



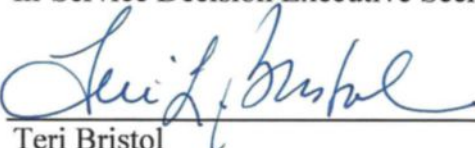
RECORD OF IN-SERVICE DECISION FOR DATA COMMUNICATION (DATA COMM) SEGEMENT 1 PHASE 2 (S1P2) EN ROUTE INITIAL SERVICES

JANUARY 31, 2020

The Data Communication (Data Comm) Segment 1 Phase 2 (S1P2) En Route Initial Services program stakeholder meeting was conducted on January 30, 2020, to obtain consensus on proceeding toward the In-Service Decision, which authorizes national deployment of the system. The request for an In-Service Decision was the result of satisfying the In-Service Decision entrance criteria in the Federal Aviation Administration's Acquisition Management System policy for determining operational effectiveness and suitability.

An In-Service Decision meeting was conducted on January 31, 2020, with the In-Service Decision Authority. Mr. Jesse Wijntjes, Program Manager, presented an action plan for resolving the one remaining In-Service Review Checklist item and addressed the Independent Operational Assessment findings. The In-Service Decision Authority, Teri Bristol, Air Traffic Organization Chief Operating Officer, approved the In-Service Decision for the Data Comm S1P2 En Route Initial Services program based on the acceptance of the proposed action plan.

Submitted by:  1/31/2020
Tracy Umstead
In-Service Decision Executive Secretariat
Date

Approved by:  1/31/2020
Teri Bristol
Air Traffic Organization Chief Operating Officer
In-Service Decision Authority
Date



DATA COMMUNICATION SEGMENT 1 PHASE 2 EN ROUTE INITIAL SERVICES

Data Communication Segment 1 Phase 2 (S1P2) En Route Initial Services provides data communications services between pilots and air traffic controllers, supplementing existing voice communications capabilities. In accordance with the Acquisition Management System policy, the following entrance criteria have been satisfied to request an In-Service Decision (ISD):

In-Service Review Checklist and ISD Action Plans

The one open In-Service Review Checklist item and other issues have been addressed in the ISD briefing (attachment). The action plan was approved by the affected stakeholder organization.

Testing

Key Site Data Comm Functional Verification was completed in November 2019.

Independent Operational Assessment

The Data Comm Segment 1 Phase 2 Independent Operational Assessment was conducted from December 2 through December 20, 2019. The Independent Operational Assessment Team determined that the system was Operational Ready for national deployment. The assessment identified two medium-risk hazards, two low-risk hazards, two operational concerns, and two comments. A Safety Risk Management panel will be convened to review the findings.

Security

In 2017, Security In-Service Review Subject Matter Expert (SME) concurred with the Program Office's determination that no additional security review was required for S1P2. During the ISD Stakeholder meeting, the Security SME requested a review of system changes made since the previous approval. An action was recorded, see Stakeholder Concurrence section for details.

Safety

The Data Comm System Safety Assessment Report (SSAR) was approved in February 25, 2019. In addition, there is an action plan to reconvene the Safety Risk Management panel to review the Independent Operational Assessment findings.

Stakeholder Concurrence

On January 30, 2020, the stakeholders, who were present at the meeting and on the telephone, concurred with proceeding with the ISD (see attachment for attendance sheet). An action was recorded for the Data Comm Program Office to brief the ATO Cybersecurity Group on the system modifications made since March 2017. The evaluation results will be incorporated into the risk assessments scheduled for DCNS, ERAM, and TDLS in fiscal year 2020.

Data Communication Full Services

As documented during the 2014 Final Investment Decision, prior to the subsequent Full Service release, the Data Comm Program will brief the In-Service Decision Authority on the ISD entrance criteria (i.e., Testing, Safety, Security, Training, and any additional Independent Operational Assessments).

Data Comm Segment 1 Phase 2 En Route Initial Services
ISD Meeting
Call-in/Sign-in Sheet

ISD Meeting		January 31, 2019
	Name	Organization
1.	Tara Holmes	ANG-C1
2.	Paul Fontaine	ANG-C
3.	Brian Throop	ATO
4.	Jeff Plandy	ATO
5.	Jeffrey U. Vincent	AJT
6.	Mark Steinbicker	AUS
7.	Amy Gusley	ASJ-3
8.	Kevin Grimmer	ASJ-34
9.	Ray Orie	ATM-34
10.	Emily Campbell	ASJ-0
11.	Malcolm Andrews	ATM-3
12.	Kris Burnham	ATM-0
13.	Mark DeViccolo	ASJ-0
14.	Tim Arel	ASJ-0
15.	Teri Bristol	ASJ-0
16.	Michael O'Donnell	AVS-2(A)
17.	Rebecca Guy	AVJ
18.	Emily Bollen	ISD/ASJ support
19.	TRACY UNSTEAD	ISD SEC/ASJ-311
20.		

ON TELEPHONE:

JESSE WIJNTJES
 JEFF SNYDER
 ERIC WIGGAM
 JOHN WOZNIAK

In-Service Decision Briefing for Data Comm Segment 1 Phase 2, Initial En Route Services

In-Service Decision Meeting

Presented to: In Service Decision Authority
By: AJM-34
Date: January 31, 2020



Federal Aviation
Administration



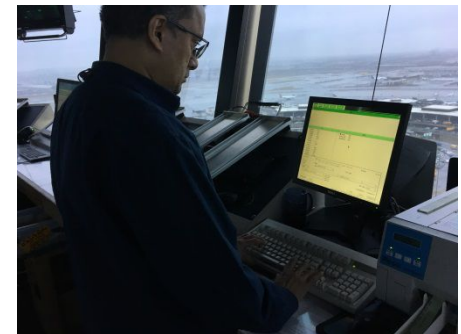
Agenda

- **Program Overview**
- **System Architecture and Design**
- **Waterfall and Critical Path**
- **In-Service Decision Readiness**
- **Program Status**
- **In-Service Decision Action Plans**
- **Independent Operational Assessment (IOA) Results**
- **Recommendation**



Program Overview

- ✈ Provides data communications services between pilots and air traffic controllers, supplementing existing voice communications capabilities
- ✈ Provides a data link between ground automation systems and flight deck avionics for air traffic control (ATC) clearances, instructions, traffic flow management, and flight crew requests
- ✈ Controllers will be able to deliver instructions with a push of a button and without the need to utilize voice frequencies
- ✈ Enables the transmission of complex instructions that can be quickly and correctly loaded into an aircraft's flight management system, upon acceptance by the pilot
- ✈ Enables NextGen Initiatives and Trajectory-Based Operations



Data Comm Services Roadmap

CY 16 18 20 22 24 26 28 30 35 40

Segment 1 Phase 1
- Tower Service



Controller-Pilot Data Link (CPDLC) Departure Clearances (DCL)
Deployment to 62 Towers Complete

Deployment Complete

Impacted due to latent avionics and air-ground network interoperability issues and the government shutdown

Initial En Route Services



Transfer of Communications / Initial Check-In
Altimeter Settings
Altitudes
Speeds (Initial)
Crossing Restrictions (Initial) Airborne
Reroutes / Go Button Controller Initiated
Reroutes (Initial) Direct-to-Fix (Initial)

Deploying
(Waterfall Re-Planned due to the Government Shutdown)

Segment 1 Phase 2
- En Route Services

Full En Route Services



Controller Initiated Routes (Full)
Direct-to-Fix (Full)
Crossing Restrictions (Full)
Speeds (Full)
Advisory Messages
Holding Instructions

