



**THE FORTY-FIFTH MEETING OF THE  
INFORMAL PACIFIC ATC CO-ORDINATING GROUP  
(IPACG/45)**

(Tokyo, Japan, 11 & 12 December 2019)

**Presented by: Federal Aviation Administration**

# **United States PBCS Updates**



**Federal Aviation  
Administration**



# Overview

- **Air Traffic Organization (ATO) updates**
  - Documentation
  - Equipage updates
  - Trends in altitude clearances
  - Monitoring program updates
  - FANS-CRA website update
- **Flight Standards (AFS) updates**
- **Air Traffic Safety Oversight (AOV) updates**



# ATO updates



# PBCS Implementation Task List

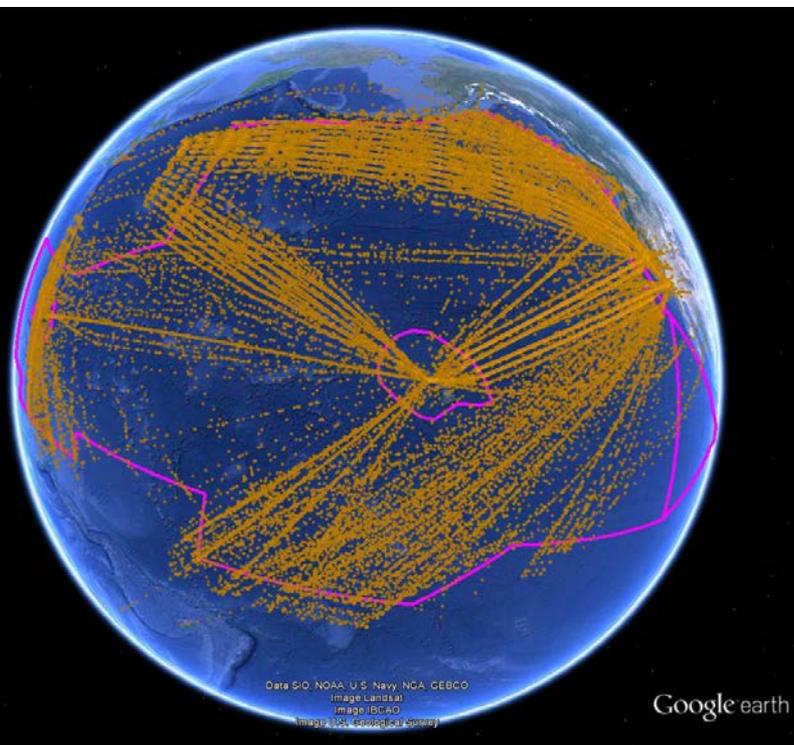
## A-2: ANSP – PBCS policies, objectives supporting safety oversight

- Update for FAA JO 7110.65, Air Traffic Control – 30 January 2020



# Oakland FIR (KZAK)

## FANS Data Link Usage



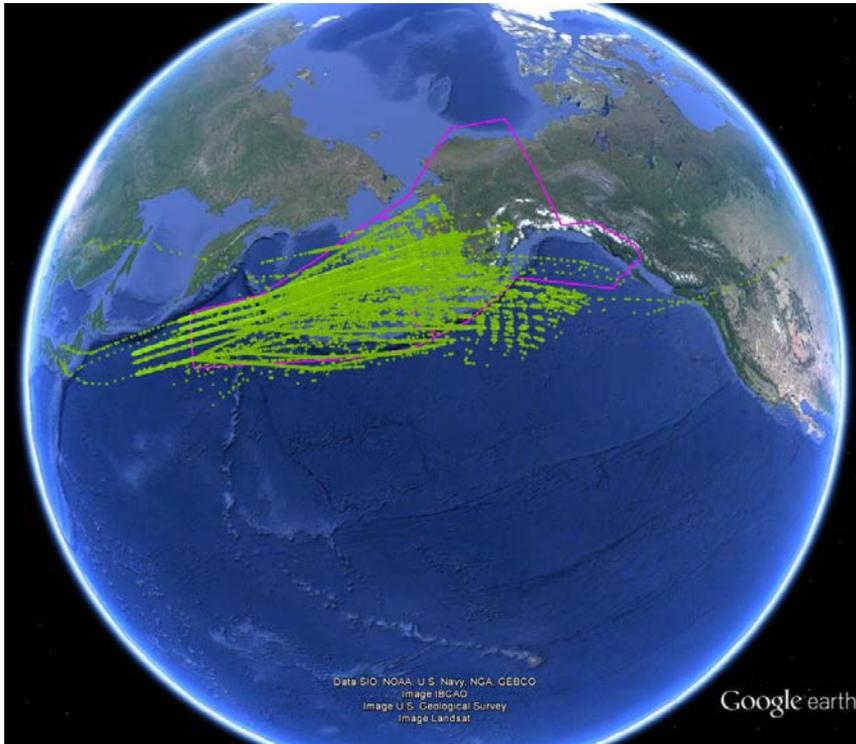
Av flights/day (Jan-Jun 2019)	<b>868</b>
% flights using FANS data link (Jan-Jun 2019)	<b>82%</b>
% data link flights filing RNP4/RCP240/RSP180 (Jun 2019)	<b>54%</b>
Individual airframes using FANS data link (Jan-Jun 2019)	<b>3,488</b>

