Ministry of Land Infrastructure Transport and Tourism

CIVIL AVATION BUREAU OF JAPAN

Session 3 : Sub-regional and National PBCS Transition Strategy

2-6 May 2016 ICAO APAC Operational Data link Seminar and FIT-Asia/5

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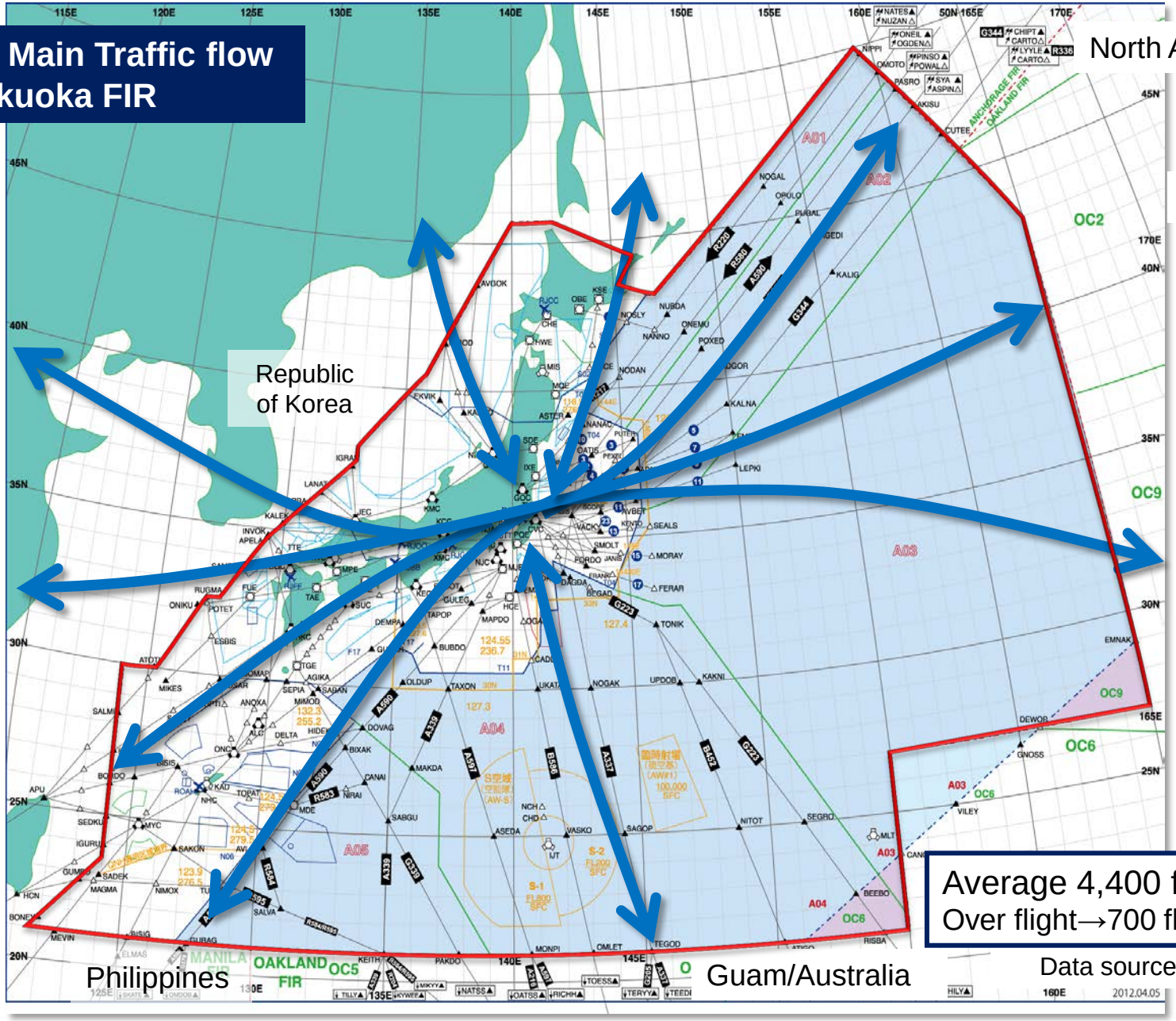
国土交通省

Overview

Overview of Fukuoka Flight Information Region

International Main Traffic flow of Fukuoka FIR



Average 4,400 flight per day
Over flight→700 flight

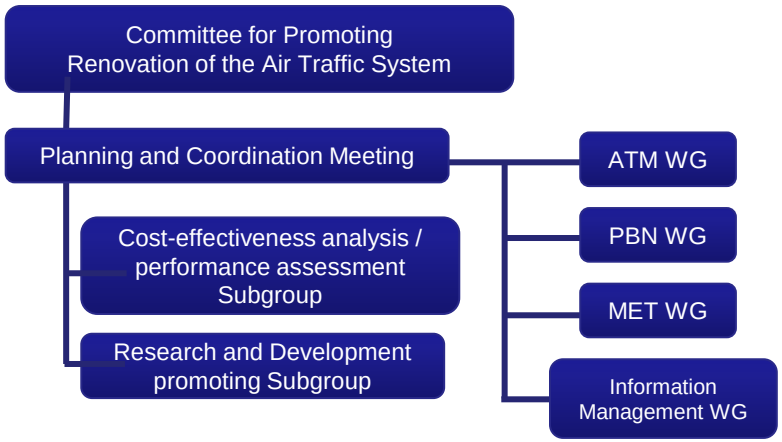
Data source：Average of 2014

●History

✓CARATS (Collaborative Actions for Renovation of Air Traffic Systems) is Japanese long-term vision in alignment with the GANP.
✓CARATS was established in September 2010.
✓Roadmap and Performance index were published in March 2011.

●Working Framework

✓CARATS is managed by the "Committee for Promoting Renovation of the Air Traffic Systems" which consists of representatives from industry, academia and government including academic expert, research institute, airline, manufacturer, association concerned and JCAB.
✓Some ad-hoc group were established under each WG for specific issues. (Data COM, TBO, GNSS, Surveillance)



●Achievement (as of March 2015.)