In Development

Funded

Unfunded

Candidate Enhanced FANS Services



Deferred from Full Services
• Adapted Arrivals, Stuck Mic, Beacon Codes
TBO Increments / Services
• Initial 4D Trajectory Management
 ○ Path Stretch
 ○ Initial Tailored Arrivals
 ○ TMC-initiated Reroutes (AFST)
• Initial Aircraft Intent (ADS-C)

Concept Exploration

Infrastructure

- Applications
- Networks
- Subnetworks

Future Air Navigation System (FANS) AFN & CPDLC

+ FANS ADS-C Application

FANS over ACARS

+ FANS over IPS

VDL Mode 0/A and VDL Mode 2

+ Commercial Subnets (e.g., Satcom)

Segment 2

- Advanced Services

Baseline 2 Services



• Dynamic RNP
• A-IM
• 4D TRAD
• Tailored Arrivals
• Aircraft Intent (EPP)
• D-TAXI

In R&D

Infrastructure

- Applications
- Networks

B2 CM, CPDLC & ADS-C

B2 over IPS

Benefits of Data Comm

Reduce communication time between controllers & pilots



Improve re-routing around weather and congestion



Increase flexibility and accommodation of user requests



Enable NextGen Initiatives & Trajectory-Based Operations



Controller/Pilot Efficiency



- Communication Time

Throughput/Efficiency



- Delay
- Fuel Burn

Environmental



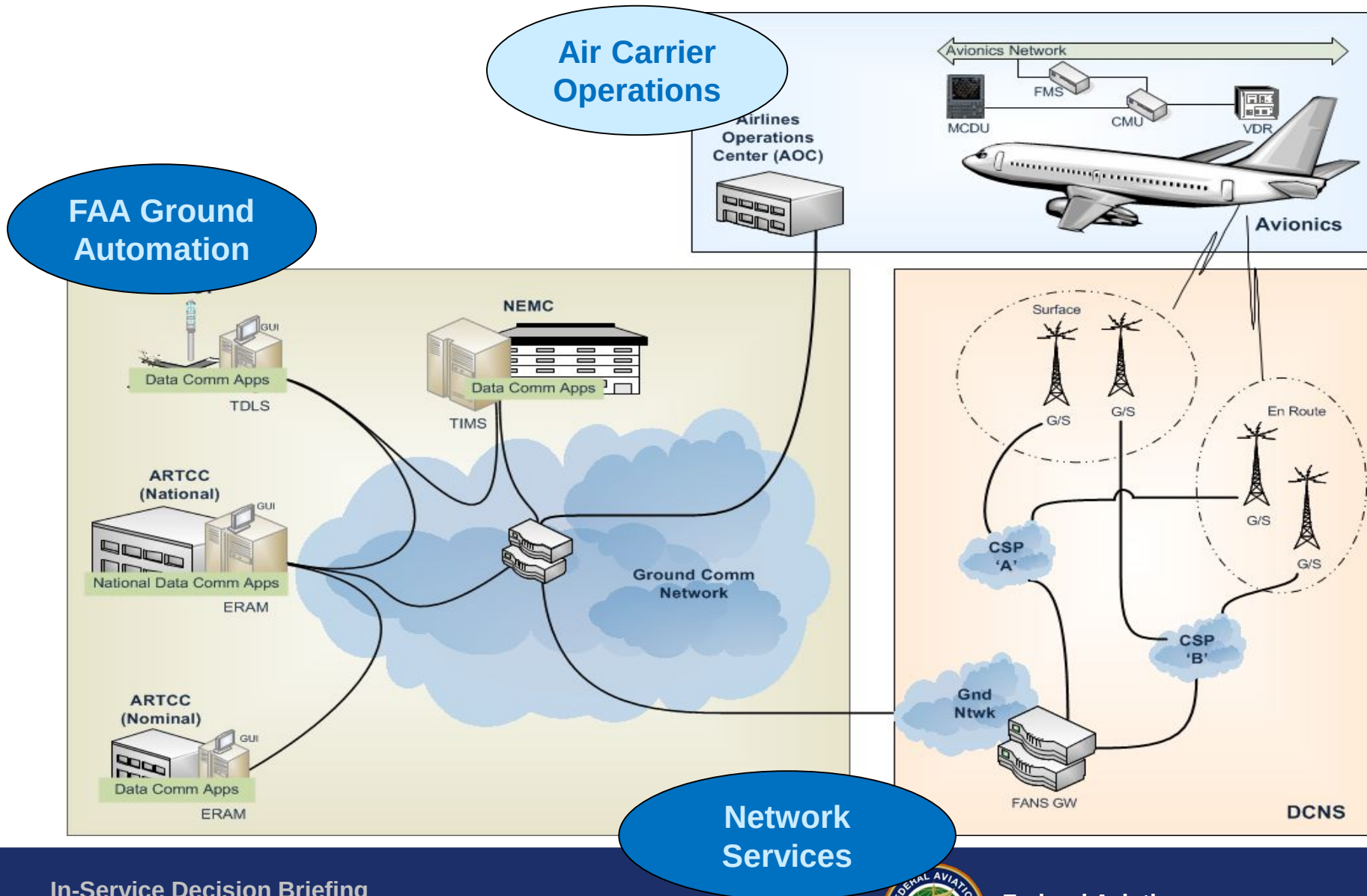
- Emissions (CO₂)

Safety



- Read/hear back errors
- Loss of Comm events

Systems Architecture



System Components

- **En Route Automation Modernization (ERAM)**
 - Software enhancements to provide flight data and aircraft correlation to support Controller Pilot Data Link Communications (CPDLC) Data Comm messaging
- **Tower Data Link System (TDLS)**
 - Software enhancements to support National Single Data Authority (NSDA)
- **FAA Telecommunications Infrastructure (FTI)**
 - Provides interfacility communications to support Data Comm messaging
 - Provides enterprise security services for secure Data Comm message exchange
- **Data Comm Network Service (DCNS)**
 - Air/ground communications network services
- **Avionics**
 - Aircraft equipped with Future Air Navigation System (FANS) 1/A avionics and VHF Data Link Mode 2 (VDLm2) radios