# June 2019 – Oakland by flow

Flow	Total flights	% datalink	% RNP4/RCP240/ RSP180
<b>Combined ZOA</b>	<b>26356</b>	<b>80%</b>	<b>54%</b>
Central East Pacific	10066	65%	32%
Pacific Organized Track System (PACOTS)	8033	99%	81%
Australia/New Zealand to/from Japan	1342	97%	61%
South Pacific	2075	96%	75%
Japan to/from Guam	1913	43%	15%
Japan to/from Hawaii	1648	99%	93%

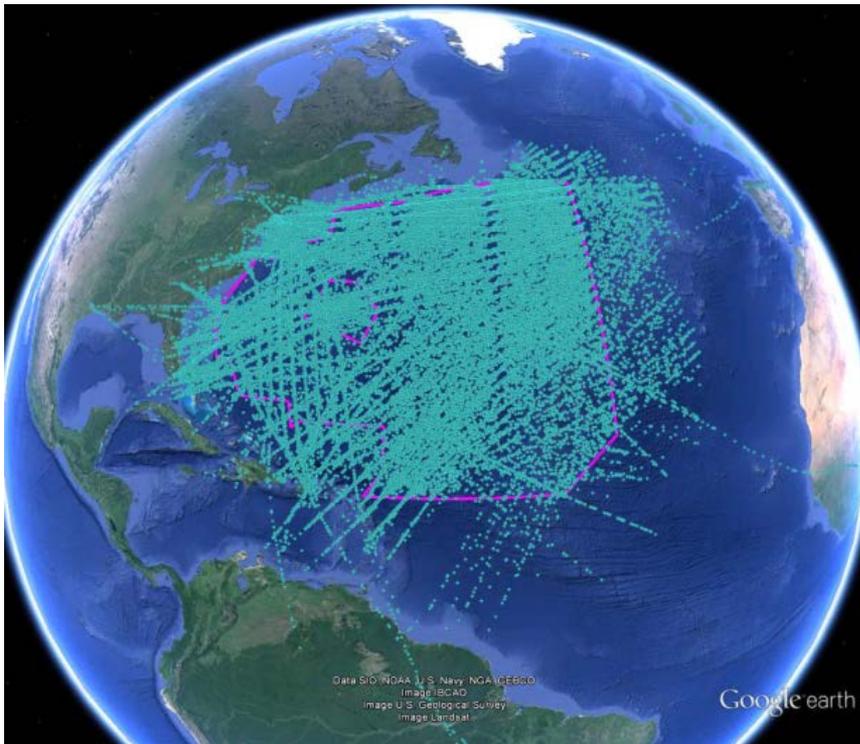
# Anchorage FIR (PAZA)

## FANS Data Link Usage



Av flights/day (Jan-Jun 2019)	<b>258</b>
% flights using FANS data link (Jan-Jun 2019)	<b>98%</b>
<b>% data link flights filing RNP4/RCP240/RSP180 (Jun 2019)</b>	<b>71%</b>
Individual airframes using FANS data link (Jan-Jun 2019)	<b>2,163</b>

# New York FIR (KZNY) FANS Data Link Usage



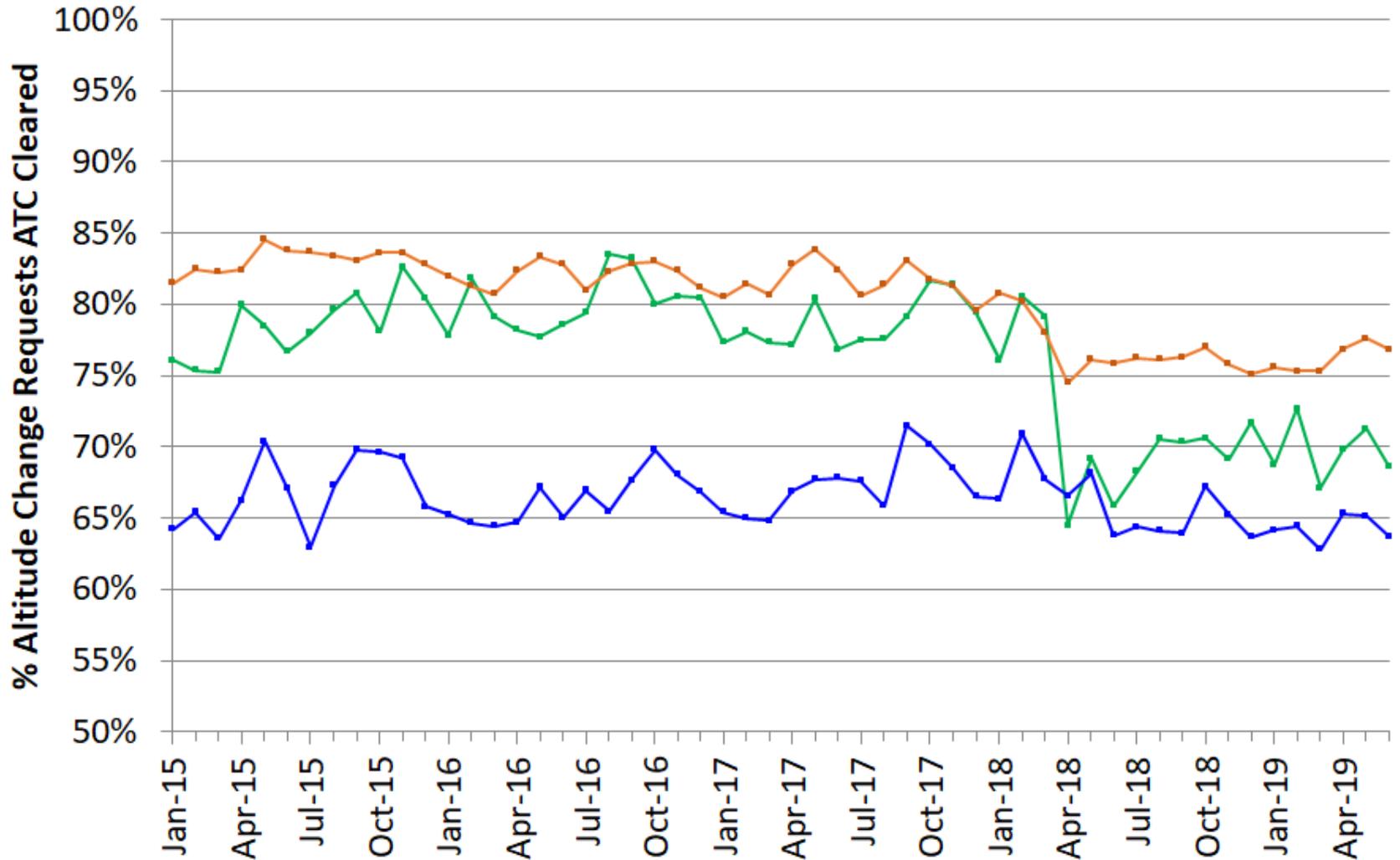
Av flights/day (Jan-Jun 2019)	<b>733</b>
% flights using FANS data link (Jan-Jun 2019)	<b>65%</b>
<b>% data link flights filing RNP4/RCP240/RSP180 (Jun 2019)</b>	<b>45%</b>
Individual airframes using FANS data link (Jan-Jun 2019)	<b>4,260</b>

