Fuze Meeting and Telecon

1-866-398-2885

Passcode 151869#

Oceanic Work Group Meeting

Date: October 8, 2014

Oakland Center Update

Dennis Addison

SM Oceanic Airspace and Procedures

October 8, 2014

Oakland ARTCC Webpage

Oakland Air Route Traffic Control Center (ZOA) - Windows Internet Explorer

http://www.faa.gov/about/office_org/headquarters_offices/ato/artcc/oakland/

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AeroStar Flights | Oakland Air Route Traffic...

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Air Traffic Organization

- ATO Organization
- **Air Route Traffic Control Centers (ARTCC)**
- Airport Traffic Control Towers (ATCT)
- Terminal Radar Approach Control Facilities (TRACON)

Oakland Air Route Traffic Control Center (ZOA)

Print

At the heart of Oakland ARTCC is a team of Air Traffic and Technical Operations Professionals. Oakland Center is unique in that two distinctly different air traffic control functions are handled here. There is the normal en route air traffic control as well as an oceanic air traffic operation that manages the largest volume of international airspace in the world at one facility.

- KZOA Domestic ATC Operations
- KZAK Oceanic ATC Operations
- NOTAMs, TFRs, SUAs

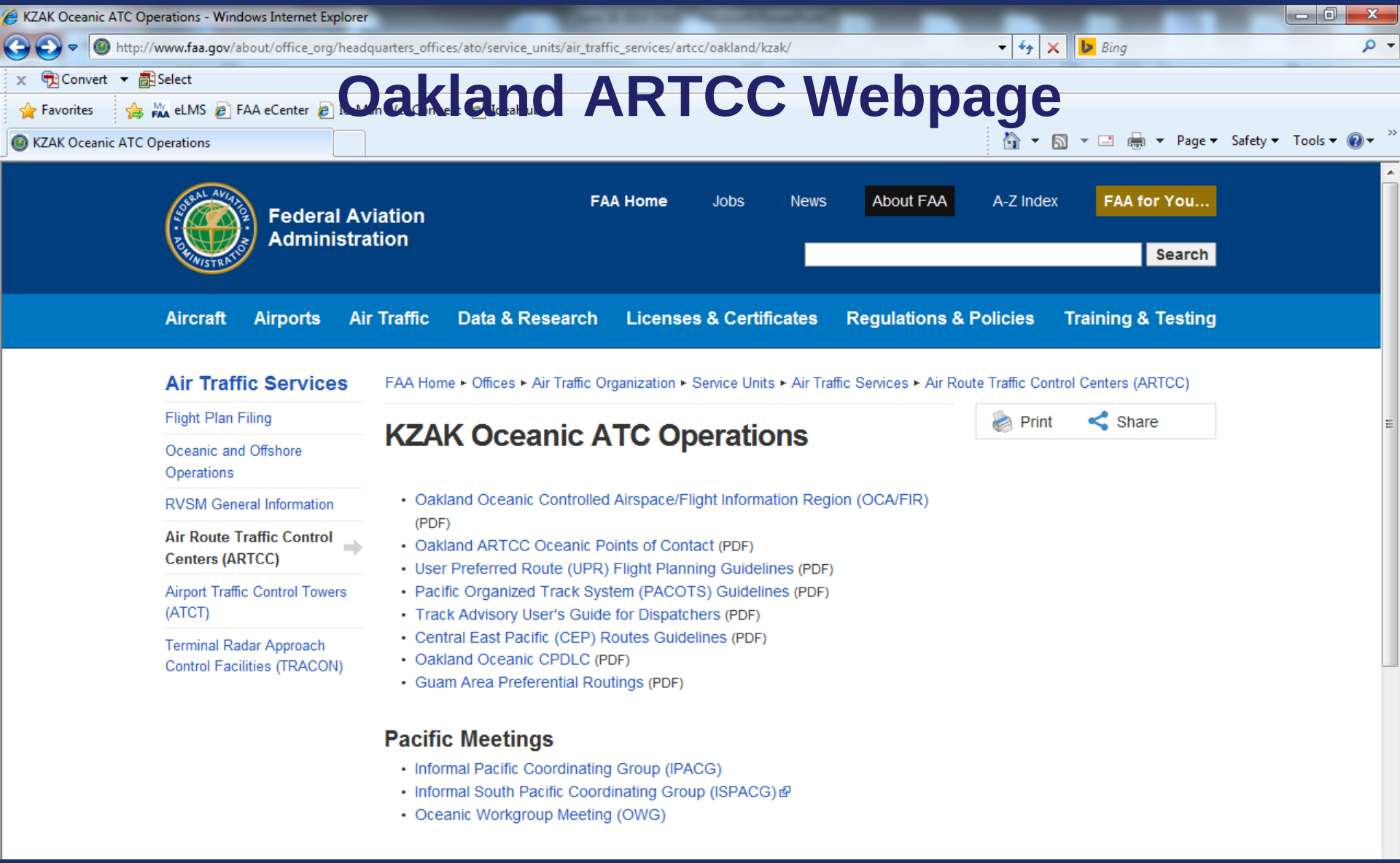
Oakland ARTCC

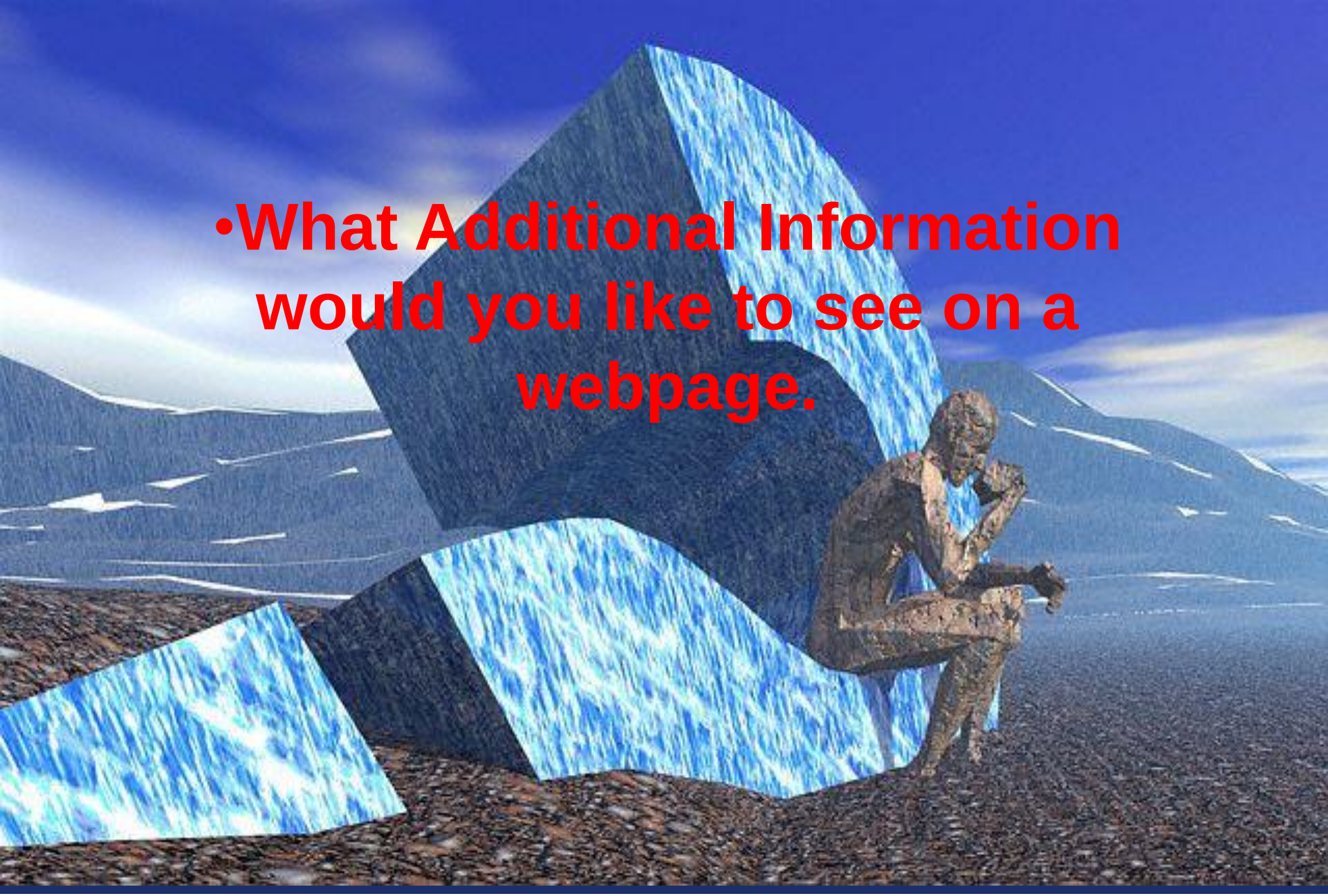
Oakland ARTCC
5125 Central Ave.
Fremont, CA. 94536
Phone: (510) 745-3000

Rohitkumar Desai,
Web POC
ZOA Web Site
Feedback

http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/air_traffic_services/artcc/oakland/

Oakland ARTCC Webpage




•What Additional Information would you like to see on a webpage.

ADS-B In Trail Procedure (ITP)

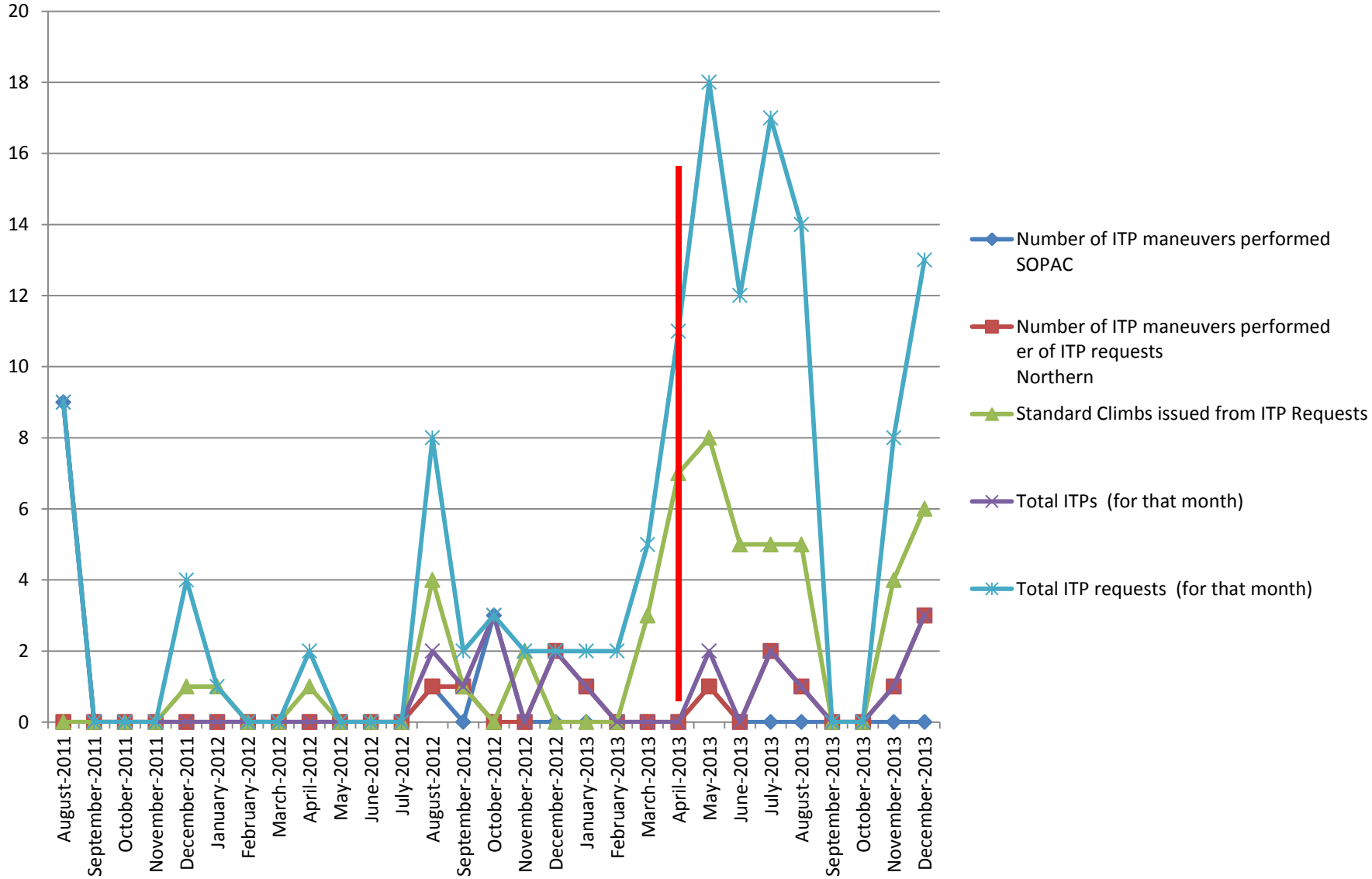
Status Update

Operational Evaluation Partnership Agreement

- **Partnership**
  - FAA and United Airlines agreement signed in April 2009

- Retrofit 12 UAL 747-400 aircraft with certified ITP systems
- Trial Began in 2011
- April 18, 2013 = 100 percent Pilots Trained

ITP Maneuvers



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Air Traffic Organization Policy

ORDER JO 7110.661

UPDATED ORDER

Effective Date:
September 30, 2014

SUBJ: Automatic Dependent Surveillance – Broadcast (ADS-B) In-Trail Procedure (ITP)

1. Purpose of This Order. This order establishes air traffic procedural guidance and requirements applicable to apply reduced longitudinal separation aircraft-to-aircraft during altitude change maneuvers between appropriately authorized and equipped aircraft during operational trials for ADS-B ITP throughout the Oakland Air Route Traffic Control Center (ARTCC) Oceanic Control Area (CTA).

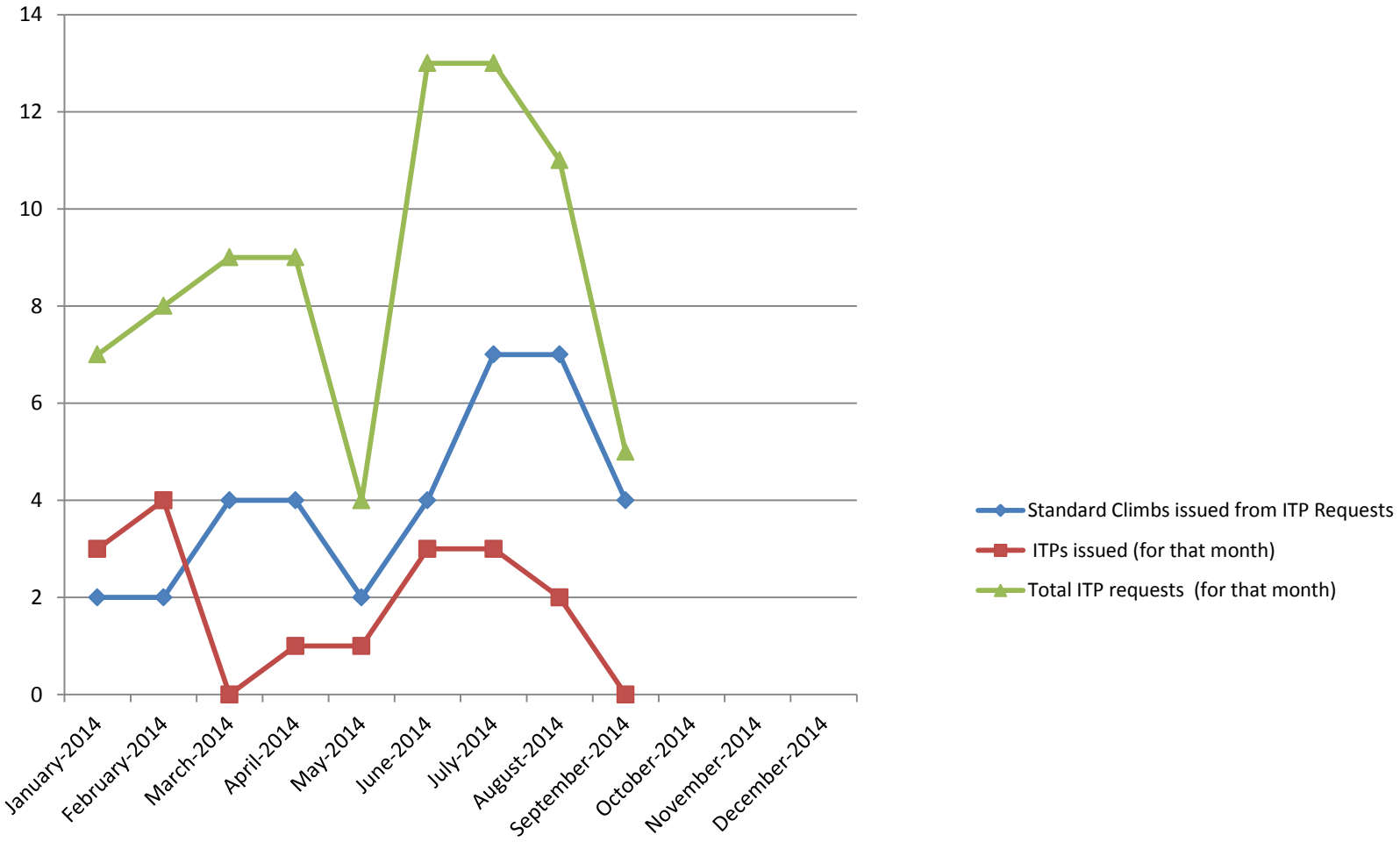
2. Audience. This order applies to the following Air Traffic Organization (ATO) service units: Air Traffic Services Headquarters (AJT); Western Air Traffic Service (ATS) South; and, Oakland ARTCC.

3. Where Can I Find This Order? This order is available on the MyFAA employee Web site at https://employees.faa.gov/tools_resources/orders_notices/ and on the air traffic publications Web site at http://www.faa.gov/air_traffic/publications/.

4. Cancellation. This order cancels the following notice: N JO 7110.641, Automatic Dependent Surveillance – Broadcast (ADS-B) In-Trail Procedure (ITP).

5. Procedures. Standard air traffic control procedures contained in FAA Order JO 7110.65 and facility orders must be applied in support of the ADS-B ITP operational trials. Oakland ARTCC

2014 ITP Activity



ADS-B ITP Checklist

- Manual Checklist is being automated in Ocean21.
- Automation is planned to be delivered 2016

ADS-B ITP CONTROLLER PROCEDURE

This procedure must be initiated by an ITP request

If any of the following steps are not true, advise the aircraft UNABLE

Validate ITP Request

- ☐ The pilot reports on CPDLC a distance between the ITP aircraft and any referenced aircraft that is **at least 18nm**.

Initiate probe on ITP aircraft

- ☐ Maximum of 1 or 2 conflicts exist
- ☐ All call signs in conflict report(s) are included in the ITP request
- ☐ All conflict aircraft are same direction traffic as ITP aircraft until vertical separation is reestablished
- ☐ Closing mach difference of ITP aircraft and any referenced aircraft is ≤ .06.
- ☐ All conflict aircraft are within 2000' of the ITP aircraft
- ☐ All conflict aircraft are at a single-assigned altitude
- ☐ No conflict exists at the requested altitude.
- ☐ No aircraft involved are cleared for or requesting a route deviation
- ☐ ITP aircraft and Reference aircraft are not part of another ITP operation at the same time

Issue ITP Altitude Change Clearance (message examples are listed on the back side of this form)

ADS-C CDP

Procedure is based on in-trail Distance Measuring Equipment (DME) rules in ICAO Doc 4444

- Near Simultaneous ADS-C Demand Reports
- Climb/Descend an aircraft through the altitude of a blocking aircraft

Automated Procedure

CWP16

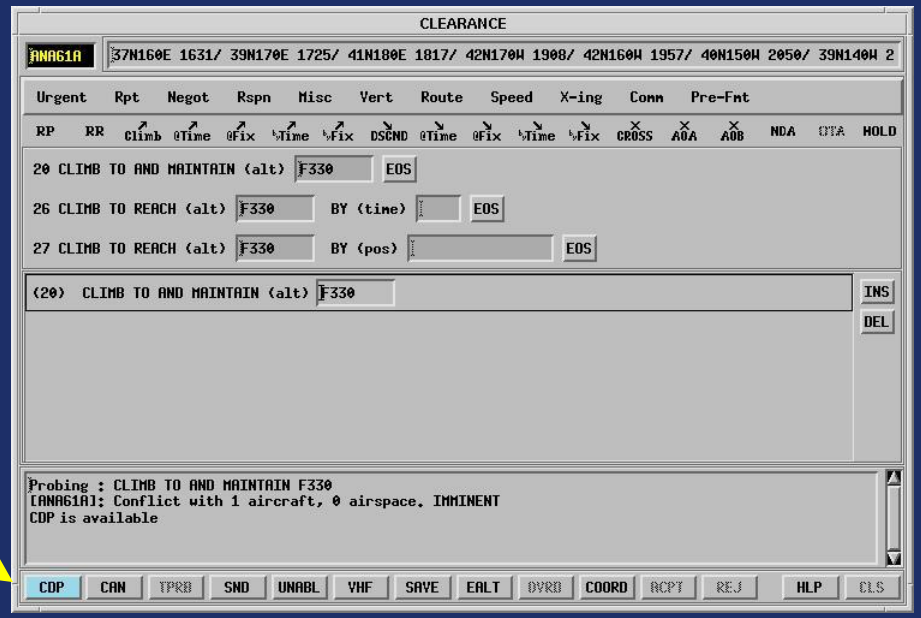
ATC ADS-C CDP CHECKLIST

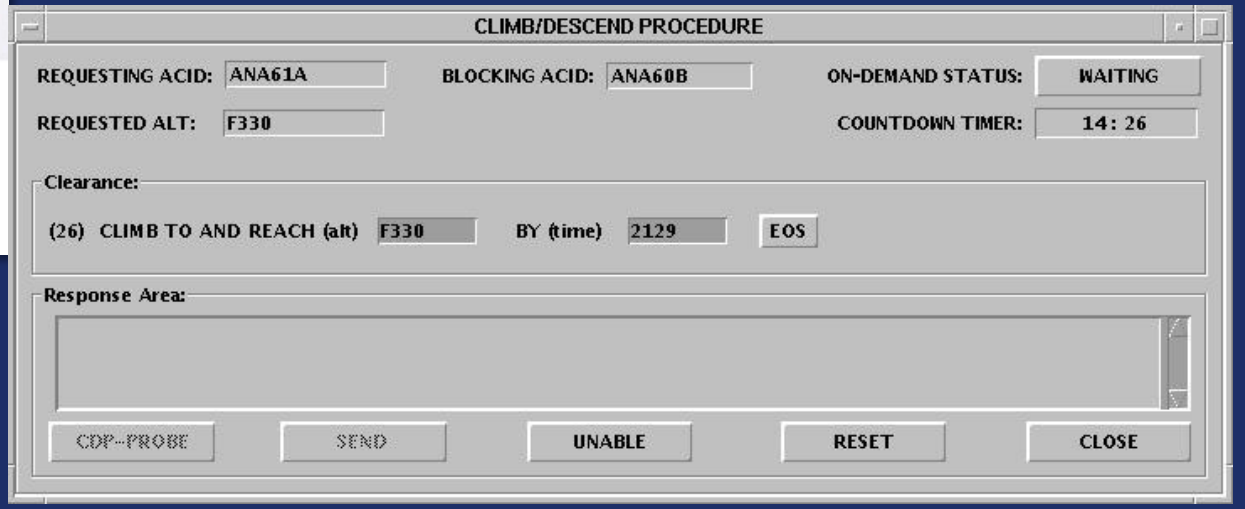
PRELIMINARY SCREENING CRITERIA CHECKS (STEPS 1-3)

Step #	Checklist Item	Checkmark or Insert Data
1.	AIRCRAFT CALLSIGNS..... ACH3059 / ACH0315	✓
2.	BOTH Blocking and Maneuvering Aircraft must have the "3" 30/30 ADS separation flag set.	☑
3.	a. Both Aircraft Level Flight/Aircraft 1,000 Feet Apart/Planned Altitude Change 2,000 Feet or more. b. Neither Aircraft on WX Dev nor requesting a WX Dev. c. Both Aircraft RVSM d. "POS" NOT Displayed on Either Data Block e. There are no Out of Conformance (ARP) messages for either aircraft in the Sector Queue. f. Aircraft Same Direction traffic	☑

FINAL SCREENING CRITERIA CHECKS (STEPS 4-9) 1245z

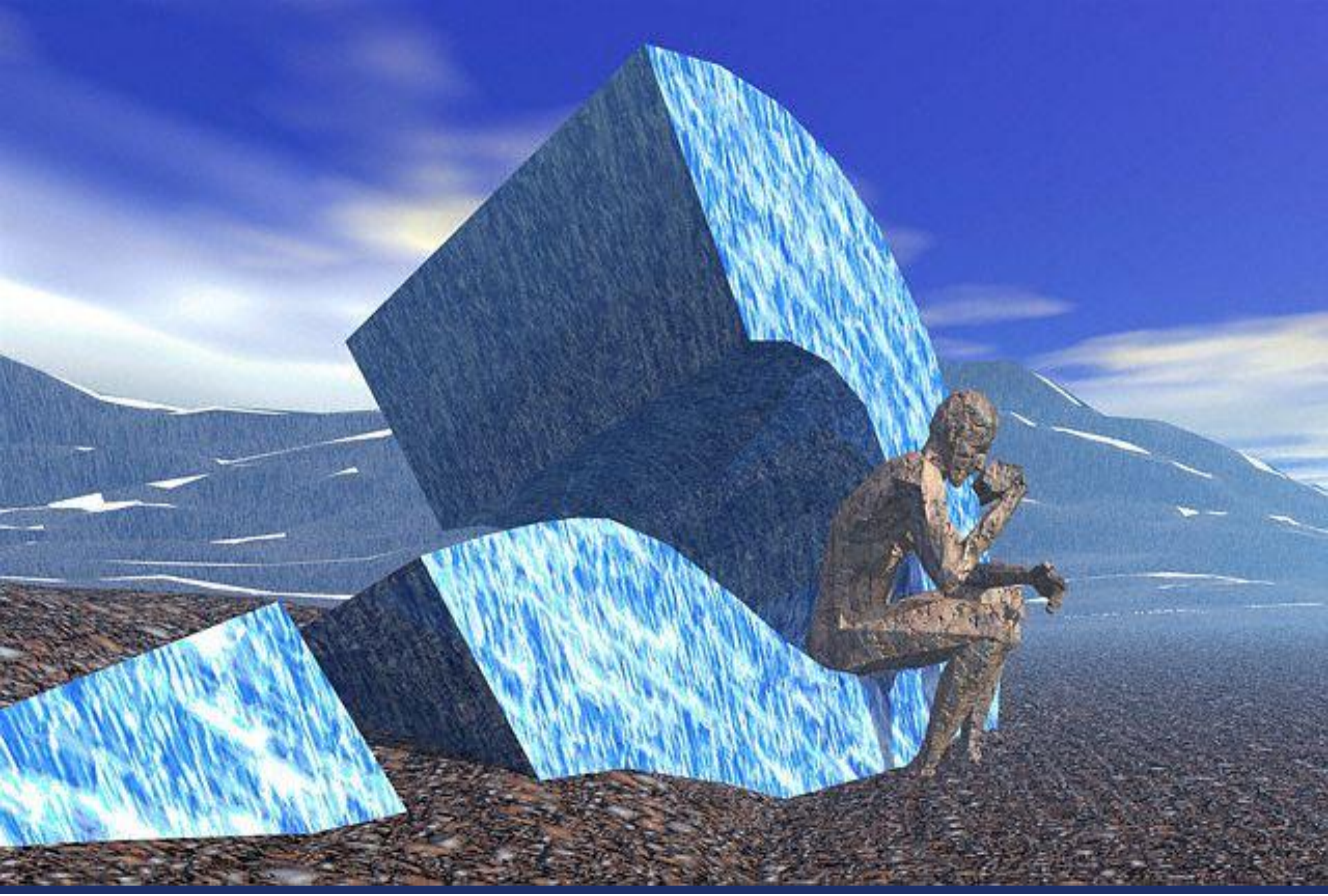
4.	Initiate ADS DEMAND for both Aircraft. ENTER TIME that DEMAND request was sent to Maneuvering Aircraft	1245z
5.	From ADD Report,	
	Mach Number of Maneuvering Aircraft.....	M.79
	Mach Number of Blocking Aircraft.....	M.81
6.	SAME SPEED OR FASTER AIRCRAFT IN FRONT: 6a, 6b, and 6c Must be Satisfied	
	6a. From Conflict Report Window, ACTUAL Longitudinal Distance Between Maneuvering and Blocking Aircraft AT LEAST 16 MILES	☑ 16
	6b. From ASD, Both Aircraft Same Groundspeed, or Faster Aircraft is in Front	☑ Faster in Front
	6c. From Step # 5, Both Aircraft Same Mach Number, or FASTER Mach AIRCRAFT IN FRONT	☑
7.	OVERTAKE SITUATION: 7a, 7b, and 7c Must be Satisfied	
	7a. From Conflict Report Window, ACTUAL Longitudinal Distance Between Maneuvering And Blocking Aircraft AT LEAST 26 MILES	☐
	7b. From ASD, Trailing Aircraft Groundspeed Must NOT be More Than 10 Knots Faster	☐
	7c. From Step # 5, Trailing Aircraft is NOT More Than .02 Mach Faster	☐
8.	Build Clearance utilizing MOPS Message 26 or 28, "CLIMB/DESCEND TO REACH (level) BY (time). Probe the Pending Clearance. Ensure that Time Inserted in Clearance is within 15 Minutes of Time Inserted in Step # 4.	☑
	8a. Append Free-Text Advisory from the Pre Formatted messages "ADS-C CDP PROCEDURE IS BEING APPLIED BY ATC".	
9.	Check the 2nd Profile Conflicts of the Maneuvering Aircraft: IF THERE ARE ACTUAL OR IMMINENT CONFLICTS WITH OTHER AIRCRAFT, DO NOT EXECUTE PROCEDURE	✓





Ocean21 Automation Platform

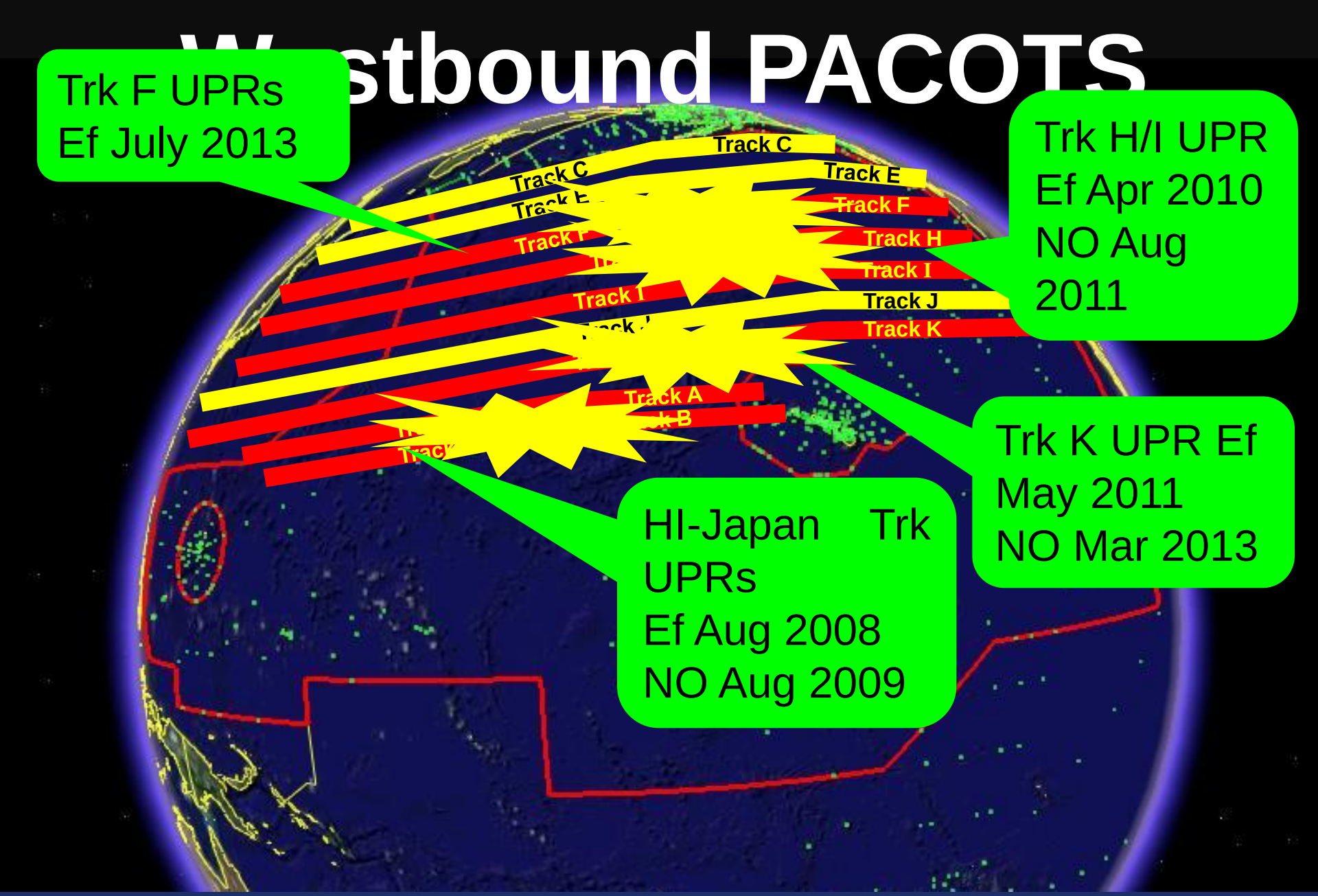
- Manual trial ended 2/15/2013
- CDP procedure is seen as a benefit.
- T24 software update 2016



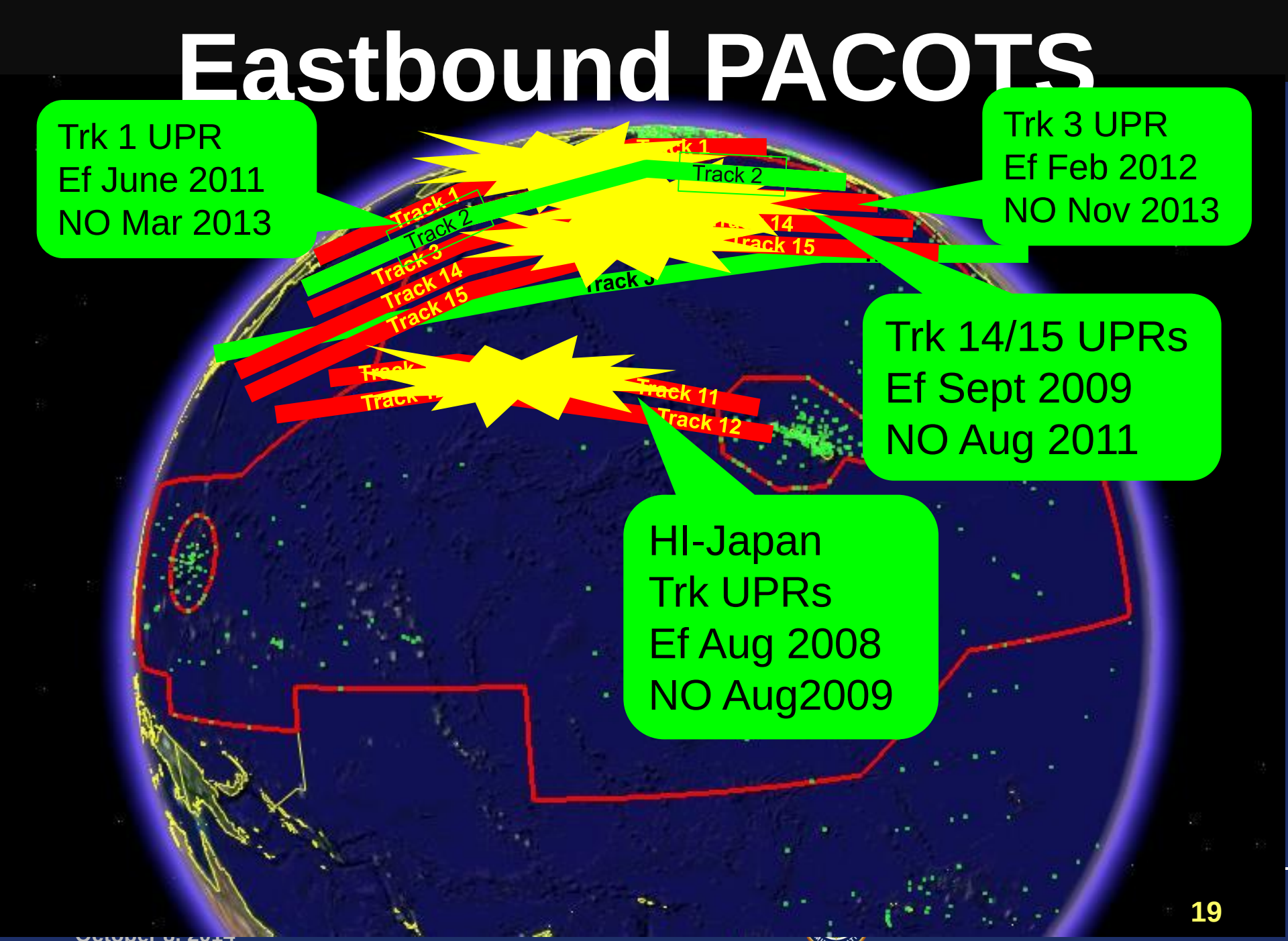
User Preferred Routes

Presented By: FAA, Oakland ARTCC
Airspace and Procedures

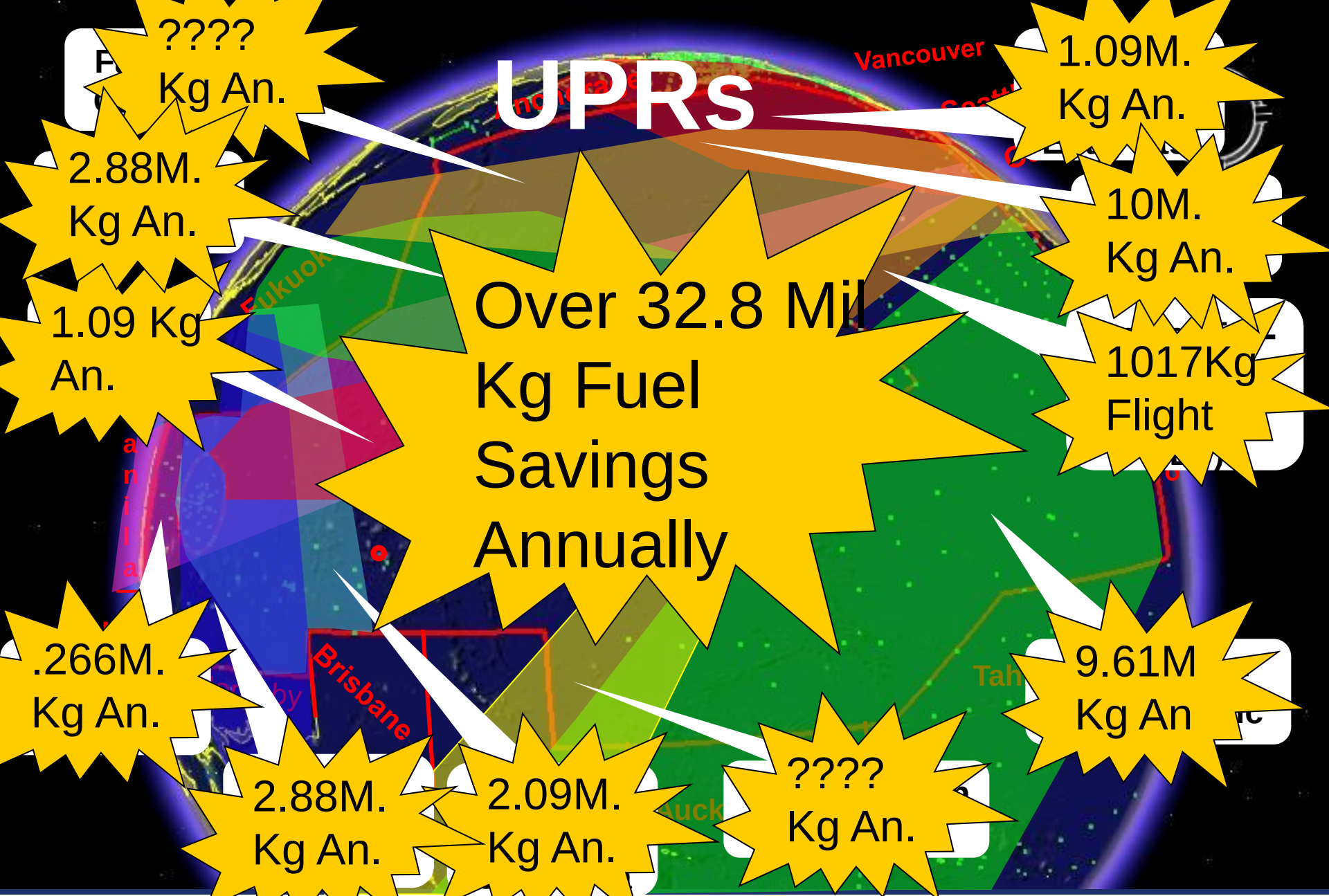
Westbound PACOTS



Eastbound PACOTS



PACOTS vs UPRs


UPRs
???? Kg An.
1.09M. Kg An.
2.88M. Kg An.
10M. Kg An.
1.09 Kg An.
Over 32.8 Mil Kg Fuel Savings Annually
1017Kg Flight
.266M. Kg An.
9.61M Kg An
2.88M. Kg An.
2.09M. Kg An.
???? Kg An.
Vancouver
Brisbane