Data Comm Tower Services

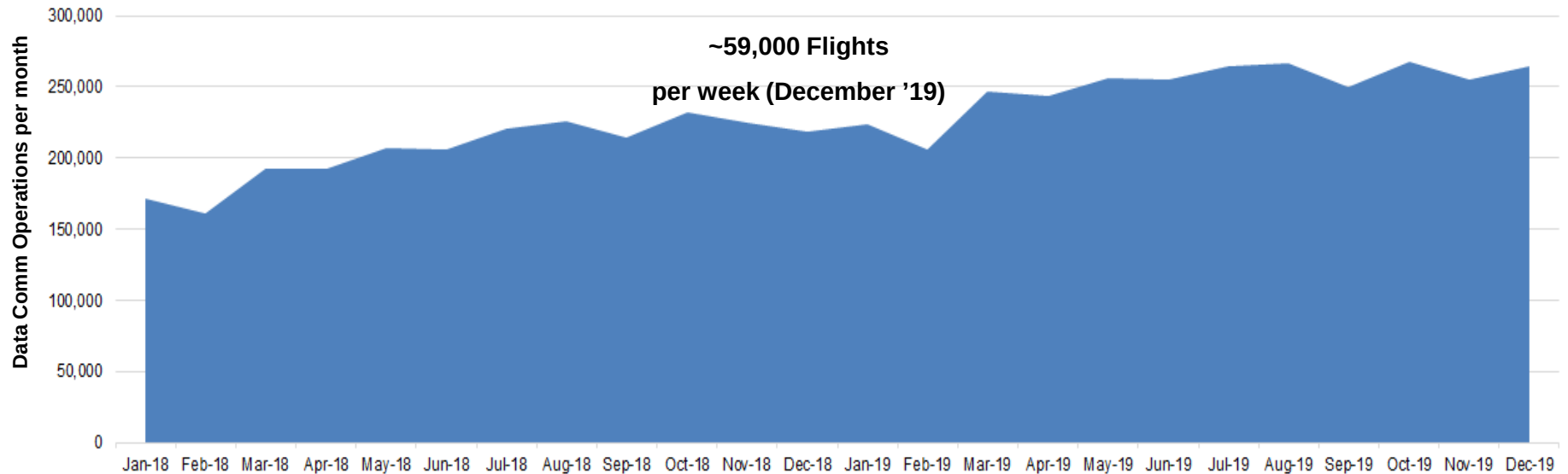
- Data Comm Tower Services completed its baseline implementation at 55 airports 29 months ahead of schedule and \$75M under budget
- Seven additional towers added to the baseline and delivered at no additional cost and 13 months ahead of the baseline schedule
 - Two of the airports were added to support DoD operations at no cost to the military
 - Three of the airports received a brand new TDLS and D-ATIS system
- Enhanced functionality delivered to all 76 airports as part of the implementation
 - All TDLS sites received tech refreshed hardware and software
- Successfully executed the transition to National Single Data Authority (NSDA) at all 20 ARTCCs and 55 CPDLC airports in one night (pre-req for En Rte Init Services)
- JFK, EWR, LGA, PHL, HPM, and TEB moved to the front of the waterfall to deliver early benefits in the Northeast Corridor at no additional cost
- Air to ground RF services at ten airports upgraded with enhanced availability / redundancy at no additional cost

Acquisition Program Baseline (APB) Milestones	APB Date	Actual Date
✓ ERAM Preliminary Design Review (PDR)	September 2011	September 2011
✓ ERAM Critical Design Review (CDR)	March 2012	March 2012
✓ FID: Final Investment Decision for ERAM & TDLS	May 2012	May 2012
✓ DCIS Contract Award	July 2012	September 2012
✓ TDLS Preliminary Design Review (PDR)	December 2012	October 2012
✓ TDLS Critical Design Review (CDR)	August 2013	July 2013
✓ ERAM Initial Test Release (ITR)	June 2014	April 2014
✓ Operational Test (OT&E)	November 2015	March 2015
✓ First-Site Initial Operational Capability (IOC)	March 2016	August 2015
✓ In-Service Decision (ISD)	December 2016	December 2015
✓ Operational Readiness Decisions (ORD)	April 2017	September 2015
✓ Last-Site IOC	May 2019	December 2016

Key: Complete On Track May Be Missed Missed



Tower Service Ops Summary



13 US Mainline Air Carriers



62 International Air Carriers



67 Aircraft Types



Business Jet Operators



In-Service Decision Briefing

January 2020



**Federal Aviation
Administration**

Data Comm Tower Benefits to Date

June 2016 - December 2019

Since 2016, CPDLC DCL...



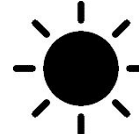
Saved 2.02M minutes of radio time



Cleared 7,280,000+ flights



Saved 1,370,100+ minutes of airspace user time



Prevented 12.9M Kgs of CO₂ Emissions



Served 1B+ passengers



Prevented 111,400+ readback errors

S1P2 En Route Initial Service Acquisition Program Baseline (APB) Milestones

	Milestone	Baseline Date	Actual Date
✓	ERAM Data Comm Contract Definitization	March 2015	March 2015
✓	Contractor Detailed Design Complete	December 2016	May 2016
✓	Order DCNS Network Service Volume for Keysite	December 2017	April 2017
✓	Development Test and Evaluation Complete	June 2018	September 2017
✓	First-Site Initial Operational Capability (IOC) *	March 2020	November 2019
	In-Service Decision (ISD)	March 2020	
	Last-Site IOC **	September 2021	

Key:

Complete

On Track

May Be Missed

Missed

*** The First-Site IOC date was changed from July 2019 to March 2020 due to the government shutdown**

– The key sites (ZKC and ZID) went IOC in November 2019

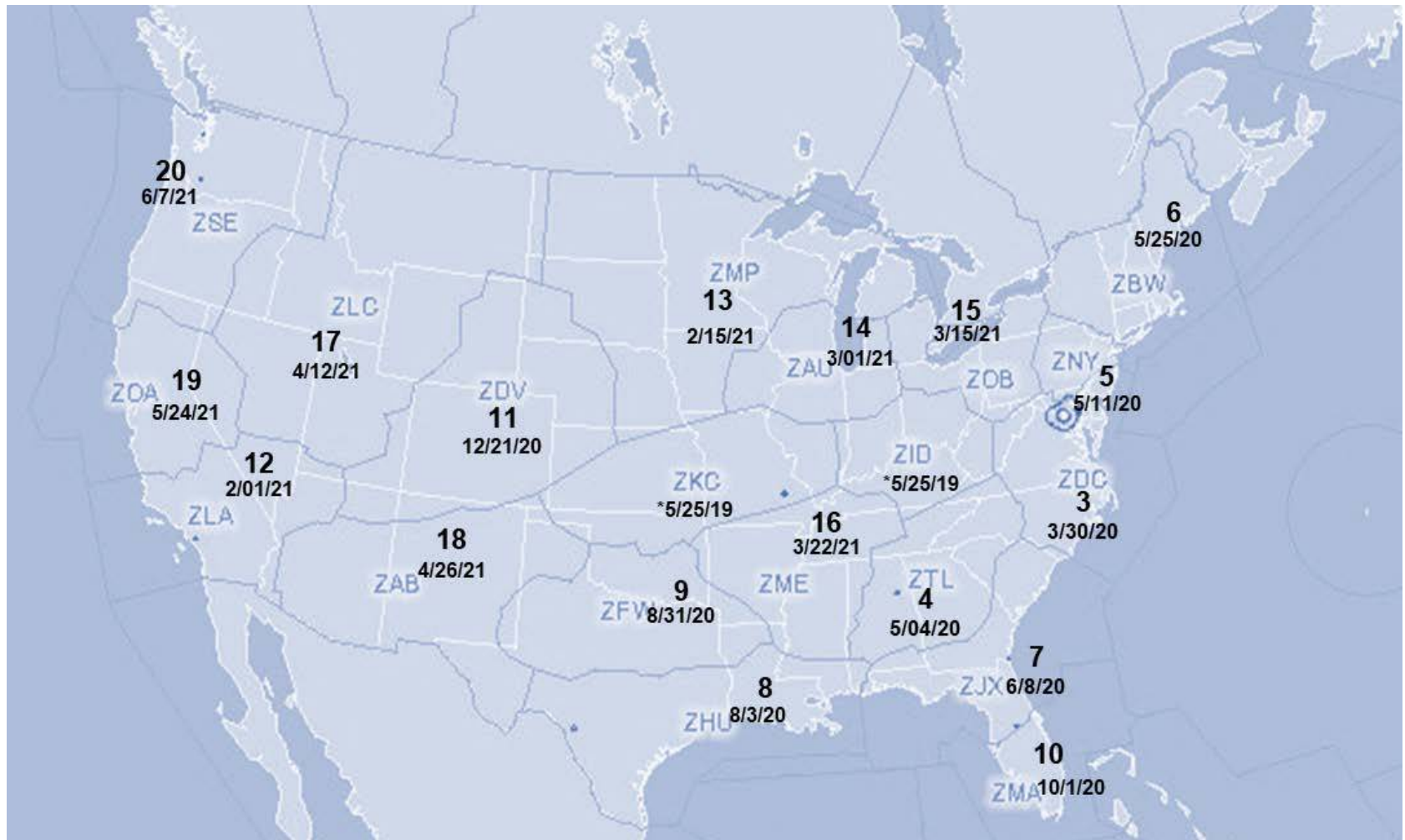
**** The Last-Site IOC date was changed from February 2021 to September 2021 due to the government shutdown**