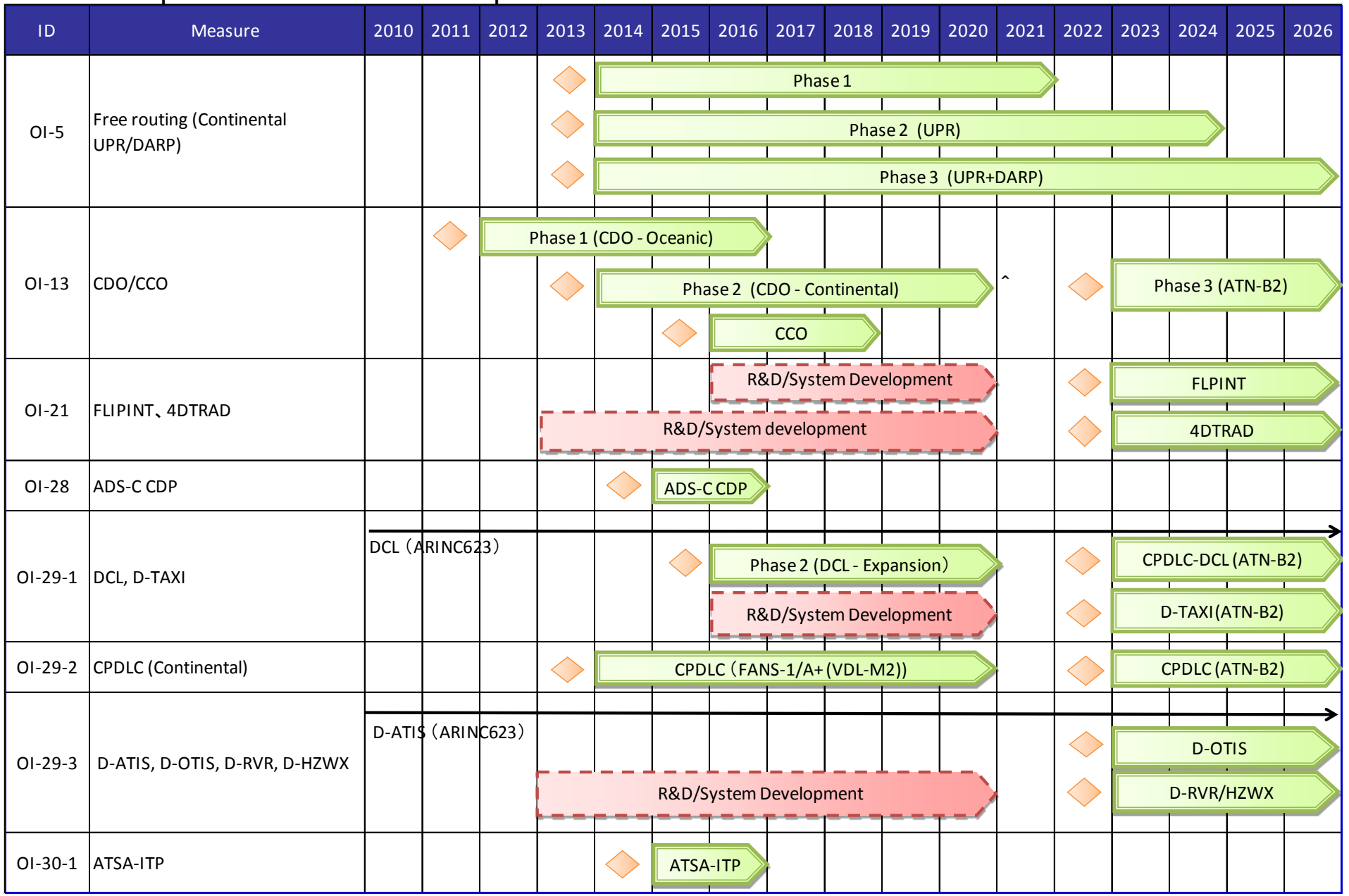
✓64 measures are described in CARATS and decision making year and implementation year are decided in each roadmap.

✓Some measures are implemented .
- RNP AR Approach
  Introduced airports : 16 airports
  Planned airports : 6 airports
- Initial CDO
  Introduced airports : 2 airports

✓Some measures are prepared for the implementation.
- RNAV5 routes in the low altitude airspace
  Trial operation started from 29th May 2014.
- Continental CPDLC
  This will be introduced in 2021.
- Airspace Re-formation
  This will be introduced in 2020
  *Detail information is shown in later slide.

National Future Plan - CARATS OI and EN on Data Link operation

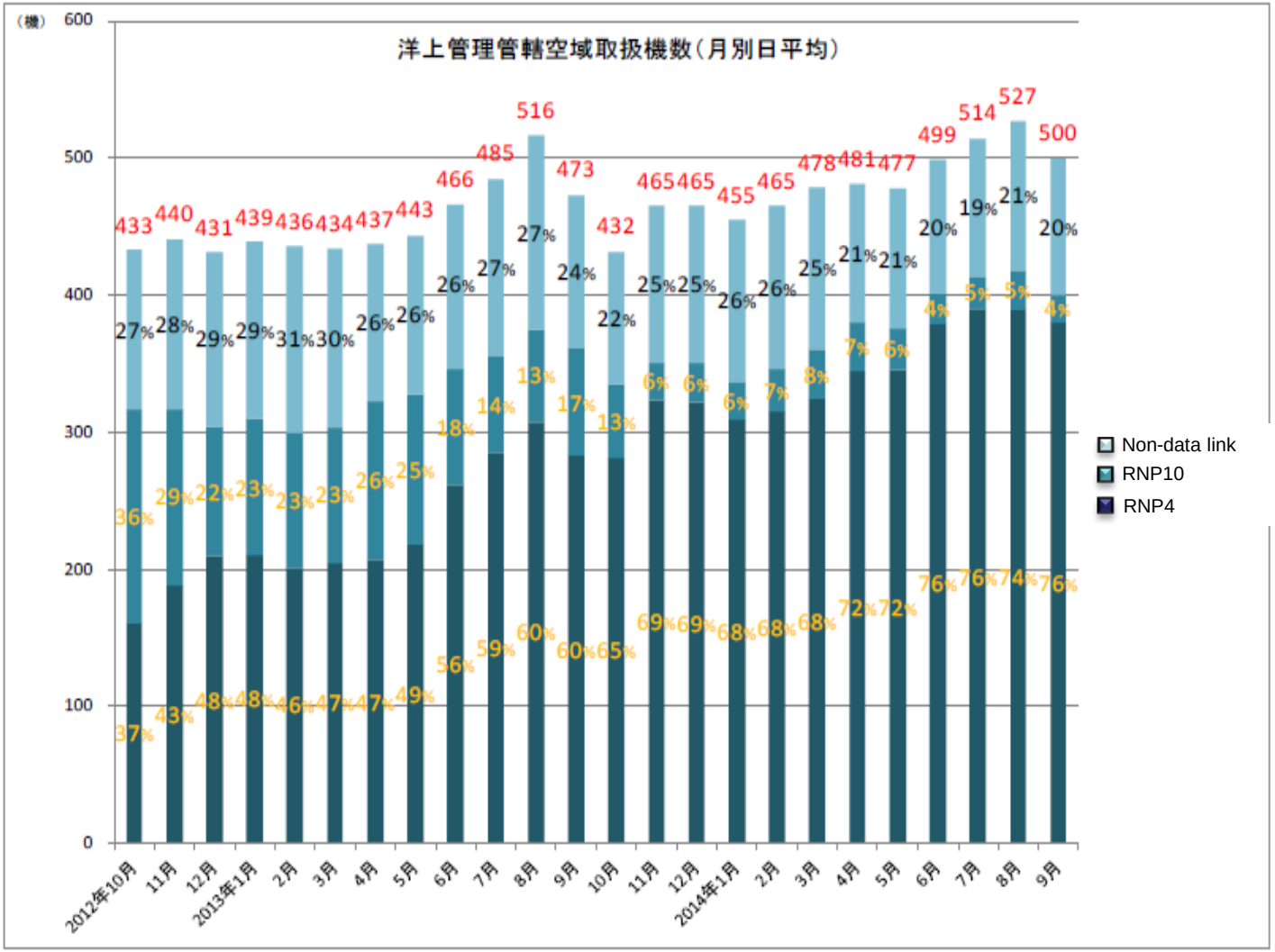
- Examples of OIs for data link operations