IATA PACOTS UPR Paper Trial

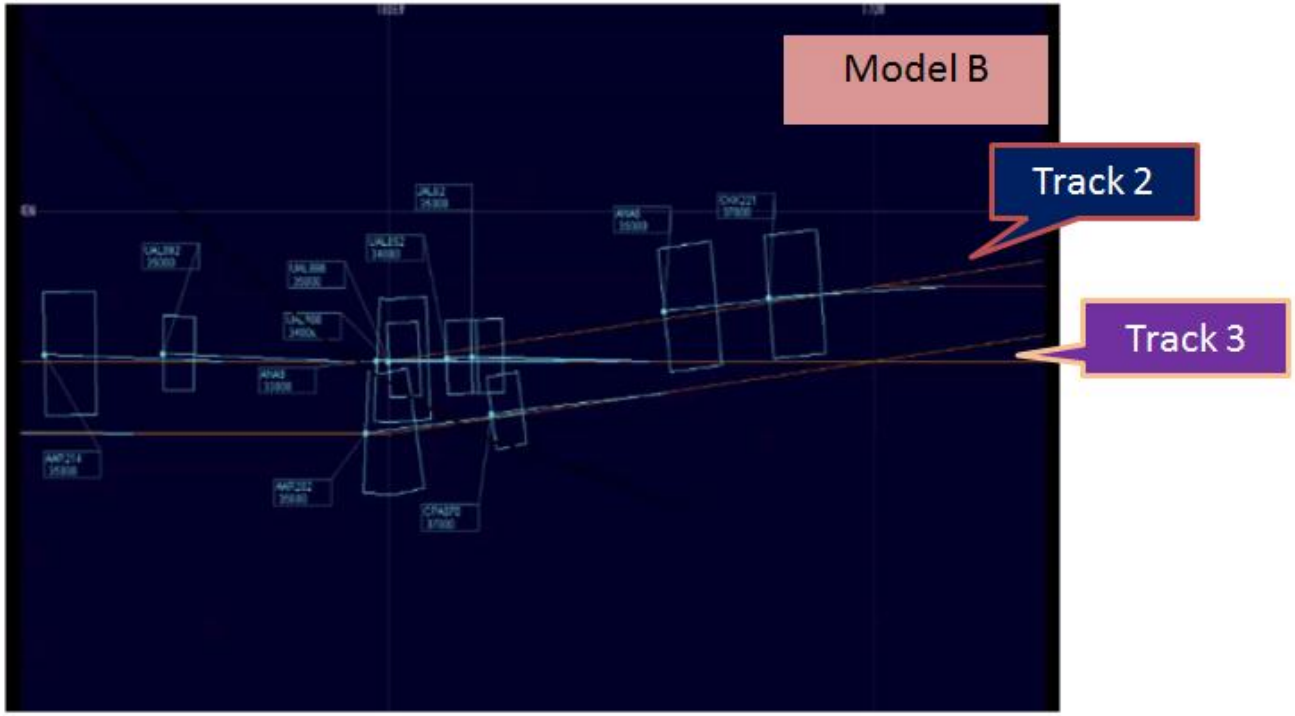
EASTBOUND				WESTBOUND				EASTBOUND				WESTBOUND				
BR12 TPE-LAX B77W				BR15 LAX-TPE B77W				BR18 TPE-SFO B77W				BR17 SFO-TPE B77W				Fuel in KGS
Avg Time Savings	Avg Fuel Savings	Best Fuel Savings	Sample Size	Avg Time Savings	Avg Fuel Savings	Best Fuel Savings	Sample Size	Avg Time Savings	Avg Fuel Savings	Best Fuel Savings	Sample Size	Avg Time Savings	Avg Fuel Savings	Best Fuel Savings	Sample Size	
7	1223	2047	13	6	778	1547	12	6	1039	3442	11	4	490	1593	10	
UA138 NRT-DEN B788				UA139 DEN-NRT B788				UA33 NRT-LAX B788				UA32 LAX-NRT B788				Fuel in LBS
Avg Time Savings	Avg Fuel Savings	Best Fuel Savings	Sample Size	Avg Time Savings	Avg Fuel Savings	Best Fuel Savings	Sample Size	Avg Time Savings	Avg Fuel Savings	Best Fuel Savings	Sample Size	Avg Time Savings	Avg Fuel Savings	Best Fuel Savings	Sample Size	
7	1640	5428	41	6	1397	4740	39	5	1228	6812	42	5	1199	4519	41	
SQ12 NRT-LAX A388				SQ11 LAX-NRT A388												Fuel in KGS
Avg Time Savings	Avg Fuel Savings	Best Fuel Savings	Sample Size	Avg Time Savings	Avg Fuel Savings	Best Fuel Savings	Sample Size									
	800	1167	42		2171	4273	42									
(CXxxx) HKG-ANC B748				(CXxxx) ANC-HKG B748				CX846 HKG-JFK B77W				CX845 JFK-HKG B77W				Fuel in KGS
Avg Time Savings	Avg Fuel Savings	Best Fuel Savings	Sample Size	Avg Time Savings	Avg Fuel Savings	Best Fuel Savings	Sample Size	Avg Time Savings	Avg Fuel Savings	Best Fuel Savings	Sample Size	Avg Time Savings	Avg Fuel Savings	Best Fuel Savings	Sample Size	
13	2774	7300	31	9	1808	10200	34	16	2805	8600	34	6	1241	3200	34	

- With approximately 550 flights across the Pacific each day, and based on a fuel cost of USD944/1000kgs, saving 500 kilograms of fuel per flight per day would generate system wide savings of USD260,000 every day, or USD95 million per annum.

ENRI IPACG39 Track 2 Divergence Paper

Discussion

Merging that occurs after the branch

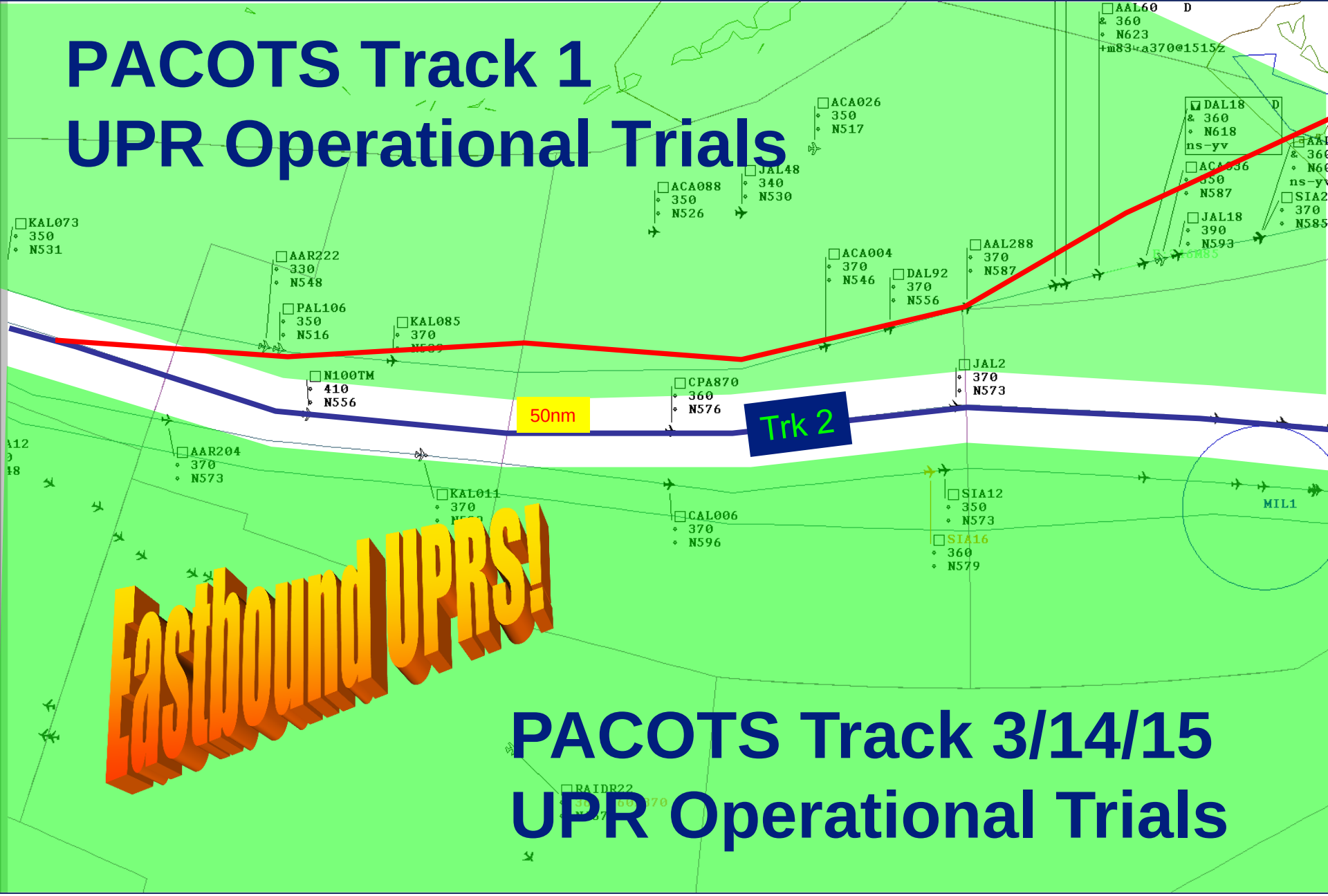


Day2 1130Z 170W

PACOTS UPRs

- **Eastbound PACOT UPRs are easier to deal with than Westbound UPRs.**
- **IATA desires to further expand the use of UPRs**
- **JCAB and the FAA are investigating the possibility of allowing UPRs to diverge to the North from PACOTS Track 2.**

PACOTS Track 1
UPR Operational Trials

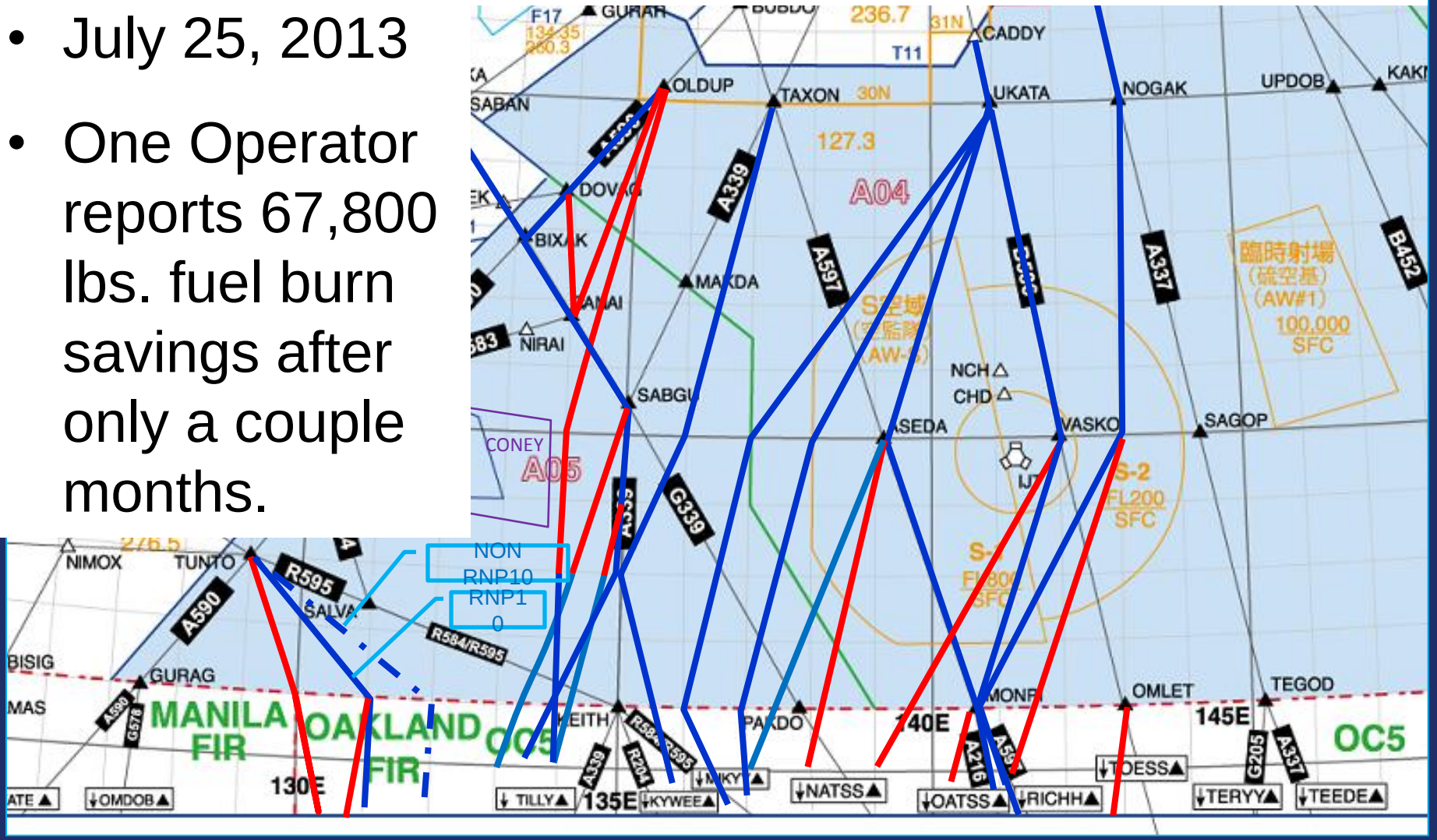


Eastbound UPRS!

PACOTS Track 3/14/15
UPR Operational Trials

PTRO UPRS

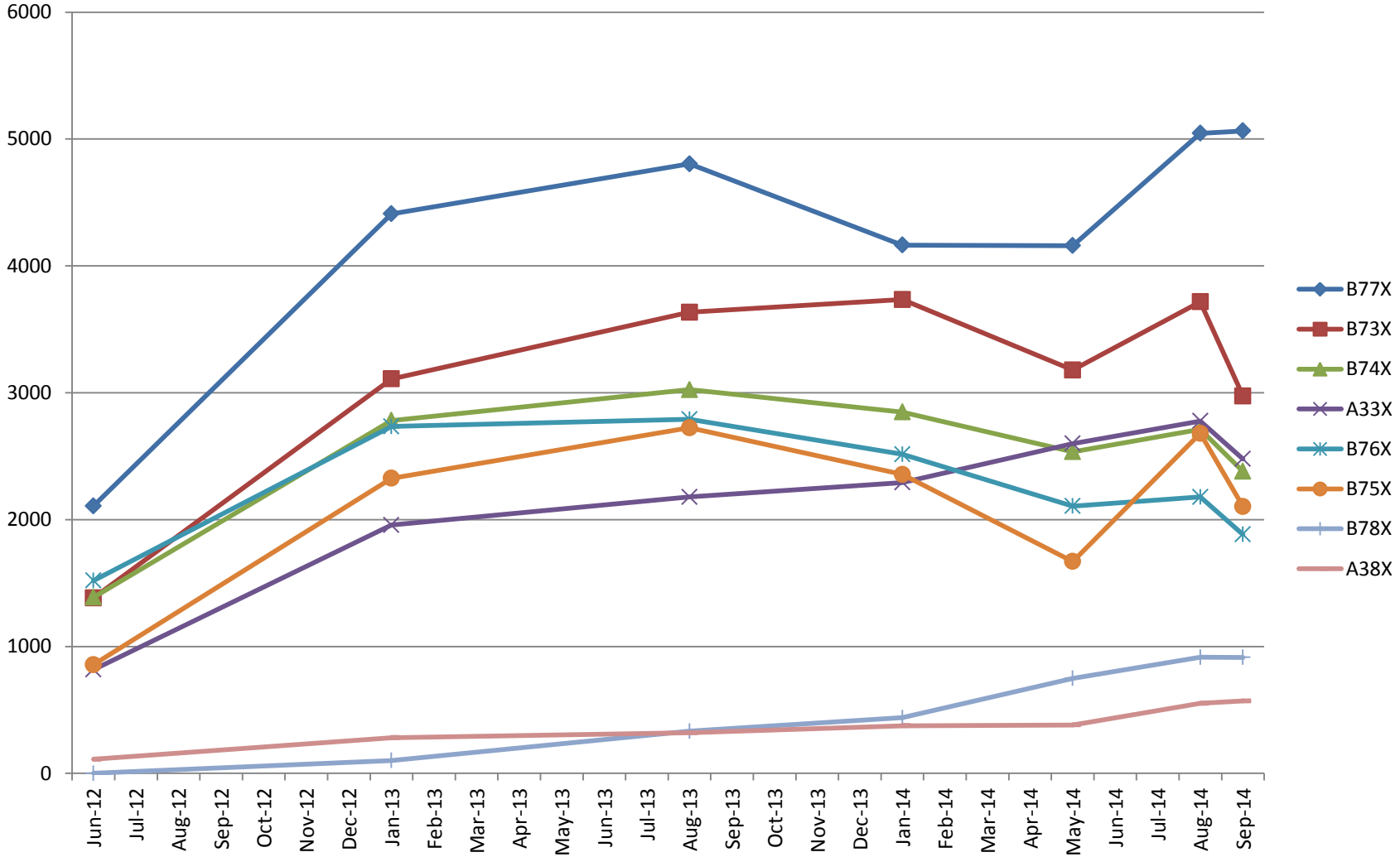
- July 25, 2013
- One Operator reports 67,800 lbs. fuel burn savings after only a couple months.



High Level UPR Trial

- Newer Composite aircraft climb above most traffic on PACOTS routes.
- Anchorage ARTCC started a High Level UPR Trial allowing aircraft at or above F400 by 170W can UPR up to NIPPI or OMOTO.
- Oakland is developing the guidelines for a High Level UPR Trial as an alternative to westbound PACOTS
- Trial will have an indefinite lifespan.

Aircraft Type



Merging PACOTS Tracks C and E

Operational Trial

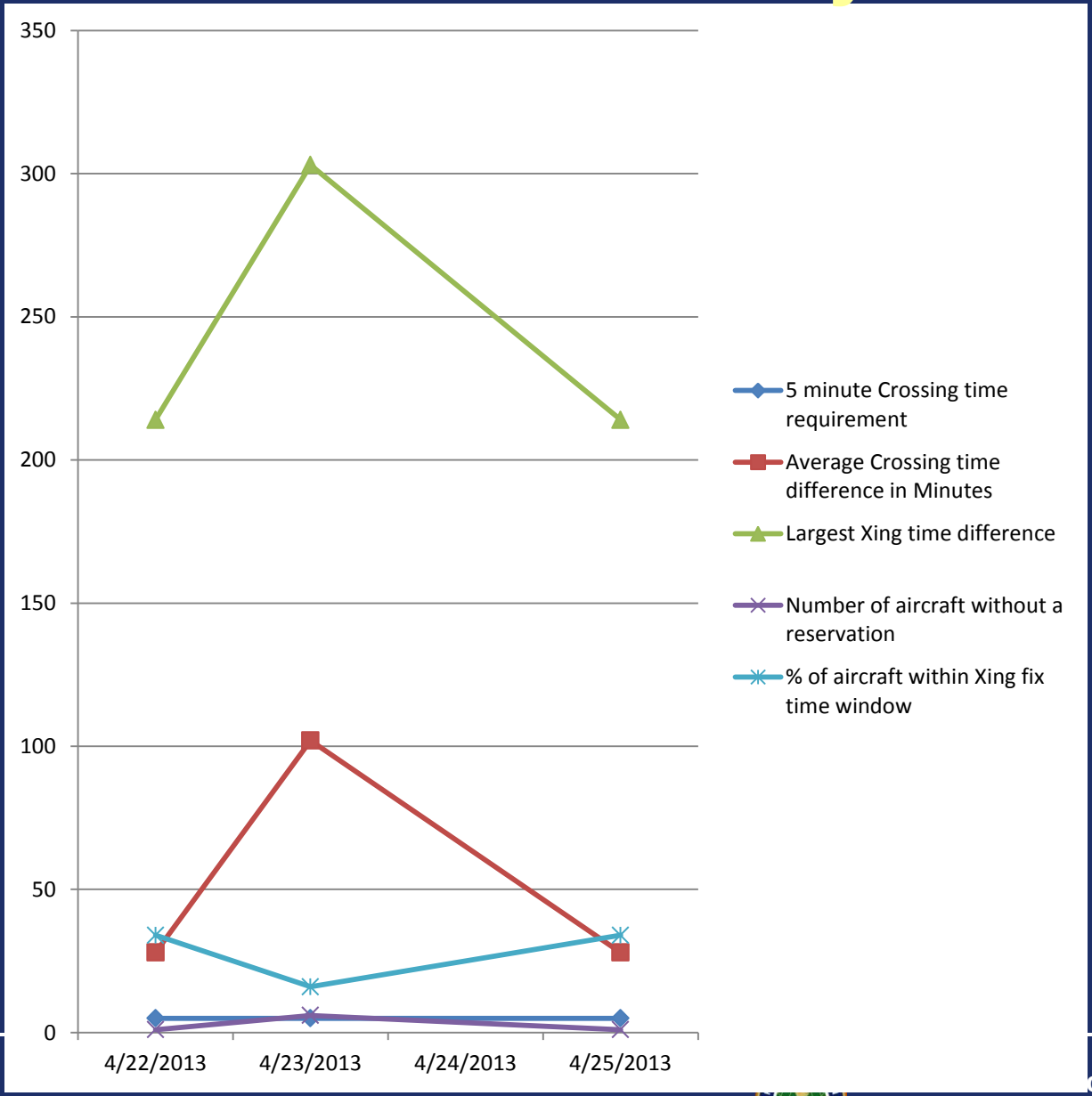
- **March 13, 2013 began a 1 year operational trial of Merging Tracks C and E when it provided an advantage.**

Merged Track C and E Operational Trial

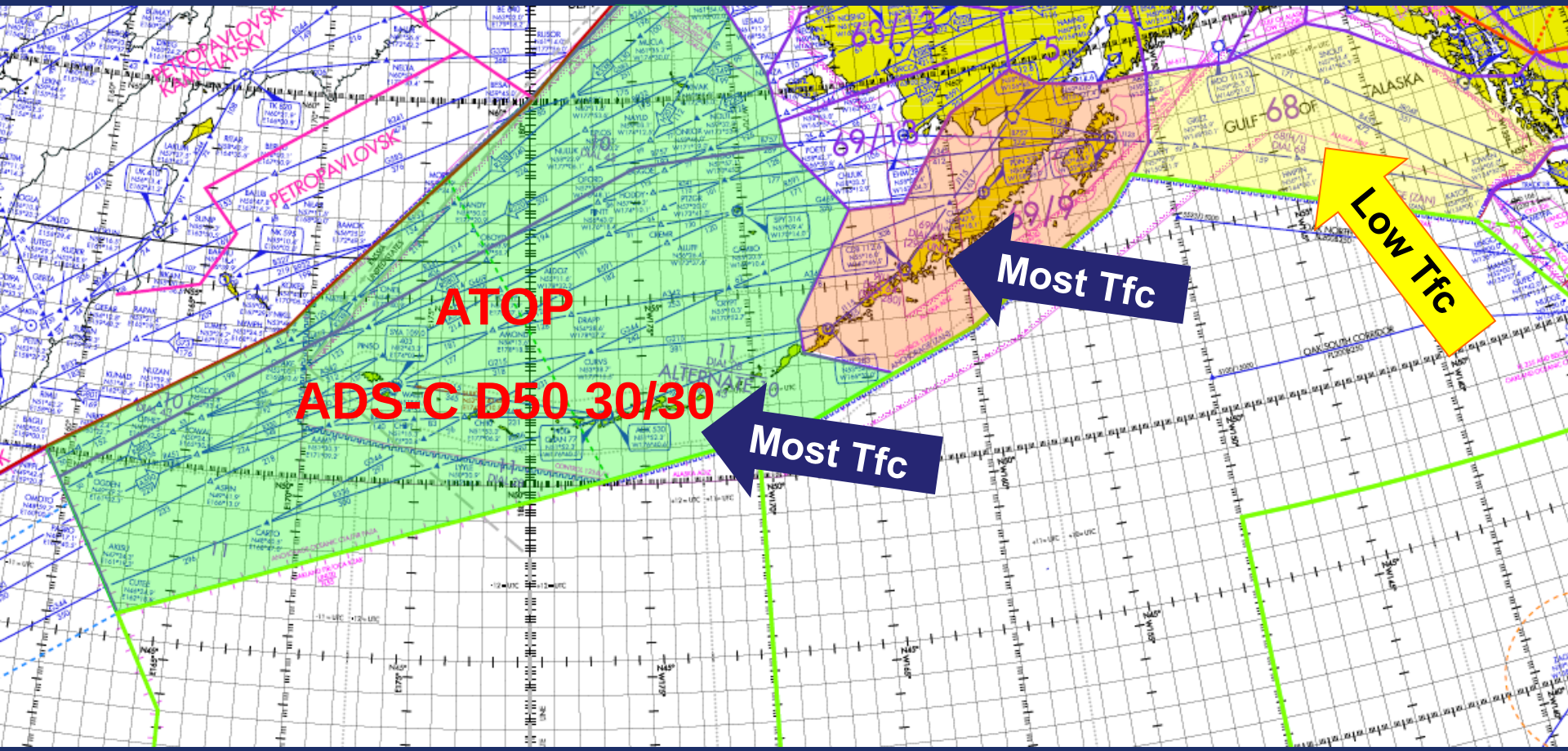
- OF THE FIRST 38 DAYS OF THE OPERATIONAL TRIAL;
- TRACKS C & E MERGED 14 DAYS.

- AVERAGE FUEL SAVINGS PER FLIGHT WAS 1120 LBS (10 DAYS)

4/22-25 Track Advisory Issues

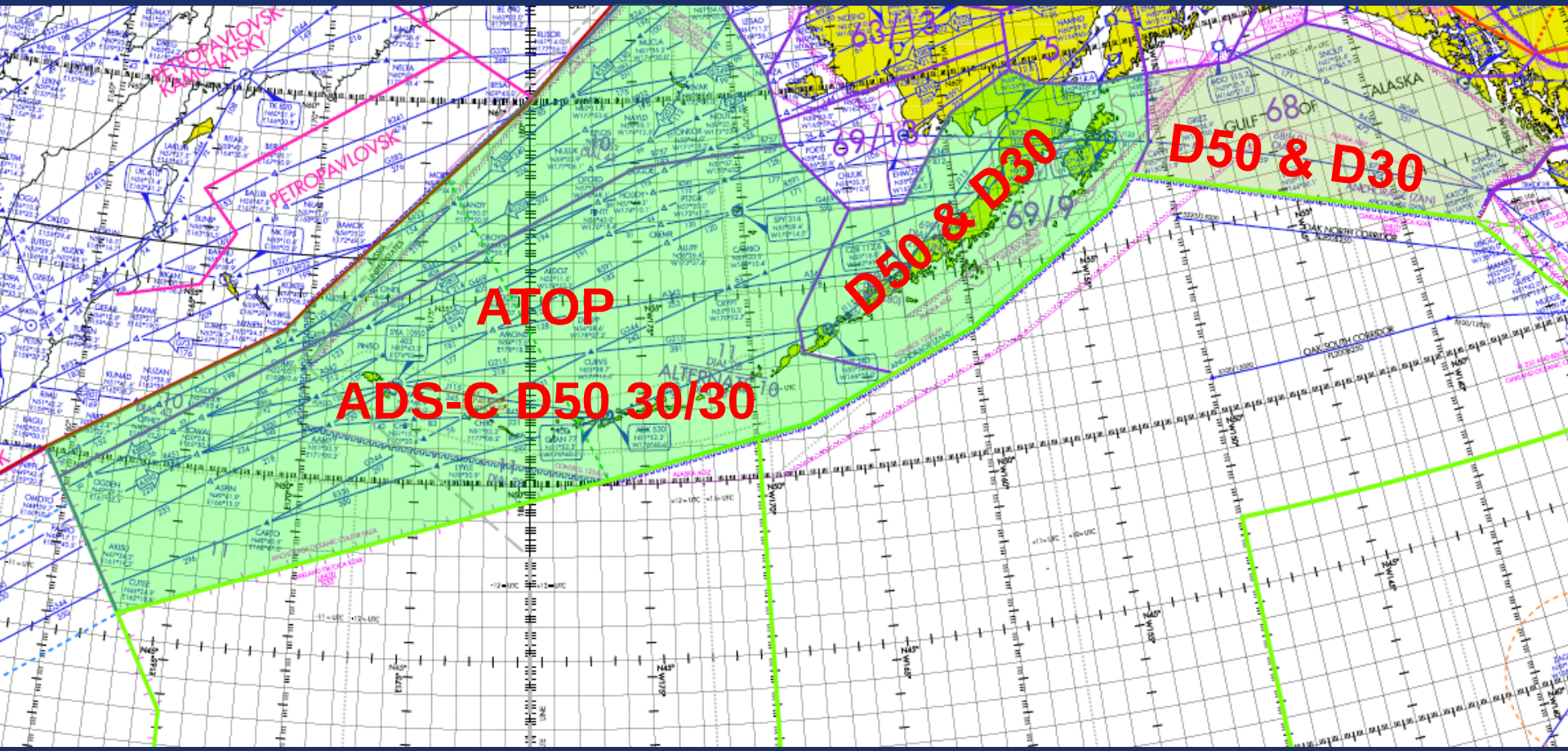


Anchorage ADS-C Distance Based Separation



January 2014

Anchorage ADS-C Distance Based Separation



February 19, 2014

Moving Forward C/E Trial

- **Operators must be better at meeting their Gateway Fix reservation times.**

- **Merging C/E requires the use of Non-Standard Altitudes.**
  - Not an issue for NOPAC
  - Mix of Aircraft types
  - Gateway time errors

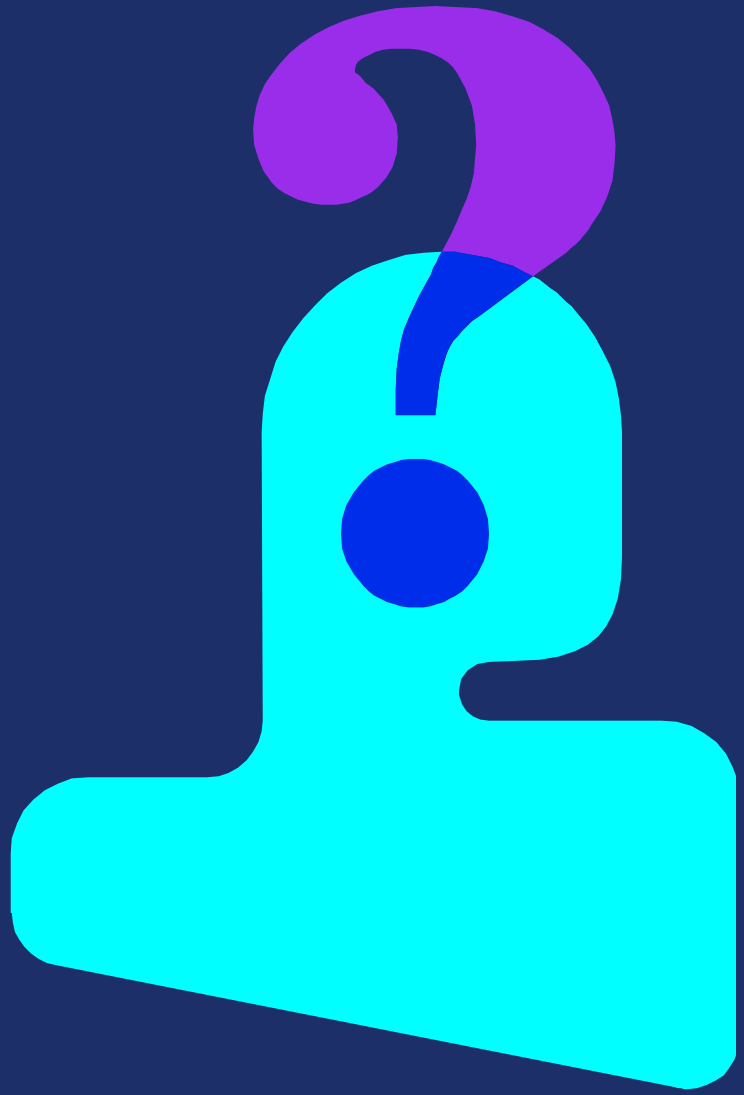
Moving Forward C/E Trial

- When the PACOTS Tracks C and E would merge, Oakland will coordinate with the next facility for the use of Non-Standard Altitudes for the next day.
- If approval for the use of the necessary Non-Standard altitudes can be obtained, the tracks will be published with a merge.
- If approval for the use of the necessary Non-Standard altitudes cannot be obtained, the tracks will be published without a merge in the Oakland FIR.