En Route Initial Services Background

- **Started training at the key sites in May 2018 with Limited Data Comm Functional Verification (DFV) testing starting in June 2018 (First En Route CPDLC clearance sent June 6, 2018)**
- **Encountered multiple latent avionics and air-ground network interoperability issues throughout Summer/Fall 2018 testing that prevented the program from moving into Expanded DFV (24/7 ops) and IOC**
- **The government shutdown (December 2018-January 2019) adversely impacted the program**
 - All test and training activities at multiple ARTCCs were stopped
 - Industry continued to address latent avionics and air-to-ground network interoperability issues discovered during field testing impacting CPDLC end-to-end success rates at the key sites
 - Due to the impacts of the shutdown, one of the key sites (ZME) was not able to continue as a test facility due to local resource constraints
 - Indianapolis (ZID) and Kansas City (ZKC) remained as key sites
- **After the government shutdown the program re-planned all of the site implementation activities and the waterfall deployment schedule for all 20 ARTCCs**
- **The program also had to conduct refresher training and re-training for all controllers at the key sites**
- **Re-started Limited Data Comm Functional Verification (DFV) at ZID and ZKC in March 2019**
- **ZID and ZKC entered into Expanded DFV (24/7 ops) in April 2019**
- **Closed on the Post Shutdown re-planned waterfall in May 2019**



Post Shutdown Waterfall Re-Plan – May 2019



En Route Initial Services Background

- After the re-start of DFV at the keysites, the program continued to be impacted by air-ground network interoperability and avionics issues that prevented the key sites (ZID and ZKC) from declaring IOC
- The FAA and industry engineering team (L3Harris, Collins/ARINC, SITA, and Leidos) developed additional mitigations which were implemented in the ground systems to alleviate impacts from these latent avionics issues until they could be fixed
- The program was also impacted by latent air-ground network defects which caused the service to be shutdown at the keysites; ZID and ZKC resumed Expanded DFV following implementation of fixes
- ERAM release EAE210, EAE300, and an additional FANS Gateway enhancement were implemented in September 2019; this configuration provided an operationally acceptable system for the key sites to IOC

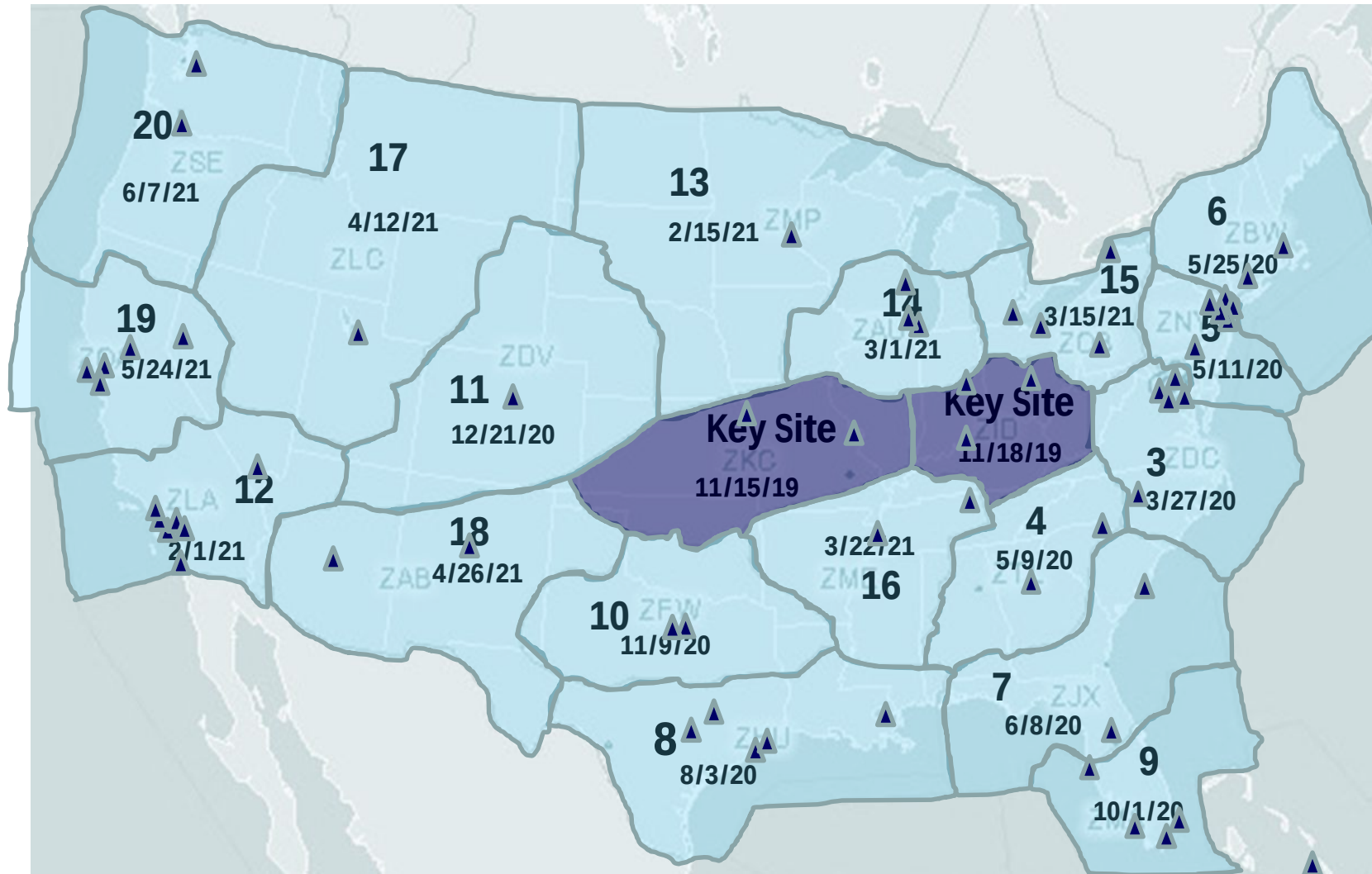
**Despite all of these challenges both of the keysites went
IOC in November 2019**