Oceanic Operation (FANS1/A)

Oceanic Data Link operation – Number of FANS aircraft in Fukuoka

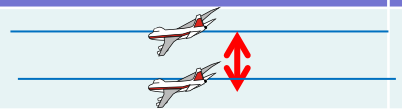
- Status of utilization of ADS-C, CPDLC and RNP4/10
  - ✓ JCAB introduced data link operations over the Pacific Oceanic airspace in 1997.
  - ✓ FANS1/A (ADS-C and CPDLC) and RNP4/10 are applied.
  - ✓ Average 480 flights per day. Almost 80% of the flights utilizes FANS1/A (*2012/10～2014/9)



IPACG Informal Pacific ATC Coordinating Group – Development of Specific ATM Operations

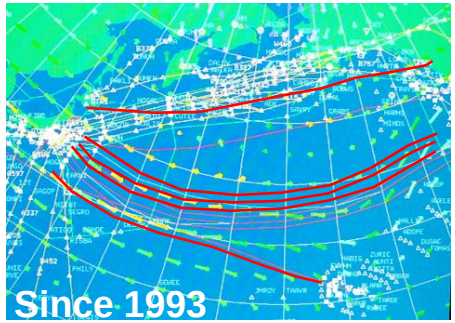
- History
  - ✓ IPACG (Informal Pacific ATC Coordinating Group) was established to provide a forum for air traffic service providers and airspace users to informally meet and explore solutions to near term ATC problems that limit capacity or efficiency within the Anchorage, Oakland, and Fukuoka Flight Information Regions (FIRs).
  - ✓ 1st meeting was held in Jul 1989. The meeting is held twice a year (including Providers Meeting).

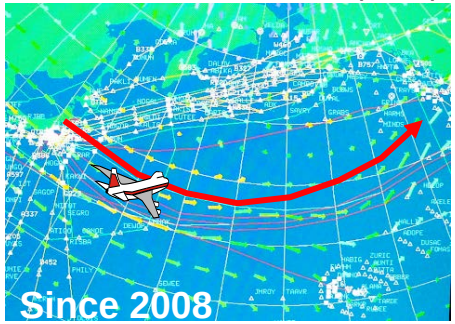
- Achievements ----------Fuel GAS reduction and CO2 greenhouse gas reduction
  - ✓ Safety Introduced AIDC(ATS Interfacility Data Communication)
  - ✓ Enhanced airspace capacity

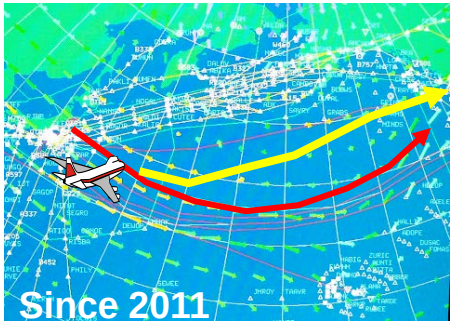
Longitudinal Separation	Before April 2005	April 2005 ～	August 2008 ～
	120-100NM 15Minuets	50NM*1 *1 for RNP10	30NM*2 *2 for RNP4
Lateral Separation	**Before April 1998**	**April 1998 ～**	**August 2008 ～**
	100NM	50NM*1 *1 for RNP10	30NM*2 *2 for RNP4
Vertical Separation	**Before February 2000**	**February 2000 ～**	
	FL290 or above 2000FT FL290- 1000FT	FL430+ 2000FT FL410or below 1000FT	

  - ✓ Introduced efficiency route system

PACific Organized Track System (PACOTS) →User Preferred Route (UPR) → Dynamic Airborne Reroute Procedure (DARP)