Moving Forward C/E Trial

- **Tentative Resume Date November 2014**

PACOTS TRACK DISCUSSION



Track Advisory Early Intent Trial

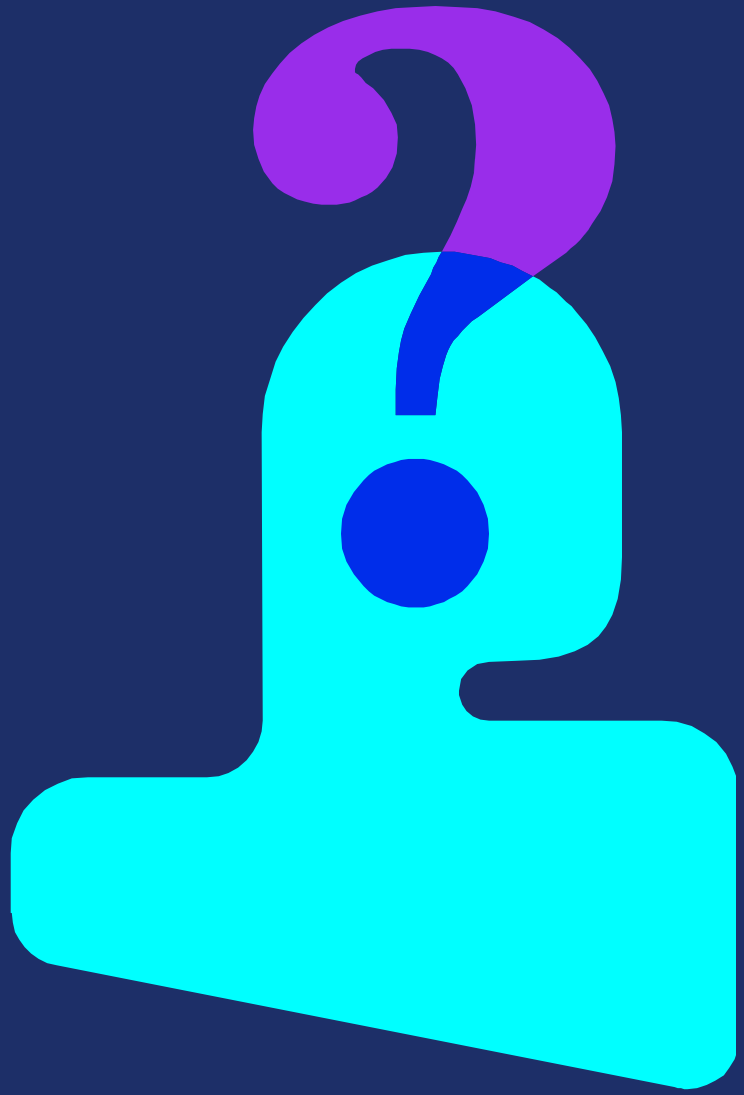
TA Early Intent GRL

- For Westbound PACOTS the TKF reservation requests for the day are compiled at 1650UTC and a Gateway Reservation List (GRL) is Published.
- OWG requested an “Early Intent Gateway Reservation” publication of the to get an idea of how the traffic is distributed on the PACOTS Tracks.
- Investigation indicates that it would be possible.
- Need Operator support for a trial to first test the capability before it is used operationally.

TA Early Intent GRL

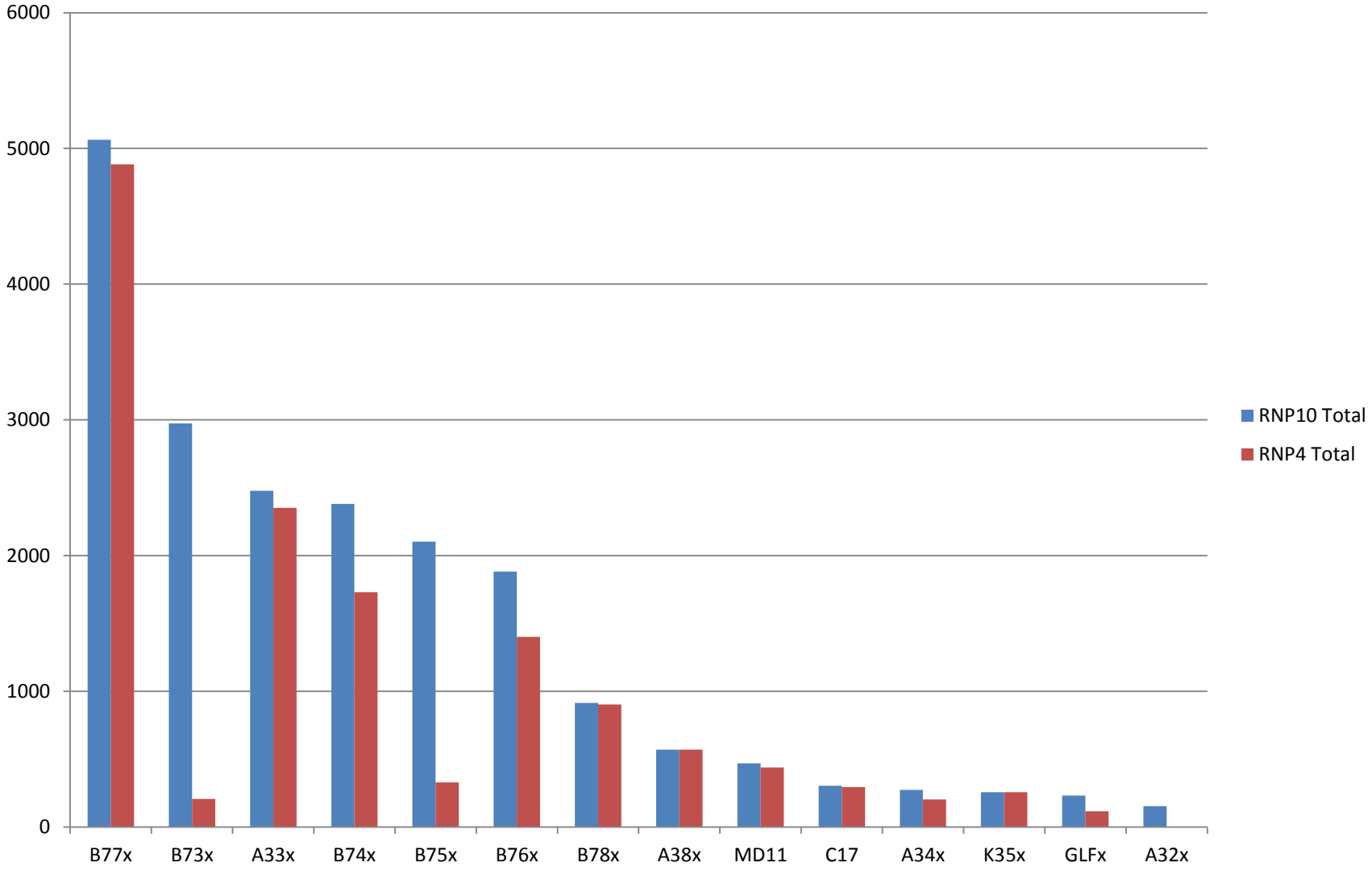
- **Operators need to understand that the "EIGR" is not the actual GRL.**
- **The EIGR may show an aircraft with their first choice in the TKF.**
  - There is no guarantee that the actual GRL published at 1650UTC will have the same reservation when it is published.
- **If Operators still desire the Early Intent GRL, Oakland is targeting a Trial for December 2.**

EIGR DISCUSSION

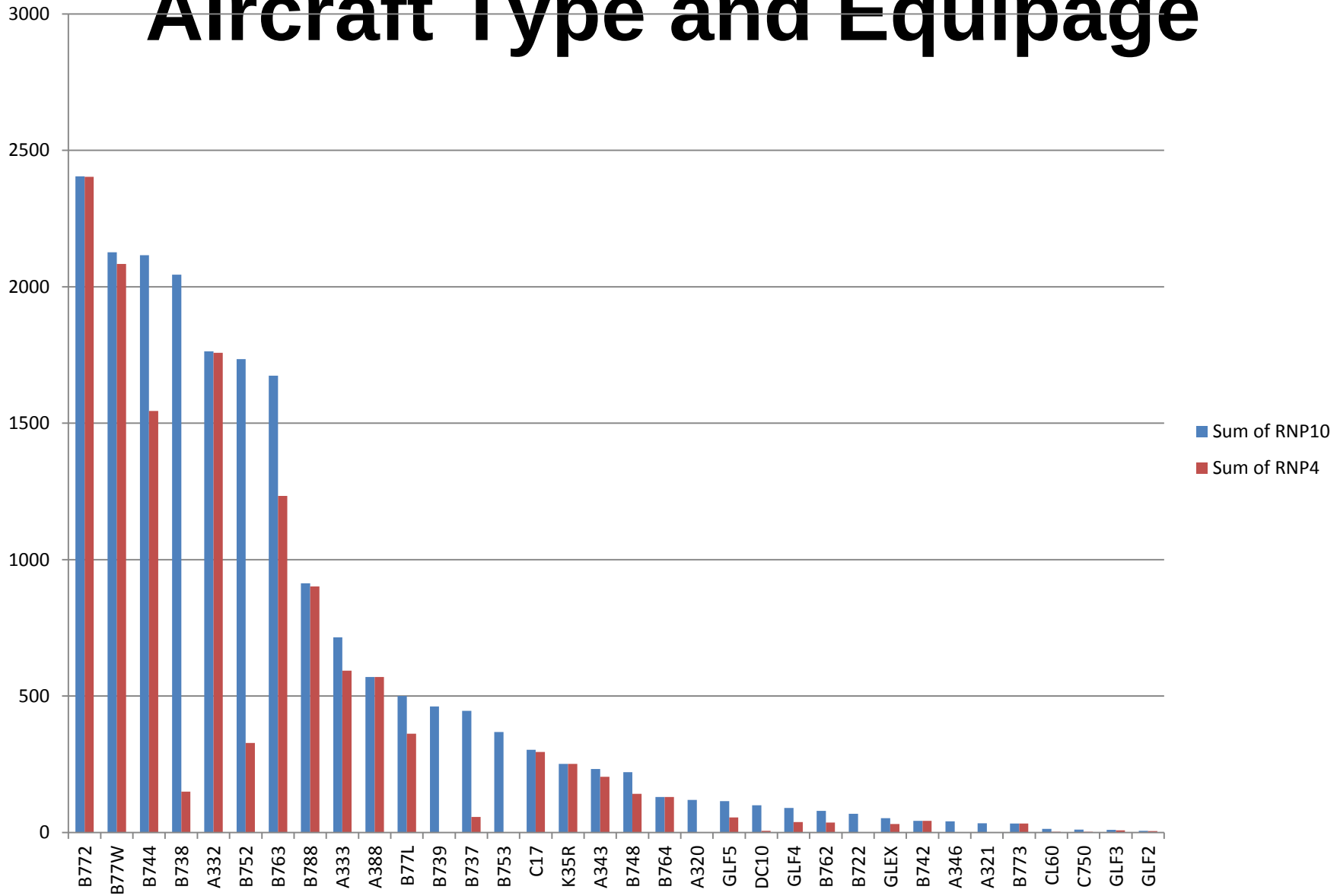


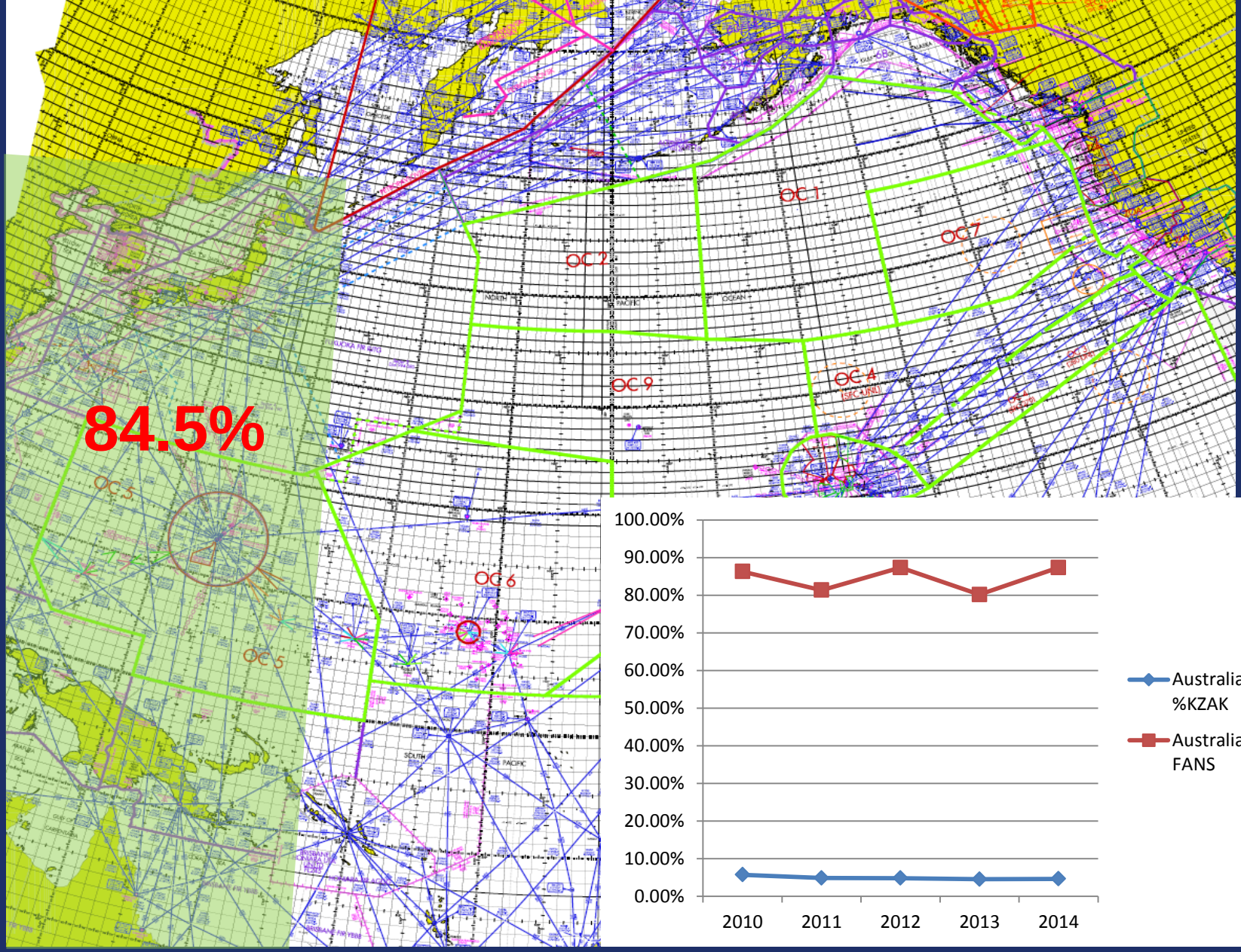
Oceanic Equipage and Separation Standards

Aircraft Type and Equipage



Aircraft Type and Equipage

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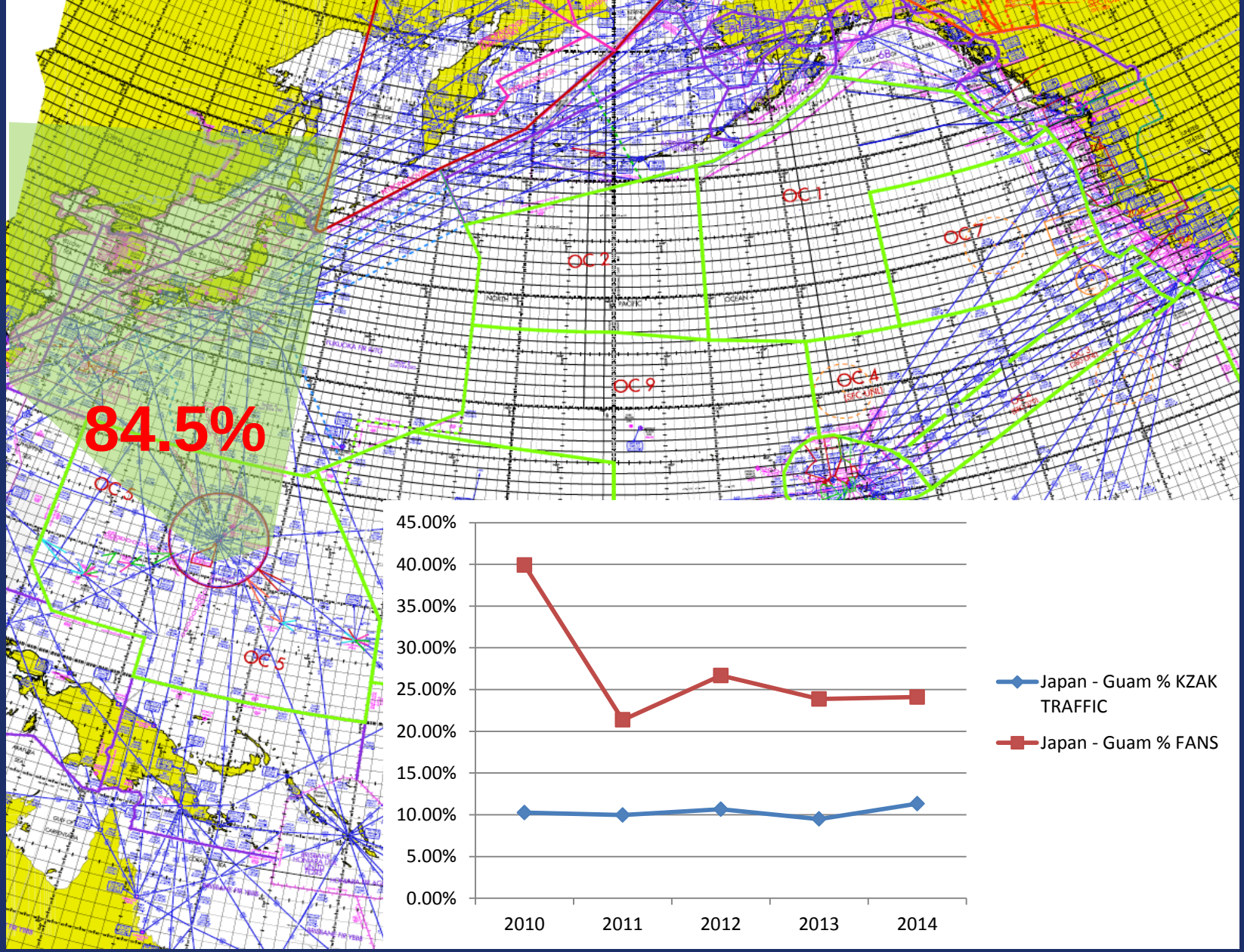
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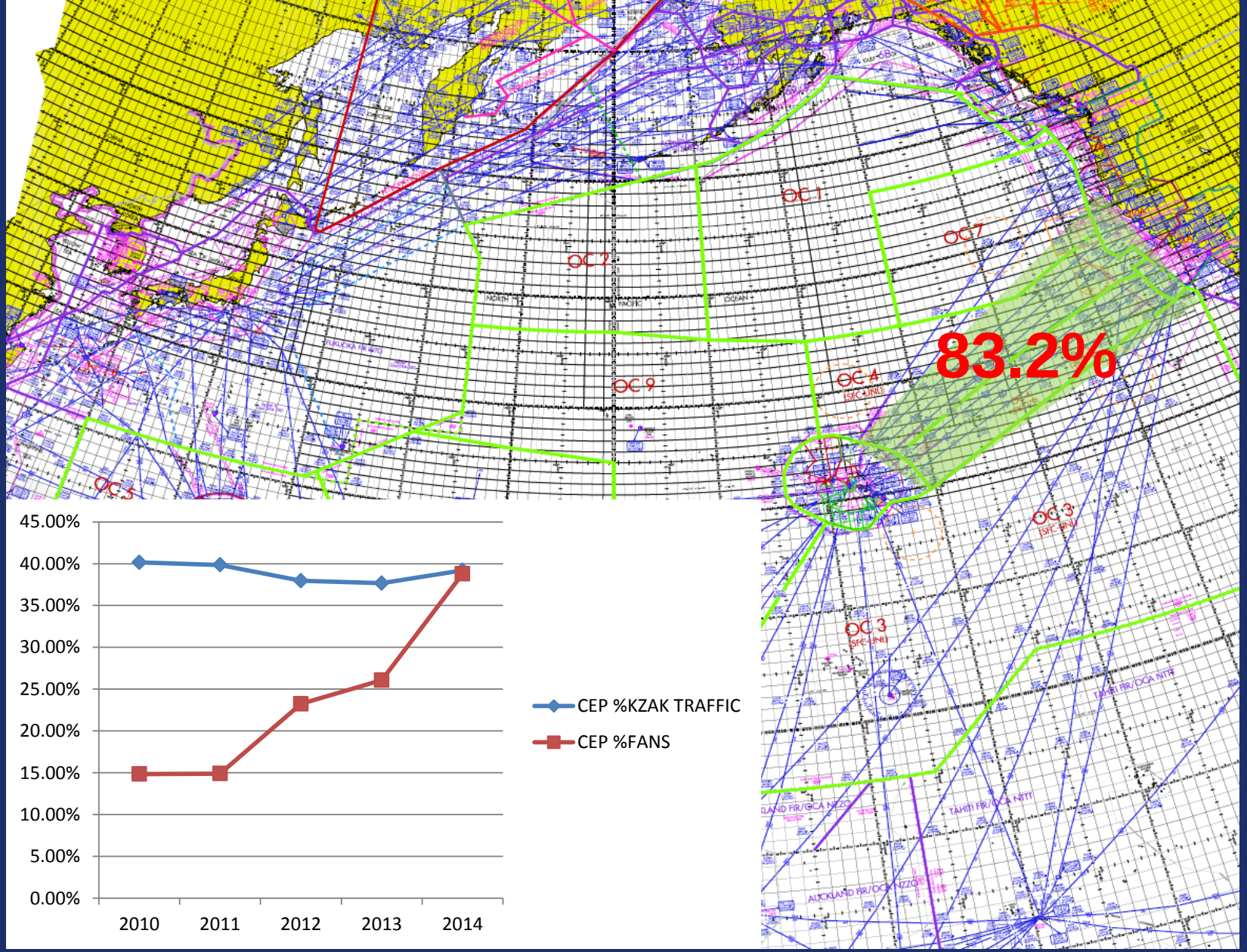
JAPAN - GUAM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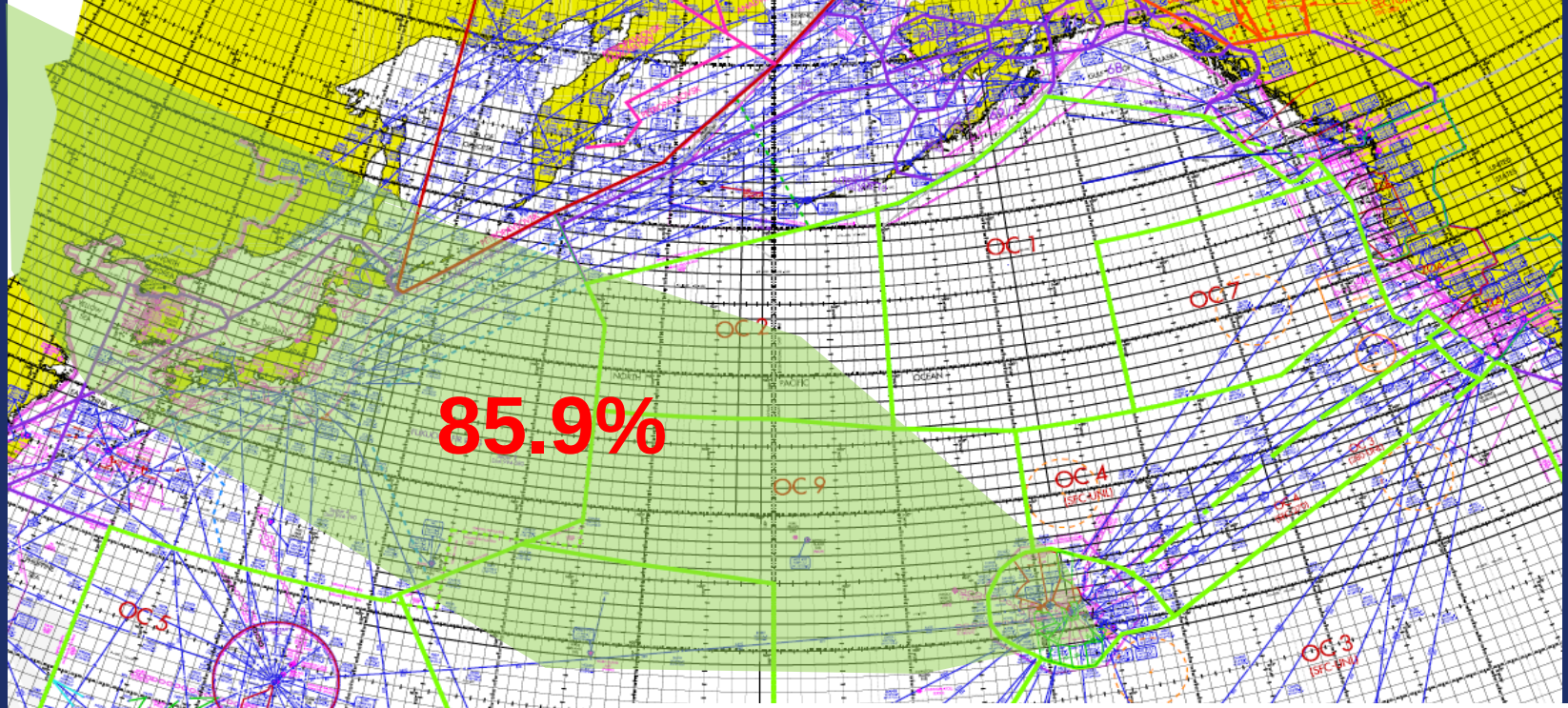
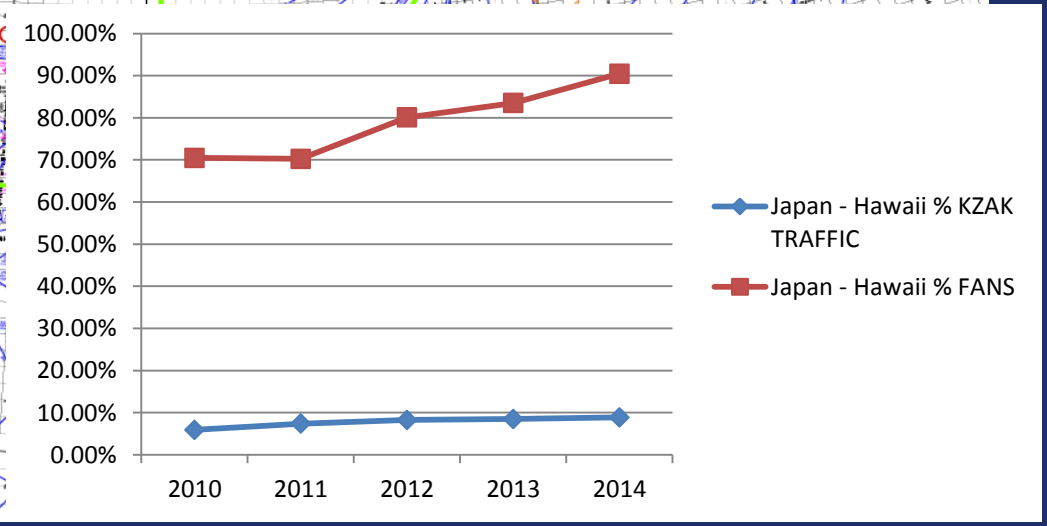
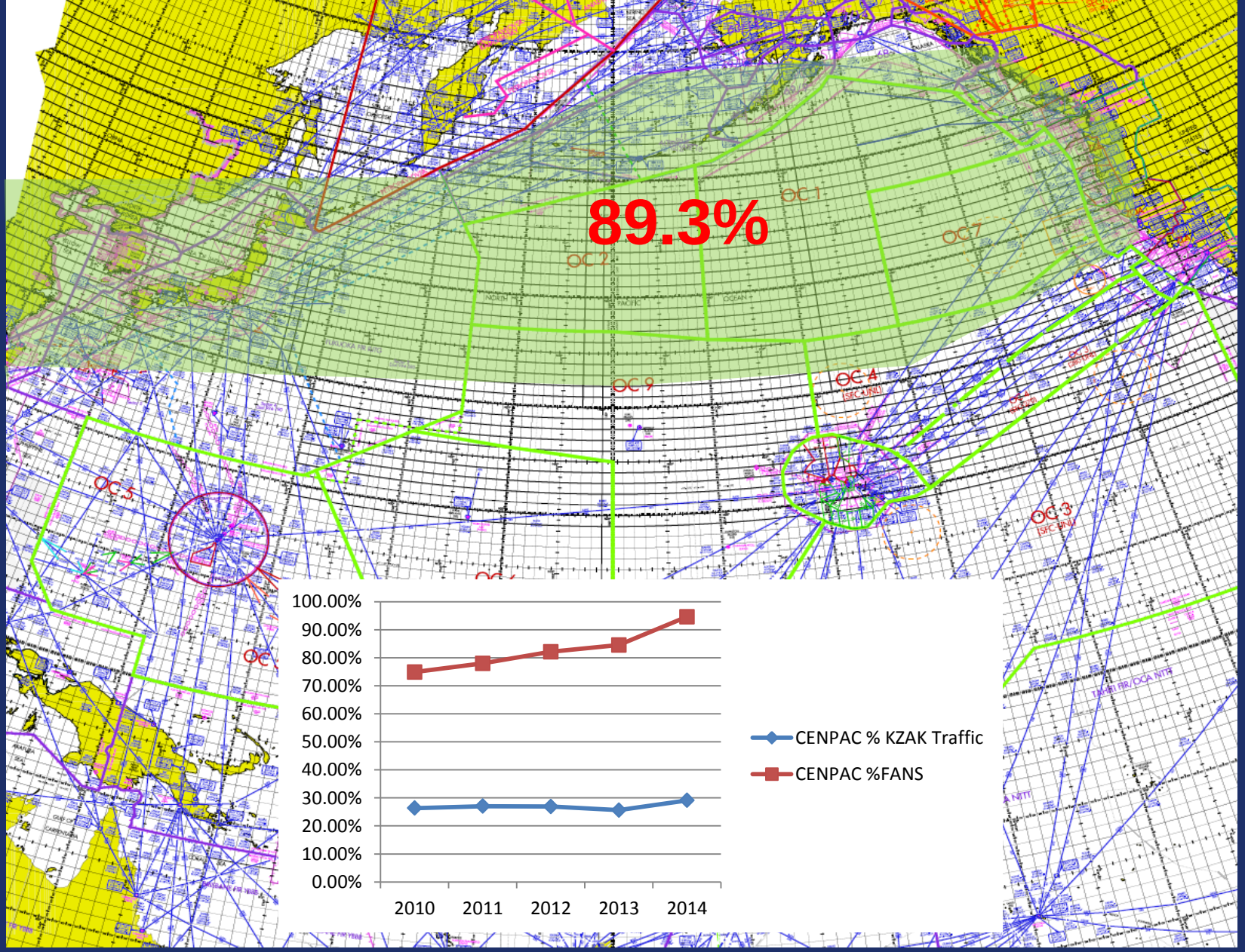




JAPAN - HAWAII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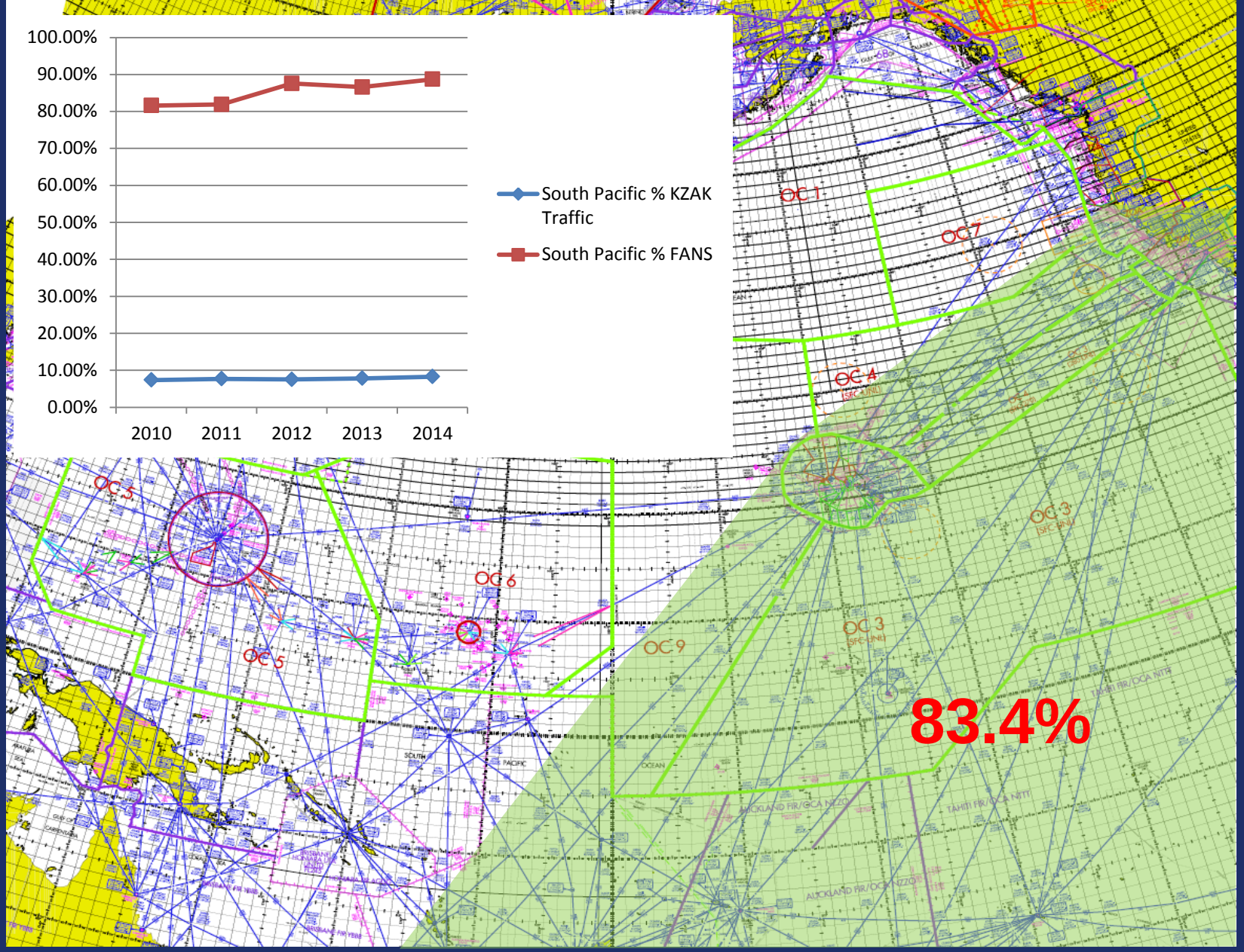
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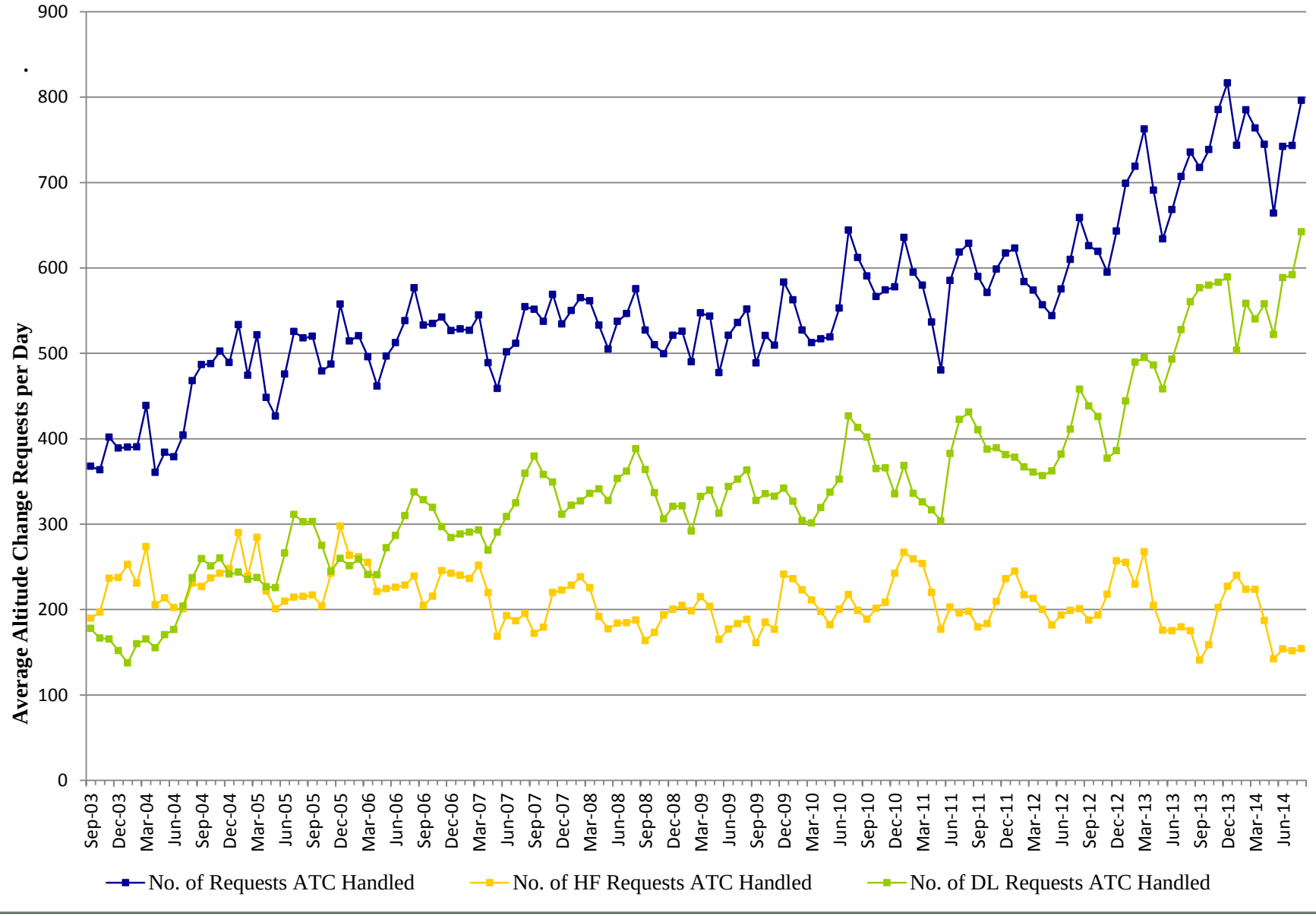
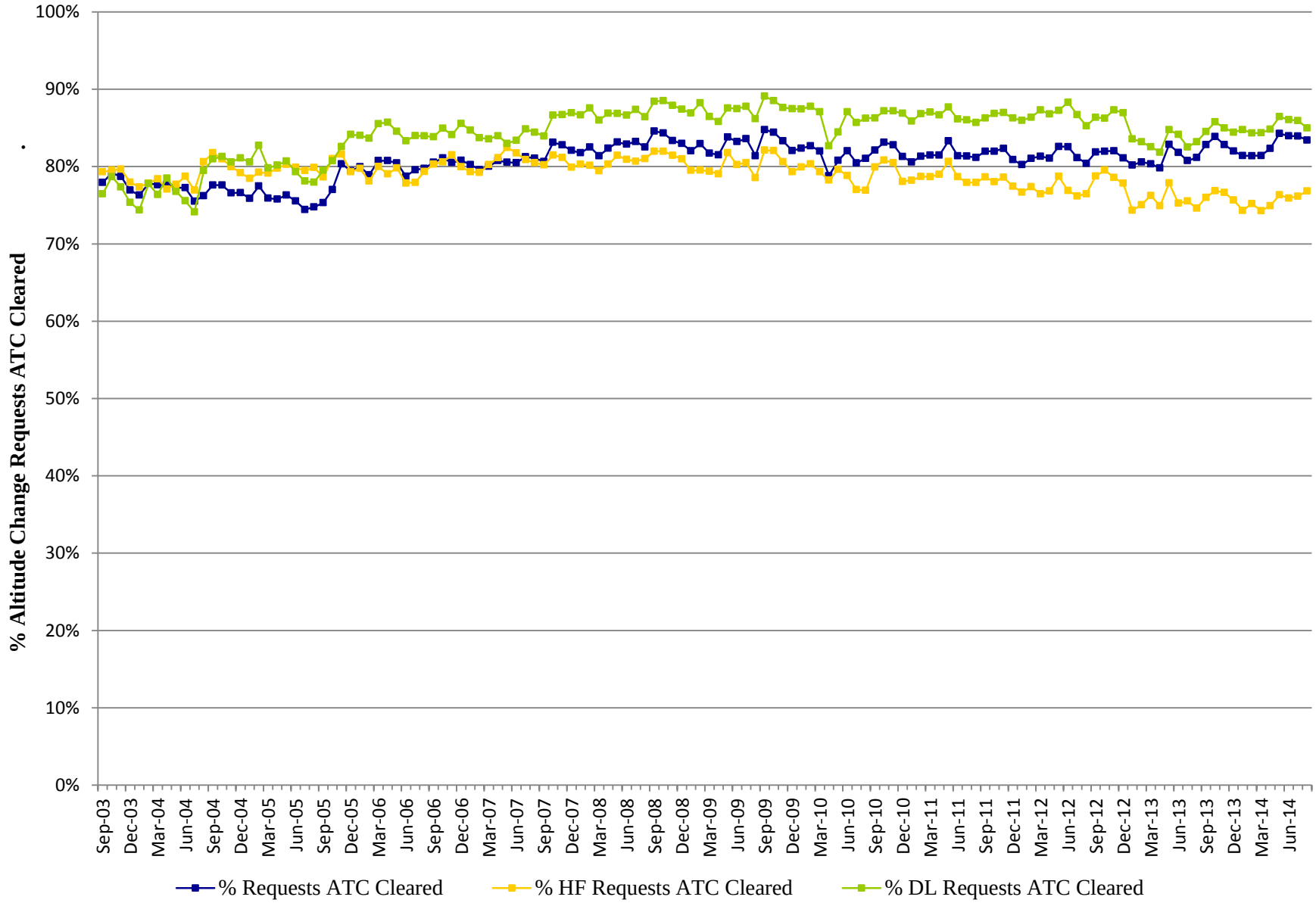
South Pacific % KZAK Traffic
South Pacific % FANS
OC 1
OC 7
OC 4
OC 5
OC 6
OC 5
OC 9
OC 3
OC 3
83.4%