Only 3½ months after the original First Site APB IOC date

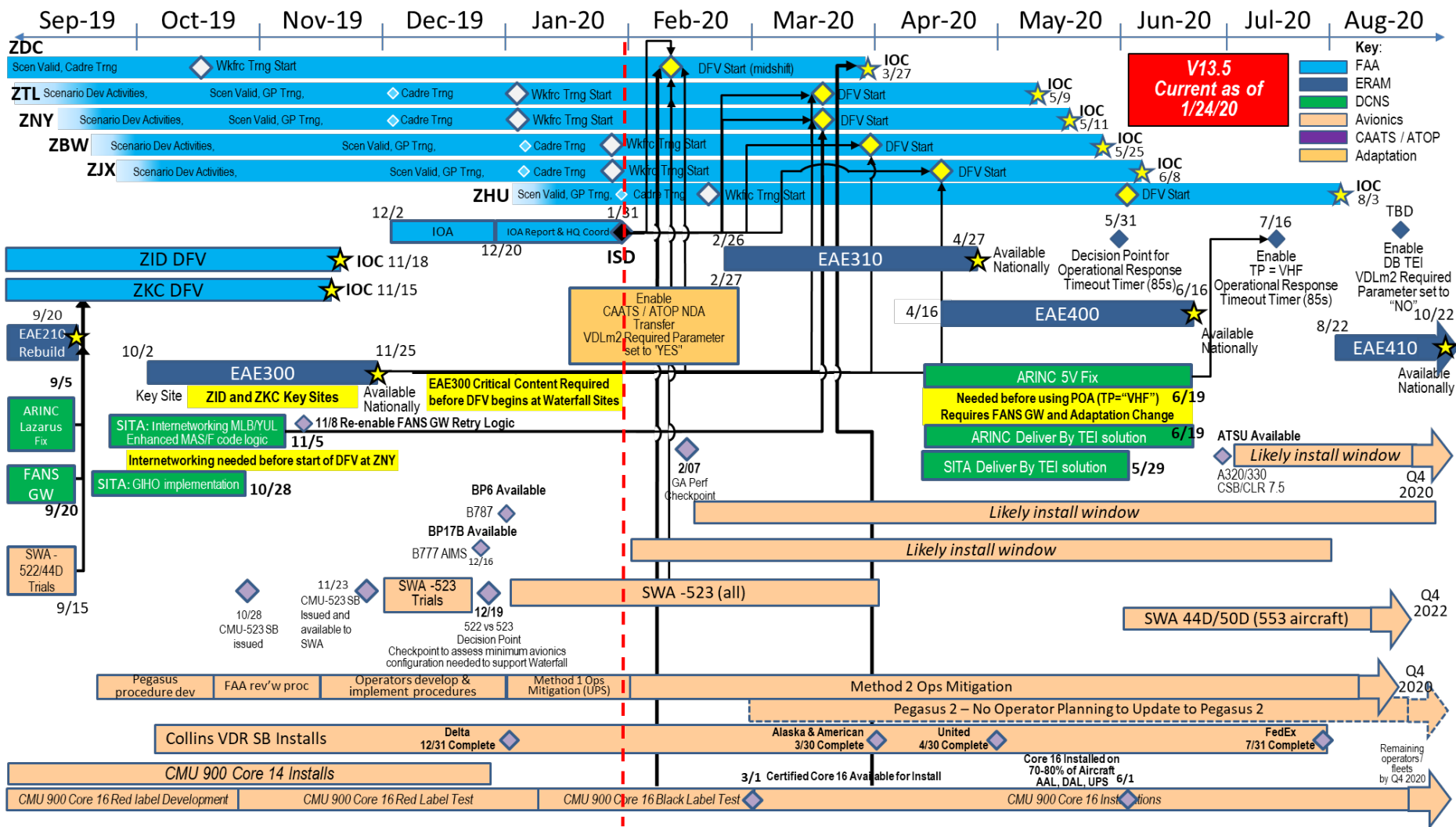
FAA Data Comm CPDLC Service Availability

Key

- Planned
- In Limited Site Testing
- In 24x7 Testing
- Fully Operational
- CPDLC DCL operational