# June 2019 – New York by flow

Flow	Total flights	% datalink	% RNP4/ RCP240/ RSP180
<i>Combined ZNY</i>	<i>20250</i>	<i>65%</i>	<i>44%</i>
ZNY-West	16999	59%	40%
ZNY-East (NAT)	3237	92%	65%

# % Altitude Change Requests ATC Cleared

ZAN ZNY ZOA



# PBCS Monitoring Updates

1. **FAA contribute to and compile semi-annual regional reports for [www.FANS-CRA.com](http://www.FANS-CRA.com)**
  - Supports global view of performance for operator monitoring processes, per AC 90-117
  - Lags in posting due to lags in receipt of data from 11 FIRs
  - When “red” performance observed operators should consult applicable regulatory document, e.g. AC 90-117, for expected actions, and may contact relevant monitoring PoC(s) for more details
2. **Perform monthly monitoring (process development in progress)**
  - a) Airspace evaluation for Oakland, Anchorage, New York to support FAA compliance with ATSP requirements
  - b) Airframe evaluation for data link operations within Oakland, Anchorage, New York to identify cases of non-compliance
    - New reporting process being coordinated globally for ATSPs to compile and send reports for cases of airframe non-compliance to the relevant Regional Monitoring Agencies (RMAs)
      - New York: NAT Central Monitoring Agency (CMA)
      - Anchorage/Oakland: Pacific Approvals Registry and Monitoring Organization (PARMO)
    - Coordination on process details still in progress – reports should begin late 2019/early 2020
    - AC 90-117 will be updated to reflect this process once mature



# PBCS Monitoring Results – Fleet/Airframe

FANS1/A Problem Reports



Not secure | fans-cra.com/performance/list/

Report De-identified Reports Performance Data and Administration PBCS Charter Contact Us Manual

ALL REGIONS

ISPACG FIT

NAT TIG

## NAT PBCS Monitoring Results - Jan-Jun 2019

(Uploaded by FAA (United States) at Sept. 16, 2019, 2:41 p.m.)

Monitoring results by fleet and by individual airframe for ADS-C ASP and CPDLC ACP in Gander, New York, Reykjavik, Santa Maria and Shanwick during Jan-Jun 2019.

[NAT PBCS MONITORING REPORT JAN-JUN 2019 ALL RESULTS.XLSX](#)

## PBCS Monitoring Points of Contact

(Uploaded by FAA (United States) at Aug. 21, 2019, 2:55 a.m.)

For further information on monitoring results, email addresses for each flight information region are provided in this spreadsheet.

[PBCS MONITORING POINTS OF CONTACT\\_15AUG2019.XLSX](#)

## PAC PBCS Monitoring Results - Jan-Jun 2019

(Uploaded by FAA (United States) at Aug. 21, 2019, 2:55 a.m.)

Monitoring results by fleet and by individual airframe for ADS-C ASP and CPDLC RCP in Anchorage, Auckland, Fukuoka, Oakland, Nadi and Tahiti FIRs during Jan-Jun 2019.

[PAC PBCS MONITORING REPORT JAN-JUN 2019 ALL RESULTS.XLSX](#)

