



FAA PBCS Monitoring Process to Support Inclusion of RCP/RSP in Data Link Approvals

New York OWG

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Overview

- PBCS Applicability
- Outline of **FAA PBCS Monitoring Process** to support addition of RCP/RSP approval
- Preliminary assessment of ASP/ACP for existing A056 data link approval holders
 - Summary of current approvals and observed operations in 3 US oceanic FIRs using data link (Oakland, Anchorage, New York)
 - Assessment against RSP180 and RCP240
- Challenges
- Operator Compliance



PBCS Background (1 of 2)

- Performance Based Communication and Surveillance (PBCS) is applicable to controller-pilot data link communications (CPDLC) and automatic dependent surveillance – contract (ADS-C) when they are required for air traffic management (ATM) operations
- The provision of PBCS applies required communication performance (RCP) 240 to CPDLC and required surveillance performance (RSP) 180 to ADS-C in the application of:
 - **50 NM, 30 NM, 5-minute longitudinal** separation minima
 - **23 NM lateral** separation minimum (formerly 30 NM lateral)



PBCS Background (2 of 2)

- ICAO is promulgating amendments for the provision of PBCS :
 - **Annex 6** - Operation of Aircraft
 - **Annex 11** - Air Traffic Services
 - **Annex 15** - Aeronautical Information Services
 - Procedures for Air Navigation Services / Air Traffic Management (**PANS-ATM, Doc 4444**)
- PBCS provision requires:
 - Initial operational approval
 - Flight plan designators (used to automatically determine that a flight is eligible to participate in relevant operations)
- Expected applicability date: **10 November 2016**
- Supporting guidance material is contained in the PBCS Manual (**Doc 9869, 2nd Edition**) - targeted for publication by November 2016



Outline of FAA PBCS Monitoring Process

- **Data link performance assessed for every operator/aircraft type pair or registration number associated with FAA data link A056 approval**
 - ASP/ACP calculated from ADS-C/CPDLC data and measured against RSP180/RCP240 for all 3 FAA oceanic FIRs (Oakland, Anchorage, New York)
- **Results posted to website by the 15th of month following end of review period (size of data set and frequency of review to be determined)**
 - ASP and ACP at 95% and 99.9% criteria
 - Using sensitive operator “code” – available upon request
 - Posted for operator/aircraft type pairs with at least 100(?) data points during the previous assessment period
- **For operator/aircraft type pair or registration number with ASP and/or ACP falling below RSP180/RCP240 in any of the 3 oceanic FIRs:**
 - Request performance details from other ANSPs (or check performance reported on shared website)
 - Provide detailed results to FAA Flight Standards (AFS) to inform RCP/RSP approval
- **Verification of filed “P” and “RSP” codes against approvals**
 - Provide reports of mis-filing to FAA Flight Standards



Preliminary Assessment of ASP/ACP for Airframes Linked to A056 Approval as of January 2016

- FAA A056 approvals database
 - **Some** approvals by specific registration number and others by operator and aircraft M/M/S only (specific airframes moved in and out of approval)
- Format of database records does not include ICAO 3-letter operator or ICAO 4-letter aircraft type
 - Needed to match to operational data
 - Translation from M/M/S format to ICAO 4-letter aircraft type not consistent
- Approvals matched to 6 months (Jul-Dec 2015) FAA operational performance data from New York, Oakland, Anchorage



Initial Compliance Assessment Part 121 (Commercial)

Part 121	Total A056 Airframes	Airframes Matched	% Matched to ADS-C/CPDLC Data in ZAK, ZAN, and/or ZNY
	1,280	996	78%

- **20** ICAO aircraft types, **14** operators
- **52** operator/aircraft type pairs
 - **43** pairs have 100% airframes matched to performance data
 - **9** pairs have 0% matched



Results for Initial Compliance

- 6 operator/aircraft type pairs not meeting RSP180 95% and/or RCP240 95%
 - 2 pairs underlined in **red** not currently filing for reduced separation
- These pairs would likely be restricted to filing P1 or P3 and RSP400 following November 2016
- 10 pairs meeting 95% but falling below required 99.9% performance would be flagged for further investigation