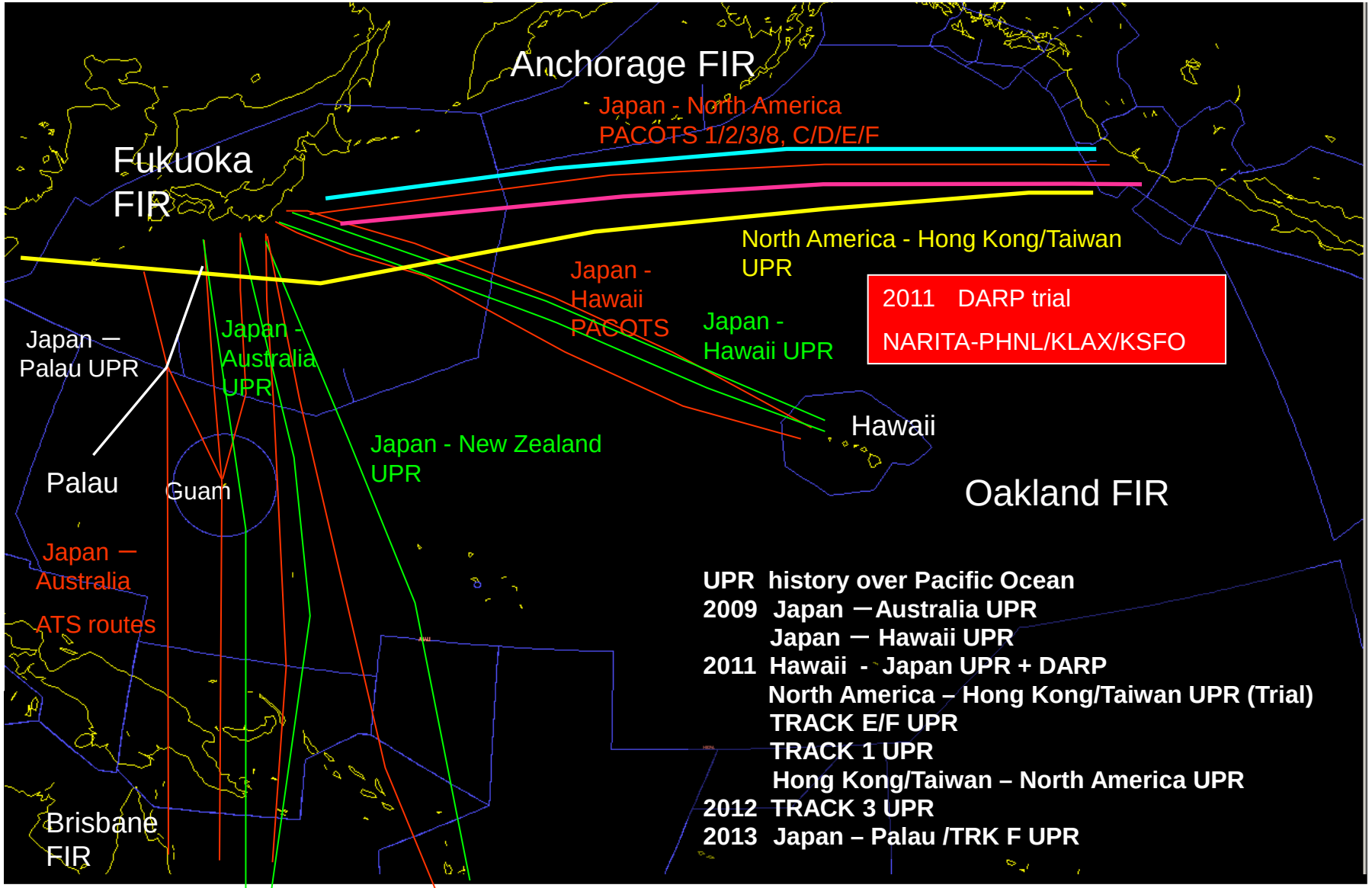






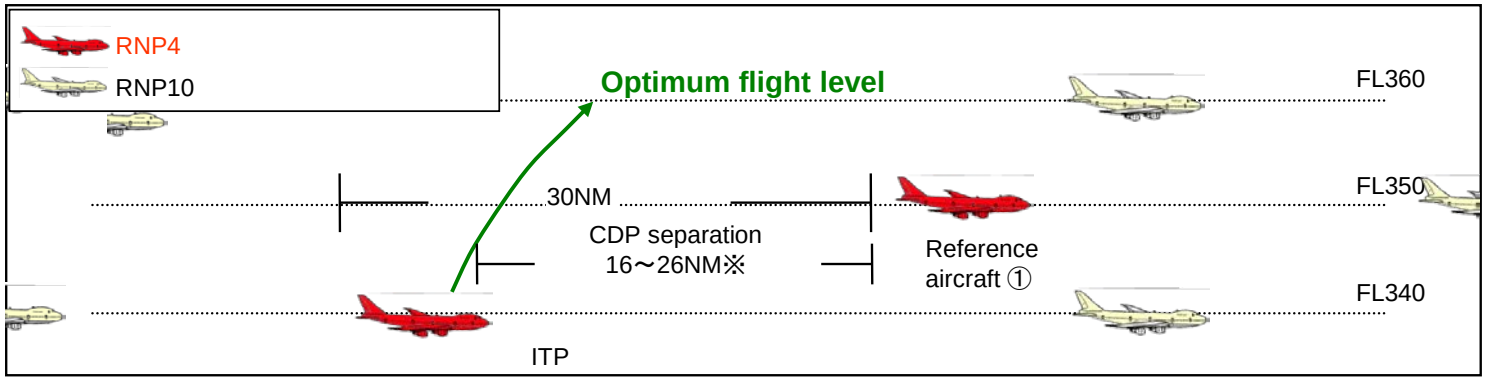
Oceanic Data Link Operations -UPR and DARP-

- Implementation of UPR・DARP
  - ✓ UPR operations started in 2008
  - ✓ DARP in 2011 (under the trial operations)



Oceanic Data Link Operations -CDP/ITP (future plan)-

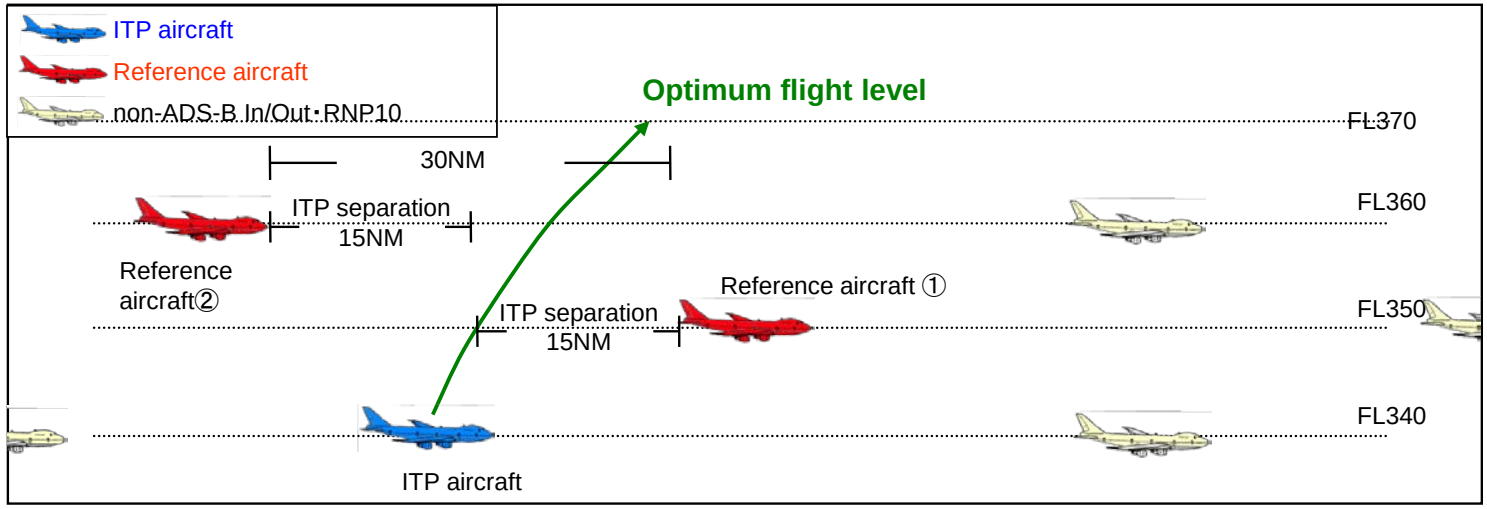
- OI-28 ADS-C CDP: Climb and Descend Procedure



Note: Separation to be applied for CDP will be determined after safety evaluation.