**PBCS Monitoring Report by Operator/Aircraft Type Pair - US Airspace**

Period: January to June 2019

- Meets criteria
- 99.0%-99.9%
- Under criteria

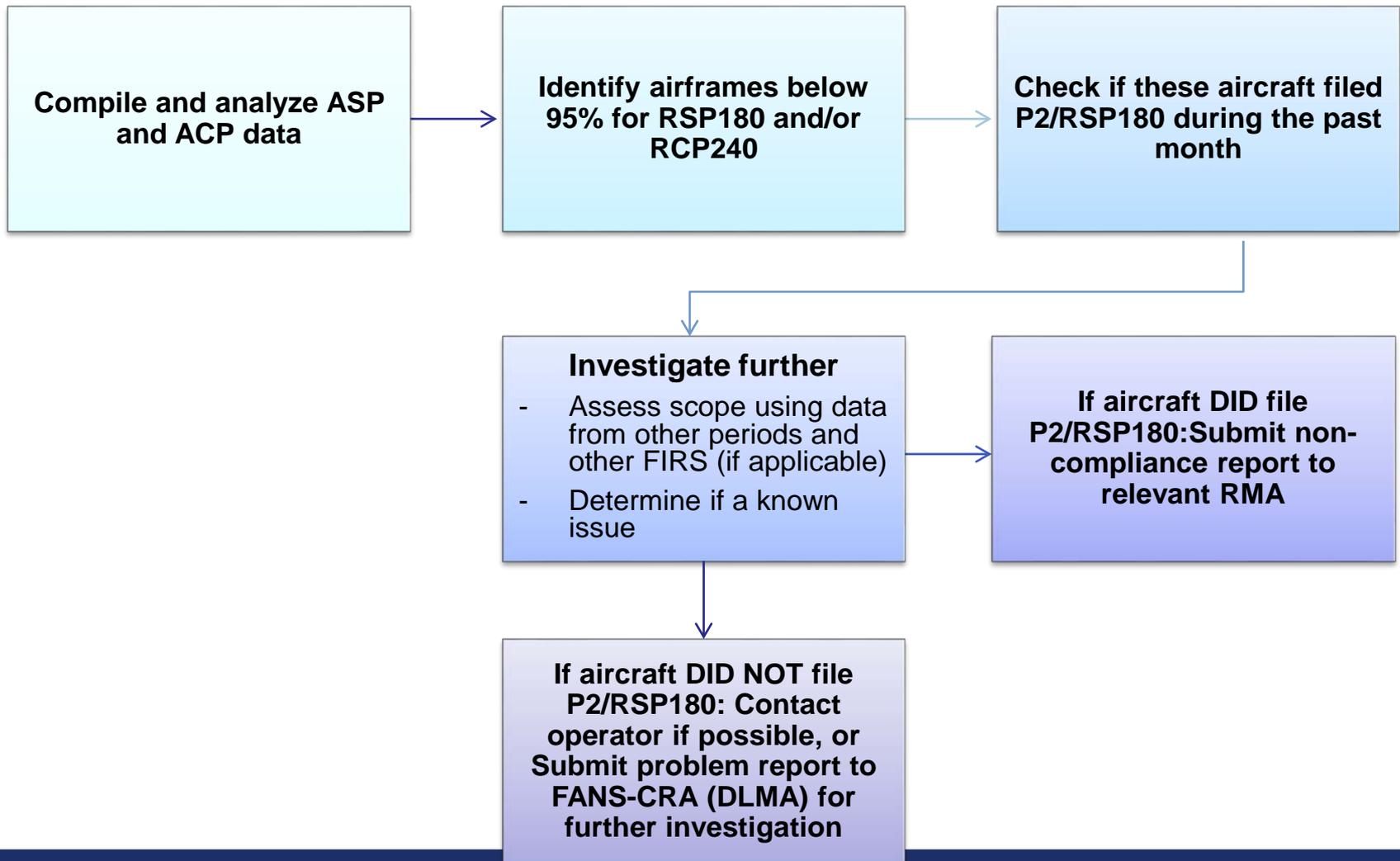
State of Registry	Data Source (FIR)	Operator/Aircraft Type	ADS-C downlink Message Counts	95% RSP 180 benchmark ASP <=90 sec	99.9% RSP 180 benchmark ASP <= 180 sec	CPDLC Transaction Counts	95% RCP 240 benchmark ACP <= 180 sec	99.9% RCP 240 benchmark ACP <=210 sec
BRAZIL	New York	TAM/A359	9,353	98.7%	99.8%	508	92.5%	96.5%
BRAZIL	New York	TAM/B763	5,423	94.7%	97.3%	279	98.9%	98.9%
CANADA	New York	ACA/B38M	4,698	93.8%	96.9%	403	96.3%	97.5%
CANADA	Oakland	ACA/B38M	30,596	93.6%	96.7%	1,584	94.3%	96.5%
CANADA	New York	ACA/B763	665	92.2%	95.0%	25	100.0%	100.0%
CANADA	New York	KCE/CL35	273	93.8%	99.3%	25	100.0%	100.0%
CANADA	Oakland	WJA/B38M	1,135	94.8%	96.9%	57	98.3%	98.3%
CANADA	Oakland	WJA/B738	217	94.9%	95.9%	12	91.7%	91.7%
CHINA	Oakland	CES/B738	117	94.9%	96.6%	3	33.3%	33.3%
FIJI	Oakland	FJI/A332	32,184	93.6%	95.8%	1,784	98.9%	99.3%
FRANCE	New York	DJT/B752	538	84.0%	90.5%	21	85.7%	90.5%
REPUBLIC OF KOREA	Oakland	KAL/B737	155	92.9%	94.8%	7	100.0%	100.0%
RUSSIAN FEDERATION	New York	NWS/A332	446	93.1%	99.3%	27	100.0%	100.0%
UNITED KINGDOM	New York	DHK/B763	342	94.4%	95.3%	12	100.0%	100.0%
UNITED KINGDOM	New York	RRR/C17	125	92.0%	92.8%	9	100.0%	100.0%
UNITED KINGDOM	New York	SXN/GLF5	383	91.9%	92.7%	35	94.3%	94.3%
UNITED STATES	New York	AAL/B738	209	92.8%	93.8%	9	88.9%	88.9%
UNITED STATES	Anchorage	ASA/B738	2,650	93.7%	98.5%	96	95.8%	95.8%
UNITED STATES	Anchorage	ASA/B739	179	92.2%	97.8%	6	100.0%	100.0%
UNITED STATES	New York	BIA/F900	120	89.2%	95.8%	7	85.7%	100.0%
UNITED STATES	New York	DAL/B752-O	4,960	97.0%	99.1%	315	93.0%	94.6%
UNITED STATES	Oakland	DAL/B752-O	42,696	97.7%	99.7%	2,637	93.5%	95.1%
UNITED STATES	New York	DAL/B752-X	241	92.1%	95.0%	18	88.9%	94.4%
UNITED STATES	New York	EDG/GLF5	127	91.3%	96.9%	6	100.0%	100.0%
UNITED STATES	New York	EJM/FA7X	205	86.8%	93.2%	14	100.0%	100.0%
UNITED STATES	Oakland	EJM/GLF5	285	94.7%	97.2%	13	100.0%	100.0%
UNITED STATES	New York	RCH/B752	251	94.8%	97.2%	7	100.0%	100.0%
UNITED STATES	New York	RDN/B737	260	92.3%	97.7%	16	81.3%	81.3%
UNITED STATES	New York	SJE/GLF5	104	94.2%	94.2%	9	88.9%	88.9%
UNITED STATES	Oakland	SJJ/CL60	176	90.3%	98.3%	16	100.0%	100.0%
UNITED STATES	New York	TWY/CL60	185	94.1%	98.4%	26	96.2%	100.0%
UNITED STATES	Oakland	UAL/B753	280	87.5%	90.0%	2	50.0%	50.0%
UZBEKISTAN	Oakland	UZB/B788	185	93.5%	96.2%	5	100.0%	100.0%