En Route Initial Services Critical Path

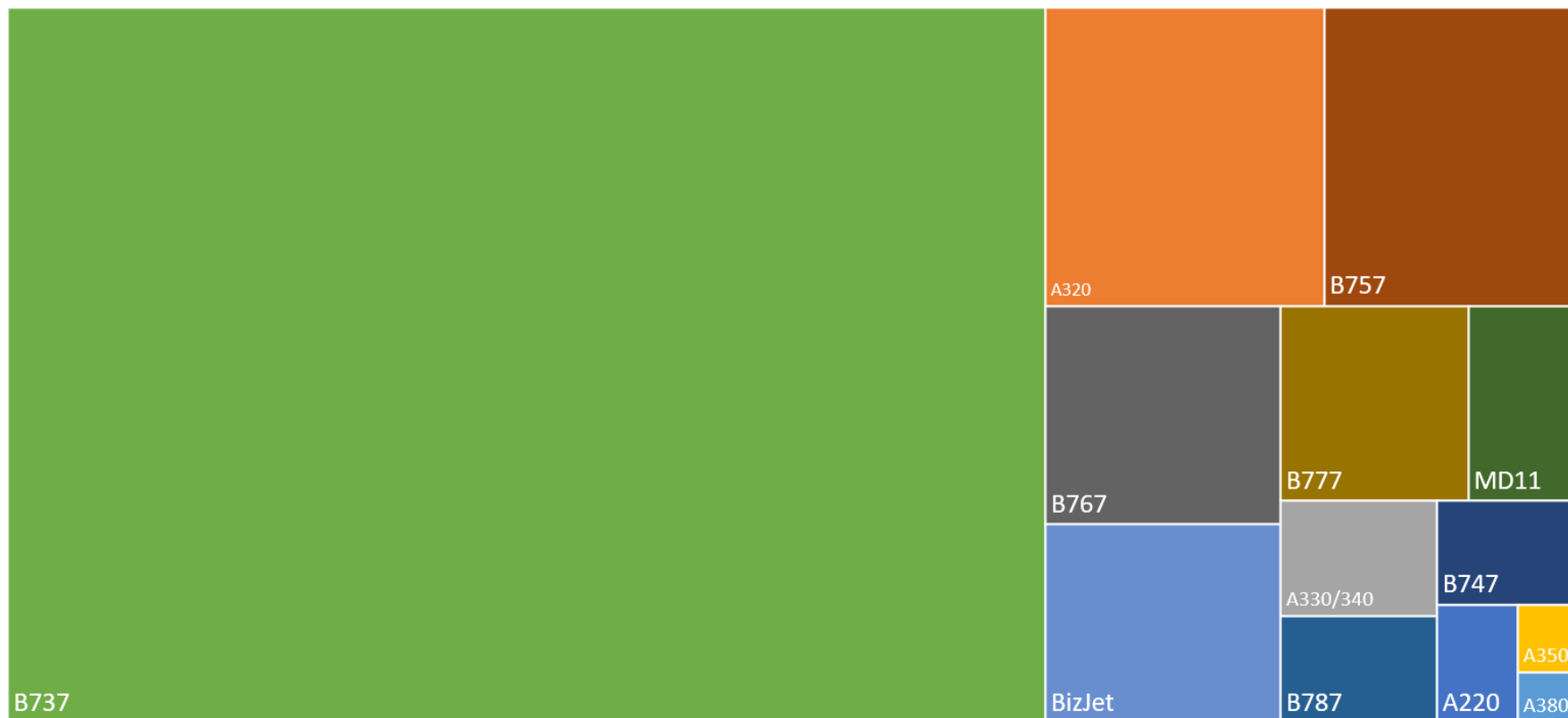


En Route Initial Services Background

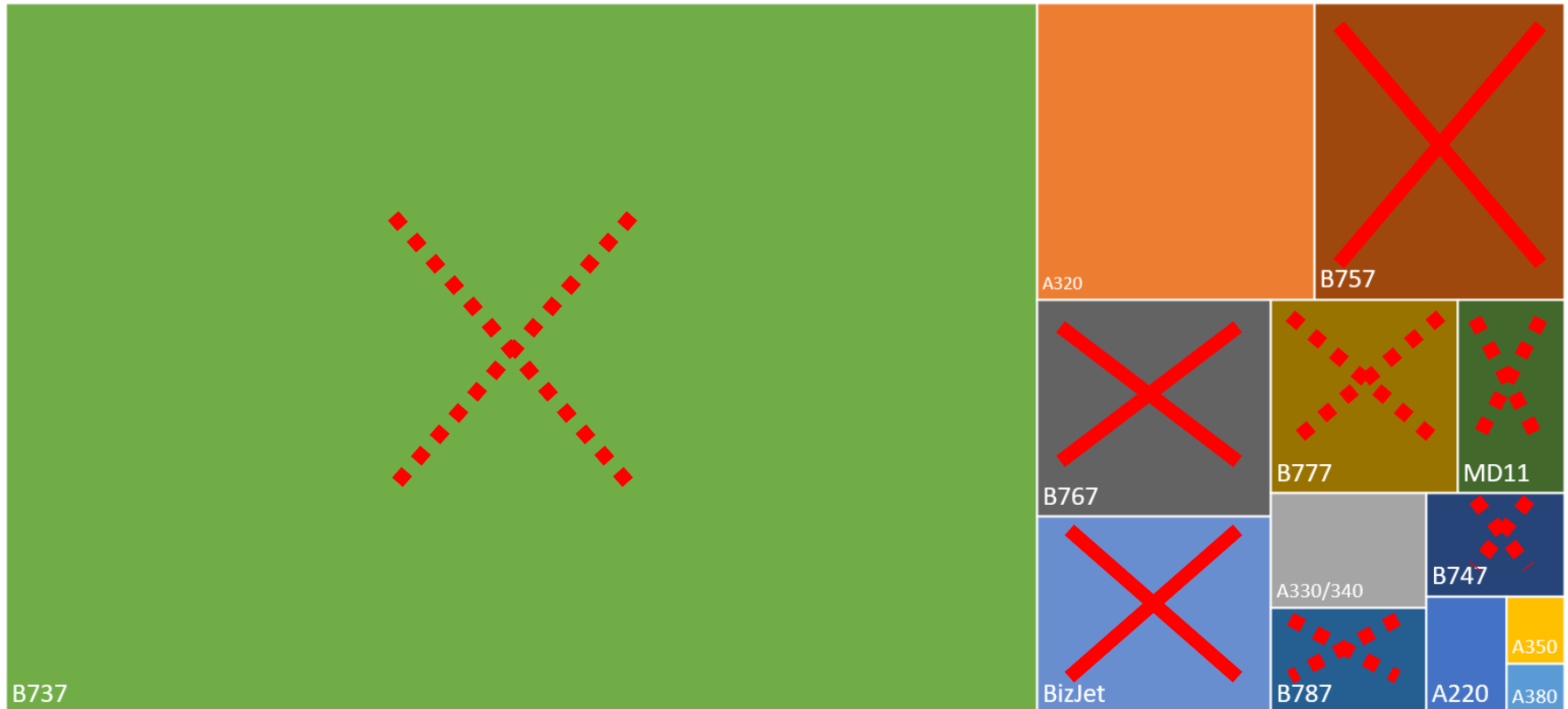
- **Industry agreed to an action plan at the NAC to address air-ground network interop and avionics issues affecting end-to-end success rates**
 - o Collins developing CMU900 fix (Core 16) to be available by March 1, 2020
 - Conducted Red Label flight testing on October 22 and November 22, 2019
 - Conducted Black Label flight testing on January 26, 2020
 - On schedule for avionics availability at the end of February
 - o Honeywell Mark II+ -523 CMU Service Bulletin to be available November 14, 2019
 - Southwest plans to have all their aircraft updated to -523 by March 31, 2020
 - Started equipping with -523 on November 26, 2019
 - o Operators submitted proposed operational mitigations for Pegasus I Ghost Message issue
 - FAA approved 'power down' mitigation method (Method 1)
 - Boeing responding to additional questions regarding proposed circuit breaker cycling mitigation method (Method 2)
 - o B787 communications media management issue
 - o Addressed in Block Point 6 – now available
 - o Radio Service Bulletin updates for all affected operators
 - o Additional avionics fixes across multiple airframes (e.g., B777, A320, etc.)

Resolution of avionics and aircraft issues are time critical to support the re-planned waterfall

Operations by Aircraft Type - Tower



Operations by Aircraft Type – En Route



Avionics Availability of Fixes

AVAILABLE NOW	
Honeywell	
Mark II+ CMU - 522	★ ●
VDR Service Bulletin	●
Collins Aerospace	
VDR Service Bulletin	★ ●
CMU Core 14	●

Established joint FAA-Industry Working Group through NextGen Advisory Committee (NAC)

- FAA, OEM, and operators have committed to avionics upgrades
- Tracked bi-weekly to ensure industry commitments aligned with program forward path

NEAR TERM	
Honeywell	
Mark II+ CMU – 523	★ ●
• Boeing SB available November 2019	
Collins Aerospace	
CMU Core 16	★ ●
• Available by March 2020	
Boeing	
Peg I – Ghost message procedural mitigation	★ ●
• Additional questions on Method 2	
Boeing 777 BP17B	●
• Available December 2019	
Boeing 787 BP6	★ ●
• Available December 2019	
Airbus	
Airbus A320/330 ATSU CSB/CLR 7.5	●
• Planned by mid-2020	

LONG TERM	
Boeing	
Pegasus II	●
• Viability of operator adoption not clear	

● Available

● Planned

● At Risk

● Need plan

★ FAA Critical Path

Operator Avionics Status (1 of 3)

Bold: Data Comm en route critical path

	Action	Installed by	Status	
	CMU 900 Core 14	31 Dec 2019	Complete	Complete
	CMU 900 Core 16	6 months from release	Pending release	Planned
	Collins VDR SB	30 Mar 2020	Start Jan 2020	On plan
	A320 CSB 7.5	Plans to install	Pending release	Planned
	CMU 900 Core 16	80% 3 months from release, full fleet by 6mo	Pending release	Planned
	Collins VDR SB	30 March 2020	B738 – 95% installed B757/767 – 0%	Delayed
	A320 CSB 7.5	Plans to install	Pending release	Planned
	B757/67 Peg I	30 March 2020	Pending VDR updates and Method 2 mitigations	Delayed Pegasus 1 Mitigation
	B757/67 Peg II	TBD		
	B777 BP17B	30 Mar 2020	Pending install	On plan
	B787 BP6	Delayed	Requires additional software install	Delayed
	CMU 900 Core 16	80% 2 months from release, full fleet by 6 months	Pending release	Planned
	Collins VDR SB	31 Dec 2019	All VDRs corrected	Complete
	A320 CSB 7.5	TBD		

Operator Avionics Status (2 of 3)

Bold: Data Comm en route critical path

	Action	Installed by	Status	
	CMU 900 Core 14	Jan 2020	Installation in progress	
	CMU 900 Core 16	6 months from release	Pending release	Planned
	Collins VDR SB	B767 – Jan 2020 B777 – Feb 2020 MD11 – Mar 2020 B757 – July 2020	45% installed	On Plan
	B757/67 Peg I	TBD	Pending Method 2 procedure approval	Delayed Pegasus 1 Mitigation
	B757/67 Peg II	TBD		
	B777 BP17B	30 June 2020	Start mid-February	On plan
	A320 CSB 7.5	6 months from release	Pending release	
	Mark II+ CMU v523	31 Mar 2020	Full fleet deployment in progress 15% installed	On Plan
	Mark II+ CMU v522	End Apr 2020	8% installed (60 a/c trial)	
	RTA 44D SB	31 Dec 2022	5% installed	