Measure ID	Measure name	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026 以降
OI-28	Reduced separation minima for oceanic airspace					◆	ADS-C CDP											

- OI-30-1 ADS-B ITP: In trail Procedure



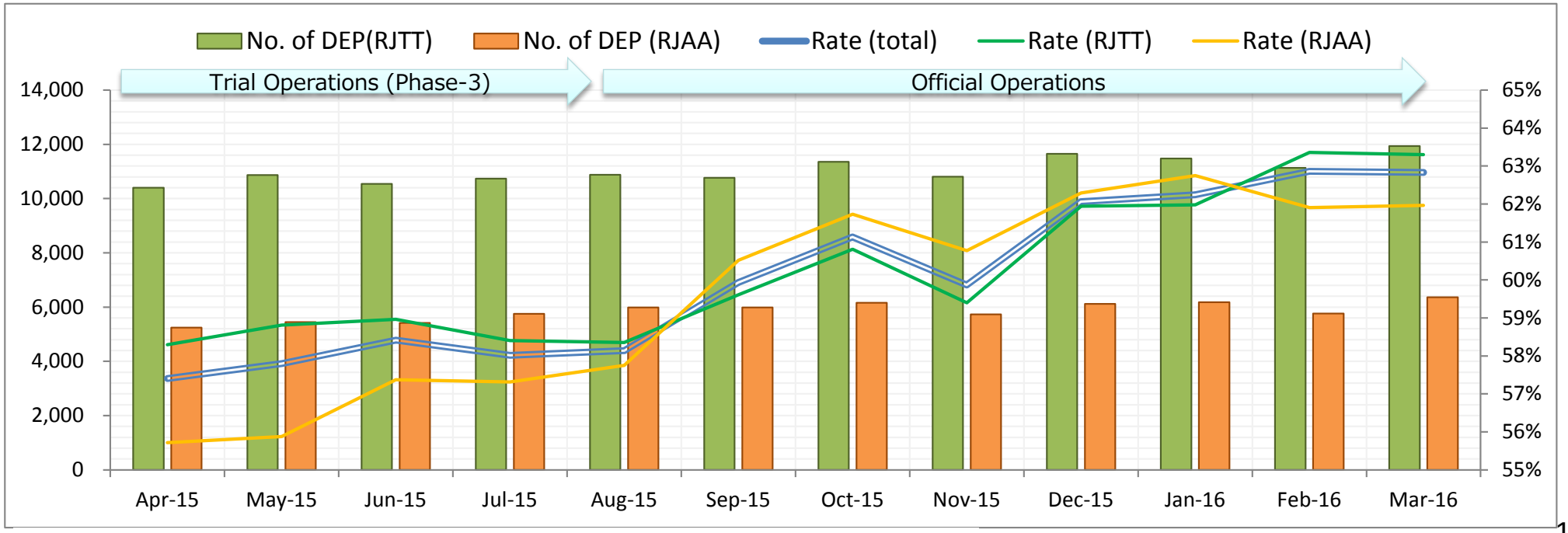
Measure ID	Measure name	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026 以降
OI-30-1	Air Separation Assistance System (ASAS) / ATSA-ITP operations			R&Ds and evaluations on ATSA-ITP		◆	ATSA-ITP											

DCL (ARINC623)

DCL Status

DCL Trial of RJTT & RJAA – Utilization rate –

		Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16
Total	Number of issue	27,266	28,235	27,322	28,411	29,012	27,952	28,662	27,623	28,646	28,383	26,881	29,119
	Number of Departures	15,652	16,319	15,960	16,484	16,867	16,752	17,522	16,538	17,778	17,667	16,897	18,296
	Utilization rate	57.40%	57.80%	58.41%	58.02%	58.14%	59.93%	61.13%	59.87%	62.06%	62.25%	62.86%	62.83%
RJTT	Number of issue	17,844	18,487	17,886	18,381	18,640	18,061	18,684	18,188	18,818	18,529	17,567	18,855
	Number of Departures	10,402	10,872	10,546	10,735	10,877	10,766	11,362	10,804	11,656	11,484	11,131	11,936
	Utilization rate	58.29%	58.81%	58.96%	58.40%	58.35%	59.61%	60.81%	59.40%	61.94%	61.98%	63.36%	63.30%
RJAA	Number of issue	9,422	9,748	9,436	10,030	10,372	9,891	9,978	9,435	9,828	9,854	9,314	10,264
	Number of Departures	5,250	5,447	5,414	5,749	5,990	5,986	6,160	5,734	6,122	6,183	5,766	6,360
	Utilization rate	55.72%	55.88%	57.38%	57.32%	57.75%	60.52%	61.74%	60.77%	62.29%	62.75%	61.91%	61.96%



RJTT: Tokyo International Airport (HANEDA) RJAA : Narita International Airport (NARITA)

PBCS Implantation
(National Transition Strategy)

CRA Activities (Current Status)

- JCAB works as CRA for the evaluation of Oceanic ATC Data link operations.
- JCAB CRA has conducted the evaluation based on FOM until 2014.
- JCAB CRA started the new evaluation activities based on PBCS concept in April 2015.

Work Flow for CRA activities in Japan

Group and tasks

★JCAB ANSP Division
- Management CRA activities
- Rap-up the draft reports to the related meetings.

★Fukuoka ATMC: Fukuoka Air Traffic Management Center
- Management of PR
- Investigation and analysis of PR
- Development of ATC procedures and report PRs to ANSP Div.

★TMC : Technical Management Center
- Communication evaluation based on PBCS
- Development of CNS issues and report related actions to ANSP Div.

★SDECC : System Development, Evaluation and Contingency Center
- analysis and development of ODP system.

★KLSC : Kobe data Link Communication Satellite Center
- Monitoring Data link Operations, report statistic-data to TMC

IPACG (Informal Pacific ATC Coordinating Group)

FIT (FANS Inter Operability Team)