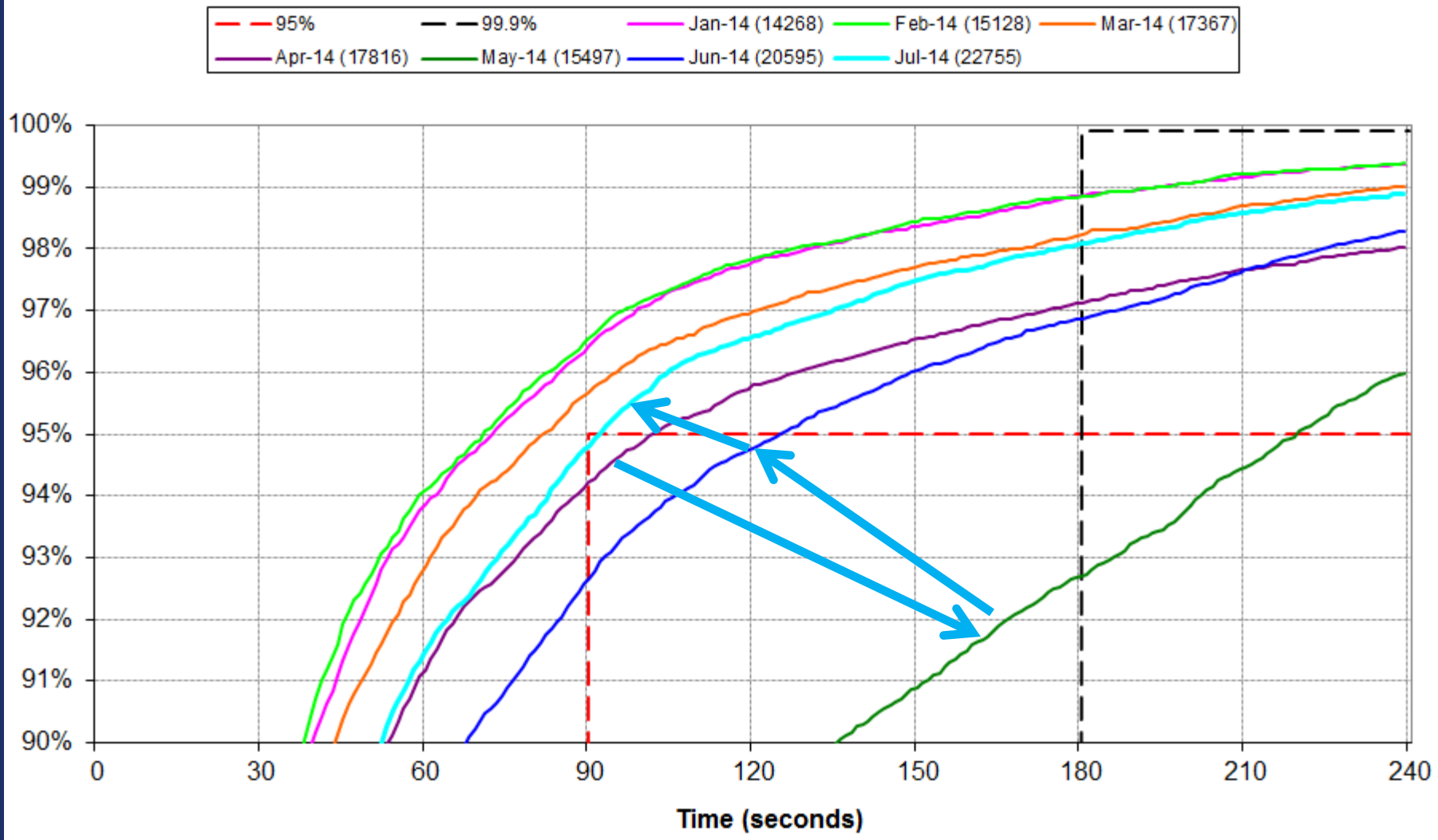
ZOA Altitude Change Requests ATC Handled



ZOA % Altitude Change Requests ATC Cleared

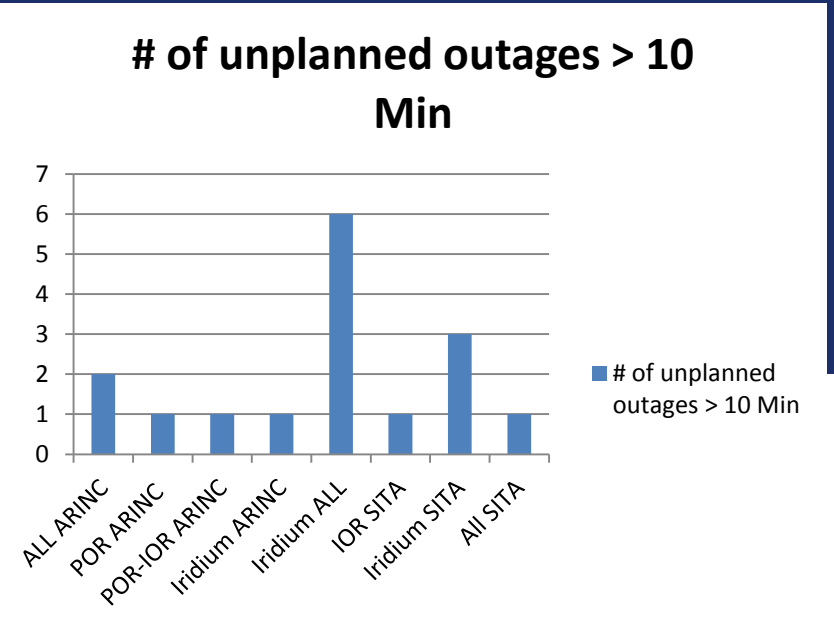


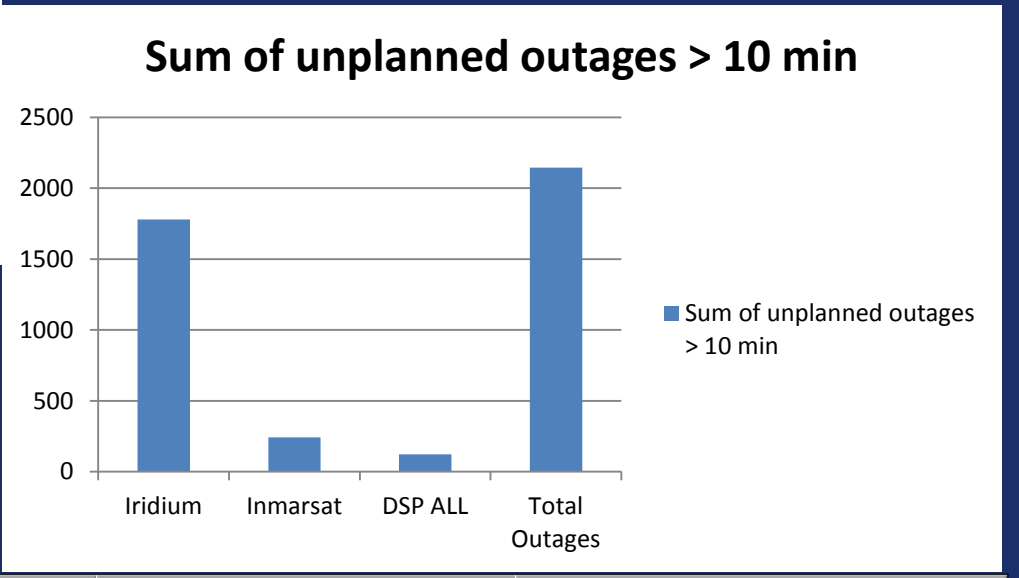
Oakland FIR - Iridium - January to July 2014
Actual Surveillance Performance (ASP)



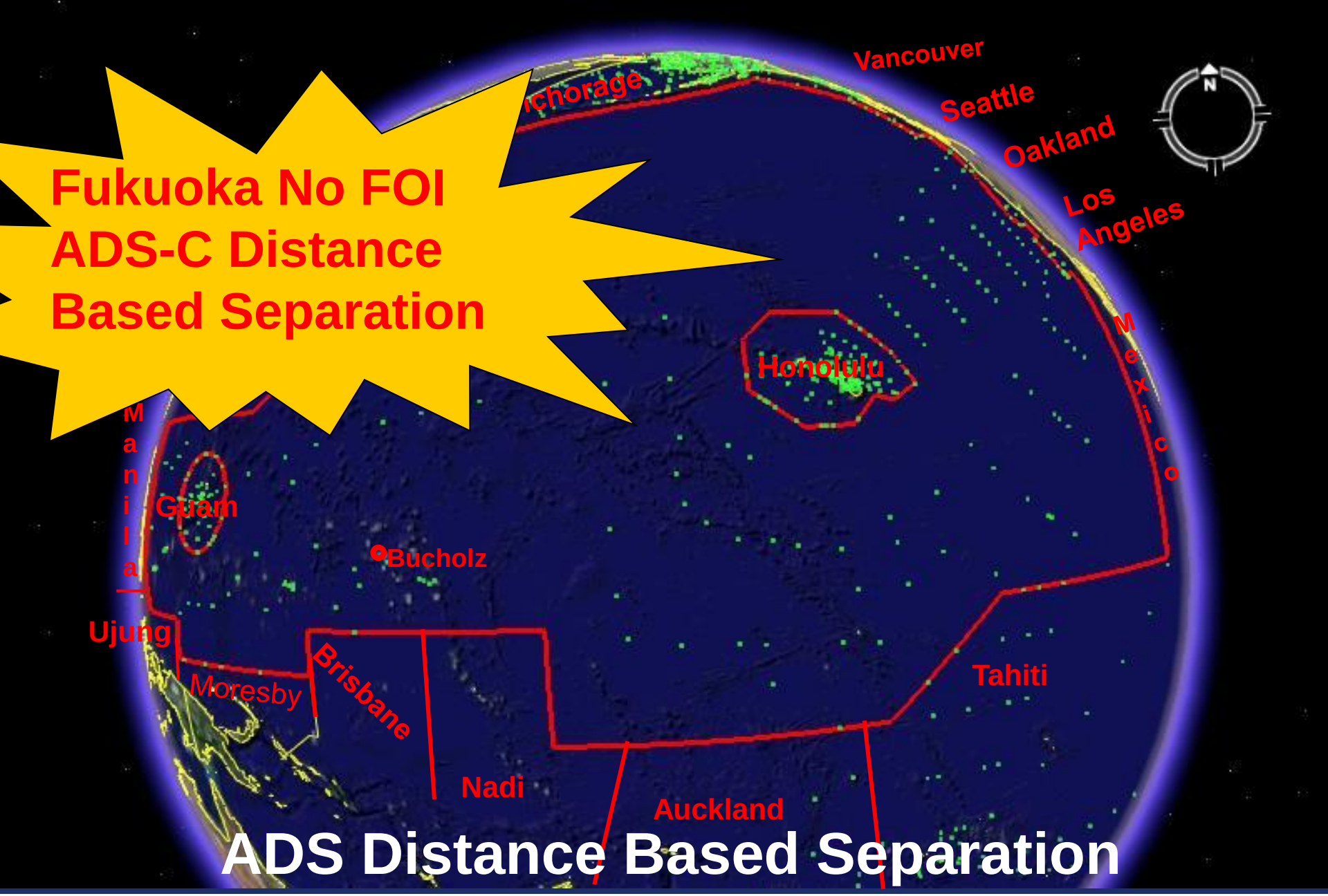
Summary of Reported Outages/Degradations

•August 2013 to July 2014





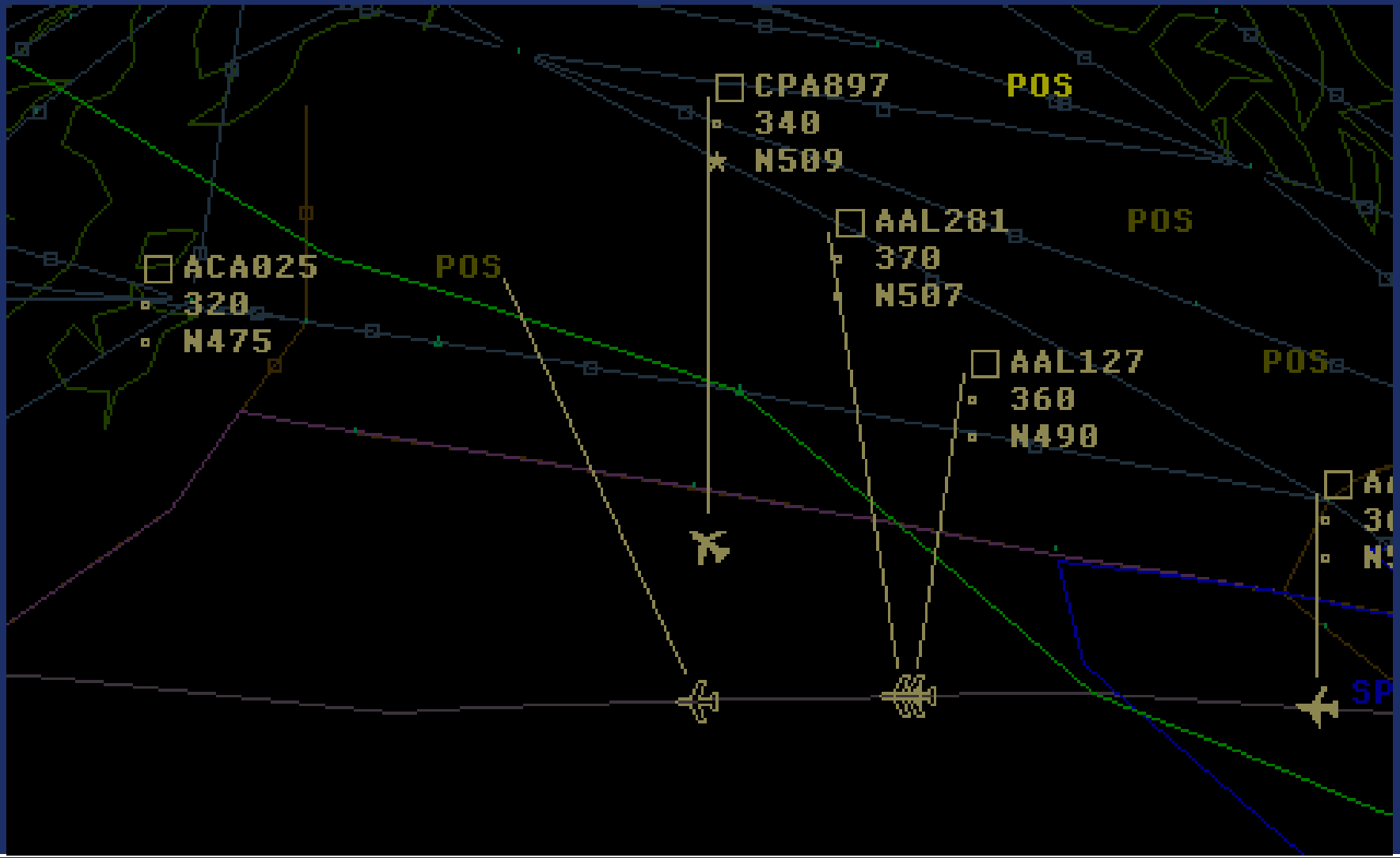
Availability Criteria	Max # unplanned outages > 10 min	Max sum of unplanned outages > 10 min (min)
Safety - 99.9%	48	520
Reliability - 99.99%	4	52


Fukuoka No FOI
ADS-C Distance
Based Separation
Vancouver
Seattle
Oakland
Los Angeles
Mexico
Honolulu
Manila
Guam
Bucholz
Ujung
Moresby
Brisbane
Nadi
Auckland
Tahiti
ADS Distance Based Separation

September 23 Datalink Outage

On September 23, 2014 the Pacific experienced a 220 minute long Inmarsat Datalink outage.

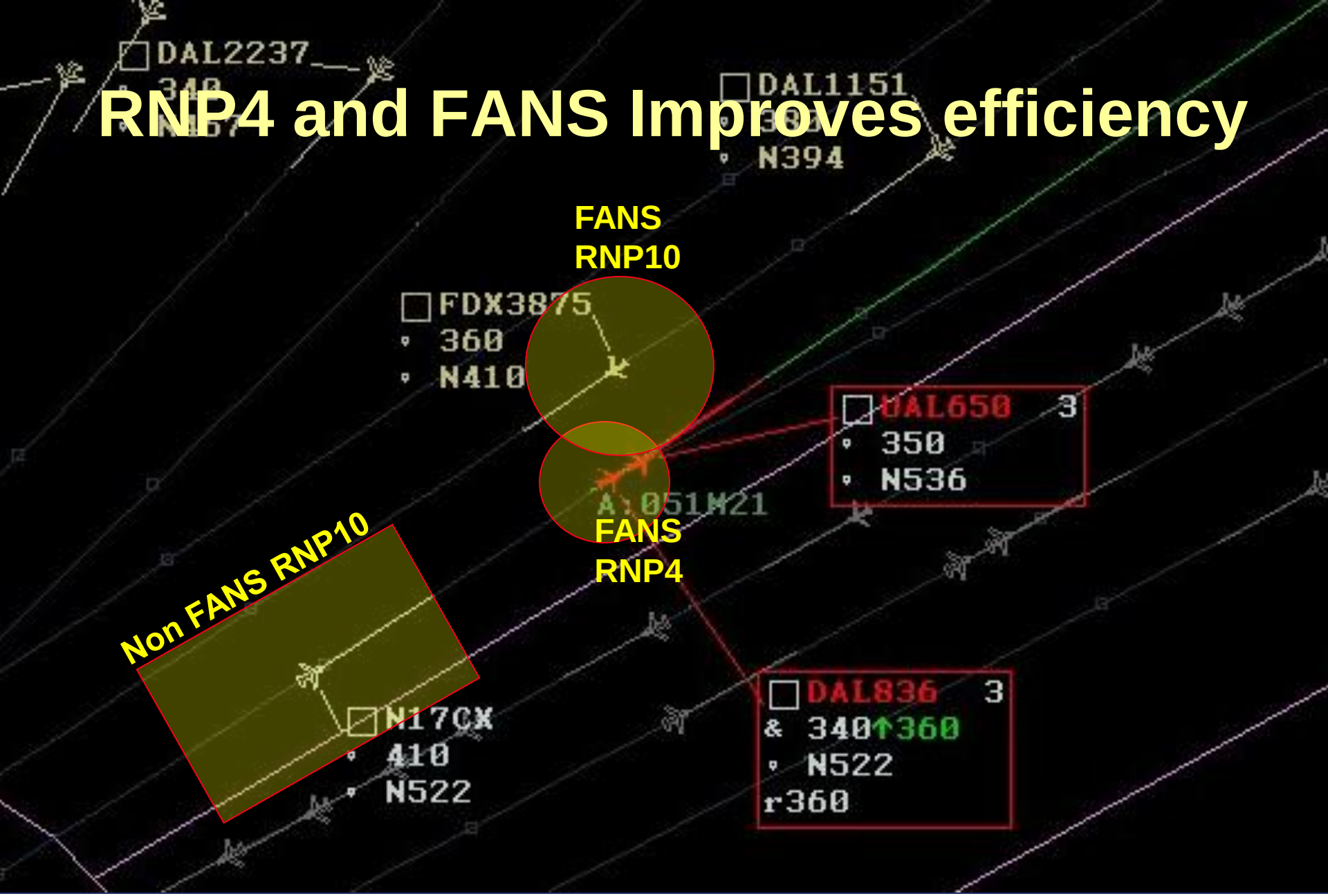
Datalink Outage ATC Impacts



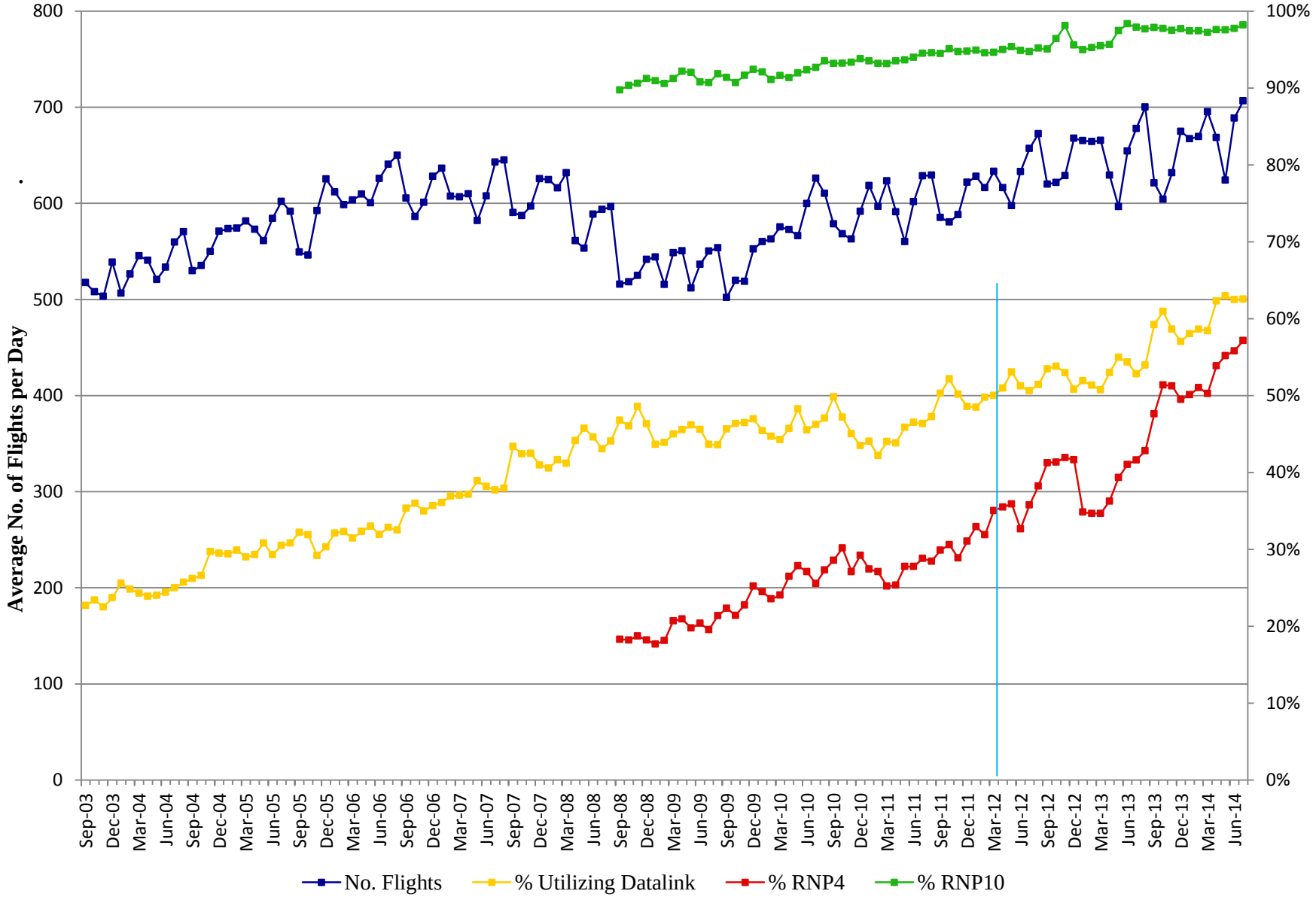
Lost Fuel Burn Savings

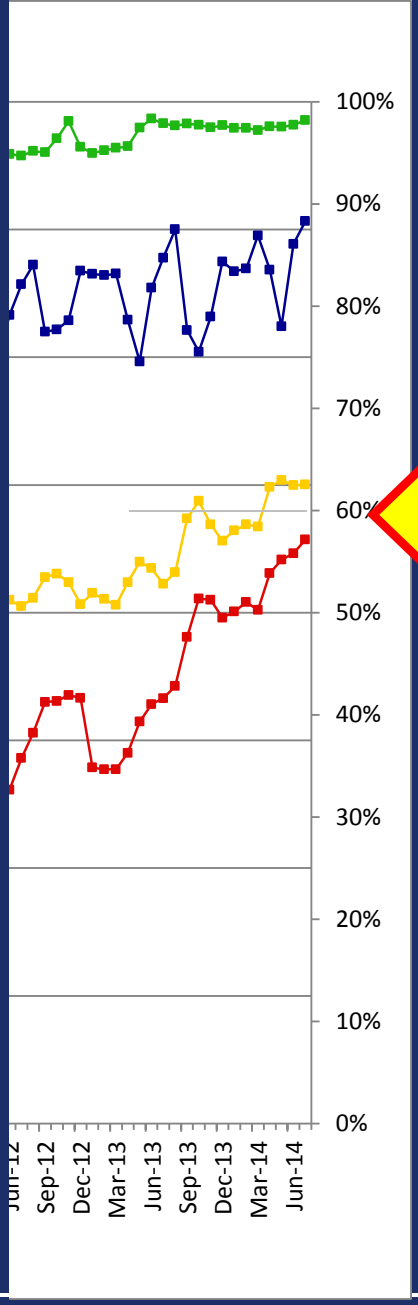
The following slides identify denied aircraft requests for climb to optimum altitudes and places a value on the increased fuel burn due to lack of FANS equipment and RNP certification

RNP4 and FANS Improves efficiency



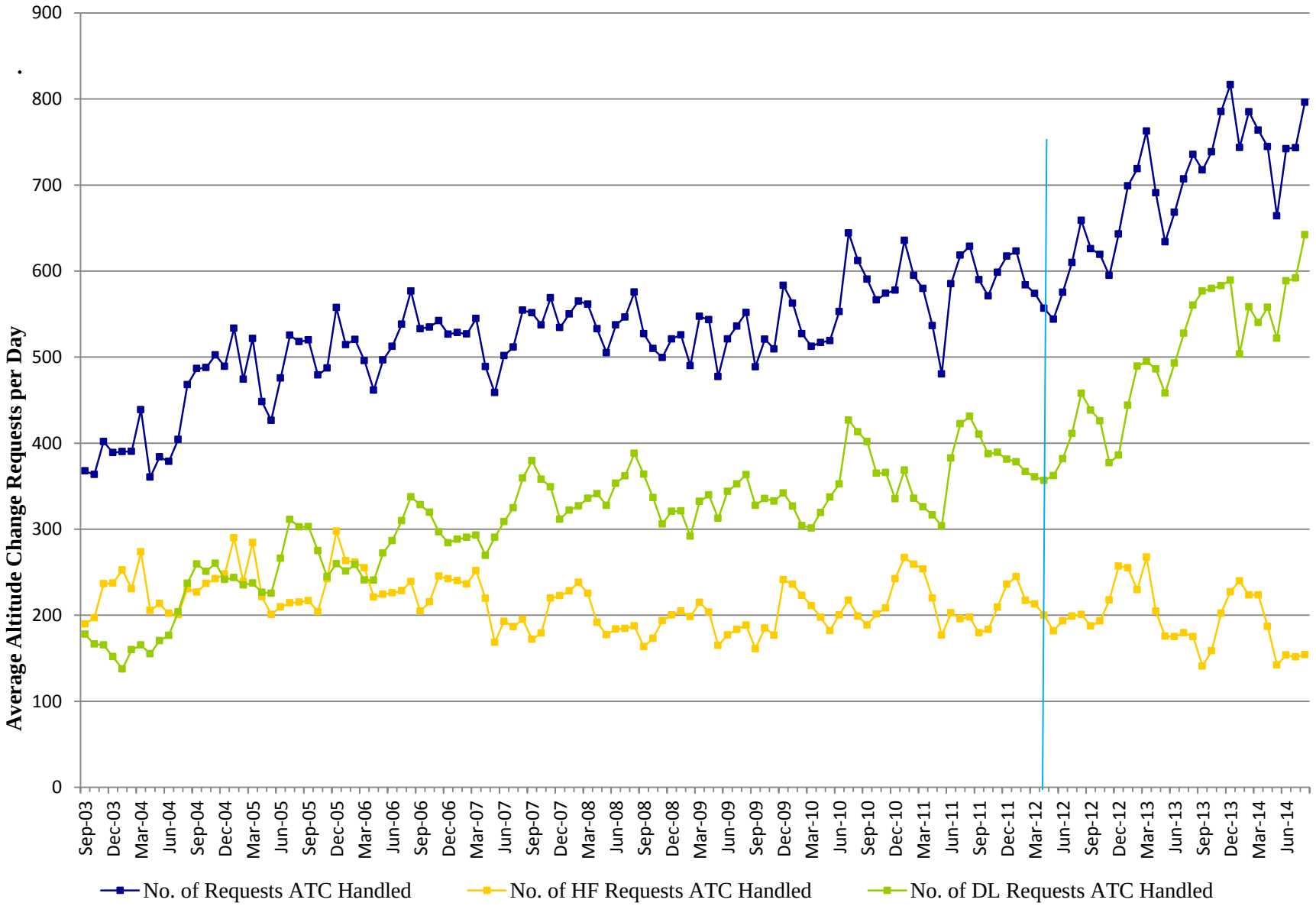
ZOA Flights & Equipment Utilization



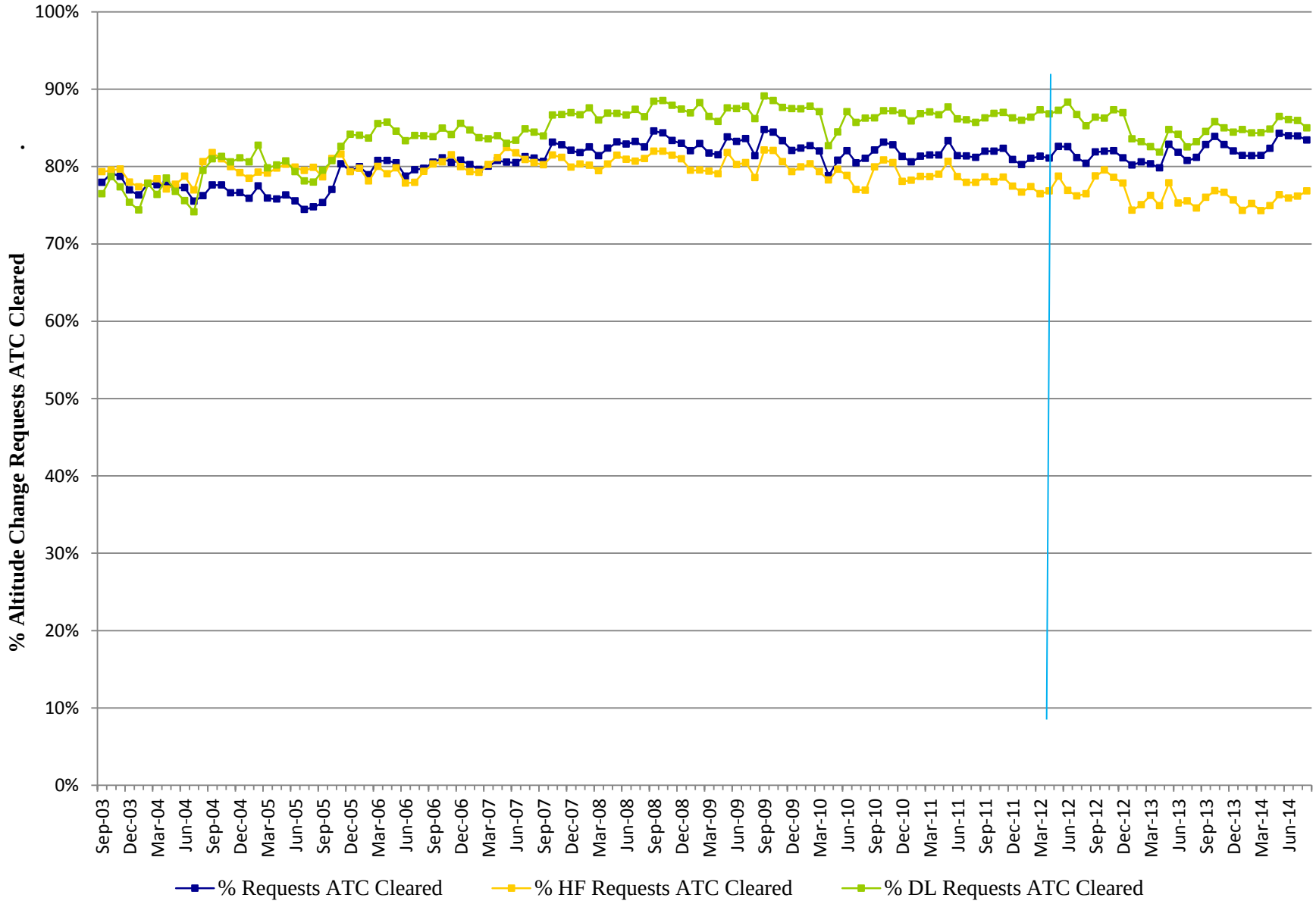


Filed NON_RNP4	
T/B744	“T” 28 Flights
P/B77W	“P” 227 Flights
P/B763	
P/B77L	
F/A333	“F” 268 Flights
F/B744	
???/B77L	??? 3 Flights
QQQ/B748	“QQQ” 51 Flights
QQQ/B744	
A/B752	“A” 26 flights