Operator Avionics Status (3 of 3)

Bold: Data Comm en route critical path

	Action	Installed by	Status	
	CMU 900 Core 16	8 months from release	Pending release	Planned
	CMU 900 VM update	30 Apr 2020	Installs started	B757/67 at risk
	Collins VDR SB	30 Apr 2020	63% installed	B757/67 at risk
	B757/67 Peg I	Awaiting new plan from United	Pending VDR and CMU VM updates and Method 2 mitigation	Delayed Pegasus 1 Mitigation
	B757/67 Peg II	TBD		
	B777 BP17B	August 2020	Installs started	Delayed
	B787 BP6	September 2020	Requires additional software install	Delayed
	CMU 900 Core 14	31 Dec 2019	Install complete	Complete
	CMU 900 Core 16	70% 3 months from release, full fleet by 6 months	Pending release	Planned
	Collins VDR SB	Complete	Complete	All compliant since start
	B757/67 Peg I	Ops start late Jan 2020	Plan to restart ops in late Jan 2020	CPDLC Operations Resumed
	B757/67 Peg II			No plans for Peg II
	B748 BP4	Complete	Ops started Nov 22	Complete

Summary of Open Issues by Risk

Issues	TOTAL	Open Issue Risk Level Rating			Total OPEN
		High	Med	Low- N/A- Ops Concern	
ISR Checklist Items *	315	0	0	1	1
IOA Hazards/ Operational Concerns	6	0	2	4	6
Other issues	0	0	0	0	0
TOTALS	321	0	2	5	7

* The open ISR Checklist item has an Action Plan

ISD Readiness

- **All subsystems as well as the overall enterprise program have been through the in-service assessment process**
 - Data Comm is a portfolio program consisting of currently operational systems (i.e., ERAM, TDLS, FTI, DCNS)
- **314 of 315 ISR checklist items are closed**
 - All In-Service Support checklist items are closed
 - All Integration checklist items are closed
 - All Test & Evaluation checklist items are closed
 - All Implementation & Transition checklist items are closed
 - Safety Risk Management Panel Action Plan for assessment of the IOA is in place
 - All Security checklist items closed
- **NATCA and PASS Representatives as well as Field Management and Labor Representatives have been part of the program since its inception**
 - Requirements Development
 - Human Factors Design including prototyping
 - Field trials
 - Test program
 - Etc.
- **All Operators and Industry participants have been involved in the program since inception**
 - CONOPS and requirements definition
 - Operator Demos
 - Field trials
 - Program DCIT (every other month FAA/Industry team meetings)
 - Collaboration at the NAC and NAC SCs

ISD Readiness

- **Worked with NATCA, PASS, and Field personnel in Requirements Definition, System Development and Test efforts including:**
 - Participation in various requirements development, test events to include PTR management, Procedure Development, Training Development, and Implementation Planning
 - Multiple SME workshops
 - Tech Ops Familiarization activities
 - Multiple Early User Evaluations
 - System Integration and OT dry runs and official conduct
 - Facility Coordination and collaboration
- **Avionics Interoperability Tests with Boeing, Airbus, Airlines, General Aviation, and DoD operational aircraft**
 - Addressed multiple air-ground communications and avionics interoperability issues discovered during Data Comm Functional Verification (DFV) key site testing
 - The program identified a set of activities that are needed from industry needed to address latent avionics issues impacting the program

ISD Readiness

- **Continued coordination with the Data Comm Implementation Team (DCIT) that includes all internal and external stakeholders**
 - Facilitates issue resolution and successful implementation and deployment of Data Comm services
- **DCIT facilitates stakeholder involvement in program execution**
 - Operational and technical integration of Operator CONOPS
 - Coordinates flight deck and AOC procedures with ground system requirements and procedures to mitigate system development risks
 - Review and resolve Operational Problem Reports (OPR) impacting system development and operations
 - Support development, integration, test, and deployment by providing aircraft, aircrews, AOC systems, and flight dispatchers
 - Supports system evaluation and recommends solutions to OPRs during deployment and operations
 - Leveraged FAA facilities to assist in assuring aircraft interoperability and procedures development (e.g., Flight Deck Users Guide)

ISD Readiness – Test Milestones

- **Developmental Test (DT) completed on ERAM (EAE3005m) – Q3 CY2019**
- **Ops Eval completed on ERAM (EAE3005n) – Q3 CY2019**
 - Included FAA and operator representatives
- **Field Testing – Key Site (ZKC/ZID) Data Comm Functional Verification (DFV) completed Q3 CY2019 (tested from June 2018-November 2019)**
 - Data Comm Functional Verification (DFV) demonstrated system behavior and operational suitability of the CPDLC service
 - DFV was conducted utilizing a nationally provided checklist to assure that all functions and messages work properly
 - The facilities will have the ability to augment the checklist for local needs
 - DFV procedures developed in conjunction with NATCA, PASS, and operators
 - Subset of Enterprise test procedures focusing on key operational functions including nominal and off-nominal operations
 - Data Comm Functional Verification (DFV) test areas included:
 - Certification
 - Session/Eligibility
 - Transfer of Communication
 - Altitudes
 - Altimeters
 - Routes
 - PIDs
 - Emergency Operations
 - ATSW functions
 - Additional facility requests

Current Program Status

- **Keysite IOCs**
 - Kansas City (ZKC) – November 15, 2019
 - Indianapolis (ZID) – November 18, 2019
- **Keysites have been in continuous operations since November 2019**
- **Alaska, American, Delta, FedEx, JetBlue, Southwest, United, and UPS are all conducting operations in keysite airspace**
- **GA and military aircraft are not currently participating in En Route operations due to latent avionics issues**
 - A return to ops plan has been developed and is being executed

ISD Action Plan – Items 6.1.1, 6.1.3-6

BACKGROUND: The Data Comm S1P2 capability was tested Jun. 2018 – Dec. 2018 at 3 sites: ZID, ZKC, and ZME. The FAA discovered avionics and air-ground network issues which, in conjunction with the government shutdown, delayed site IOC. Testing resumed at ZID and ZKC in March 2019. ZKC transitioned to 24/7 operations on April 17th, 2019. ZID transitioned to 24/7 operations on April 22nd, 2019. Since migrating to 24/7 operations, there have been no Human Factors issues identified in the field.