Planning, Results

Reports, Proposals for development

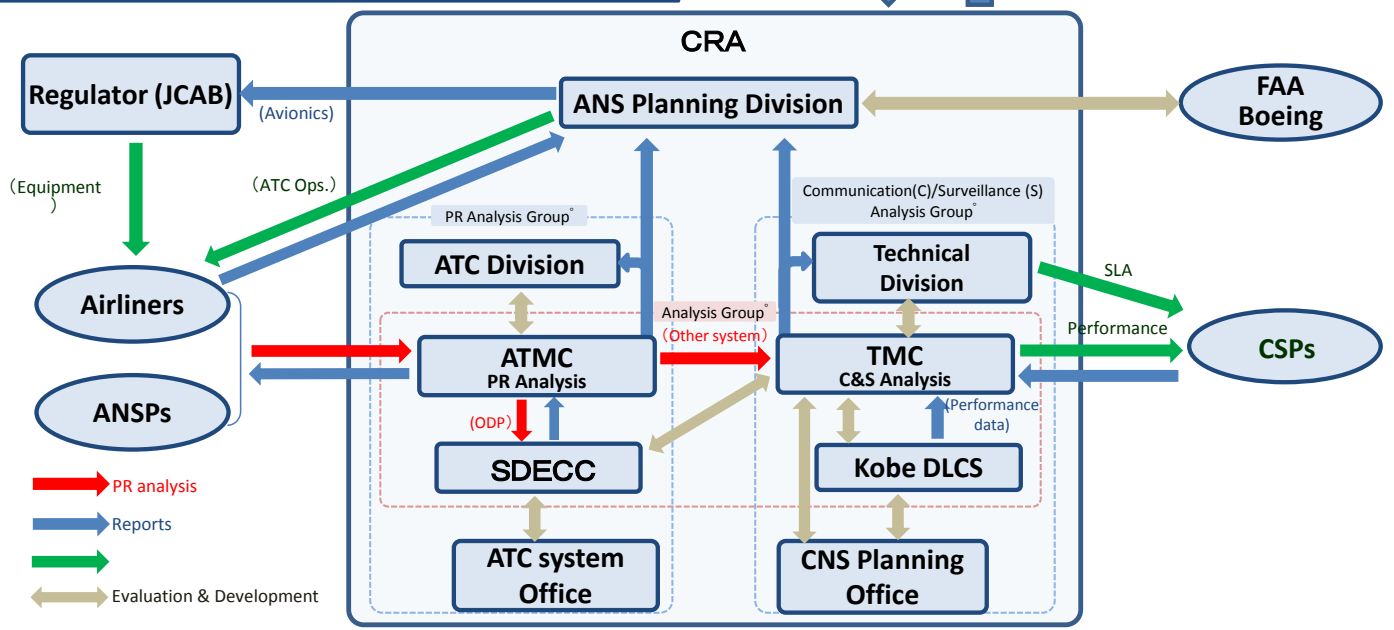
ATC Data-link Operation evaluation committee

Report and review of the status of data link operations, communication analysis based on PBCS, actions to be taken for the relevant problem in the Fukuoka FIR.

JCAB, SDECC, TMC, ATMC, Kobe DLCS, Airliners, DSPs (AVICOM, SITA, ARINC)

Planning, Results

Reports, Proposals for development



National Transition Strategy for PBCS

- ✓ Japan concluded to establish a “national” transition strategy.
- ✓ We are conducting actions in accordance with the amendments of SARPs and manuals.
- ✓ Major actions to be taken by JCAB will include;

a) Establishment of an operational approval process

b) Establishment of evaluation committee for PBCS implementation

c) Prescription of AIP including RCP/RSP specification, interoperability standards and ATM operation.

d) Modification to ATC automation to adopt the appropriate separation standards

e) Application of reduced separation minimum (30/30NM, 50NM)

f) Implementation of PBCS monitoring programme

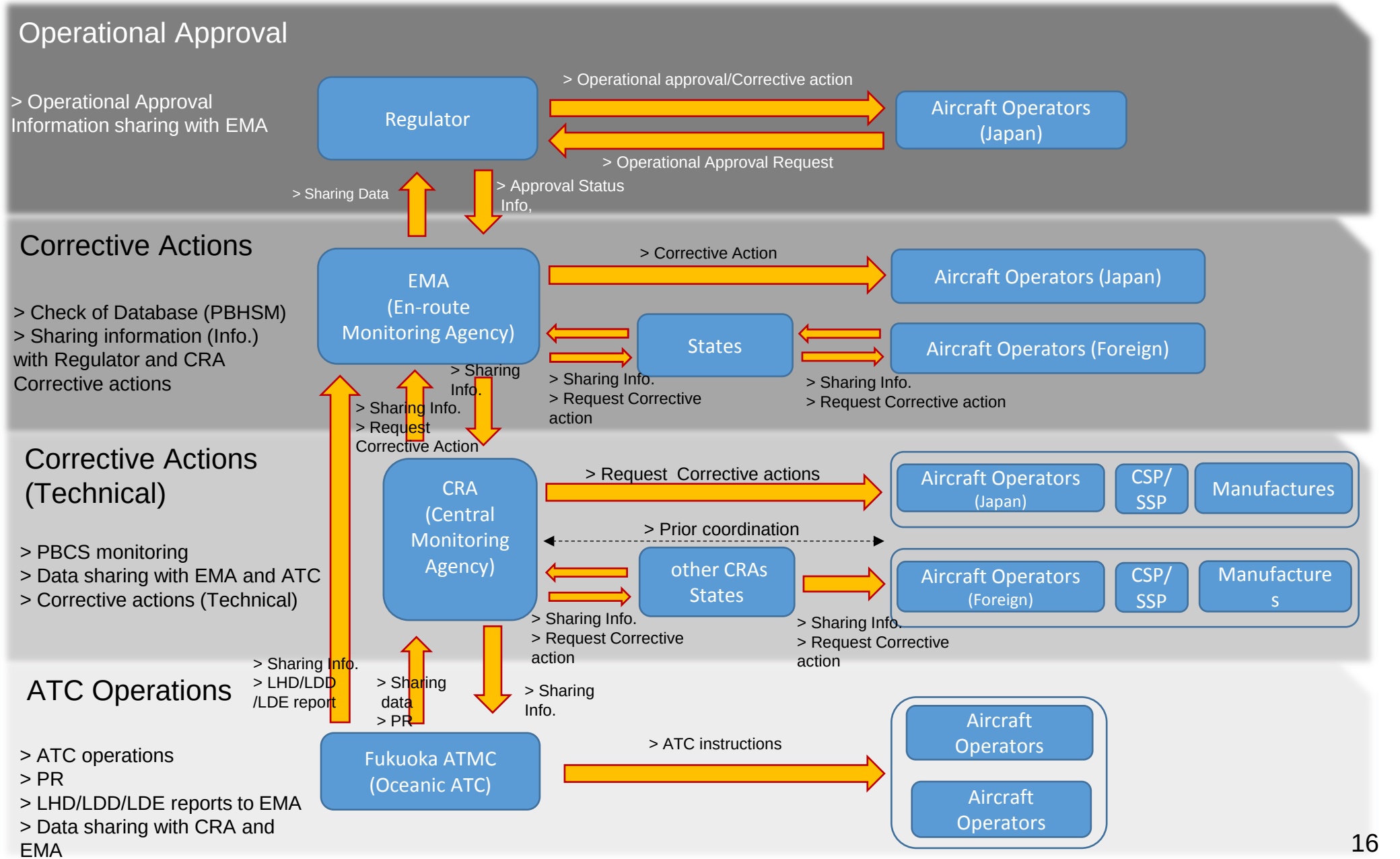
g) Implementation of PBHSM monitoring programme

National Transition Strategy– Check list and management of strategy

- ✓ JCAB made a check list for PBCS implementation.
- ✓ The list was developed based on Appendix A of Doc. 9869
- ✓ All stakeholders (Regulators, ANSP, Aircraft Operators, CSP/SSP and ESP) involved.