CODE/ AType	# Airframes	ADS msgs	ASP %<90	ASP %<180	RCP msgs	ACP %<180	ACP %<210	ADS msgs	ASP %<90	ASP %<180	RCP msgs	ACP %<180	ACP %<210	ADS msgs	ASP %<90	ASP %<180	RCP msgs	ACP %<180	ACP %<210
<u>A/B752</u>	41	7,701	94%	98%	235	97%	97%	-	0%	0%	-	0%	0%	11,367	93%	97%	274	99%	99%
<u>A/B753</u>	12	260	92%	93%	-	0%	0%	-	0%	0%	-	0%	0%	83	94%	94%	-	0%	0%
<u>CG/B748</u>	4	38	97%	97%	-	0%	0%	3,383	99%	99%	38	100%	100%	1,139	93%	97%	22	95%	95%
<u>R/B788</u>	13	14,314	97%	97%	537	99%	99%	11,269	94%	96%	142	94%	95%	29	79%	83%	-	0%	0%
<u>S/B763</u>	25	-	0%	0%	-	0%	0%	102	77%	79%	-	0%	0%	-	0%	0%	-	0%	0%
<u>Y/B763</u>	59	8,747	97%	98%	79	95%	95%	21,440	94%	97%	137	96%	97%	1,005	96%	97%	10	90%	100%



Initial Compliance Assessment Parts 91, 91k, 125, 135 (IGA)

Parts 91, 91k, 125, 135	Total A056 Airframes	Airframes Matched	% Matched
	1,210	522	43%

- 30 ICAO aircraft types

Results for Initial Compliance

- 9 airframes not meeting RSP180 95% and/or RCP240 95%
- These airframes would likely be restricted to filing P1 or P3 and RSP400 following November 2016
- 30 airframes meeting 95% but falling below required 99.9% performance would be flagged for further investigation

ACType	ADS msgs	ASP %<90	ASP %<180	RCP msgs	ACP %<180	ACP %<210	ADS msgs	ASP %<90	ASP %<180	RCP msgs	ACP %<180	ACP %<210	ADS msgs	ASP %<90	ASP %<180	RCP msgs	ACP %<180	ACP %<210
FA7X	204	94%	98%	11	82%	91%	-	0%	0%	-	0%	0%	52	98%	100%	2	100%	100%
GLEX	-	0%	0%	-	0%	0%	115	93%	100%	-	0%	0%	-	0%	0%	-	0%	0%
GLF5	-	0%	0%	-	0%	0%	-	0%	0%	-	0%	0%	526	88%	98%	12	92%	92%
GLF5	-	0%	0%	-	0%	0%	-	0%	0%	-	0%	0%	128	95%	98%	3	67%	67%
GLF5	-	0%	0%	-	0%	0%	-	0%	0%	-	0%	0%	313	94%	97%	3	100%	100%
GLF6	112	93%	98%	6	100%	100%	-	0%	0%	-	0%	0%	-	0%	0%	-	0%	0%
GLF6	261	100%	100%	5	100%	100%	122	94%	100%	1	100%	100%	-	0%	0%	-	0%	0%
GLEX	151	99%	100%	2	100%	100%	50	98%	100%	-	0%	0%	264	94%	97%	2	100%	100%
GLF4	117	90%	94%	3	100%	100%	-	0%	0%	-	0%	0%	-	0%	0%	-	0%	0%

Challenges for Assessing Compliance

- Need to monitor separately cases aircraft with differences in avionics for same aircraft type for same operator
- Establishing minimum amount of data points required
 - Difference between typical amount of ADS-C one-way downlink reports and CPDLC two-way transactions
 - Takes longer to compile CPDLC data set → May determine approval based on ADS-C data alone
 - Typical GA takes longer to compile data
 - **If no data – assume operator not using data link on ocean and not interested in reduced separation – P1 and SUR/RSP400**
- Cases of differences in performance between FIRs
 - Need to determine whether to restrict operator/aircraft type in all US FIRs or only where not meeting

Operator Compliance - “P” Flight Plan Codes

- After November 2016: Following initial compliance check and A056 approval updates operators will file appropriate codes in fields 10 and 18 in ICAO flight plans
 - **Field 10:** P1-CPDLC RCP400, P2-CPDLC RCP240, P3-SATVOICE RCP400
 - **Field 18:** SUR/RSP180, SUR/RSP400
- ANSP flight processing systems will need to be modified to use these codes to determine if flights are approved to use reduced separation standards based on equipage **AND** data link performance
- Correct filing will be verified by comparing “P” and “RSP” codes in flight plans to approvals
- FAA Flight Standards will be notified of cases of incorrect filing – standardized report form