# [www.FANS-CRA.com](http://www.FANS-CRA.com) updates

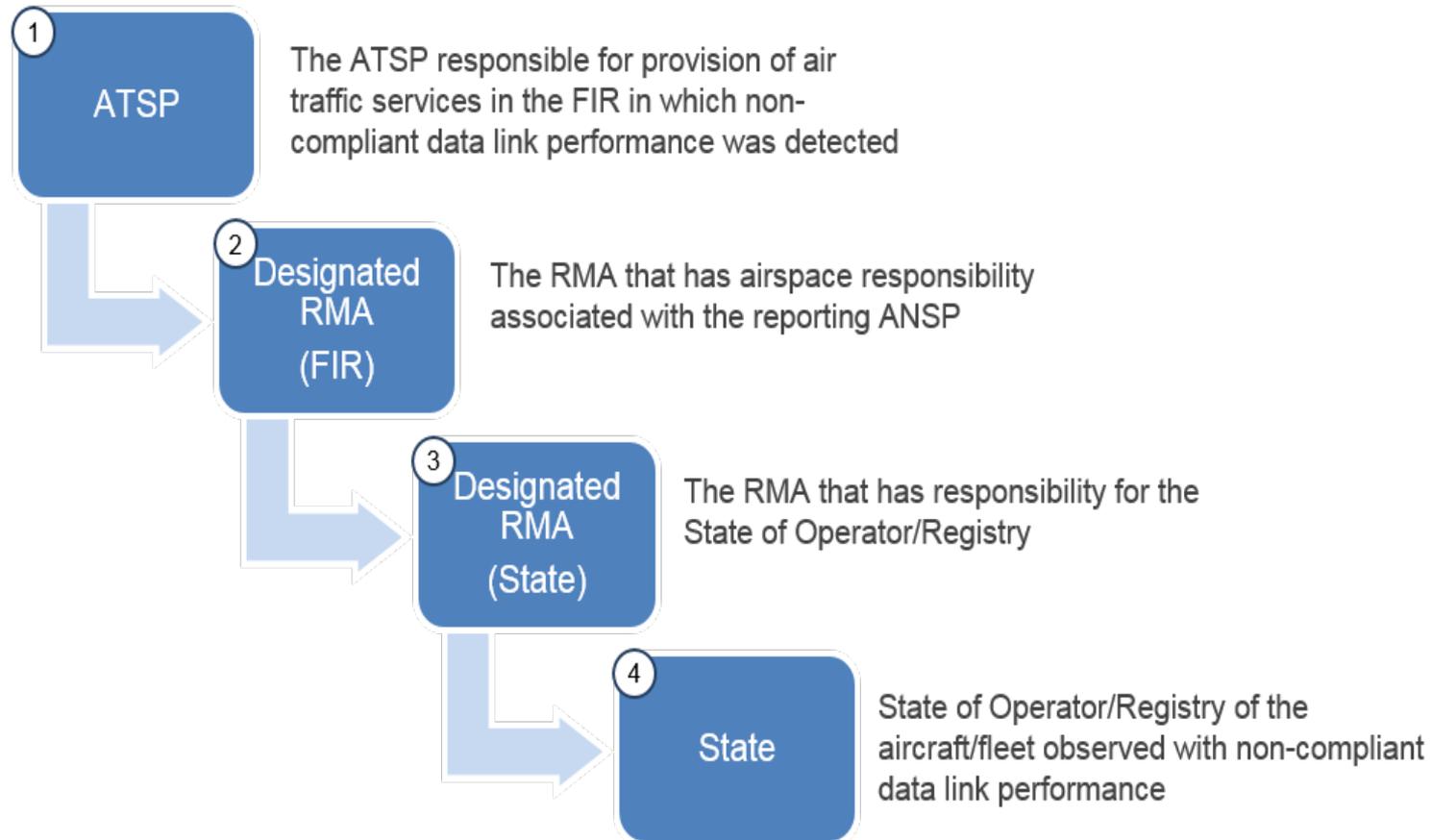
- **Current user status:**
  - Airline/Operator - 1504
  - ANSP/CAA - 53
  - Manufacturers - 19
  - CSP - 10
- **Current PBCS Charter status:**
  - Airline/Operator - 1112
  - ANSP/CAA - 11
  - CSP - 8
  - Manufacturers - 5
- **Recent software maintenance:**
  - resolved issue with email addressing
  - added protection against spam access requests
  - modified format of de-identified PR downloads at CRA request
  - resolved issue with menu selection with reduced browser width
  - resolved issue with downloading PR spreadsheet