ZOA Altitude Change Requests ATC Handled



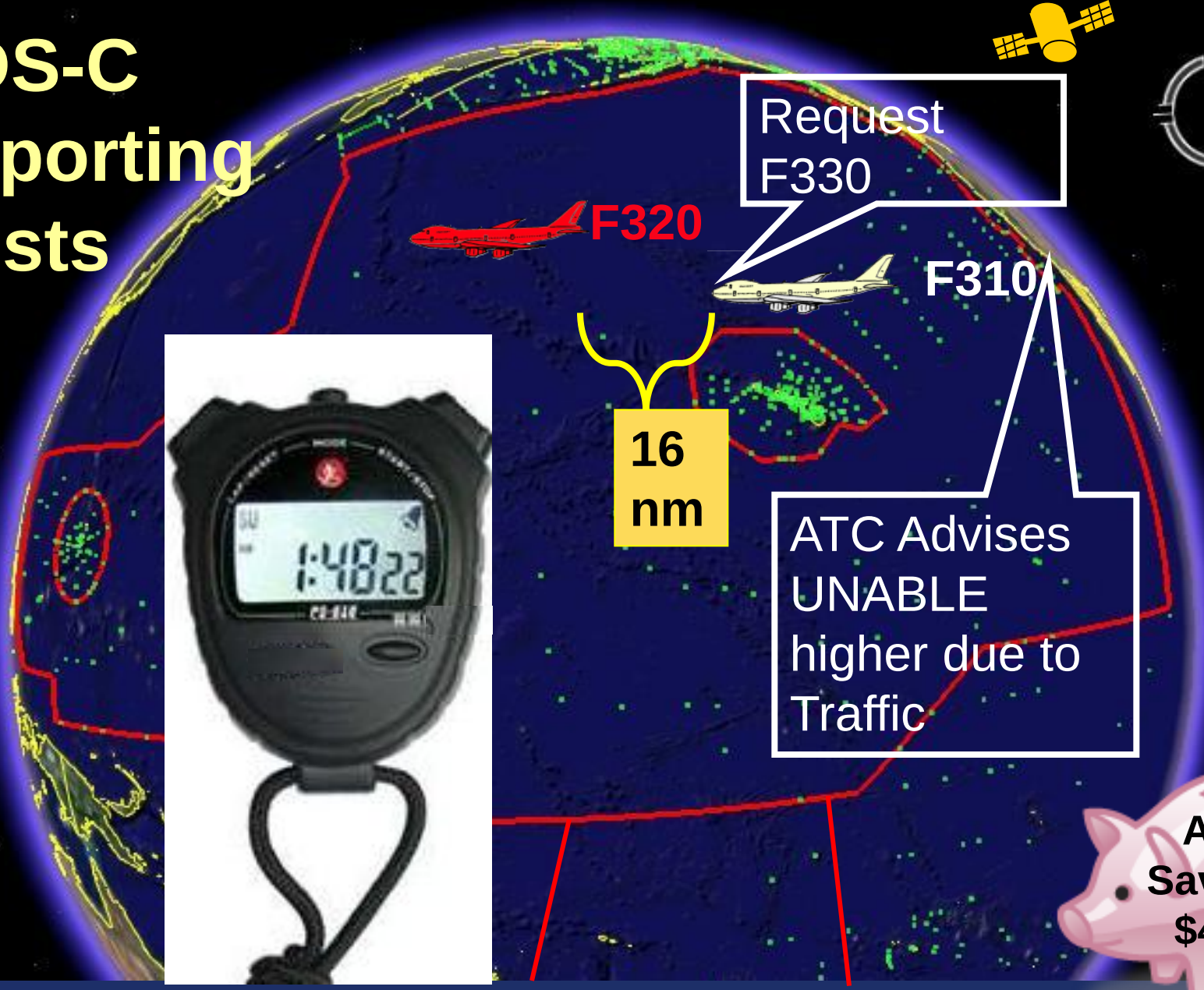
ZOA % Altitude Change Requests ATC Cleared



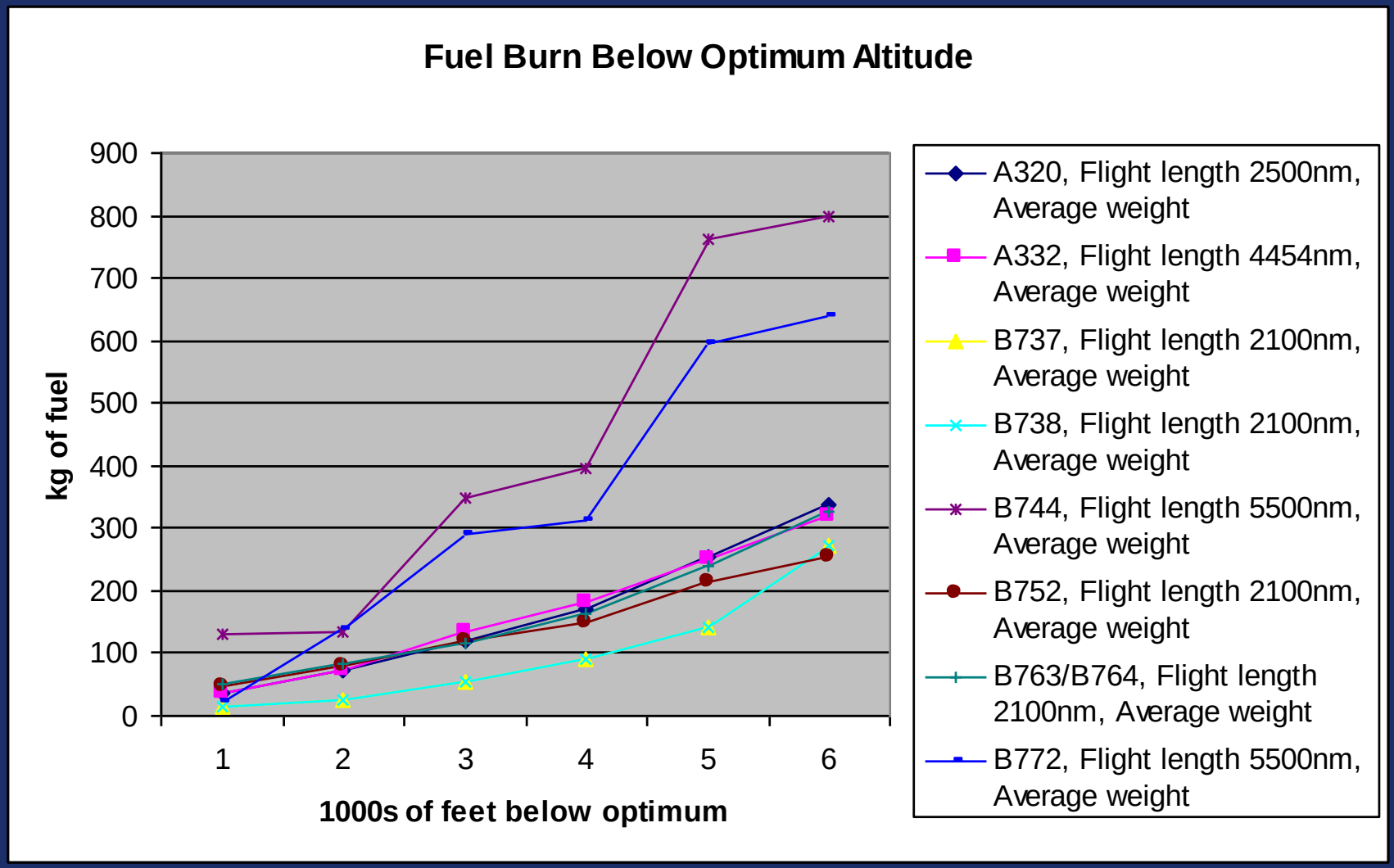
Lost Fuel Burn Savings

The following slides identify denied aircraft requests for climb to optimum altitudes and places a value on the increased fuel burn due to lack of FANS equipment and RNP certification

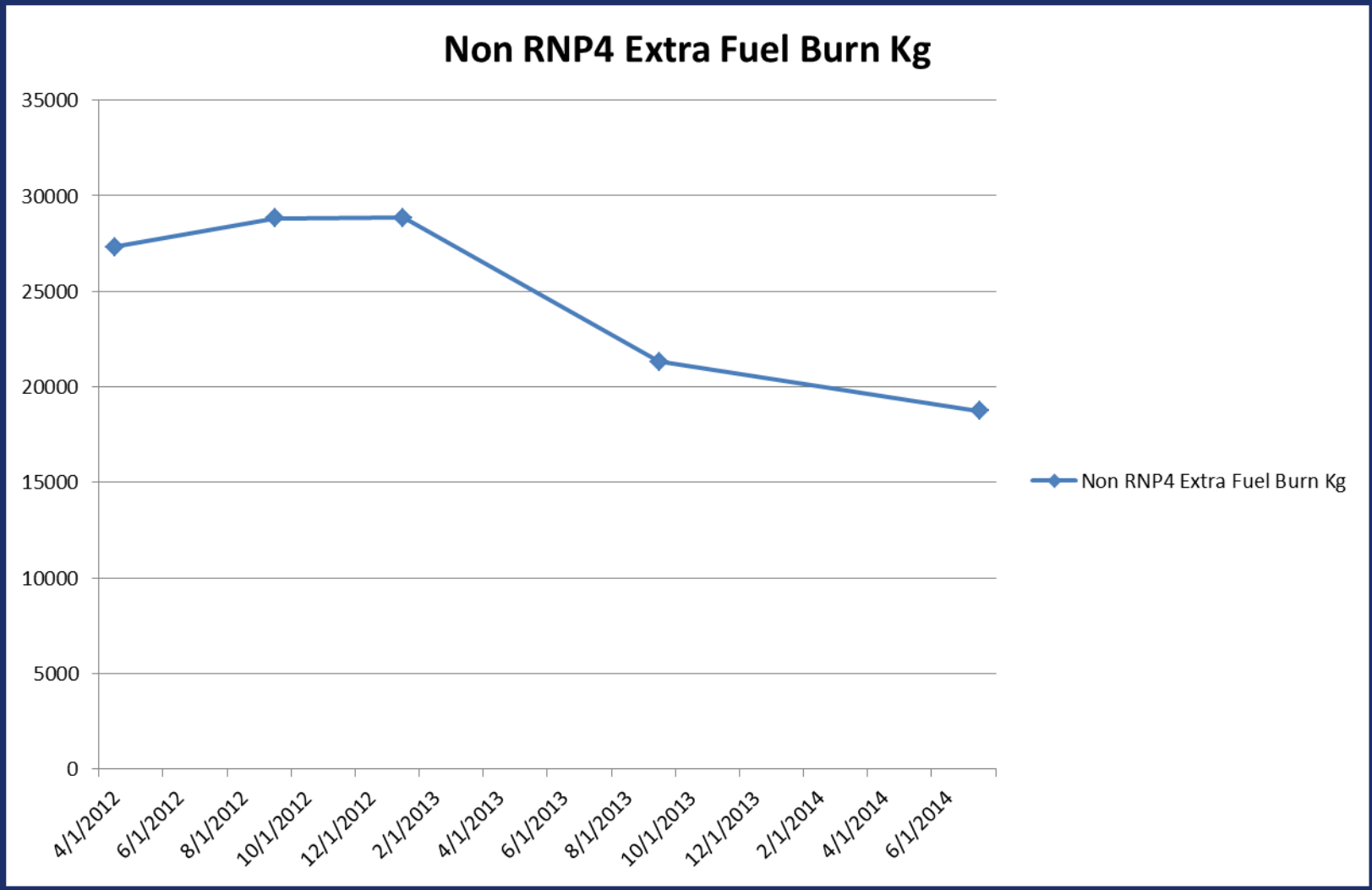
ADS-C Reporting Costs



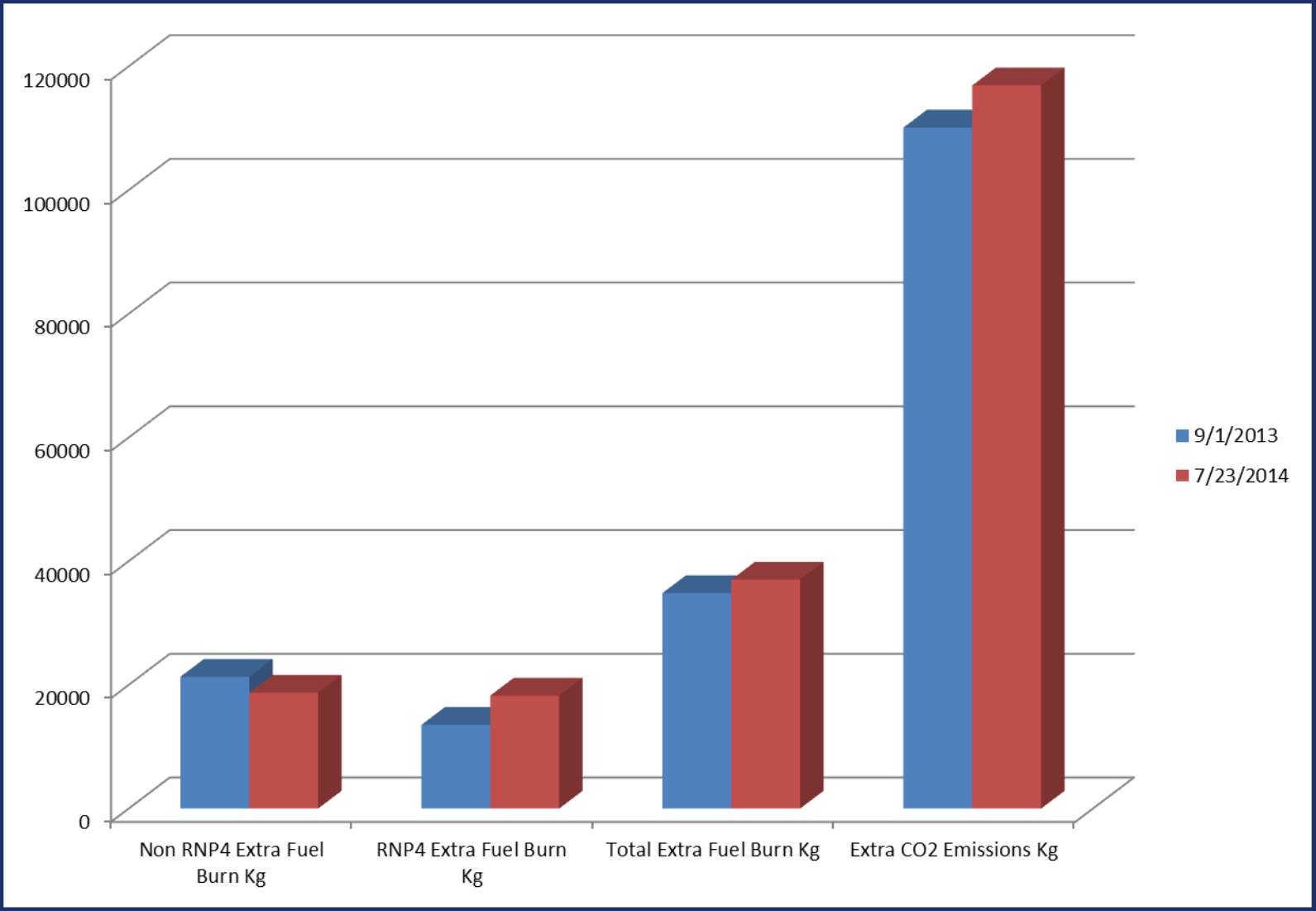
Impact of Denied Altitude Change Requests



Lack of RNP4 extra fuel burn



RNP4 extra fuel burn



Additional benefits are not tracked

- 30nm separation after two opposite direction aircraft have passed

- If an aircraft is held below optimum altitude because of traffic and does not make requests for a new optimum altitude.

Additional benefits are not tracked

- Savings that could be realized by developing route systems based on a 30nm lateral standard.

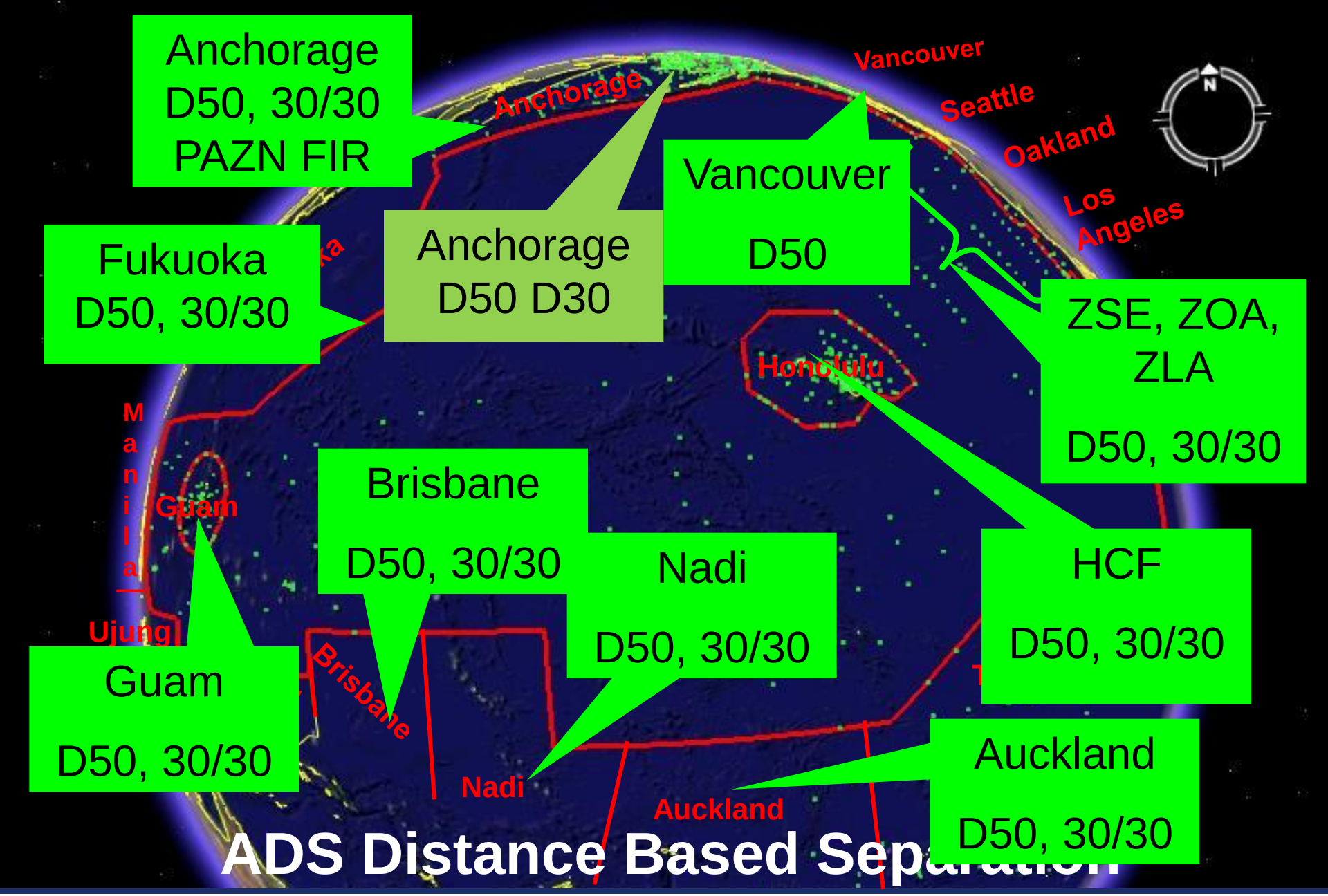
- This paper only captures the lost savings for the Oakland FIR. It would be much higher if calculated for all FIRs

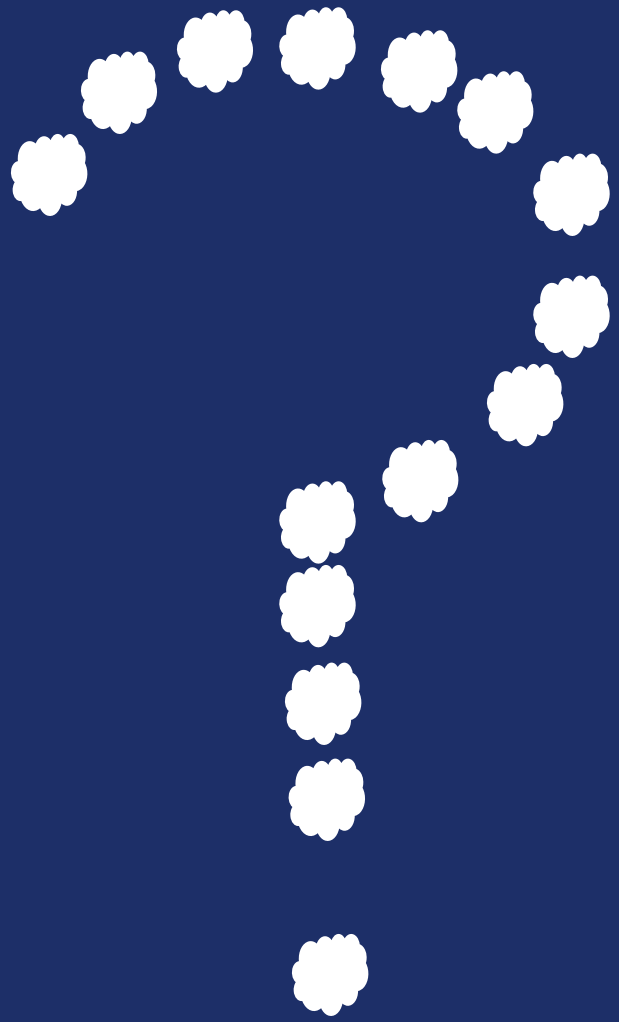
Conclusion

- **The meeting is requested to:**
  - **Recognize the benefits of RNP 4 and FANS equipage; and**
  - **Consider certifying FANS equipped aircraft as RNP 4; and**
  - **Consider equipping aircraft with satellite FANS and RNP 4 certification.**

Seamless Airspace Chart

ANSP	FIR	RVSM	Surveillance			Comm				RNAV/ RNP 10		10 MIN LONG NMC	RNP 4		RNP2			ADS-C CDP	ADS-B ITP	Lat Offsets for Climb or Descent	UPR	DARP		AIDC												Network Optimisation			
			Radar	ADS-C	ADS-B	CPDLC	FMC WPR	SCV	HFDL	50 NM LAT	50 NM LONG		30 NM LAT	30 NM LONG	30nm Climb-Descend	15nm VHF Lateral	8nm VHF Climb-					Accept	Initiate	CPL/EST	CDN	Weather Deviation	Offset	Block Level	Mach Speed	FANFCN	ADS forwardfiin	TRU Msg	Enhanced CDM	Enhanced ABI	A-CDM	Enroute CFM	ODP/ Tailored Arrival	Optimised Climb
AirNav Indonesia	Jakarta	X	X	X																																
	Ujung Pandang	X	X	X																																
AFL Ltd	Nadi	X		X	O	X	X			X	X	X	X	X					X		X	X	X	X	X	X	X	X								
AirServices Australia	Brisbane (Honiara & Nauru)	X	X	X	X	X	O			X	X	X	X	X						X	X	X	X													
	Melbourne	X	X	X	X	X				X	X	X	X	X						X			X													
Airways NZ	Auckland Oceanic	X	X	X		X	X	X	X	X	X	X	X	X							X	X	X	X	X		X	X						O	O
CAAP	Manila	X	X							X																										
CAAS	Singapore	X	X	X	O	X				X	X	X																							X	
DGAC	Santiago	X																			X															
FAA	Anchorage Oceanic	X	X	X		X				X	X	X	X	X							X		X	X	X	X	X	X								
	Oakland Oceanic	X		X		X		X	X	X	X	X	X	X				O	X	X	X	X	X	X	X	X	X	X					X		X	
JCAB	Fukuoka	X	X	X		X		X		X	X	X	X	X							X	X	X	X	X	X	X	X	X	X					X	
PNG ASL	Port Moresby	X	X							X	X										X															
SEAC-PF	Tahiti	X	X	X		X				X	X										X	X		X		X		X						X		
FAA	Anchorage Domestic FIR	X	X		X					X		X												X	X											
	Anchorage Arctic FIR	X																																		
	Guam CERAP	X	X							X	X	X	X	X								X		X	X			X								
	Honolulu Control Facility	X	X							X	X	X	X	X								X		X	X			X								
	Oakland Domestic, Seattle and Los Angeles ARTCC	X	X							X	X	X	X	X						X	X	X												X	X	X
NavCanada	Vancouver ACC	X	X			X				X	X	X																								
SENEAM	Mazatlan FIR	X	X																																	
DGAC Ecuador	Guayaquil FIR	X																																		


Anchorage
D50, 30/30
PAZN FIR
Anchorage
Vancouver
Seattle
Oakland
Los Angeles
Vancouver
D50
Anchorage
D50 D30
Fukuoka
D50, 30/30
Honolulu
ZSE, ZOA, ZLA
D50, 30/30
Manila
Guam
Brisbane
D50, 30/30
Nadi
D50, 30/30
HCF
D50, 30/30
Ujung
Guam
D50, 30/30
Brisbane
Nadi
Auckland
Auckland
D50, 30/30
ADS Distance Based Separation



Flight Planned Mach Speeds

Mach Speed Variation

- The FAA has presented papers at IPACG and ISPACG which outline the dangers of unannounced speed changes.
- This issue needs attention by ICAO and a Global or Regional Procedure developed.
- The ISPACG Working Group has been working on this issue to try and develop a unified regional procedure.

ICAO Annex 2 3.6.2.2 change

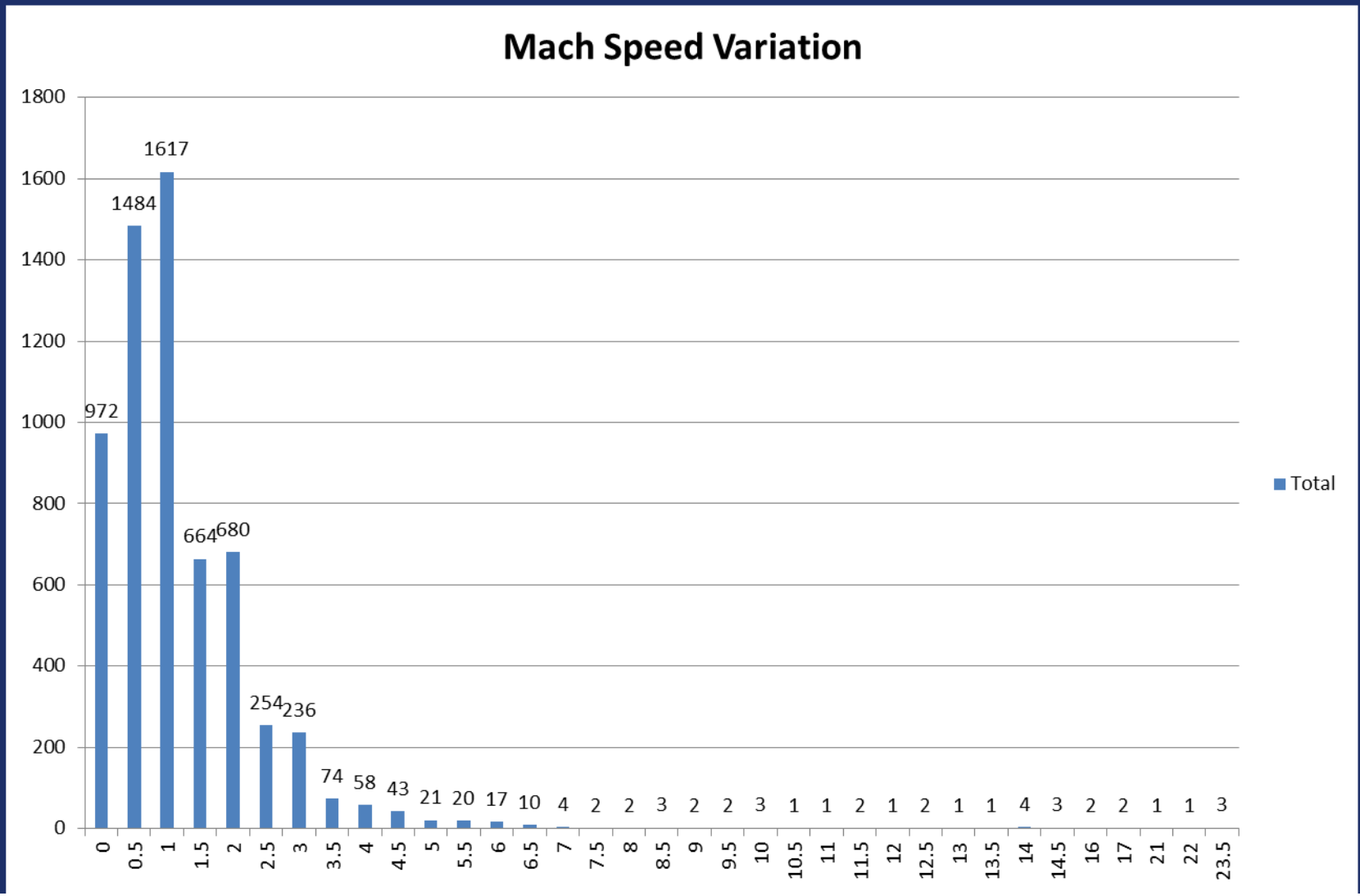
- *3.6.2.2 Inadvertent changes. In the event that a controlled flight inadvertently deviates from its current flight plan, the following action shall be taken:*
- *a) Deviation from track: if the aircraft is off track, action shall be taken forthwith to adjust the heading of the aircraft to regain track as soon as practicable.*
- *b) Variation in true airspeed: if the average true airspeed at cruising level between reporting points varies or is expected to vary by plus or minus 5 per cent of the true airspeed, from that given in the flight plan, the appropriate air traffic services unit shall be so informed.*
- *c) Change in time estimate: if the time estimate for the next applicable reporting point, flight information region boundary or destination aerodrome, whichever comes first, is found to be in error in excess of 2 minutes from that notified to air traffic services, or such other period of time as is prescribed by the appropriate ATS authority or on the basis of air navigation regional agreements, a revised estimated time shall be notified as soon as possible to the appropriate air traffic services unit.*
-
- *3.6.2.2.1 Additionally, when an ADS agreement is in place, the air traffic services unit shall be informed automatically via data link whenever changes occur beyond the threshold values stipulated by the ADS event contract.*

Mach Speed Variation

- **Annex 2 change fails to fully address the issue.**

- **An en route aircraft at 500 knots only has to inform ATC when its true airspeed changes by 25 knots or more from the speed given in the flight plan. This allows for speed changes of 48 knots without informing ATC.**

Mach Speed Variation

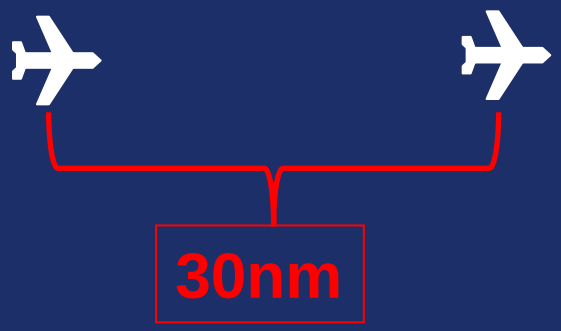


Flight Planned Speed Changes

- (FPL-XXXX-IS
- -B744/H-SDE3FGHIJ3J5M1RWXY/LB2D1
- -RJAA1025
- -M073F290 DCT CUPID Y808 ALLEN/M072F290 Y812 SCORE OTR11 LEPKI DCT 37N160E/M071F290 DCT 35N170E/M084F390 DCT 32N180E DCT 27N170W DCT CANON V15 LILIA/M083F390 DCT KLANI KLANI2
- -PHNL0633 PHJR
- -PBN/A1L1B1C1D1O1S2 DOF/140508 REG/XXXXX EET/KZAK0227
- PHZH0542 SEL/FGJP CODE/XXXX RVR/75 OPR/XXX PER/D RALT/RJCK PMDY RMK/TCAS)

Mach Speed Variation

- In the Pacific, FIRs are applying 30nm longitudinal separation standard using an ADS-C reporting rate of 10 minutes. A 48 knot speed change by <u>one</u> aircraft could result in an 8nm closure between two aircraft between ADS-C reports.



Mach Speed Variation

- Aircrews predominantly do not monitor their flown speed versus the flight planned speed.
- It does not matter whether an ATC system uses the first speed in field 15 of the FPL or accounts for the speed changes imbedded in the route of flight.

Australia AIP Amendment

- *AIP ENR 1.1 para 21:*
- *A pilot must inform ATS if the average cruising speed, either TAS or Mach whichever is applicable, between reporting points, varies or is expected to vary, by a value equal to or greater than:*
- *a. 5% TAS*
- *b. 0.01 Mach from that given in the flight plan.*

Speed Change NOTAM Proposal

- IN ORDER TO PREVENT UNANNOUNCED SPEED CHANGES AIRCREWS ARE REQUIRED TO USE THE FOLLOWING PROCEDURES IN THE RJJJ FIR. UPON CROSSING THE RJJJ FIR BOUNDARY, AIRCRAFT ARE REQUIRED TO REPORT THEIR SPEED VIA CPDLC OR HF VOICE. TURBOJET AIRCRAFT ARE TO REPORT THEIR MACH NUMBER (AND NON-TURBOJET AIRCRAFT ARE TO REPORT A TRUE AIRSPEED.)
- A PILOT MUST INFORM ATS EACH TIME THE CRUISING (SPEED, EITHER TAS OR) MACH NUMBER (WHICHEVER IS APPLICABLE) VARIES OR IS EXPECTED TO VARY BY A VALUE EQUAL TO OR GREATER THAN:
  (A. 10 KNOTS TAS FROM THE PREVIOUSLY REPORTED SPEED - Non-Turbojet)
  B. 0.02 MACH FROM THE PREVIOUSLY REPORTED SPEED (- Turbojet.)
- (AIRCREWS ARE ALSO REQUIRED *TO* REPORT THEIR PRESENT MACH NUMBER WHEN DIFFERS 0.02 MACH NUMBER OR MORE FROM THE FLIGHT PLANNED SPEED)

Mach Speed Variation

- By requiring a speed report upon entering the FIR/CTA, a pilot is made aware of their speed and the need to notify ATC if the speed will change by .02 Mach or more.

- The speed report also allows ATC to check the speed the ATC system is using to calculate separation for the aircraft.

Speed Change Proposal

- Procedurally when an aircraft wanted to change by .02 Mach number, they could downlink DM18 with the requested speed (Mach number).
- If ATC required a speed assignment for separation, an appropriate speed assignment would be assigned ie UM106 MAINTAIN *Speed.*

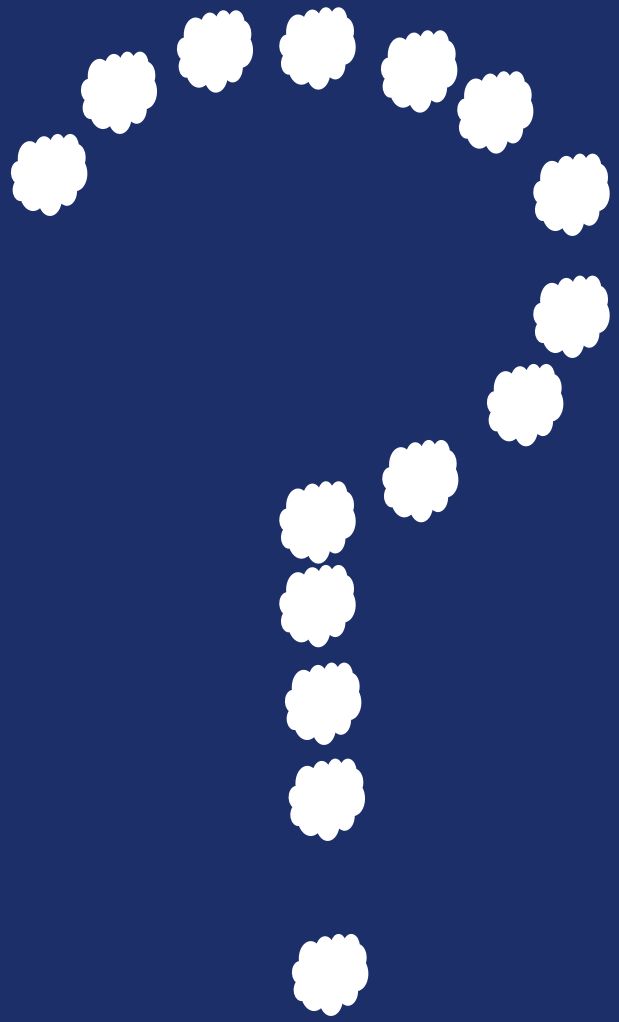
- If ATC did not require a speed assignment, the following could be Uplinked:
- UM ROGER?
- UM169 Speed change to M0.84 approved
- This advises the aircraft that the requested speed change is approved but no speed restriction has been assigned.