ID	Task Descriptor	Task Detail& IDs	Name of Divisions	Due date	Status	Remarks	ICAO reference
Group A tasks – State/region preparation							
A-1	AIP – Prescription of an RCP/RSP specification	Prescribe the appropriate RCP/RSP specification in the AIP (or equivalent publication). If applicable, common AIP language may be based on a bilateral, multilateral or regional air navigation agreement.					PBCS Manual (Doc. 9869) Chapter 4
	IDs	A-1-1: Review of the draft of AIP （including Applied separation standard, RCP/RSP specifications and others）	ATC Div.	Early July /2016	On-going	・reviewing contents.	
		A-1-2: Confirmation of the schedule to issue AIP	ANSP Div.	April /2016	Done	・draft:16/08/2016 ・Issue: 15/09/2016 ・Effective 10/11/2016	
A-2	ANSP – PBCS policies, objectives supporting safety oversight	Identify means to apply RCP/RSP specifications and compliance criteria for initial approval and continued compliance, including: a) ATS provision requirements, and requirements for ATS unit's system and CSP/SSP service agreements, if applicable; b) flight plan requirements; and c) monitoring, alerting and reporting requirements.					PBCS Manual Chapter 5 Section 5.2.1 Section 5.2.2
	IDs	A-2-1: Confirmation of policy and condition of application of specific ATM operations（Checking P-code, Operational procedures）	ATC Div.	-	On-going	・ATC system modification: 02/2018	
		A-2-2: Confirmation of operational requirement for ATC system (Indication of P-code and alert of TSD)	ATC Div. SYSTEM Div.	March /2015	Done	・Modification system: 2016-2018	
		A-2-3: Engagement of SLA with CSP/SSP (SITA, ARINC and AVICOM）	ATCT DIV.	-	On-going	・JCAB has a SLA with SITA	
		A-2-4: Confirmation of P-code/SUR in Item 10 and 18 of FPL (ICAO ANNEXs and PANS)	ATC Div. OPS. Div.	March/2 015	Done	・JCAB has modified in 2012	
		A-2-5: Confirmation of PBCS monitoring program (Collecting sample date of ACP/ASP. Executing the monitoring program)	CRA	August /2015.	Done	・Stated PBCS monitoring program from 04/2015.	
		A-2-6: Information sharing with internal facilities. (Fukuoka ATMC and related Area Control Centers)	ANSP Div. ATC Div.	June /2016	On-going		

National Transition Strategy – Approval Process, Evaluation, Corrective Actions



PBCS Implantation
(Sub-regional Transition Strategy)

Pacific FIRs Seamless PBCS Planning Chart

Background

- ✓ FAA and JCAB had a IPACG-Provider Meeting/17(IPACG-PM/17) (March 2016, Tokyo)
- ✓ IPACG providers agreed to adopt a draft of “Pacific FIRs Seamless PBCS Planning Chart”.
- ✓ IPACG submitted a joint proposal to ISPACG (March 2016, Gold Coast Australia)
- ✓ ISPACG and IPACG agreed to develop the draft of the Chart

Purpose

- ✓ **To clarify required tasks for PBCS implementation (before/after)**
- ✓ **To make easier understanding of implementation status for all stakeholders**
- ✓ **To facilitate regional transition strategy**

Contents

- ✓ The chart consists of two parts:

1 PBCS Implementation Task List derived from Appendix A in PBCS Manual

2 Prescription of specifications, interoperability and ATM operations

- RCP240/400, RSP180/400 and/or RNP2/4/10…..
- CPDLC, ADS-C, SATVOICE and/or HF
- 30/30NM and/or 50NM Separation Standard Note: These should be included in AIP

Sub-regional Transition Strategy – Pacific FIRs Seamless PBCS Planning Chart1

Pacific FIRs Seamless PBCS Planning Chart

	Task Group	Task ID	TASK descriptor			Anchorage Oceanic FIR	Auckland FIR	Brisbane (Honiara & Nauru UTAs)	Fukuoka FIR	Manila FIR	Nadi FIR	Oakland Oceanic FIR	Port Moresby FIR	Santiago FIR	Tahiti FIR	Ujung Pandang FIR	Anchorage Domestic FIR	Anchorage Arctic FIR	Guam CERAP	Honolulu Control Facility	Los Angeles ARTCC	Mazatlan FIR	Oakland Domestic ARTCC	Seattle ARTCC	Vancouver ACC
PBCS Implementation Task List	Group A	A-1	AIP (Prescription of an RCP/RSP specification)																						
		A-2	ANSP (PBCS policies, objectives supporting safety oversight)																						
		A-3	Operatpr and aircraft System- PBCS policies, objectives supporting safety																						
		A-4	Regional Supplementary Procedures (Doc. 7030) for PBCS operations , if																						
	Group B	B-1	PBCS Implementaion Plan																						
		B-2	Target dates for PBCS and relevant ATM operations																						
		B-3	RCP/RSP specifications																						
		B-4	PBCS awareness																						
	Group C	C-1	Operational concepts and procedures for PBCS operations																						
		C-2	ATC automation changes to use flight plan RCP/RSP indicators																						
		C-3	ATC automation changes for PBCS monitoring																						
		C-4	Confirm initial ANSP compliance with RCP/RSP specifications																						
	Group D	D-1	Aircraft operator readiness																						
	Group E	E-1	PBCS monitoring - post implmentation																						
Cmmunication Specifications & Interoperatability Standards			Normal	RCP240	FANS1/A CPDLC	X	X	X	X		X	X		X	X	X									X
			Alternate	RCP400	SATVOICE																				
				RCP400	HF																				
Surveillance Specifications & Interoperatability Standards			Normal	RSP180	FANS1/A ADS-C	X	X	X	X		X	X		X	X	X									
			Alternate	RSP400	SATVOICE																				
				RSP400	HF																				
			ADS-B			X	X	X			O				O	X	X		X		X		X	X	
Navigation Specifications & Applicable ATM Operations			RNAV/RNP	RNAV/RNP 10	50 NM Lateral Separation	X	X	X	X	X	X	X	X	X	X		X		X	X	X		X	X	X
					50 NM Longitudinal Separation	X	X	X	X		X	X	X	X	X		X		X	X	X		X	X	X
				RNP 4	30 NM Lateral Separation	X	X	X	X		X	X							X	X	X		X	X	
					30 NM Longitudinal Separation	X	X	X	X		X	X					X		X	X	X		X	X	
				RNP2	30NM Climb-Descend Through																				
					15 - 20 NM VHF Lateral Separation																				
					8NM VHF Climb-Descend Through																				
			10 MINUTE Longitudinal Separation without MNT.			X	X	X	X		X	X		X			X		X	X	X		X	X	X
			RVSM			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Other ATM Operations			ADS-C CDP			P			P			P													
			ADS-B ITP			P			P			X													
			Tactical Lateral Offsets for Climb or Descent				X	X				X													
			Tailored Arrival									X													
			CDO			O			X															X		
			UPR			X	X	X	X		X	X	X	X	X										
			DARP	Accept		X	X	X	X		X	X			X				X	X	X		X	X	
				Initiate			X		X		X	X			X										

Note: Current status of each FIR is as of March 2016. Legend : X: Implemented. O : Under operational trial. P : Under planning.