# PBCS monthly monitoring process



# Non-compliance reporting



# In Progress... Airspace Dashboard

## ADSC Media Types

COMTYP	ADS-C message downlink counts	95% RSP 180 benchmark ASP <= 90 s..	99.9% RSP 180 benchmark ASP <= 1..
SAT	954,956	97.77%	99.17%
VHF	330,959	99.25%	99.68%
HF	1,611	70.33%	84.11%

## CPDLC Media Types

COMTYP	CPDLC Transaction Counts	99.9% RCP 240 benchmark ACP <= 2..	95% RCP 240 benchmark ACP <= 180..
SAT	73,601	99.15%	98.71%
VHF	16,024	99.60%	99.41%
HF	5	80.00%	60.00%
SAT-VHF	1,651	95.82%	94.61%
VHF-SAT	1,066	96.15%	95.03%
SAT-HF	72		
HF-SAT	89		

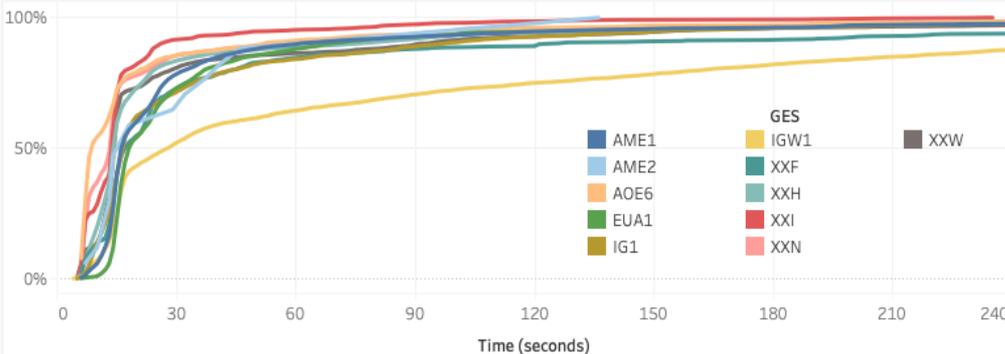
## ADS-C flight data for mayjunjulADSCdata



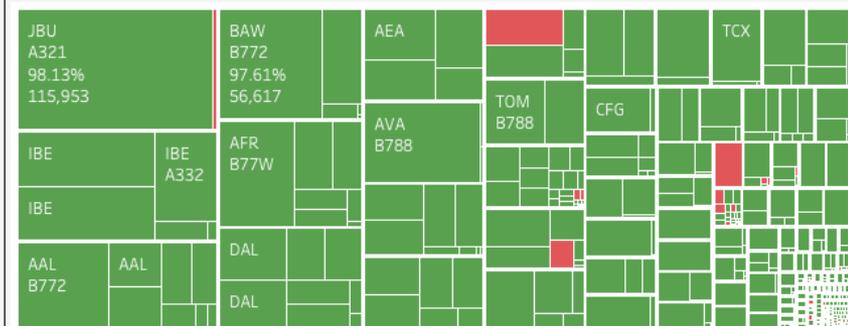
Select Menu

ADS-C airframe report under 95%

## ADS-C by Path ID



## All ADS-C operator/aircraft type



ADS-C airframe report under 95%

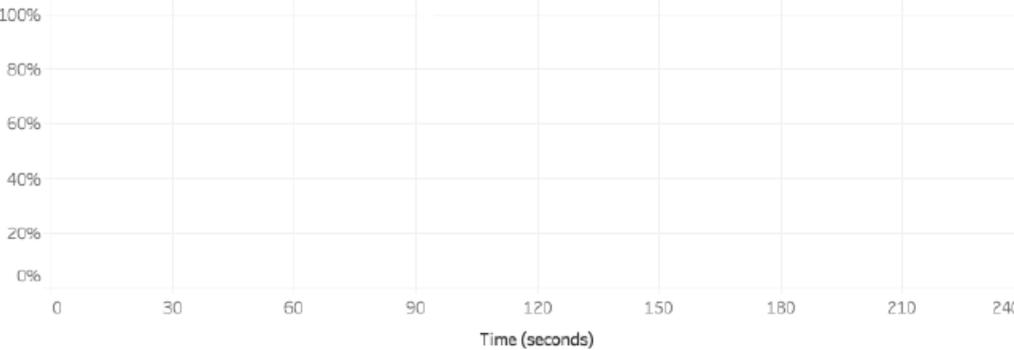
ATSP	ADS-C message downlink counts	95% RSP 180 benchmark ASP <= 90 secs	99.9% RSP 180 benchmark ASP <= 180 sec
KZNY	256	91.41%	95.31%
	100	94.00%	98.00%
	199	76.88%	86.93%
	155	94.84%	96.13%
	109	93.58%	99.08%
	148	92.57%	95.27%
	110	94.55%	99.09%
	102	94.12%	99.02%
	248	93.15%	97.98%
	271	91.88%	98.15%
	111	89.19%	94.59%
	234	93.59%	99.57%
	316	92.09%	97.15%