Flight Planned Speed Changes

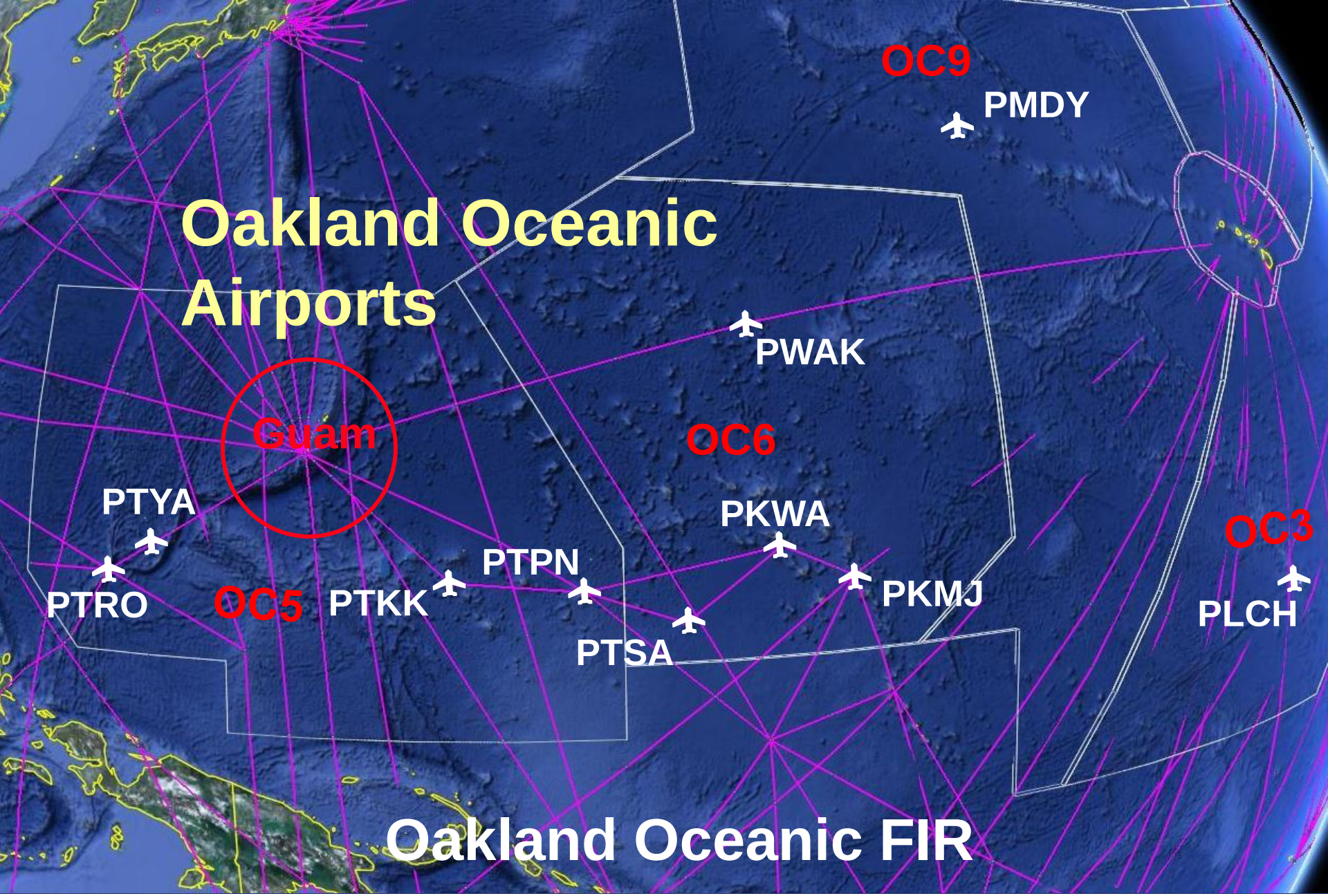
- (FPL-XXXX-IS
- -B753/M-SDE2E3FGHIRWXYZ/S
- -KSEA0035
- -N0396F300 HAROB4 HQM C1418 SEDAR A331 ZINNO/N0463F340 A331 ZIGIE MAGGI3
- -PHNL0541
- -PBN/A1B1C1D1O1S1T1 NAV/RNVD1E2A1 REG/XXXXX
- EET/KZAK0039
- SEL/XXXX
- RMK/TCAS AGCS EQUIPPED NRP USA)

Flight Planned Speed Changes

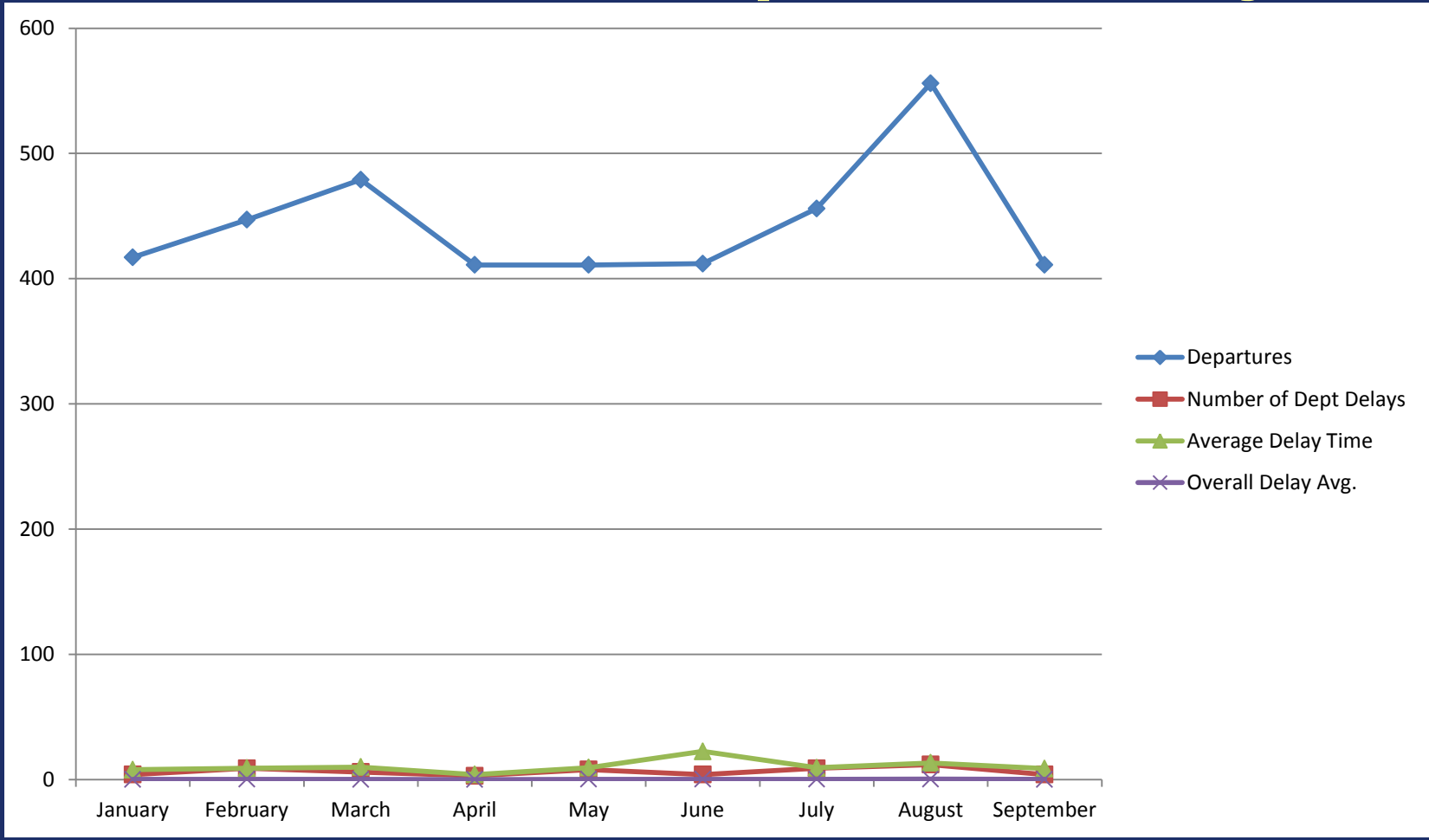
- ABC123 IS B788 SADE2FGHIJ2J4J5J6M1M2RWXYZ LB1D1SH
- RJAA KSEA P270 270 N0446 N345806A TR 1
- N0446F270 CUPID Y808 ONION OTR5 KALNA/M069F270 DCT 44N160E/M084F390 47N170E
- 49N180E/M085F410 50N170W 51N160W 52N150W 51N140W DCT ORNAI/N0488F410 DCT
- SIMLU DCT KEPKO DCT TOU MARNR3



Pacific Island Traffic


OC9
PMDY
Oakland Oceanic Airports
PWAK
Guam
OC6
PTYA
PKWA
OC3
PTPN
PTRO
OC5
PTKK
PKMJ
PLCH
PTSA
Oakland Oceanic FIR

2014 Island Departure Delays

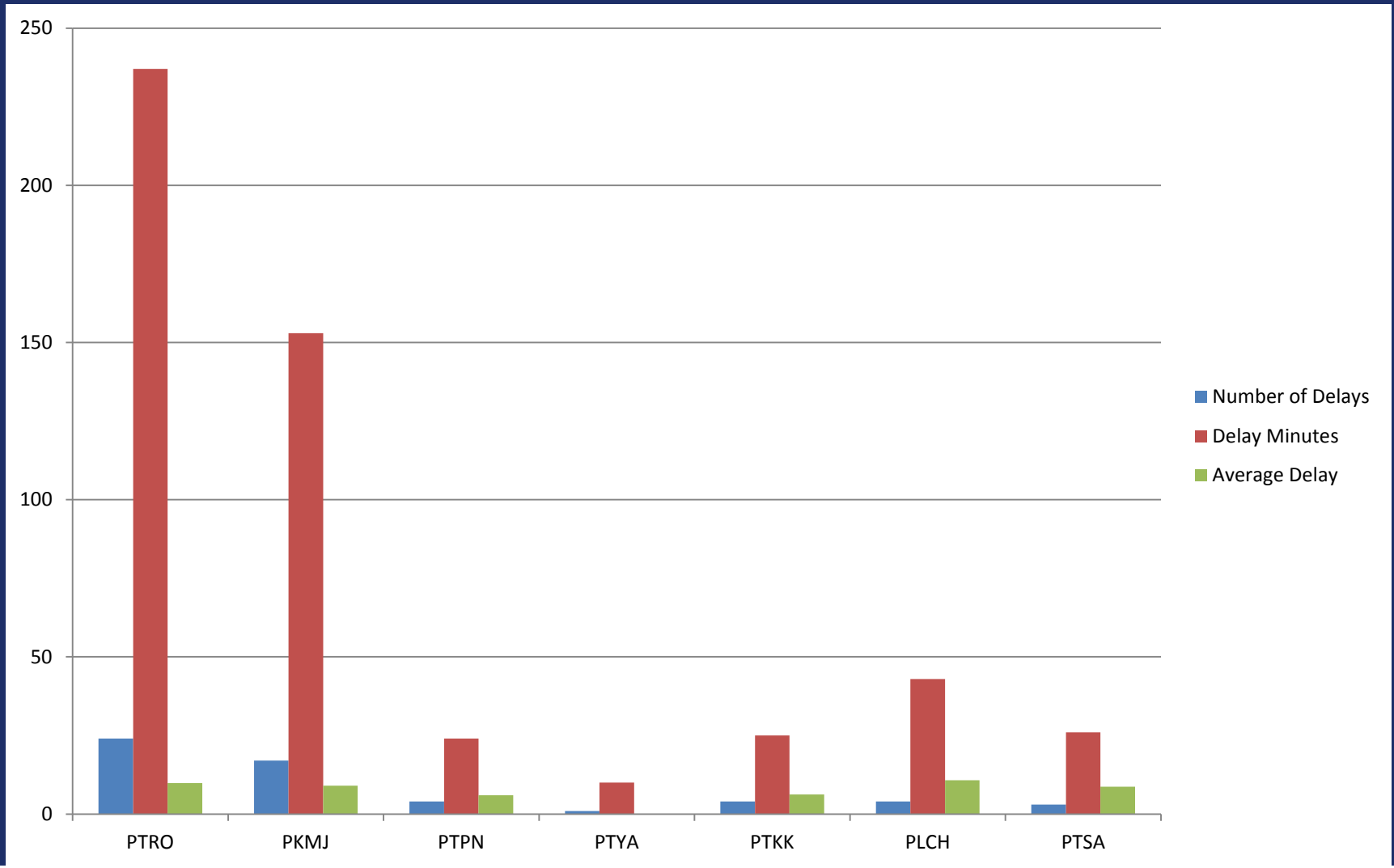


Overall average flight delay was less than a minute

Island Departure Delays

- **Departure Delays, October 2010 to March 9, 2011**
  - About 4% of departures are delayed.
  - Delayed flight average = 18 minutes
- **Departure Delays, 2014**
  - 0.015% of departures were delayed
  - Delayed flight average = 10.6 minutes

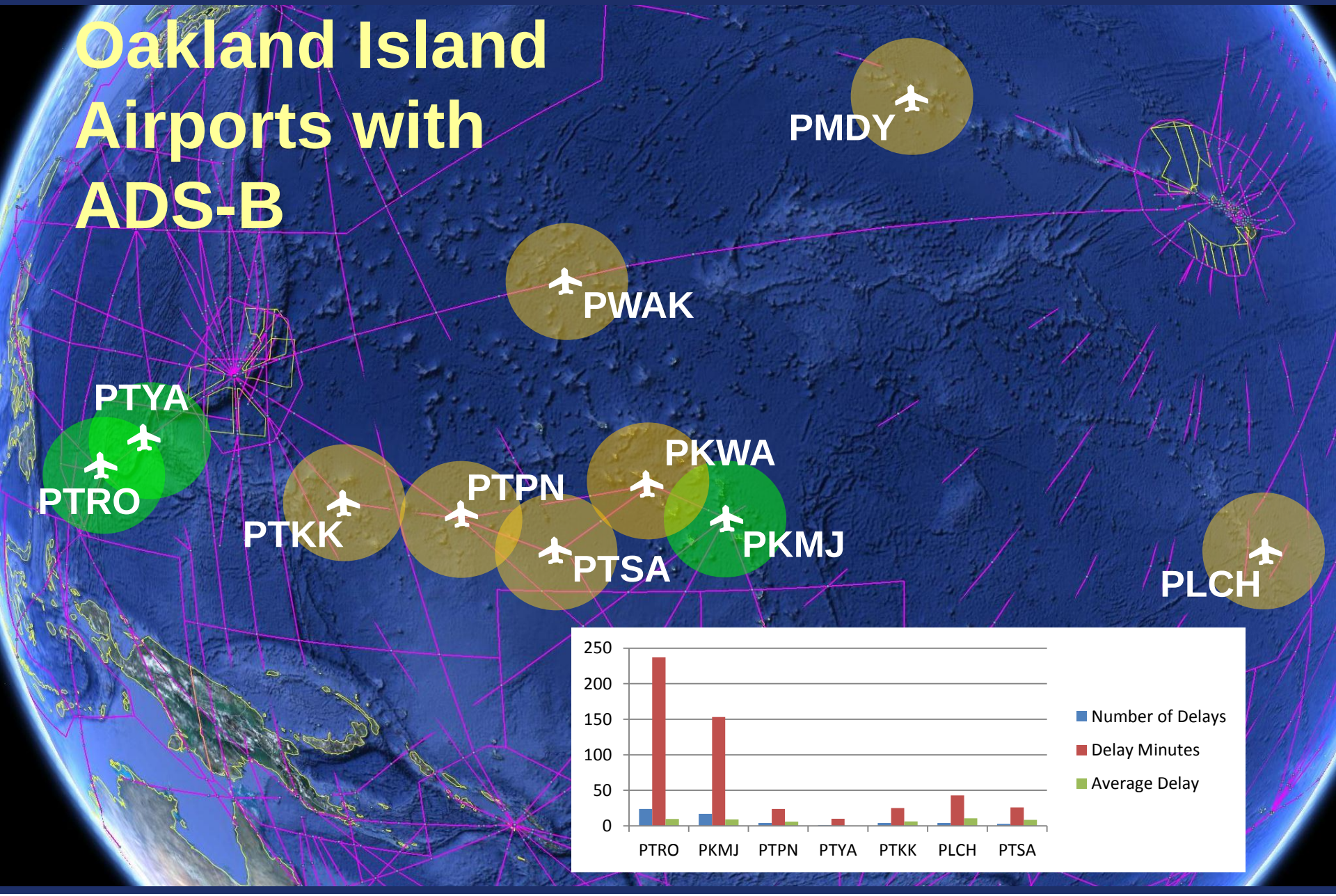
2014 Island Departure Delays



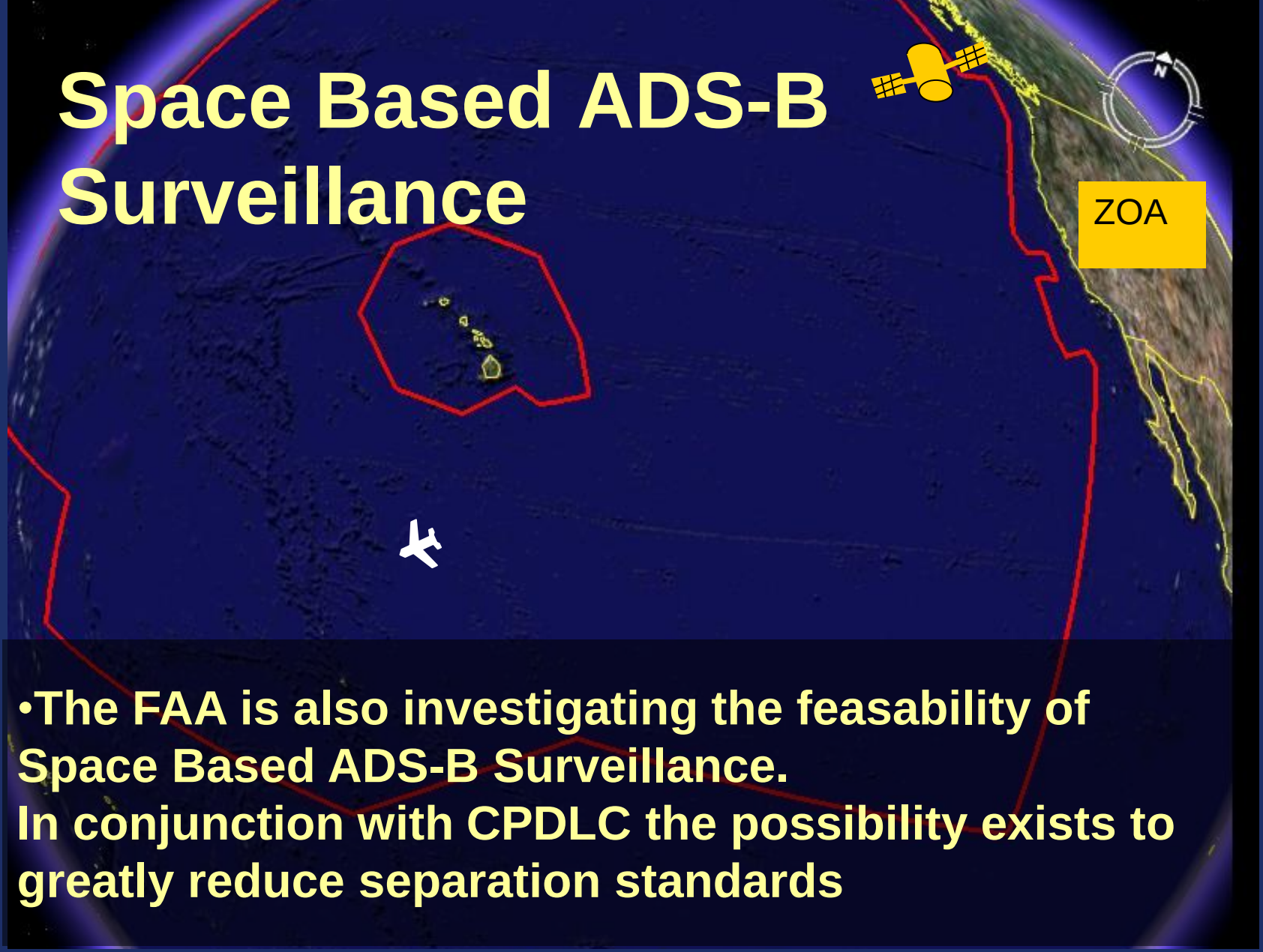
ADS-B

- **The FAA is investigating the possibility of using ADS-B at selected oceanic island airports to facilitate improved aircraft operations.**

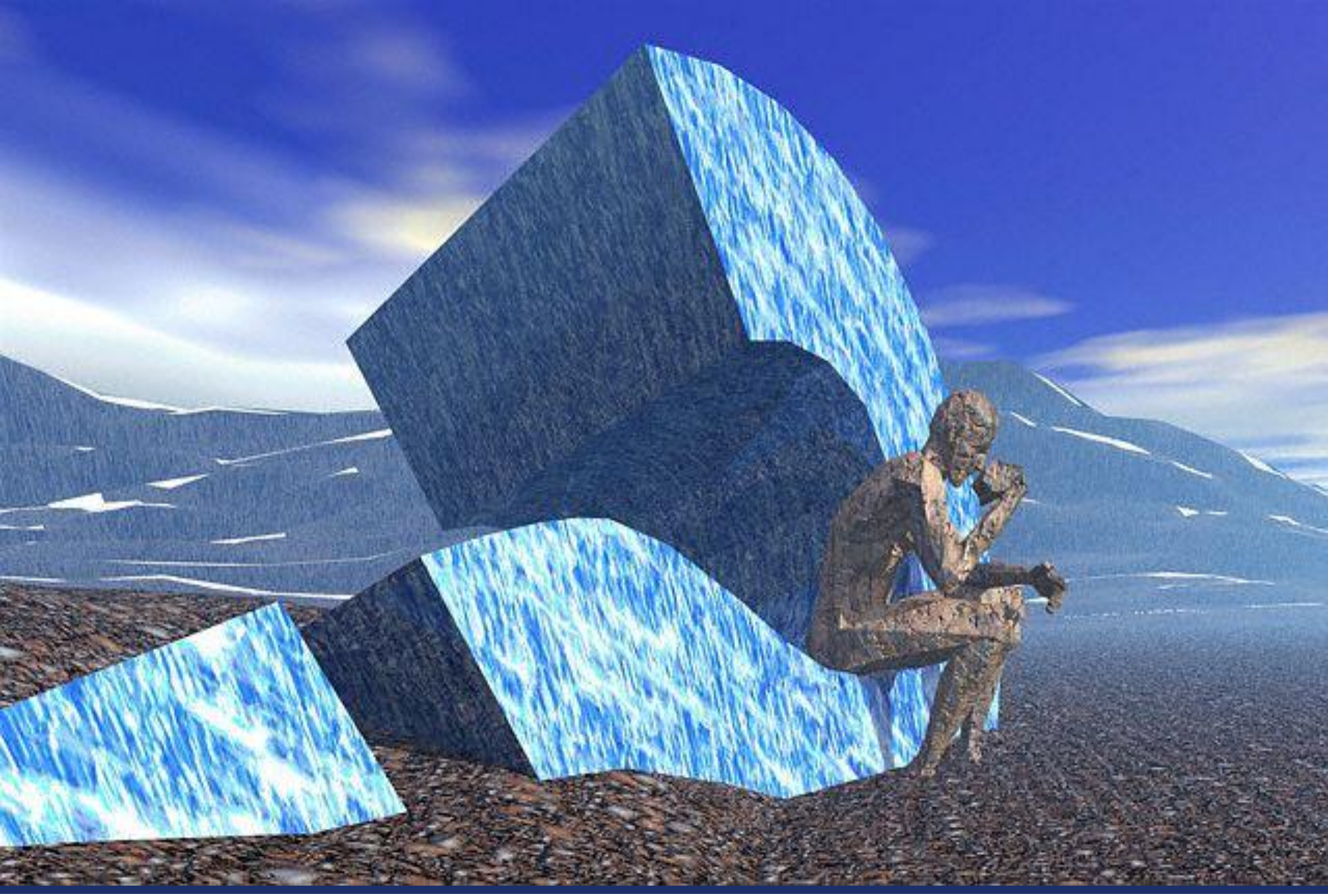
Oakland Island Airports with ADS-B



Space Based ADS-B Surveillance

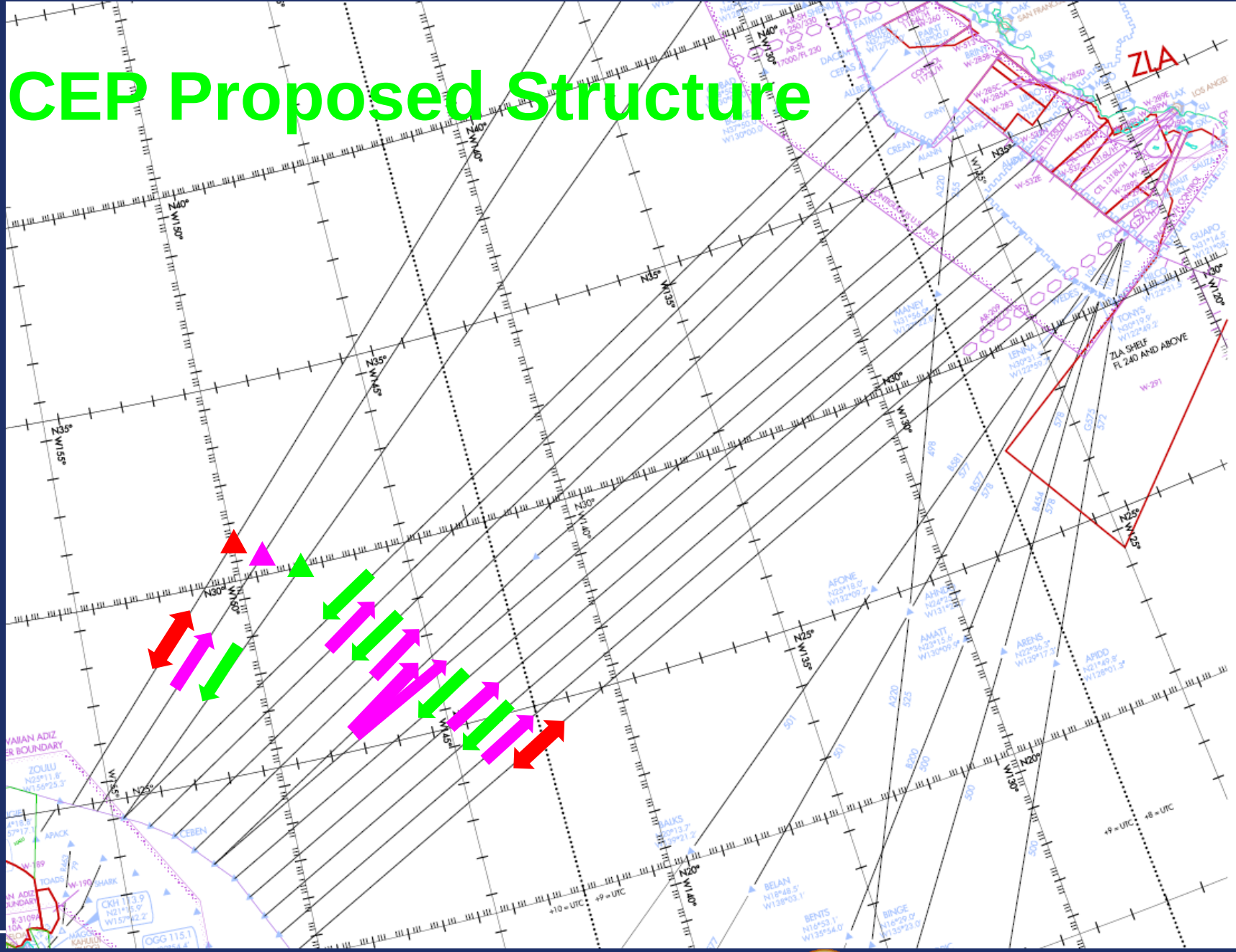


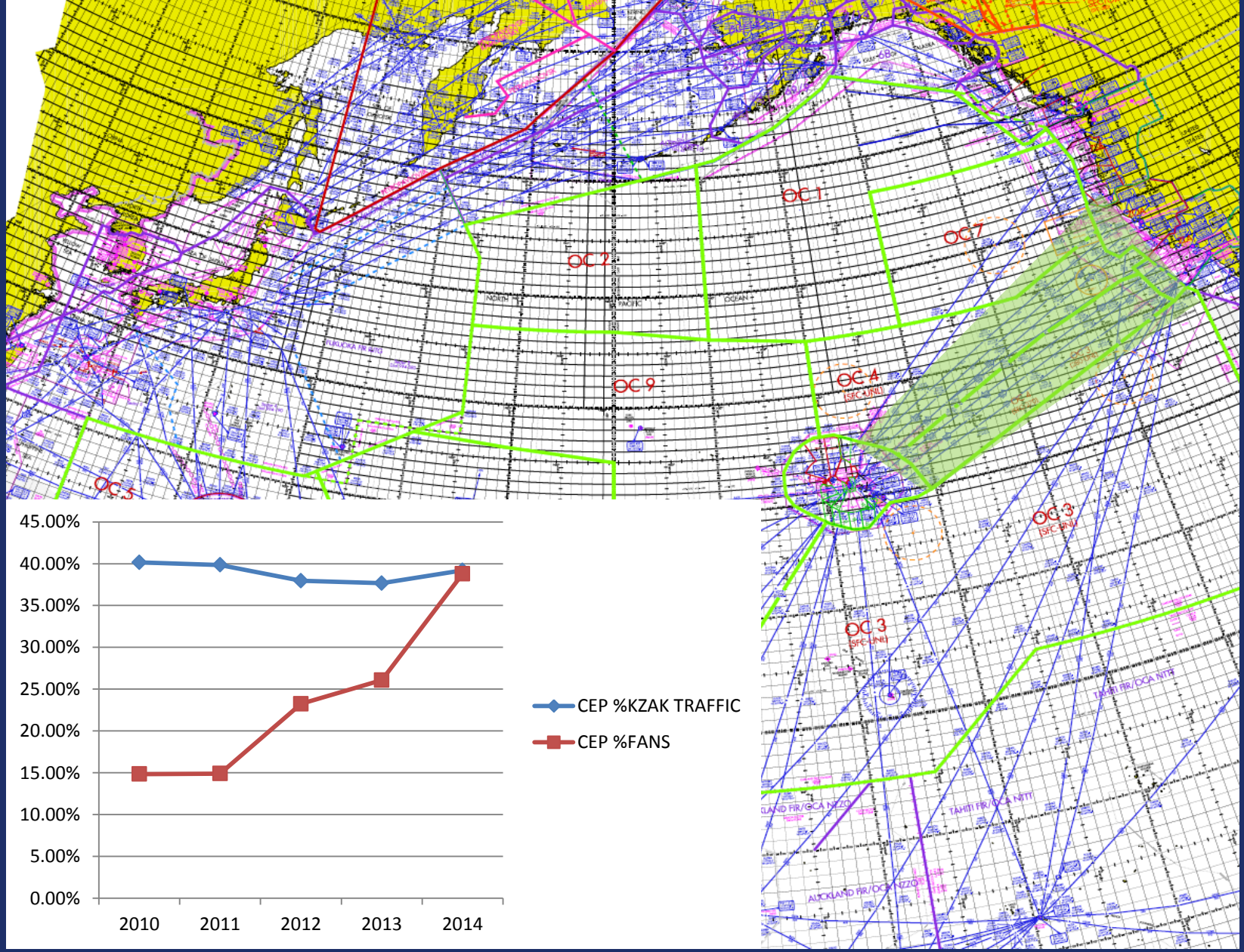
- The FAA is also investigating the feasability of Space Based ADS-B Surveillance.
In conjunction with CPDLC the possibility exists to greatly reduce separation standards



CEP
Route
Structure

CEP Proposed Structure




OC 1
OC 2
OC 7
OC 9
OC 4
OC 5
OC 3
OC 3
TAHITI FIR/OCA NTTT
AUCKLAND FIR/OCA NZZO

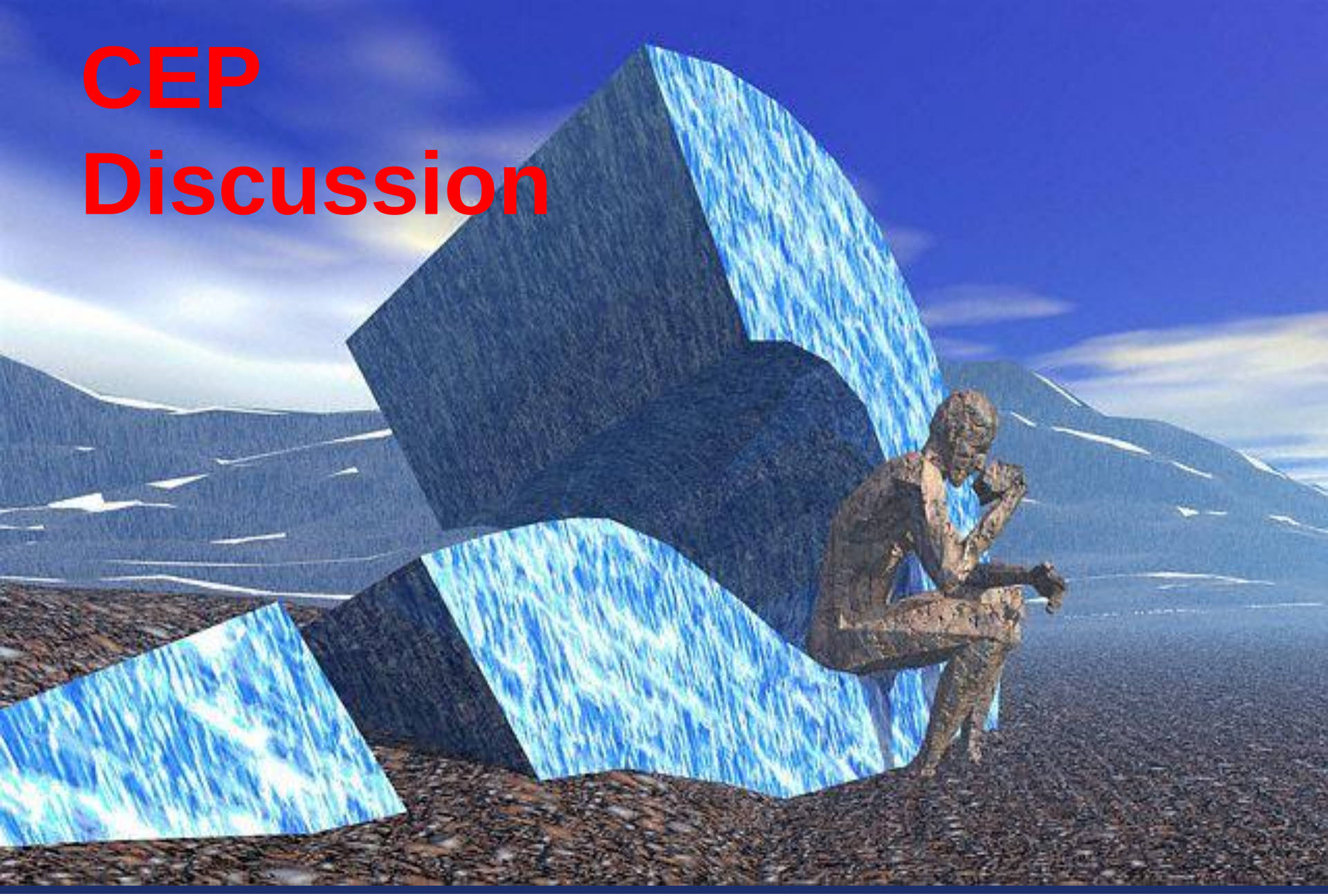
45.00%
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
2010
2011
2012
2013
2014
CEP %KZAK TRAFFIC
CEP %FANS

CEP

30nm CEP Track Discussion

- **Aircraft Lifespan.**
- **At a certain point it makes sense to switch to 30nm separated CEP Routes.**
- **Drawing a line in the sand.**