ISSUE DESCRIPTION: There are open Human Factors checklist items related to implementing CPDLC changes in ERAM

SOURCE OF ISSUE/HAZARD: ISR Checklist items 6.1.1, 6.1.3, 6.1.4, 6.1.5, and 6.1.6

ACTION REQUIRED: A Human Factors evaluation will be conducted at the key sites, ZKC and ZID. Any issues identified will be addressed based on an agreement between the ATO and ANG-C. **UPDATE: ZKC evaluation conducted week of January 13. No critical issues were identified. ZID Human Factors evaluation planned for February 11-13.**

PROGRAMMATIC RISK LEVEL: Low

FUNDING: TBD based on the results of the evaluation

PLANNED COMPLETION DATE: TBD based on the results of the evaluation

ACTION OFFICE: Malcolm Andrews, Director, Enterprise Services, AJM-3

CLOSING AUTHORITY: Paul Fontaine, Director, Portfolio Management and Technology, ANG-C

ISD Action Plan – Item 14.7

BACKGROUND: A Safety Risk Management Panel (SRMP) is required to assess the findings of the Independent Operational Assessment (IOA) process and the Program Office is to update the Safety Risk Management Document SSAR accordingly

ISSUE DESCRIPTION: There was not sufficient time between the delivery of the IOA report and the ISD to convene an SRMP prior to the waterfall implementation

SOURCE OF ISSUE/HAZARD: ISR Checklist item 14.7

ACTION REQUIRED: To close this action the Data Comm program will:

- Convene an SRMP with an IOA representative, Data Comm representatives, Engineering representative, ERAM representatives, etc. The IOA will present their findings to the SRMP
- The SRMP will:
 - Review and assess each hazard to determine if it is traced to an existing hazard;
 - Determine if it is a new or potential hazard in the field; and
 - Modify the hazard per Subject Matter Expertise
- All panel deliberations will be documented in an SSAR/SRMD (with or without hazards). The SRMD will build off of approved safety documents. The SRMD will go through the AJI and ATO review and signature process

PROGRAMMATIC RISK LEVEL: Low

FUNDING: N/A

PLANNED COMPLETION DATE: October 2020

ACTION OFFICE: Malcolm Andrews, Director, Enterprise Services, AJM-3

CLOSING AUTHORITY: Kimberly Pyle, Director, Policy and Performance, AJI-3

IOA Hazards/Ops Concerns – Summary

Item	Description	Category	Program Response
Hazard 5.0.1	CPDLC use during initial descent results in an increase in flight crew workload	Medium	The implementation approach for En Route CPDLC Services was extensively vetted with the pilot community and is dependent on legacy avionics cockpit designs. The program will continue to work with the operators and the DCIT representatives to address any latent issues in the cockpit.
Hazard 5.9.1	CPDLC uplinks that time out during high-density traffic or severe weather result in a slight reduction in the safety margin	Medium	This risk was identified and accepted as a medium risk as part of the <i>En Route Automation Modernization (ERAM) Data Communications (Data Comm) Subsystem and Interface Safety Hazard Analysis (SISHA) for Segment 1 Phase 2 (S1P2), Final Revised Version 1.1</i> , dated July 15, 2016. Planned CHI enhancements in future ERAM releases will further reduce controller workload in cases where uplinks time out.

IOA Hazards/Ops Concerns – Summary

Item	Description	Category	Program Response
Hazard 3.3.1	CPDLC outages result in a slight increase in ATC workload or inconvenience to the flight crew	Low	This risk was identified and accepted as a medium risk as part of the <i>Data Communications System Preliminary Hazard Analysis for Data Communications Segment One Phase Two, Version 1.3</i> , dated June 30, 2014 and <i>En Route Automation Modernization (ERAM) Data Communications (Data Comm) Subsystem and Interface Safety Hazard Analysis (SISHA) for Segment 1 Phase 2 (S1P2), Final Revised Version 1.1</i> , dated July 15, 2016. There are activities proposed with AJW executive management and all Data Comm stakeholders to identify opportunities for improving outage coordination and response to minimize impacts to the operation.
Hazard 2.6.1	Failed uplinks result in a slight increase in ATC workload	Low	This is a workload efficiency issue, not a safety hazard. The majority of failed uplinks are the result of identified network or avionics issues which will be addressed as part of the forward plan on the program. The Program will continue to work with all stakeholders to improve air to ground interoperability and to reduce the number of failed uplinks.

IOA Hazards/Ops Concerns - Summary

Item	Description	Category	Program Response
Ops Concern 7.5.1	Limitations to the VECC's current monitoring tools diminish situational awareness and delay restoration of services	-	The implementation of CPDLC leveraged the existing NAS infrastructure (TDLS - ERAM) and authorized monitoring tools (RMLS). These platforms and monitoring systems were upgraded in accordance with the existing Technical Operations Remote Maintenance, Monitor and Control (RMM&C) policies, existing workstation tools (MASS / MCF) and are compliant with the Tech Ops organizational Maintenance Concept of Operations (MCO). The IRDs and ICDs were developed by all stakeholders through the Inter-facility Working Group (IFWG). The program MCO was coordinated with AJW-1 Tech Ops Operations, AJW-B Tech Ops NASEO, and AJM-3 PMO Enterprise Services. Regarding VECC situational awareness, the program will continue to work with the VECC to enhance processes for communications across facilities and vendors to enhance situational awareness and improve operational efficiency. This will include continued efforts to leverage existing tools in the NAS and identify opportunities for improvement.
Ops Concern 5.0.1	Pilots may lose some situational awareness regarding potential trajectory changes	-	Air traffic operation is a dynamic environment. While aircrews may hear trajectory altering clearances for surrounding aircraft over voice, this does not necessarily mean that they will receive the same clearance. While there may be a small loss of situational awareness as a result of the use of CPDLC over voice, the benefits from reduced radio congestion and the significant efficiency enhancements which will be gained through the increased use of Data Comm Services will far outweigh any negative impacts. The program continuously monitors the implementation of CPDLC services in the NAS, and if there are any issues identified they will be discussed and mitigated through the Safety Risk Management Process.

Recommendation

- **Recommend In-Service Decision be granted for Data Comm Segment 1 Phase 2 Initial En Route Services:**
 - CPDLC services have been stable since the keysites IOC'd in November
 - Avionics upgrades and additional ground enhancements are planned in 2020 and beyond which will further improve operational performance
 - Action plans are in place to address the open IOA findings
 - A successful ISD and commencement of the waterfall supports commitments made with industry at the NAC
- **Impacts if In-Service Decision is not granted:**
 - Will require the program to re-plan the deployment waterfall which will extend the duration, adding significant additional F&E and Ops costs to the program baseline
 - Impacts implementation plans for other programs/initiatives (e.g., NEC, Metroplex, ACR, etc.)
 - Failure of the FAA to meet its NAC/NIWG commitments will undermine stakeholder confidence, which is critical to the success of the program
 - Will not accrue efficiency, safety and environmental benefits on the timeline committed to in the APB
 - Delayed implementation of En Route Initial Services will increase risk to the Full Services deployment and likely result in an impact to the APB
 - Will incur recurring costs for air-ground network service volumes without the associated operational benefits

Back-up



The Data Comm Stakeholder Cloud



Data Comm S1P2 Initial Services
ISD Stakeholder Meeting
Call-in/Sign-in Sheet

Stakeholders' Meeting		Jan 30, 2020
	Name	Organization
1.	Yen Khanh Vu	AJT-31
2.	Kevin Grimm	AJM-341
3.	MARK MINTIC	AJT-31
4.	Larry Greene	AJI-314
5.	Gregg Nesemerer	AIR-6B2
6.	Paul Fontaine	ANG-C
7.	RAY ORIE	AJM-34
8.	EMILY BOLLEN	AJI ISD SUPPORT
9.	TRACY UNSTAD	ISD SECRETARAT
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Data Comm S1P2 Initial Services
ISD Stakeholder Meeting
Call-in/Sign-in Sheet

Stakeholders' Meeting		Jan 30, 2020
	Name	Organization
1.	James Gruenewald	ON PHONE
2.	Jesse Wintjes	
3.	George Harrum	
4.	Bradley Crouch	
5.	William Thaggard	
6.	Luci Holemans	
7.	Jennifer Duffy	
8.	Cheryl Veney	
9.	Abby Smith	
10.	Susan O'HARA	✓
11.	Linda Baranovics	
12.	John Wozniak	
13.	Edward Ellison	
14.	Angela Lewis	
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