ADS-C flight data for mayjunjulADSCdata

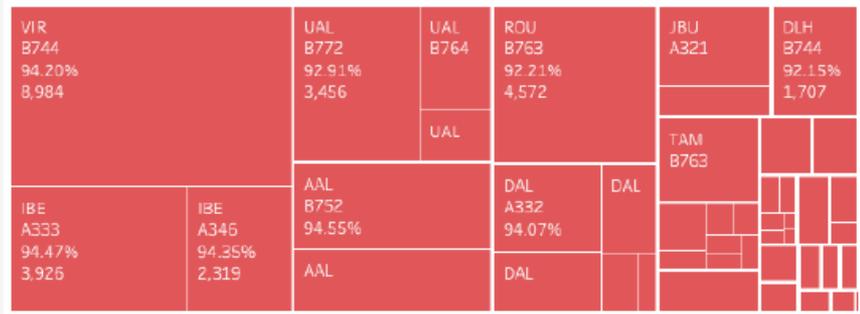


Select Menu: ADS-C airframe report under 95%  
 Registration Number: Multiple values

ADS-C by Path ID



ADS-C operator/aircraft type under 95%



### ADS-C airframe report under 95%

ATSP	ADS-C message downlink counts	95% RSP 180 benchmark ASP <= 90 secs	99.9% RSP 180 benchmark ASP <= 180 sec
KZNY	286		
	298		
	188		
	2,319		
	351		
	3,980		
	587		
	2,218		
	1,451		
	2,152		
	1,429		
	1,742		
	206		

Select Menu: ADS-C airframe report under 95%  
 Registration Number: (Multiple values)

### ADS-C flight data for mayjunjulADSCdata

#### View Data: ADS-C airframe under 95 percent

3,980 rows |  Show aliases |  Show all fields | Copy | Export All

ATSP	COMTYP	OPER	ACTYPE	DATE	RGS	RTIME	STIME	LAT	LONG	DEL
KZNY	VHF	IBE	A333	7/2/2019	BDA7	05:48:58 AM	05:48:54 AM	35.7372	-65.6675	4
KZNY	SAT	IBE	A333	7/1/2019	AME1	06:08:05 AM	06:07:54 AM	37.4261	-60.6833	11
KZNY	SAT	IBE	A333	7/1/2019	AME1	06:13:56 AM	06:13:42 AM	38.0747	-60.0589	14
KZNY	SAT	IBE	A333	7/2/2019	AME1	04:42:56 AM	04:42:45 AM	30.8811	-73.4381	11
KZNY	SAT	IBE	A333	7/23/2019	AME1	12:14:29 AM	12:14:18 AM	38.8803	-59.2653	11
KZNY	SAT	IBE	A333	7/23/2019	EUA1	12:58:09 AM	12:57:56 AM	41.3722	-52.0869	13
KZNY	SAT	IBE	A333	7/28/2019	AME1	09:42:18 PM	09:41:47 PM	28.8622	-60.6561	31
KZNY	SAT	IBE	A333	7/28/2019	AME1	10:26:12 PM	10:24:09 PM	27.2664	-66.6775	123
KZNY	SAT	IBE	A333	7/23/2019	EUA1	01:00:52 AM	12:58:41 AM	41.4119	-51.9561	131
KZNY	SAT	IBE	A333	7/23/2019	AME1	12:19:43 AM	12:16:58 AM	39.0408	-58.8525	165
KZNY	SAT	IBE	A333	7/28/2019	AME1	10:24:07 PM	10:20:29 PM	27.4158	-66.1608	218
KZNY	SAT	IBE	A333	7/28/2019	AME1	09:47:00 PM	09:43:00 PM	28.8208	-60.8286	240
KZNY	SAT	IBE	A333	7/5/2019	EUA1	01:11:29 AM	01:11:15 AM	38.1575	-48.9231	14
KZNY	SAT	IBE	A333	7/17/2019	EUA1	06:24:47 AM	06:24:36 AM	32.8536	-51.4503	11
KZNY	SAT	IBE	A333	7/17/2019	EUA1	06:47:11 AM	06:47:00 AM	34.0019	-48.2903	11
KZNY	SAT	IBE	A333	7/20/2019	AME1	05:59:07 AM	05:58:54 AM	37.5036	-58.9031	13
KZNY	SAT	IBE	A333	7/23/2019	AME1	01:22:46 PM	01:22:35 PM	36.0435	-51.0078	11

Summary | Full Data | 3,980 rows

#### ADS-C by Path ID

Legend: AME1 (Blue), AOE6 (Orange), EUA1 (Green)



# AFS updates



# U.S. RCP240 / RSP180 Approvals

(as of 6 Aug 2019)

Part 121 Operator	Fleets authorized for RCP240 and RSP180
Air Transport International	None
Alaska	A320; A321
American	A330; B757; B767; B777; B787
Atlas / Polar	B747*; B767* pending
Delta	A330; A350; B737*; B757*, B767*, B777*
Fedex	B757, B767, B777, MD11
Hawaiian	A321; A330
Hillwood	B737
Jet Blue	A320; A321
Kalitta Air	None
Omni	B777
Southern Air	None
Southwest	B737 pending
United	B757*, B767*; B777*; B787
UPS	B747, B757*, B767*



