraft types operating in the NAS (~90 evaluations for FY22)
- Continue collection of aircraft wake tracks at SFO & JFK (reduced funding may reduce data collection capacity)
- Assess requested airport/airspace ATC operations to develop wake risk mitigation solutions that will address specific operational constraints
- Continue development of Absolute Wake Encounter Metrics
- Evaluate changes to ATC procedures which involve wake risk mitigation

Expected Research Products:

- Wake risk assessments for new aircraft types and for aircraft types requested by ATC
- Wake risk mitigation recommendations to safely enable more flight capacity in capacity constrained NAS airspace
- Absolute wake encounter metrics for several aircraft types
- Wake risk assessments of proposed changes of ATC operations in the NAS (reduced funding will limit these assessments)

Continuing & Emerging FY23 Focal Areas

- Develop wake risk assessments for aircraft types slated to begin operating in the NAS (~90 evaluations for FY23)
- Develop generalized methods for doing wake risk assessments for Large UAS that will begin operations in the NAS
- Assess requested airport/airspace ATC operations to develop wake risk mitigation solutions that will address specific operational constraints
- Complete the development of candidate Absolute Wake Encounter Metrics for use in evaluating safe separations
- Evaluate changes to ATC procedures which involve wake risk mitigation
- Continue collection of aircraft wake tracks at SFO & JFK



Wake R,E&D

Research Requirements

- Assess wake risk in today's and future ATC operations to enable a safe increase in NAS capacity

Outputs/Outcomes

- Wake risk assessments for new aircraft types
- Wake risk assessments of proposed changes to ATC procedures
- From additional collected data – update aircraft wake risk assessments for RECAT's use in developing wake risk mitigations for ATC's current and future operations

FY 2023 Planned Research

- Assess new & requested re-evaluations of aircraft types for wake risk
- Assess proposed changes to ATC procedures for wake safety
- Complete development of candidate metrics (Absolute Metrics) for evaluating wake risk in cases that use of relative risk is not applicable
- Continue collection of wake track data to enhance the statistical data used for wake risk assessments

Past, Current and Planned Project Funding

	FY17	FY18	FY19			
	7.6	5.8	5.6			
R,E&D (\$M)	FY20	FY21	FY22	FY23	FY24	FY25
	3.9	2.6	2.6	2.6	2.6	2.6