CEP Discussion

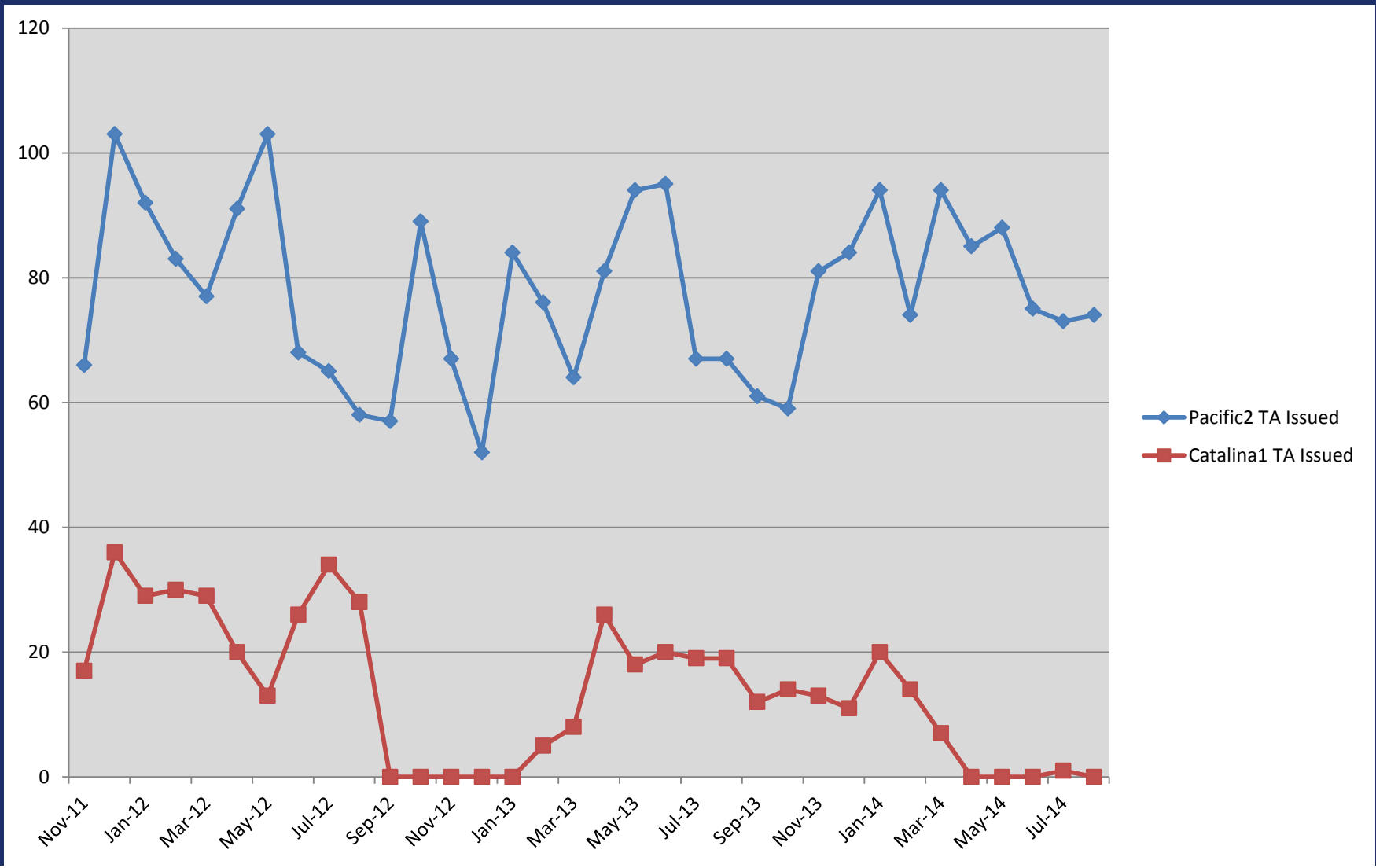


OWG Meeting
October 8, 2014

Federal Aviation Administration

Tailored Arrivals

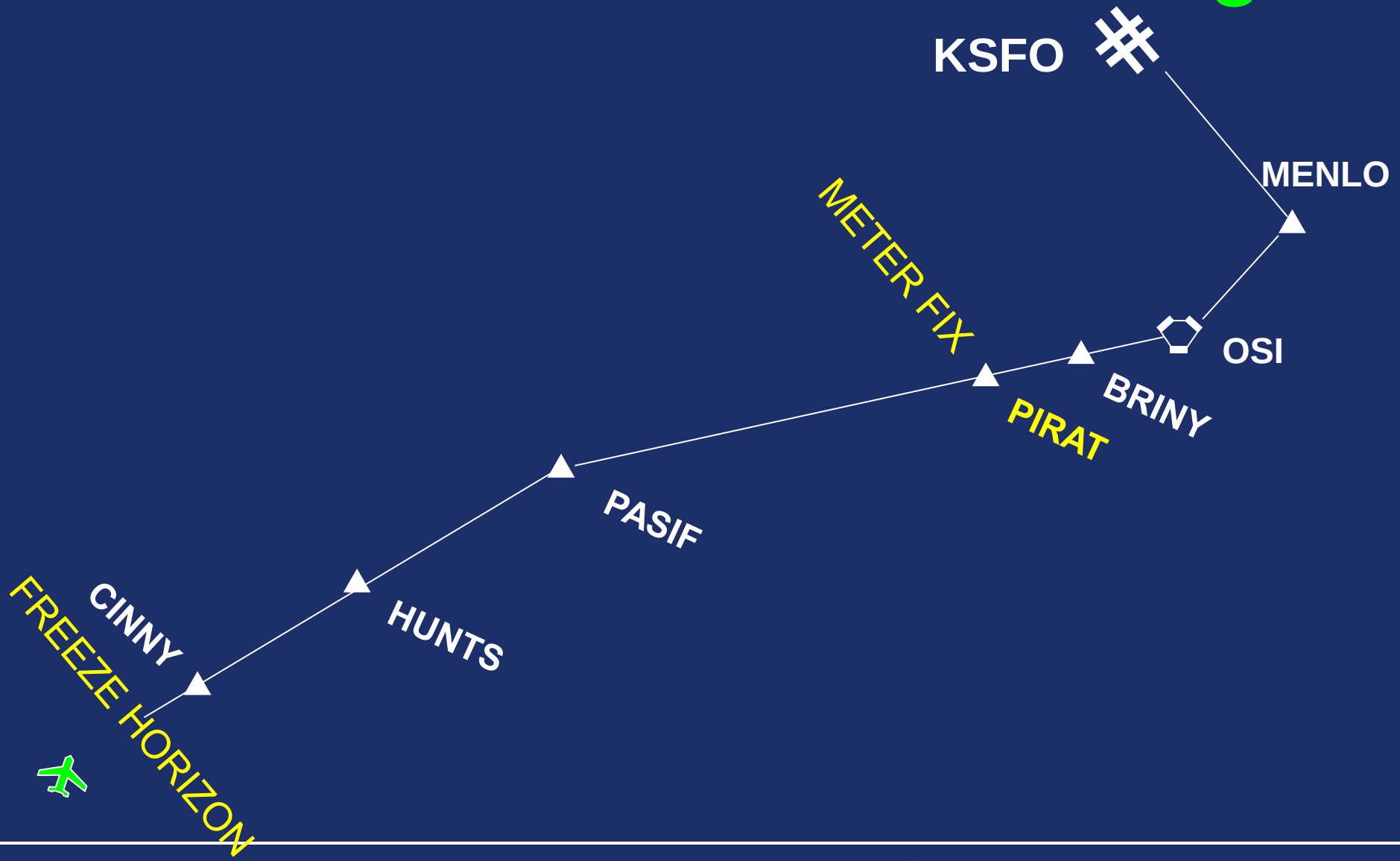
Tailored Arrival Clearances



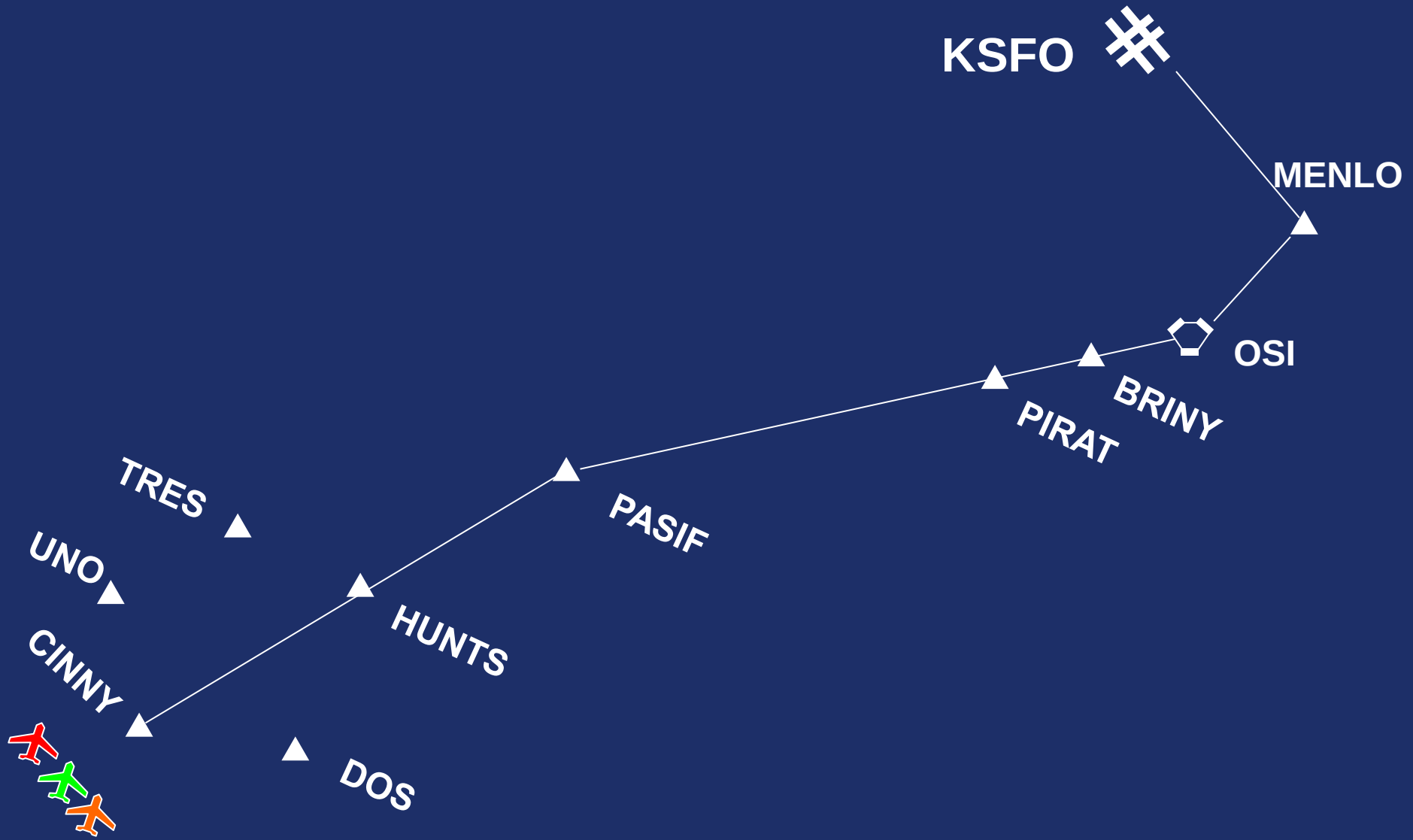
KSFO Tailored Arrivals

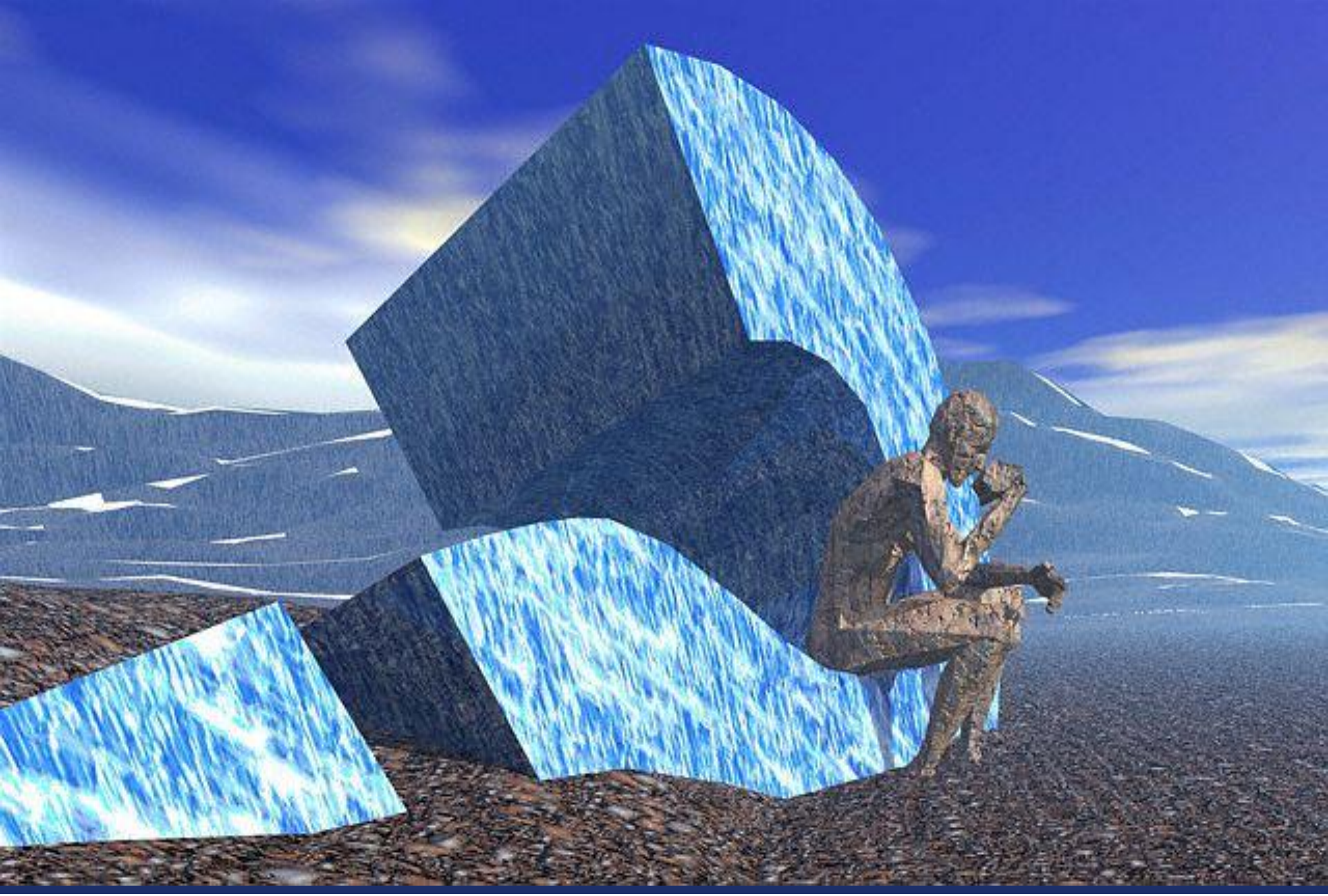
- A new RNAV PIRAT1 STAR is being developed to mirror the KSFO Pacific 2 TA.
- The PIRAT1 STAR would provide an OPD for non FANS aircraft.
- The Target Date for implementation is ???

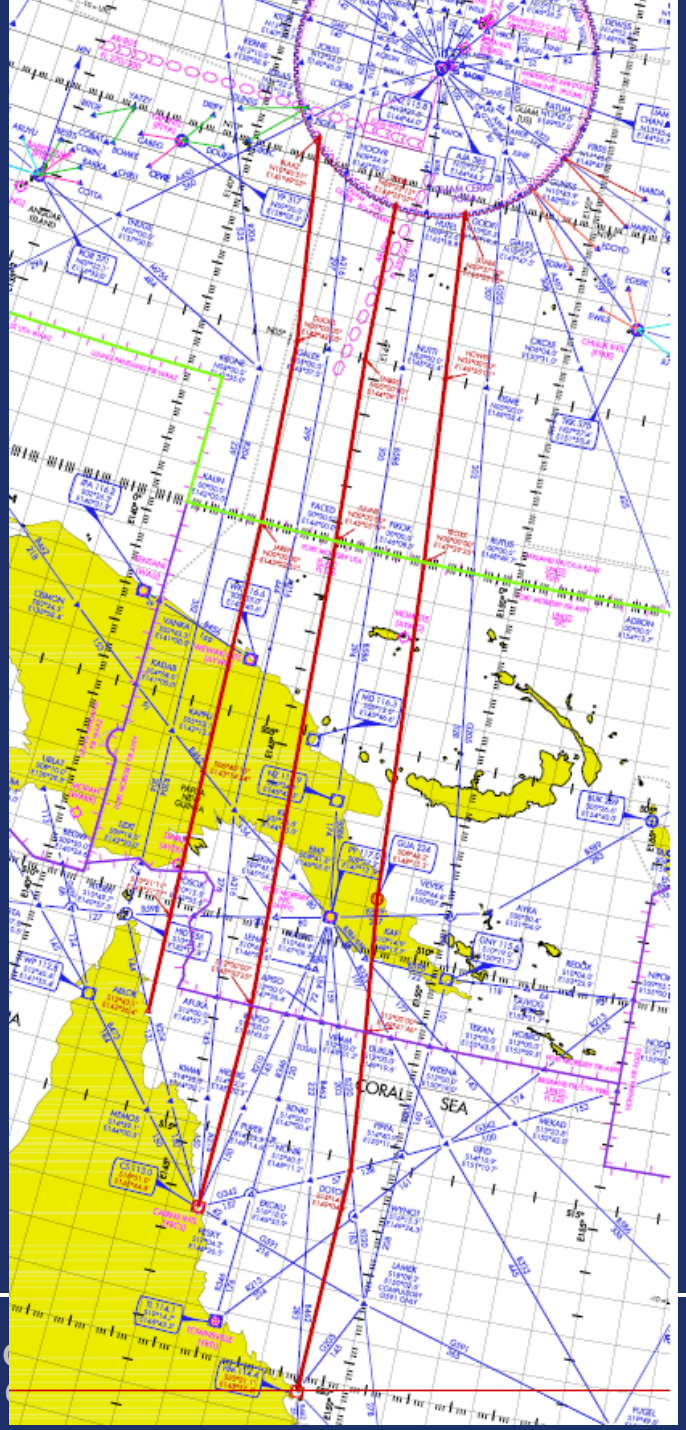
KSFO Time Based Metering



"Tailored" Arrivals





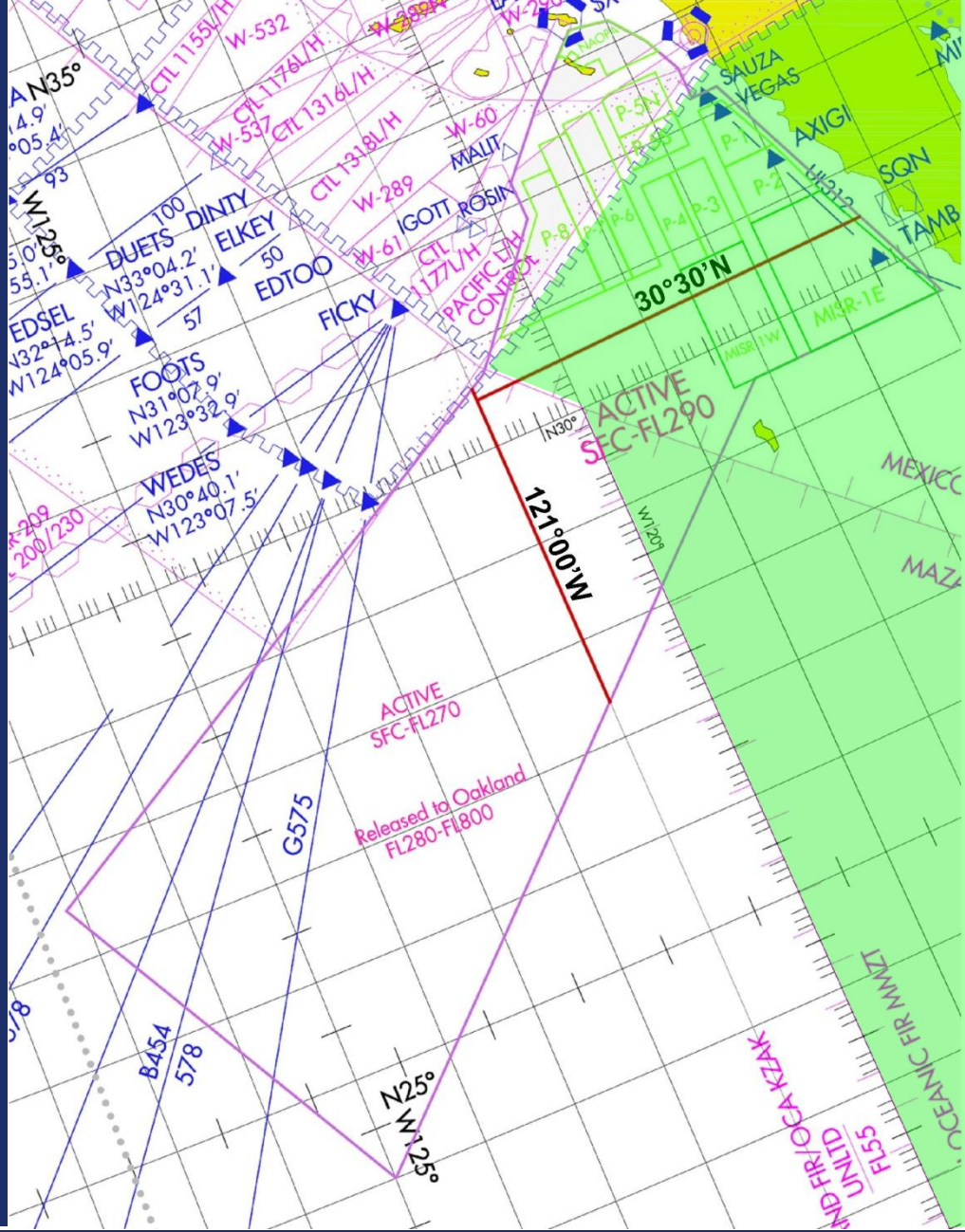


Port Moresby 50nm RNP10 Lateral Separation

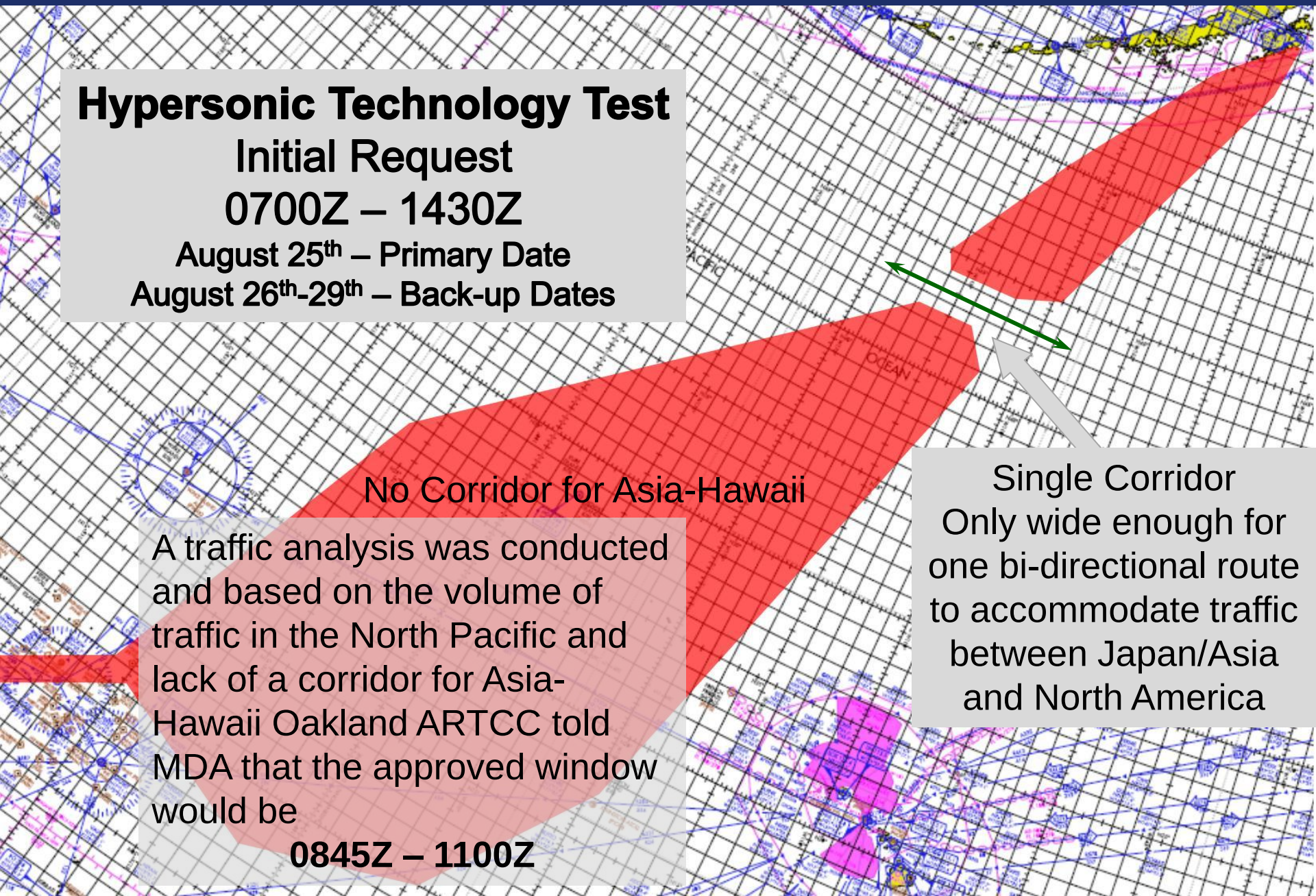
- 50nm lateral Sep began November 14, 2013
- Investigating New Routes
- D50 Longitudinal Separation

Mazatlan ACC

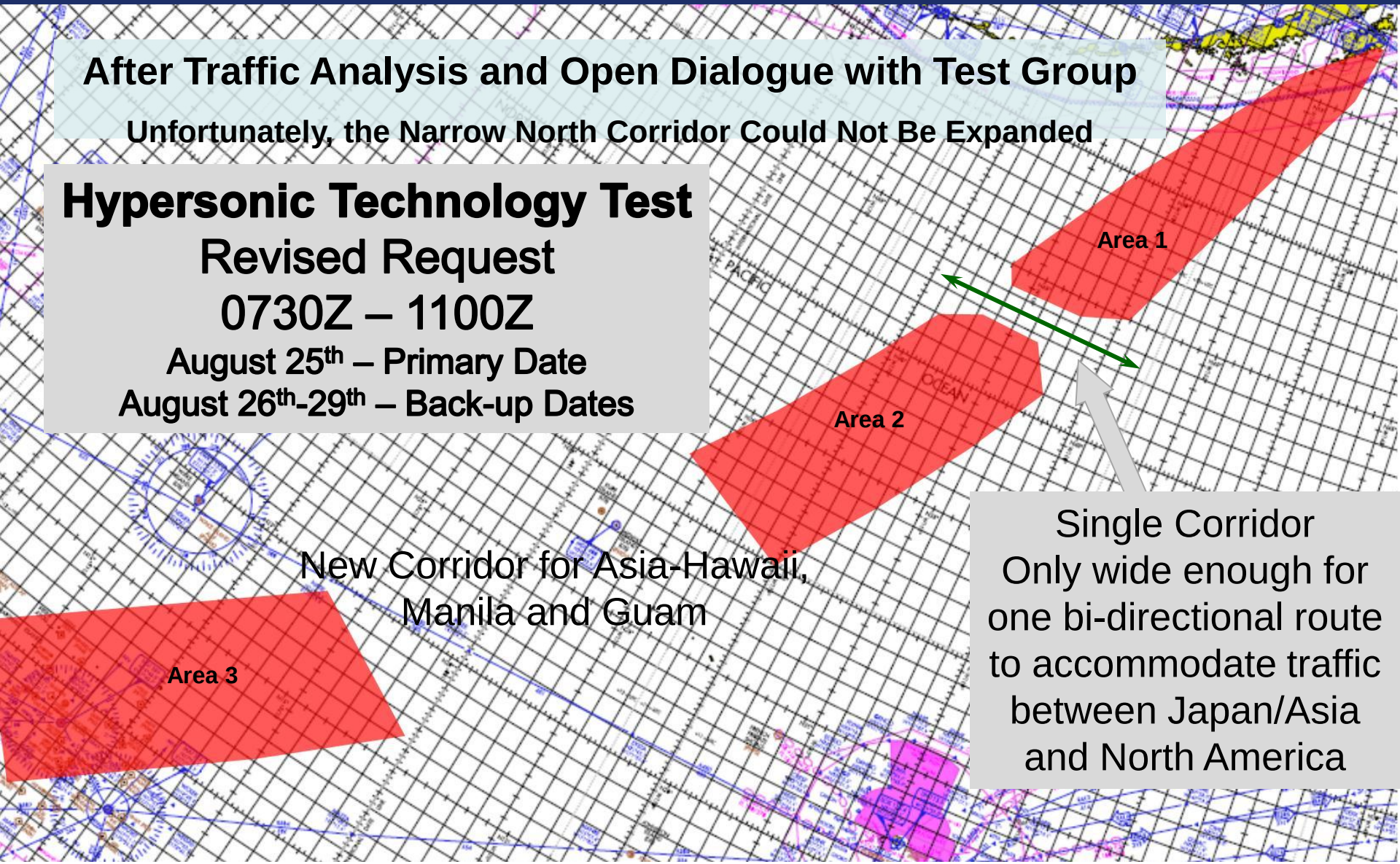
- FAA working to establish an AIDC connection between Oakland and Mazatlan.
- Mazatlan announced they are working to convert their Class G Airspace to Controlled Airspace.

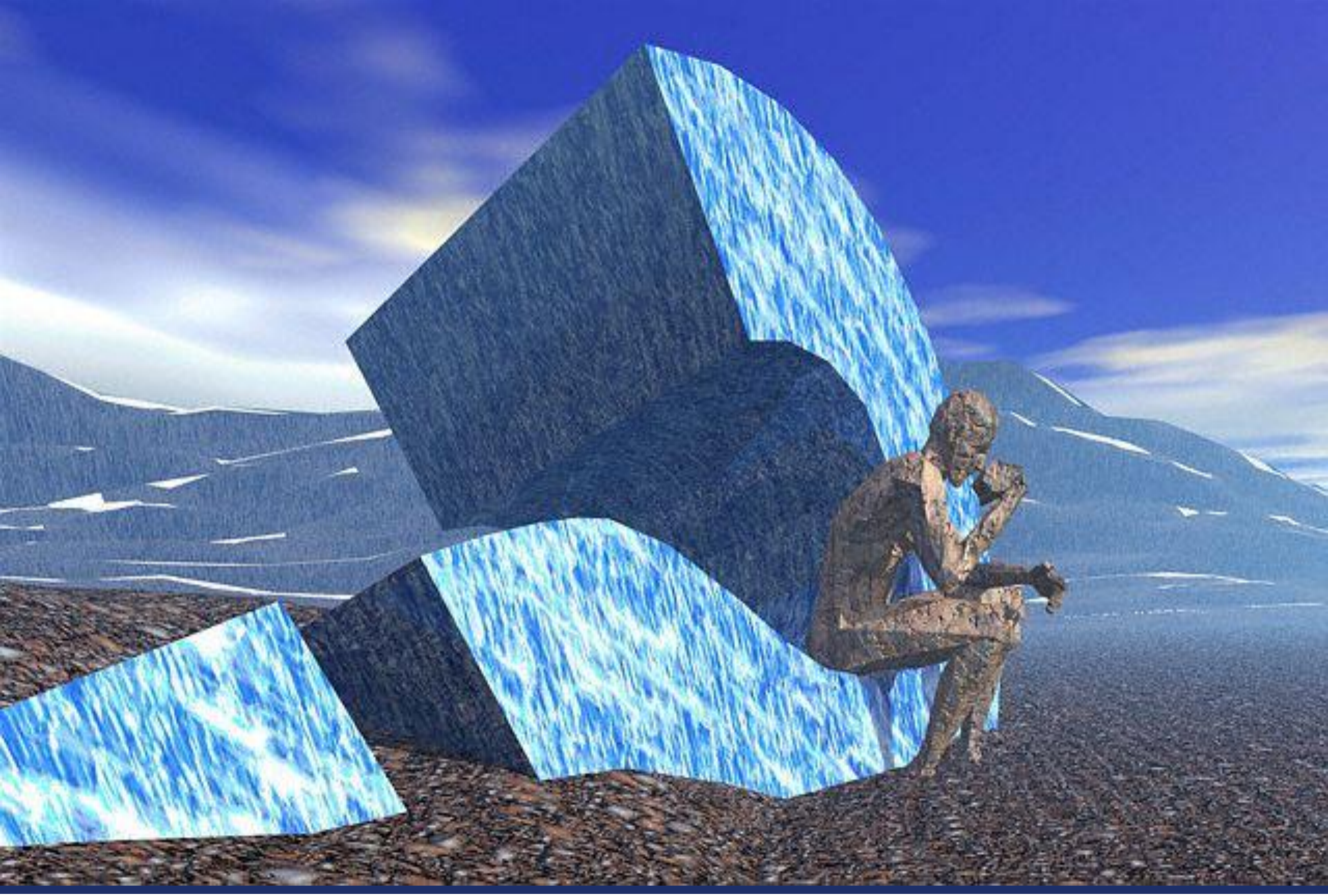


Impacts From Hypersonic Technology Test



Impacts From Hypersonic Technology Test





Volcanic Ash & PACOTS

Volcanic Ash & PACOTS Generation

- ICAO Doc 9974 Chapter 2 states:
- THE AIRCRAFT OPERATOR
- 2.3 ICAO's generic safety risk assessment process is described in the *Safety Management Manual* (SMM) (Doc 9859). An approach, aligned with an operator's SMS, would be equally appropriate. The material in this document is designed to provide States with information to support operators in developing the safety risk assessment, within their SMS, covering the volcanic cloud hazard.
-
- 2.4 Responsibilities
- The operator is responsible for the safety of its operations.
- In order to decide whether or not to operate into airspace forecast to be, or aerodromes known to be, contaminated with volcanic ash, the operator should have in place an identifiable safety risk assessment within its SMS.
- *Note.— Guidance on the production of a safety risk assessment is provided in Appendices 1 (Guidelines for completing a safety risk assessment), 2 (Procedures to be considered when conducting a safety risk assessment) and 3 (Hazards and risks to be considered by aircraft operators). Each operator should develop its own list of procedures and hazards since these have to be relevant to the specific equipment, experience and knowledge of the operator, and to the routes to be flown.*

Volcanic Ash & PACOTS Generation

- **ICAO's safety risk assessment process is described in the *Safety Management Manual* (SMM) (Doc 9859). An approach, aligned with an organization's SMS, would be equally appropriate.**

- **2.10 The State is advised that the CAA exercising oversight of an operator that intends to undertake operations into airspace forecast to be, or aerodromes known to be, contaminated with volcanic ash should establish a methodology for evaluating the safety risk assessment process of the operator's SMS particular to volcanic ash. The operator should not be prevented from operating through, under or over, airspace forecast to be affected by a VAA, VAG or SIGMET provided it has demonstrated in its SMS the capability to do so safely. The guidance set out in Appendix 6 indicates a process that the CAA can use to achieve this outcome.**

The ATC responsibilities are covered in ICAO Doc 4444 par 15.8:

15.8 PROCEDURES FOR AN ATC UNIT WHEN A VOLCANIC ASH CLOUD IS REPORTED OR FORECAST

15.8.1 If a volcanic ash cloud is reported or forecast in the FIR for which the ACC is responsible, the controller should:

a) relay all information available immediately to pilots whose aircraft could be affected to ensure that they are aware of the ash cloud's position and the flight levels affected;

b) suggest appropriate re-routing to the flight crew to avoid an area of known or forecast ash clouds;

c) inform pilots that volcanic ash clouds are not detected by relevant ATS surveillance systems;

d) if the ACC has been advised by an aircraft that it has entered a volcanic ash cloud the controller should:

1) consider the aircraft to be in an emergency situation;

2) not initiate any climb clearances to turbine-powered aircraft until the aircraft has exited the ash cloud; and

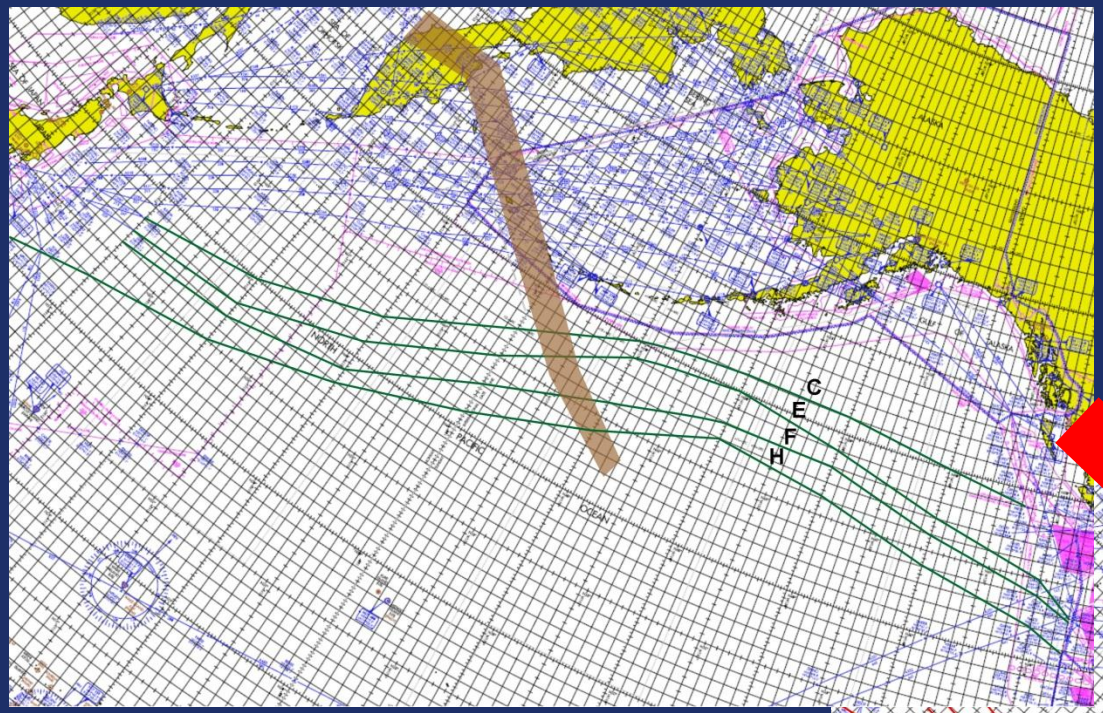
3) not initiate vectoring without pilot concurrence.

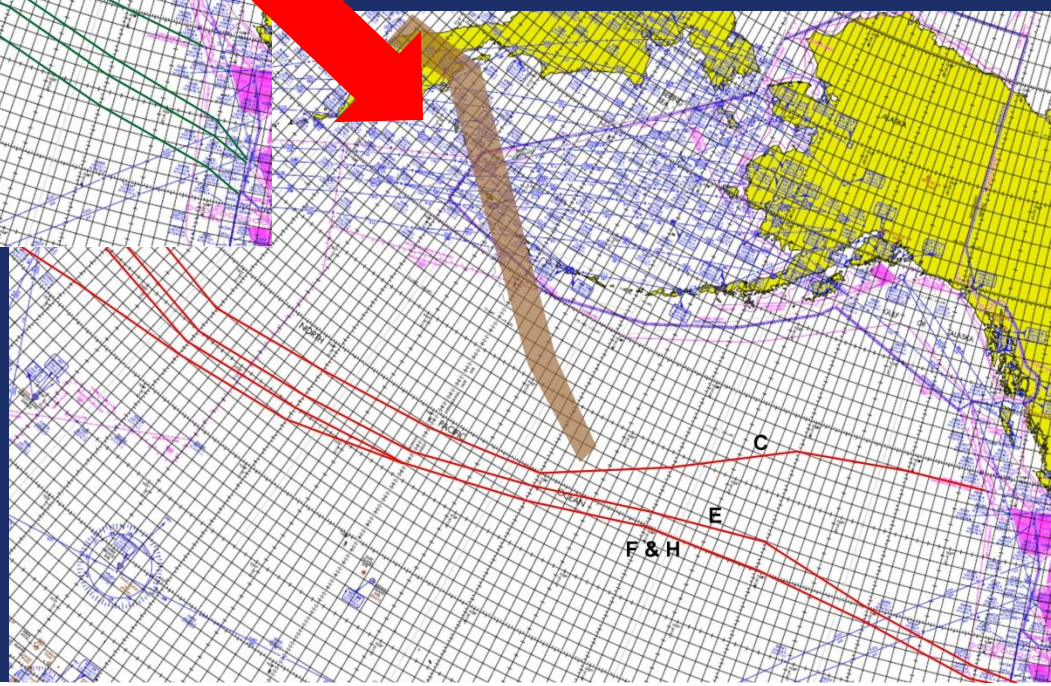
Note.— Experience has shown that the recommended escape manoeuvre for an aircraft which has encountered an ash cloud is to reverse its course and begin a descent if terrain permits. The final responsibility for this decision, however, rests with the pilot.