# FAA AC 90-117, Data Link Communications

- **Under revision with expected publish date in December 2020 Changes**
  - New GOLD guidance and ICAO Annex requirements
  - Add basic B2 information and guidance
  - Add domestic en route information and guidance
  - Clarify commonly misunderstood sections (plain language)
    - Oceanic vs domestic avionics requirements / ops
    - PBCS vs Data Link Mandate
    - Alternate means of compliance requests
    - Flight planning



# B777 AIMS2 conditional authorization

- **Spring 2017** - During PBCS testing for legacy aircraft, Boeing discovered fleet did not meet RCP240/RSP180 avionics allocations
- Boeing requested an alternate means of compliance based on known fix set for future software release (BP17b; 1<sup>st</sup> Qtr 2019)
- **FAA agreed to a conditional authorization**
  - B777 AIMS2 fleet must still meet end-to-end RCP/RSP performance
    - Must pass current (2017) demonstrated performance monitoring
    - Must pass future demonstrated performance monitoring
  - Operators must submit an installation schedule upon BP17b release
  - Operators must install BP17b within 8 months of its release
  - Based on a release date NLT 31 March 2019
    - delays trigger an automatic review and could be a cause for revocation



# B777 AIMS2 conditional authorization (cont)

- **May 2019 – Boeing informed lab / flight testing verified software fix complies with all aircraft allocated requirements.**
  - Current delivery date now 4th Qtr 2019
    - Software delayed due to customer Software Change Request not associated with PBCS
- **June 2019 - FAA granted extension per Boeing request**
  - **30 Nov 2019** - new deadline
  - **Advised no further extensions will be approved**
  - Forward fit – delivered aircraft must have BP17b installed
  - Retro fit – all airworthiness & certification documentation must be delivered to FAA



# B757/767 “Ghost messages” issue

- Avionics displays an old message to flight crew
- First seen in oceanic ops
- Domestic en route ops - occurring at a higher level
  - **B757/767 removed from US domestic en route ops**
- Legacy software issue (Pegasus 1); OEMs require upgrade to Pegasus 2
  - Pegasus 2 is a hardware & software change
  - very costly (money / time)
  - operators unsure if they have business case to upgrade
- FAA DCIT working acceptable operator procedures to mitigate issue while waiting for “fix”
- May affect B757/767 approvals for RCP240



# AOV updates



# State Regulator Monitoring of RCP/RSP performance

- **Air Traffic Safety Oversight (AOV) requested data from the Air Traffic Organization (ATO) demonstrating state compliance with requirements allocated to the ANSP for RCP240**
- **Data is currently being analyzed**
- **Next steps**
  - Regular updates of RCP compliance data
  - Request for RSP180 compliance data



# ANSP RCP240/RSP180 allocations

## 1. Transaction time/data delivery time and continuity

- RCP240: 95% within 10 sec, 99.9% within 15 sec
- RSP180: 95% within 3 sec, 99.9% within 5 sec

## 2. Availability: 99.9%

## 3. Integrity: Malfunction = $10^{-5}$ per flight hour

## 4. Monitoring and alerting criteria:

RCP monitoring and alerting criteria		
Specification: RCP 240/D	Application: CPDLC	Component: ANSP
Ref:	Criteria	Compliance means
MA-1a	The ground system shall be capable of detecting ground system failures and configuration changes causing the communication service to no longer meet the requirements for the intended function. <i>Note.— If changes are made to the system capacity limits, as specified by the airspace requirements, and the changes cause the system to perform below the RCP specification, this would be considered a change in system configuration.</i>	System design, implementation. CSP contract/service agreement. See also paragraph B.2.1.3, RCP availability criteria.
MA-1b	When the communication service no longer meets the requirements for the intended function, the ground system shall provide indication to the controller.	System design, implementation. CSP contract/service agreement. See also paragraph B.2.1.3, RCP availability criteria.
MA-2	When the controller receives an indication that the communication service no longer meets the requirements for the intended function (e.g. reduced longitudinal separation), the controller shall take action to resolve the situation (e.g. apply an alternative form of separation).	System design, procedures, implementation.

## 5. Safety requirements

RCP related safety requirements		
Specification: RCP 240/D		Component: ANSP
Ref:	Related RCP parameter	Safety requirement
SR-1a (ANSP)	A	The ATS unit shall display the indication provided by the aircraft system when a data link service request initiated by the ground system or the controller is rejected at the application layer.
SR-1b (ANSP)	A	The ATS unit shall provide the aircraft system with an indication when it rejects a data link service request initiated by the flight crew at the application layer.
SR-2 (ANSP)	A, C	The ATS unit shall advise the controller of a detected data link service loss.
SR-3 (ANSP)	A	Data link service shall be established in sufficient time to be available for operational use.
SR-4 (ANSP)	A, C	The ATS unit shall be notified of data link service planned outages sufficiently ahead of time.
SR-5 (ANSP)	A, C	The ATS unit shall advise the controller when a message cannot be successfully transmitted.
SR-6 (ANSP)	C, I	The ATS unit end system shall provide the unambiguous and unique identification of the origin and destination with each message it transmits.
SR-7 (ANSP)	C, I	The ATS unit shall indicate in each response to which messages it refers.
SR-8 (ANSP)	I	The ATS unit shall send the route clearance information with the route clearance via data link.
<b>SR-9 (ANSP)</b>	C, I	The ATS unit end system shall timestamp (to within one second UTC) each message when it is released for onward transmission.
SR-11 (ANSP)	C, I	Any processing performed by the ATS unit (data entry/encoding/transmitting/ decoding/displaying) shall not affect the intent of the message.
SR-12 (ANSP)	C, I	The ATS unit end system shall reject messages not addressed to itself.