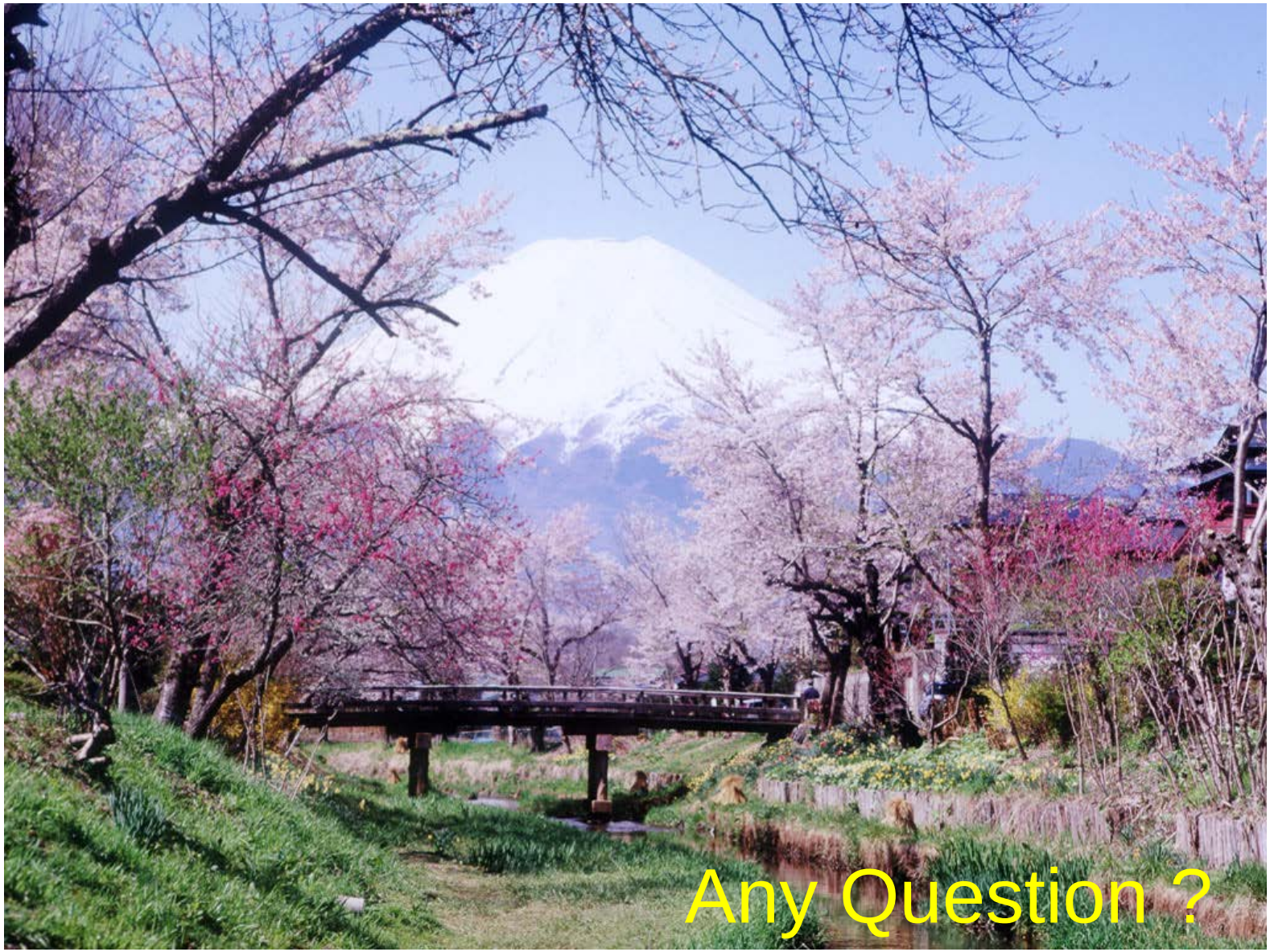
Sub-regional Transition Strategy – Pacific FIRs Seamless PBCS Planning Chart2

Ver. 20160418

Pacific FIRs Seamless PBCS Planning Chart

	Task Group	Task ID	TASK descriptor			Applicable Airspace: Jakarta FIR	Melbourne FIR	Singapore FIR	Guayaquil FIR
PBCS Implementation Task List	Group A	A-1	AIP (Prescription of an RCP/RSP specification)						
		A-2	ANSP (PBCS policies, objectives supporting safety oversight)						
		A-3	Operatpr and aircraft System- PBCS policies, objectives supporting safety						
		A-4	Regional Supplementary Procedures (Doc. 7030) for PBCS operations , if						
	Group B	B-1	PBCS Implementaion Plan						
		B-2	Target dates for PBCS and relevant ATM operations						
		B-3	RCP/RSP specifications						
		B-4	PBCS awareness						
	Group C	C-1	Operational concepts and procedures for PBCS operations						
		C-2	ATC automation changes to use flight plan RCP/RSP indicators						
		C-3	ATC automation changes for PBCS monitoring						
		C-4	Confirm initial ANSP compliance with RCP/RSP specifications						
	Group D	D-1	Aircraft operator readiness						
	Group E	E-1	PBCS monitoring - post implmentation						
Cmmunication Specifications & Interoperatability Standards		Normal	RCP240	FANS1/A CPDLC			X	X	
		Alternate	RCP400	SATVOICE					
			RCP400	HF					
Surveillance Specifications & Interoperatability Standards		Normal	RSP180	FANS1/A ADS-C		X	X	X	
		Alternate	RSP400	SATVOICE					
			RSP400	HF					
				ADS-B		X	X	O	
Navigation Specifications & Applicable ATM Operations		RNAV/RNP	RNAV/RNP 10	50 NM Lateral Separation			X	X	
				50 NM Longitudinal Separation			X	X	
			RNP 4	30 NM Lateral Separation			X		
				30 NM Longitudinal Separation			X		
			RNP2	30NM Climb-Descend Through					
				15 - 20 NM VHF Lateral Separation					
				8NM VHF Climb-Descend Through					
				10 MINUTE Longitudinal Separation without MNT.			X	X	
				RVSM		X	X	X	X
Other ATM Operations				ADS-C CDP					
				ADS-B ITP					
				Tactical Lateral Offsets for Climb or Descent			X		
				Tailored Arrival					
				CDO				X	
				UPR					
		DARP		Accept			X		
				Initiate					

Note: Current status of each FIR is as of March 2016. Legend : X: Implemented. O : Under operational trial. P : Under planning.


Any Question ?