Volcanic Ash & PACOTS Generation

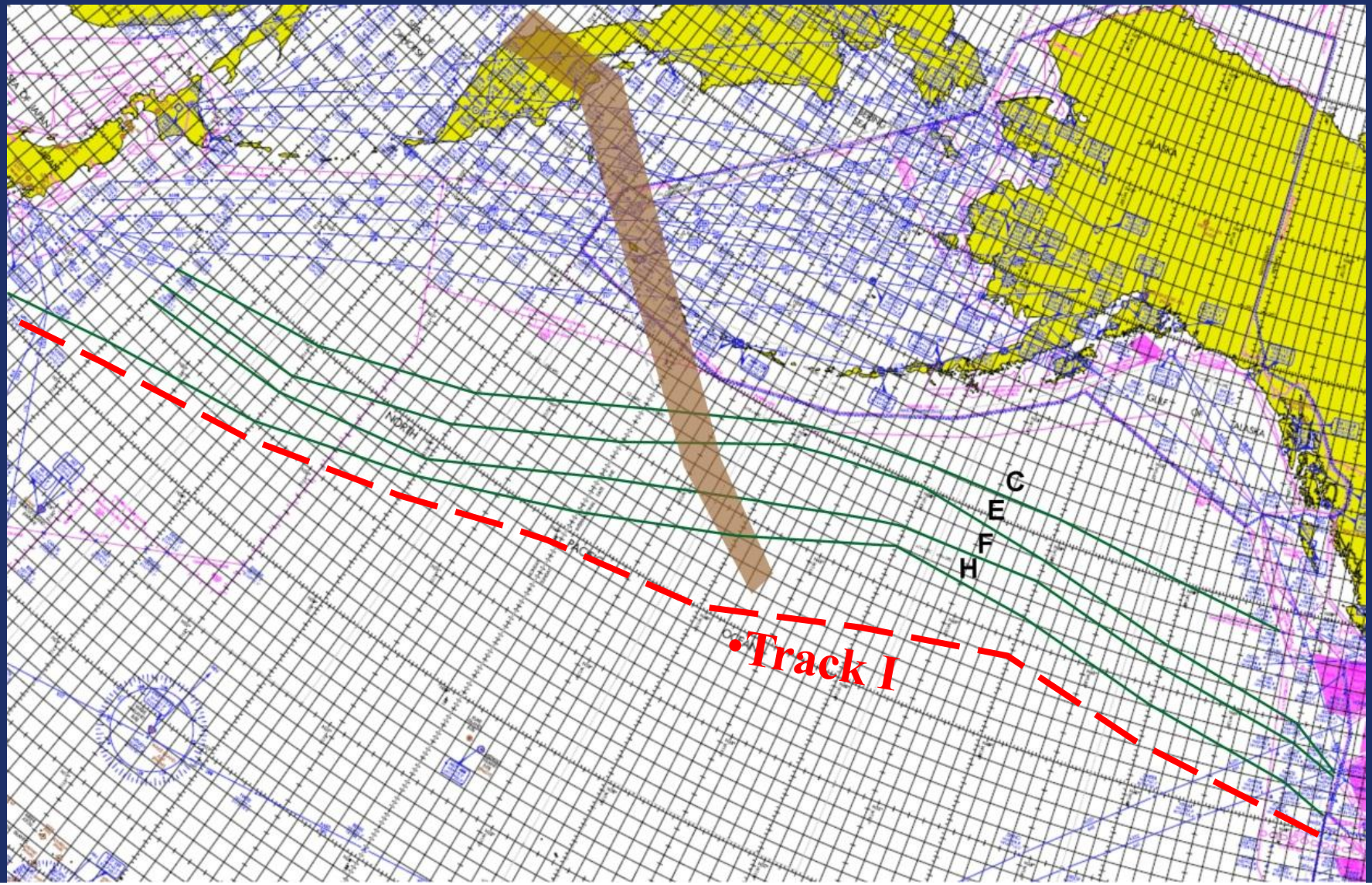
- **VOLKAM13 (IPACG39 Paper IP11)**
- **October 2013, Kamchatka Volcano Klyuchevskoy Eruption.**
- **Ad-hoc telecon to discuss PACOTS and Ash Plume**
  - Need for international dispatchers on telecon.
- **Decision was made to move PACOTS south around Ash Plume**
- **Ash Plume was found to be lower than forecast**

Volcanic Ash & PACOTS Generation





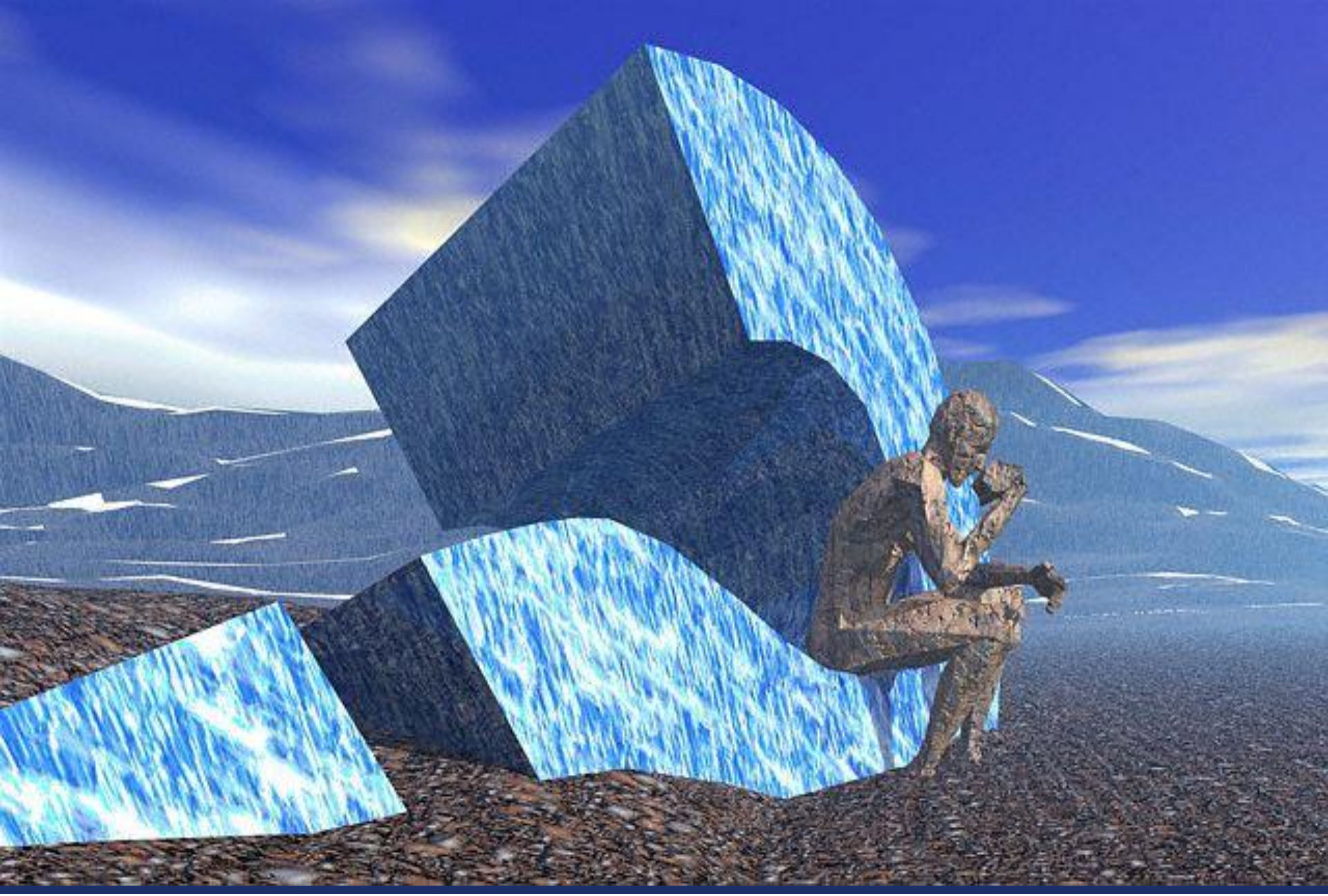
Volcanic Ash & PACOTS Generation



Federal Aviation Administration

Volcanic Ash & PACOTS Generation

- **IPACG40, in the event of an Ash Plume:**
- **Critical Event Contact List (CECL)**
  - 24 Hour Emergency Contact List
  - Emails
  - Cell Phone #, Text Notification
- **Collaborative Decision Making (CDM)**
  - When time allows
  - Allow 1 hour lead time when possible
- **Online Meetings**
  - No Cost Phone Calls
  - Control extraneous noise
  - Visual Impact Display
- **Discuss Options**
- **Reach Consensus Plan**



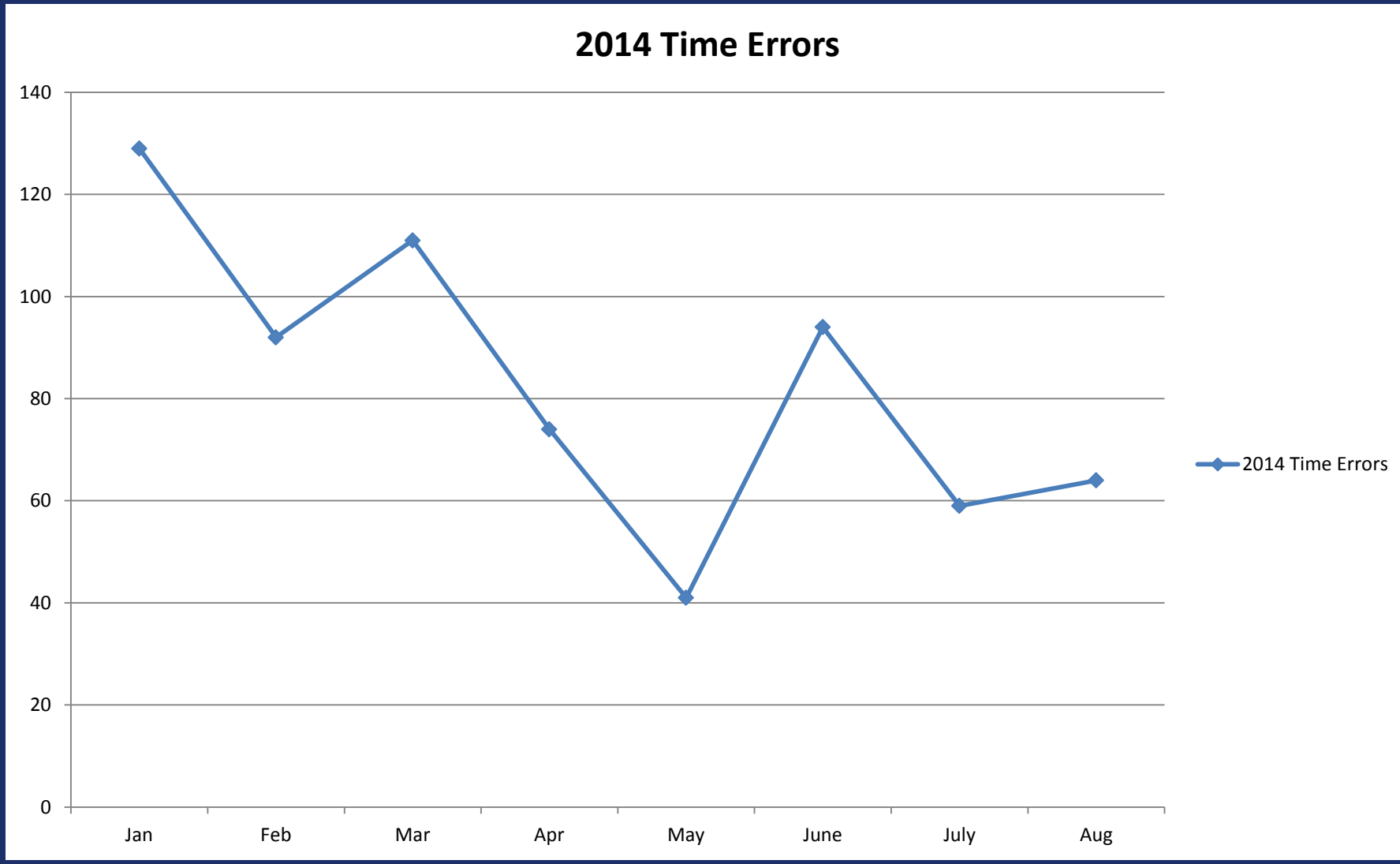
ICAO Annex 2 3.6.2.2 change

- *3.6.2.2 Inadvertent changes. In the event that a controlled flight inadvertently deviates from its current flight plan, the following action shall be taken:*
- *a) Deviation from track: if the aircraft is off track, action shall be taken forthwith to adjust the heading of the aircraft to regain track as soon as practicable.*
- *b) Variation in true airspeed: if the average true airspeed at cruising level between reporting points varies or is expected to vary by plus or minus 5 per cent of the true airspeed, from that given in the flight plan, the appropriate air traffic services unit shall be so informed.*
- *c) Change in time estimate: if the time estimate for the next applicable reporting point, flight information region boundary or destination aerodrome, whichever comes first, is found to be in error in excess of 2 minutes from that notified to air traffic services, or such other period of time as is prescribed by the appropriate ATS authority or on the basis of air navigation regional agreements, a revised estimated time shall be notified as soon as possible to the appropriate air traffic services unit.*
-
- *3.6.2.2.1 Additionally, when an ADS agreement is in place, the air traffic services unit shall be informed automatically via data link whenever changes occur beyond the threshold values stipulated by the ADS event contract.*

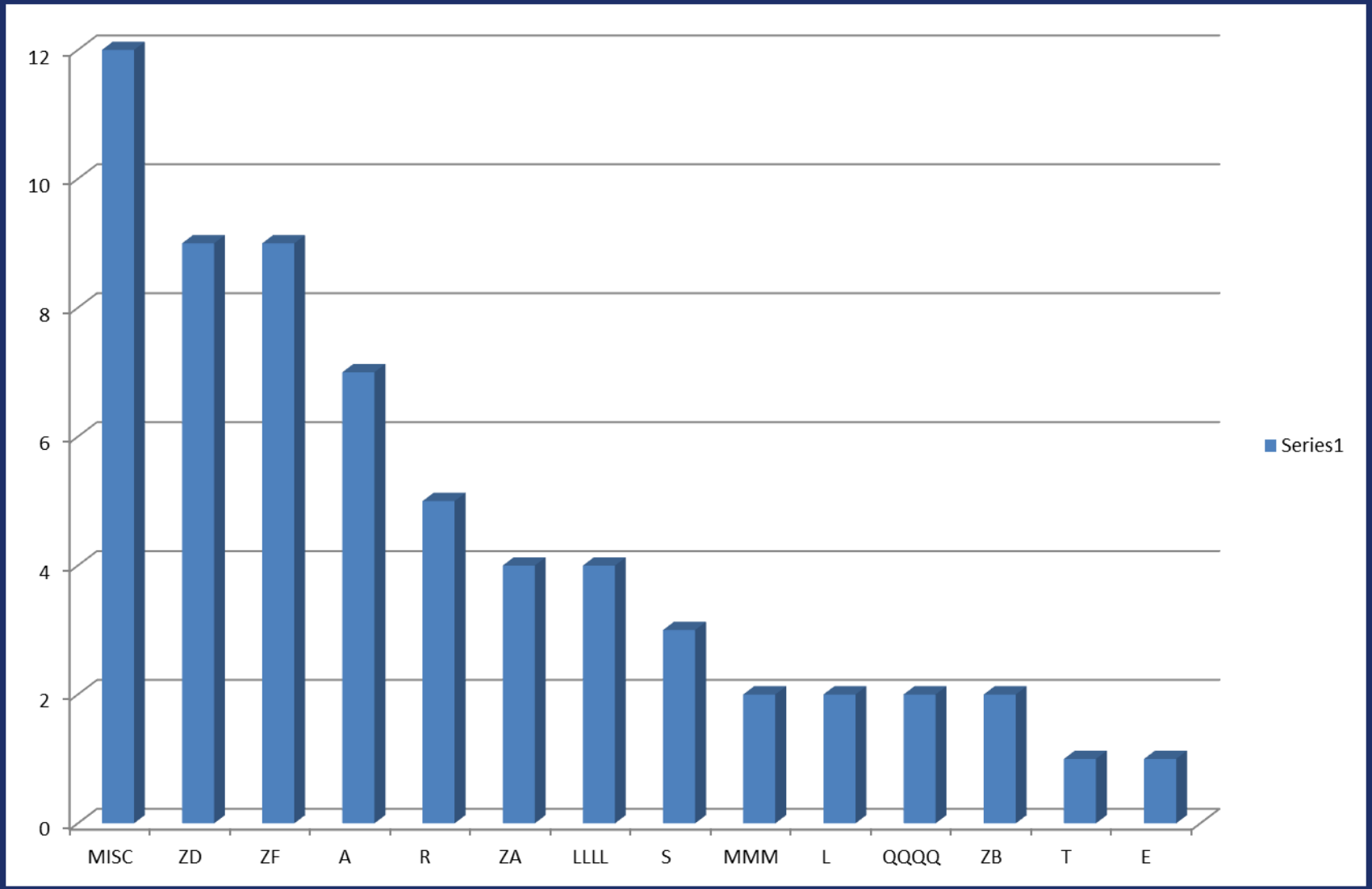
Oceanic Navigation Error Reporting

- **FAA requires reporting of Oceanic Navigation Errors:**
  - GNE (Gross Navigation Error) 25nm or more.
  - Intervention: Aircraft on different route than ATC.
  - Height Error: 300 feet or more.
  - Time Errors: Pacific = More than 3 minutes
- **ONER Reports are forwarded to:**
  - Flight Standards
  - Technical Center, Airspace Safety Calculations.
- **Oakland has automated Time Error tracking and reporting.**

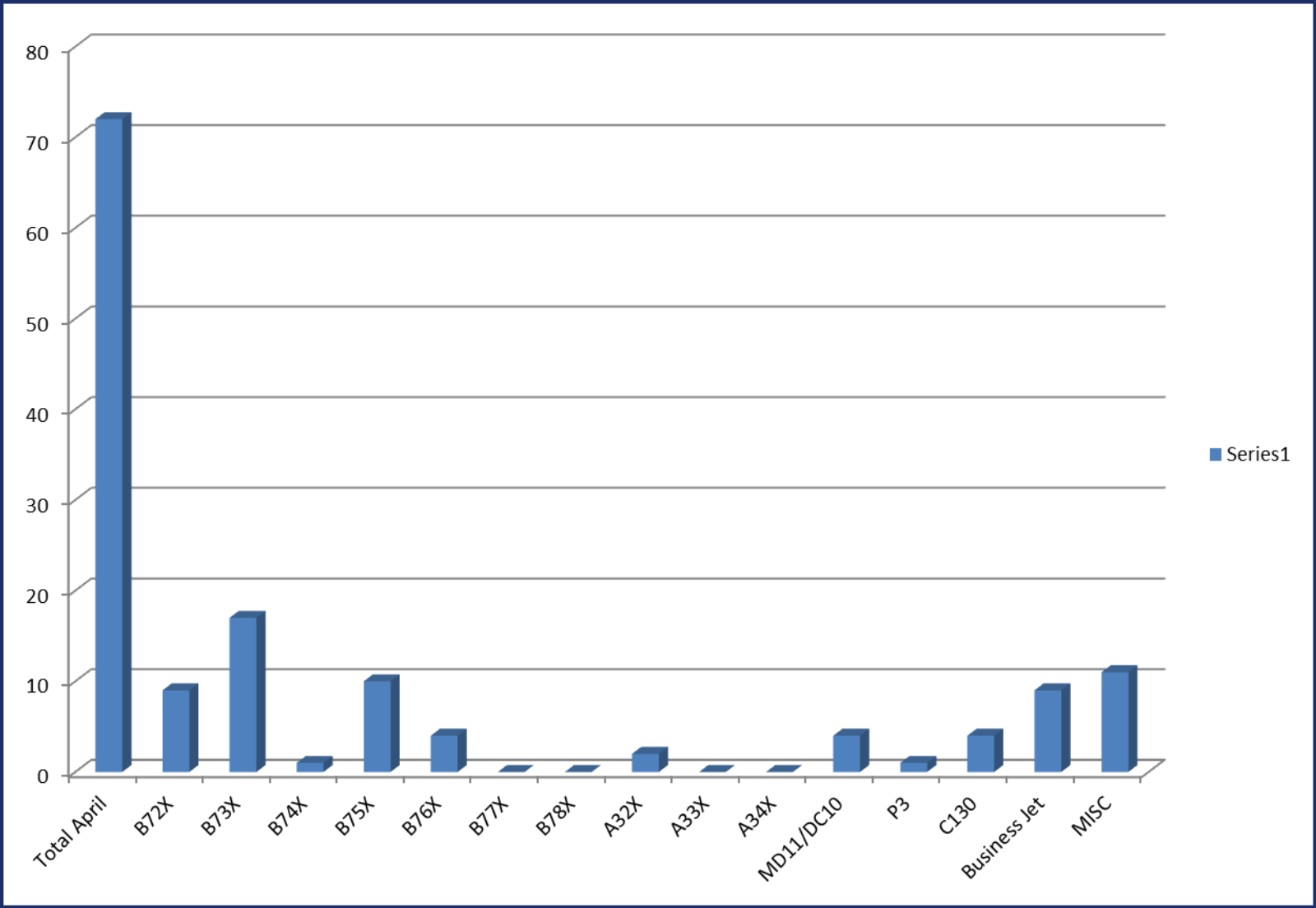
ONER Time Errors

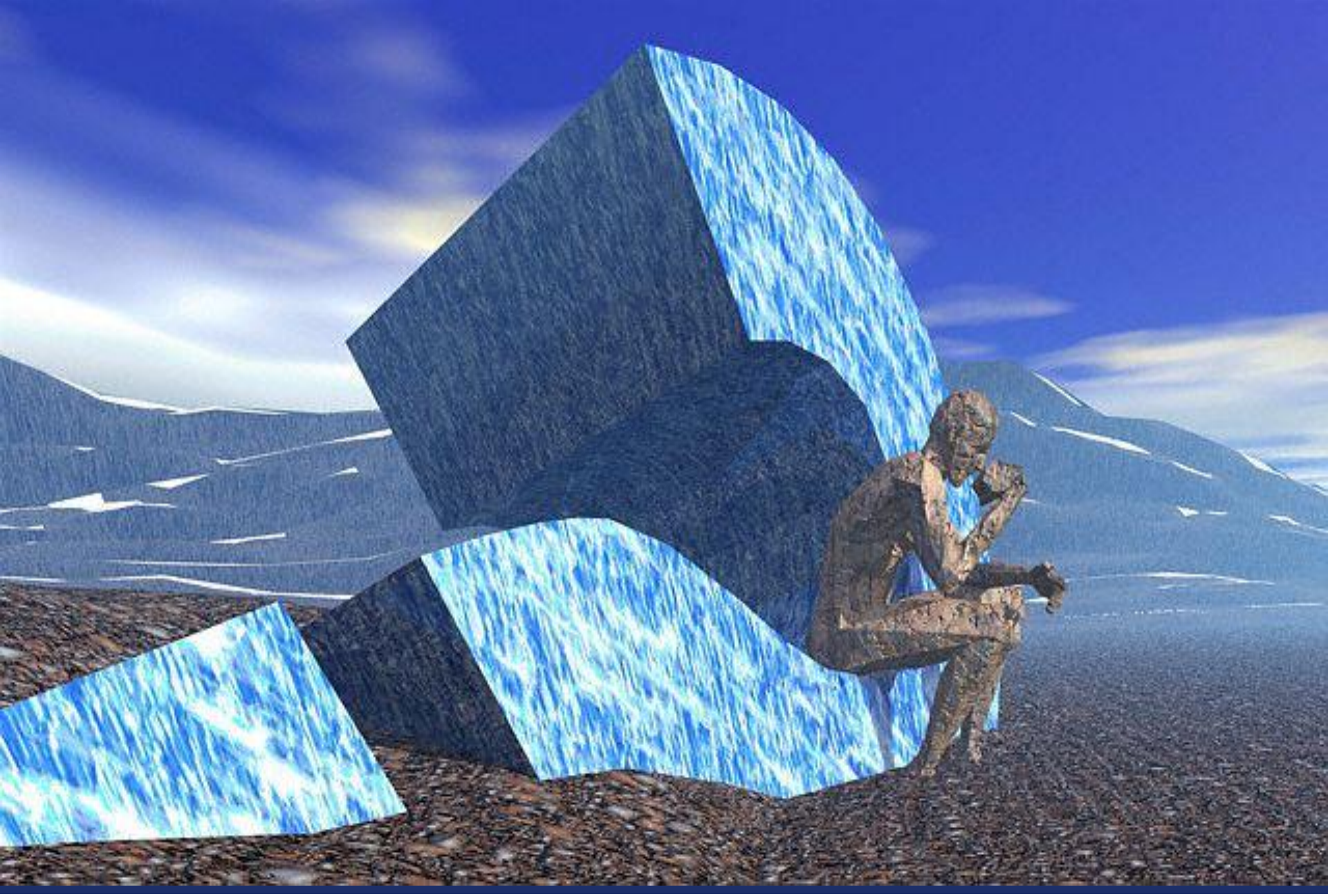


April Operator ONER Time Errors



ONER Time Errors April 2014





Advanced Technologies & Oceanic Procedures (ATOP)

ATOP Work Package 1 (WP1) Benefits Discussion

October 8, 2014

Kevin King
MCR

Agenda

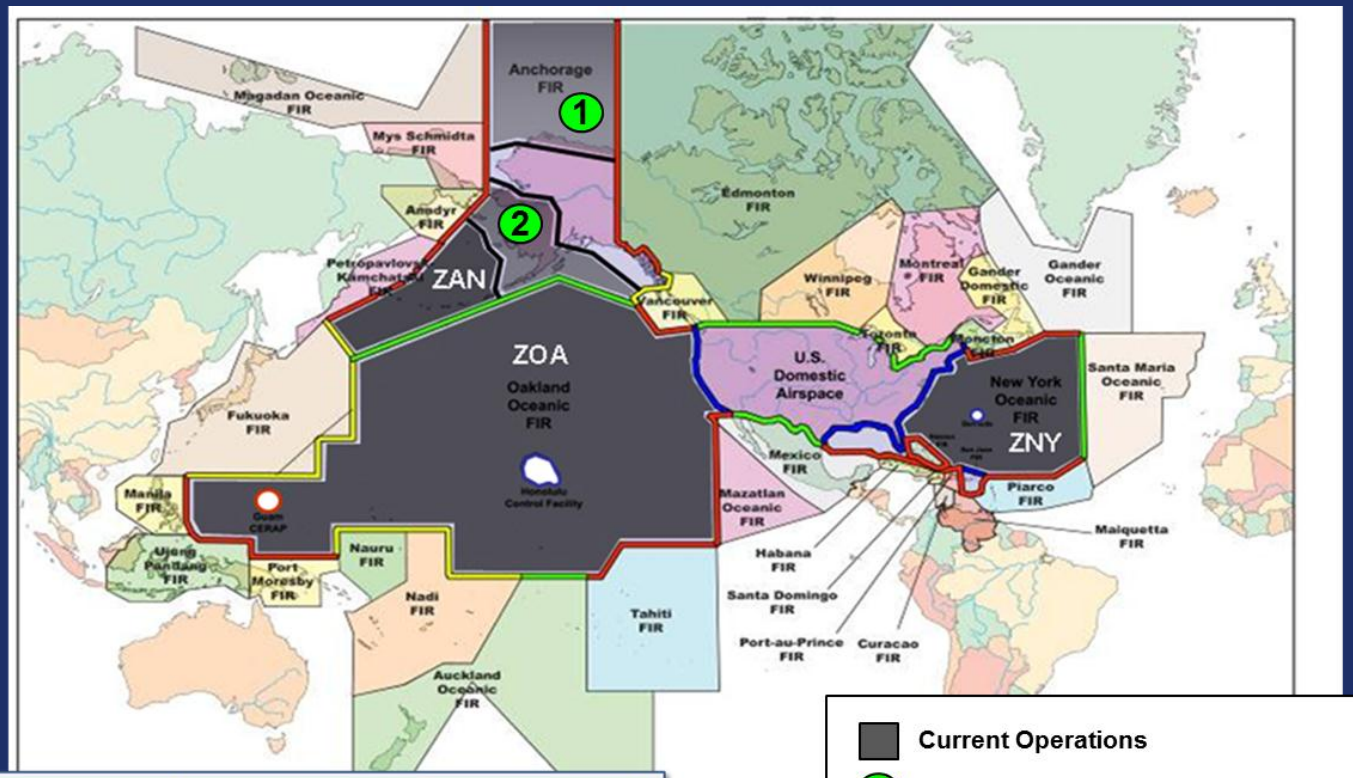
- ATOP System Overview
- ATOP Investment Analysis Overview
- ATOP Work Package 1 Candidates
- Potential Benefits of WP1 Candidates (to Airlines and ANSPs)
- Q&A

ATOP Overview

ATOP allows properly equipped aircraft and qualified aircrews to operate using reduced oceanic separation criteria resulting in more optimal routes and enhanced flight time (and fuel and payload) efficiency during oceanic legs of flight

- **System Capabilities**
  - Integrated radar & non-radar capabilities
  - Enhanced conflict probe
  - System-maintained electronic flight data
  - Automatic Dependent Surveillance - C
  - Controller-Pilot Data Link Communications (CPDLC)
  - Air Traffic Services Inter-facility Data Communications (AIDC)
  - High Frequency (HF) Radio Operator interface
  - Integrated Monitor and Control (M&C)
  - 24/7 Operations (dual channel architecture)
- **Benefits**
  - Reduced separation standards
  - Increased sector capacity and throughput
  - Increased controller efficiency
  - Reduced delays and restrictions
  - Increased predictability

ATOP Controlled Airspace



Facility	Miles of Airspace	Flights per Day[1]
New York (ZNY)	3.3M sq miles	564
Oakland (ZOA)	18.6M sq miles	607
Anchorage (ZAN)	2.8M sq miles	163

[1] Avg Operations from March 2011 to April 2012

ATOP Investment Analysis

- **Capital budget of $548M established in 2001 to support deployment of the ATOP system (2005 to 2007), tech refresh (2009), and enhancement development through FY15**

F&E	Total	00-03	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Budget Summary														
APB (Official Baseline 05/01/01)	**548.2**	**256.7**	**68.7**	**50.4**	**35.1**	**31.7**	**52.0**	**23.1**	**12.3**	**5.8**	**5.3**	**7.1**		
Offiical/Proposed Budget Adjustments	*14.6*	*(11.0)*	*(2.0)*	*(2.9)*	*-*	*(0.8)*	*0.8*	*8.6*	*0.4*	*15.0*	*9.7*	*(8.1)*	*2.8*	*2.0*
Rescissions	*(37.3)*	*(0.7)*	*(0.4)*	*(0.4)*	*(0.4)*	*-*	*-*	*(11.0)*	*(5.0)*	*(16.8)*	*(11.0)*	*4.8*	*2.0*	*1.5*
Adjusted Official/ Proposed Budget	**525.4**	**245.0**	**66.3**	**47.2**	**34.7**	**30.9**	**52.8**	**20.7**	**7.7**	**4.0**	**4.0**	**3.8**	**4.8**	**3.5**
Internal Reprogrammings	*(12.0)*	*(11.5)*	*0.7*	*0.8*	*(0.8)*		*(0.1)*		*(0.8)*	*(0.4)*				
Current Official CIP (dated 9/20/13)	**513.4**	**233.5**	**67.0**	**48.0**	**33.9**	**30.9**	**52.7**	**20.7**	**6.9**	**3.6**	**4.0**	**3.8**	**4.8**	**3.5**

Remaining Planned F&E Budget

- **Creation of new programs are needed after 2015 to continue ATOP functional enhancements and perform a second tech refresh**

ATOP Investment Analysis

- **Investment Analysis Readiness Decision (January 2015)**
  - Development of Program Requirements and Concept of Operations for candidate enhancement
  - Development of ROM life cycle cost model
  - Development of Shortfalls and Benefits

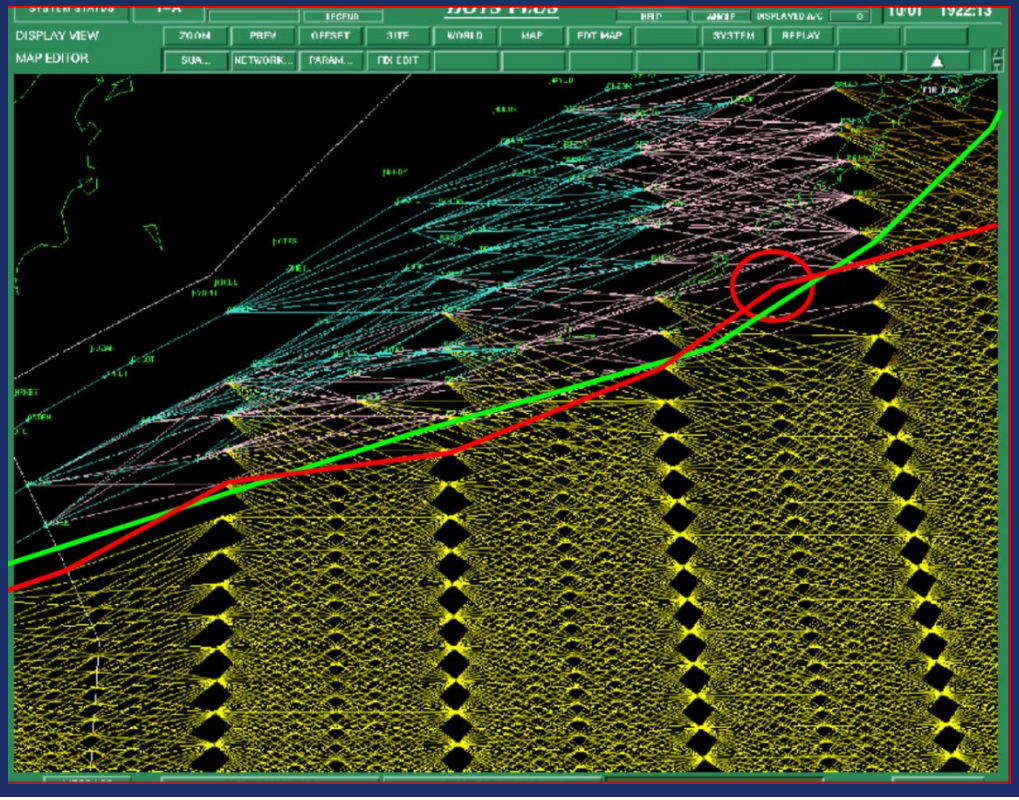
- **Final Investment Decision (January 2016) - establishes program and creates a multiyear funding stream**
  - Development detailed system requirements
  - Development of detailed life cycle cost model
  - Development of Business Case

Evaluating Shortfalls

- **The shortfalls analysis considers the potential benefit to society as a whole**
  - FAA (e.g. equipment maintenance cost savings, safety)
  - Airlines (e.g. fuel savings)
  - Passengers (e.g. delay reduction)
  - Community (e.g. emissions reduction)
- **Evaluations of shortfalls can be:**
  - Qualitative (e.g. description of link between capability and reduction in operational errors)
  - Quantitative (e.g. tons of CO_2 reduced)
  - Monetized (e.g. dollar value of fuel saved)

Shortfalls of Interest

Capability	Shortfall	Metric
Enhanced Controller Coordination	Inefficiencies in controller coordination within the ATOP system for flights persisting in the vicinity of FIR boundaries	Safety
		Fuel Burn



Shortfalls of Interest

Capability	Shortfall	Metric
Data Exchange via SWIM	Inability of the ATOP system to provide real-time flight data, SAR and SYNC data to authorized users	Qualitative
	Suboptimal flight profiles from lack of real-time knowledge of SAA status and NOTAMs	Safety
		Fuel Burn

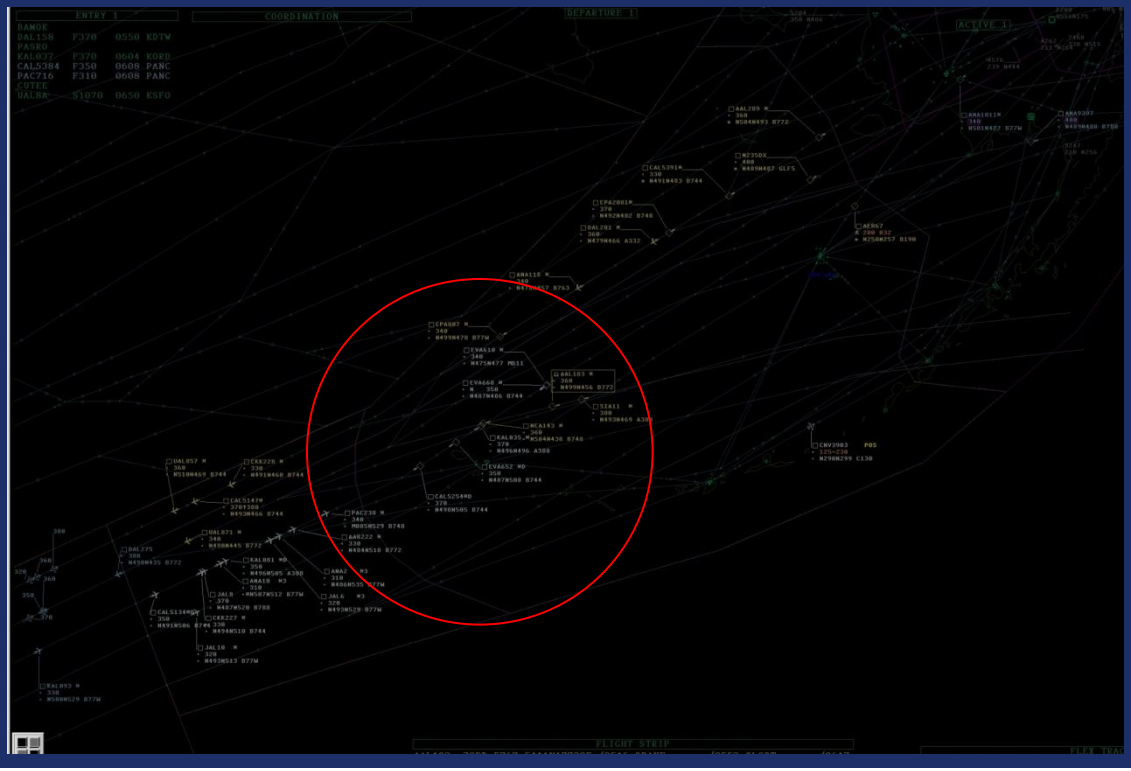
Shortfalls of Interest

Capability	Shortfall	Metric
Expanded Oceanic International Interfaces	Inefficiencies in controller coordination between the ATOP system and external ANSPs	Safety
		Fuel Burn

- **AIDC Version 3 provides for a more efficient transfer of the aircraft FANS Connection**
- **FCN message from the transferring ATSU lets the receiving ATSU know they are the CDA**
- **Required Boundary CPDLC Position Report**

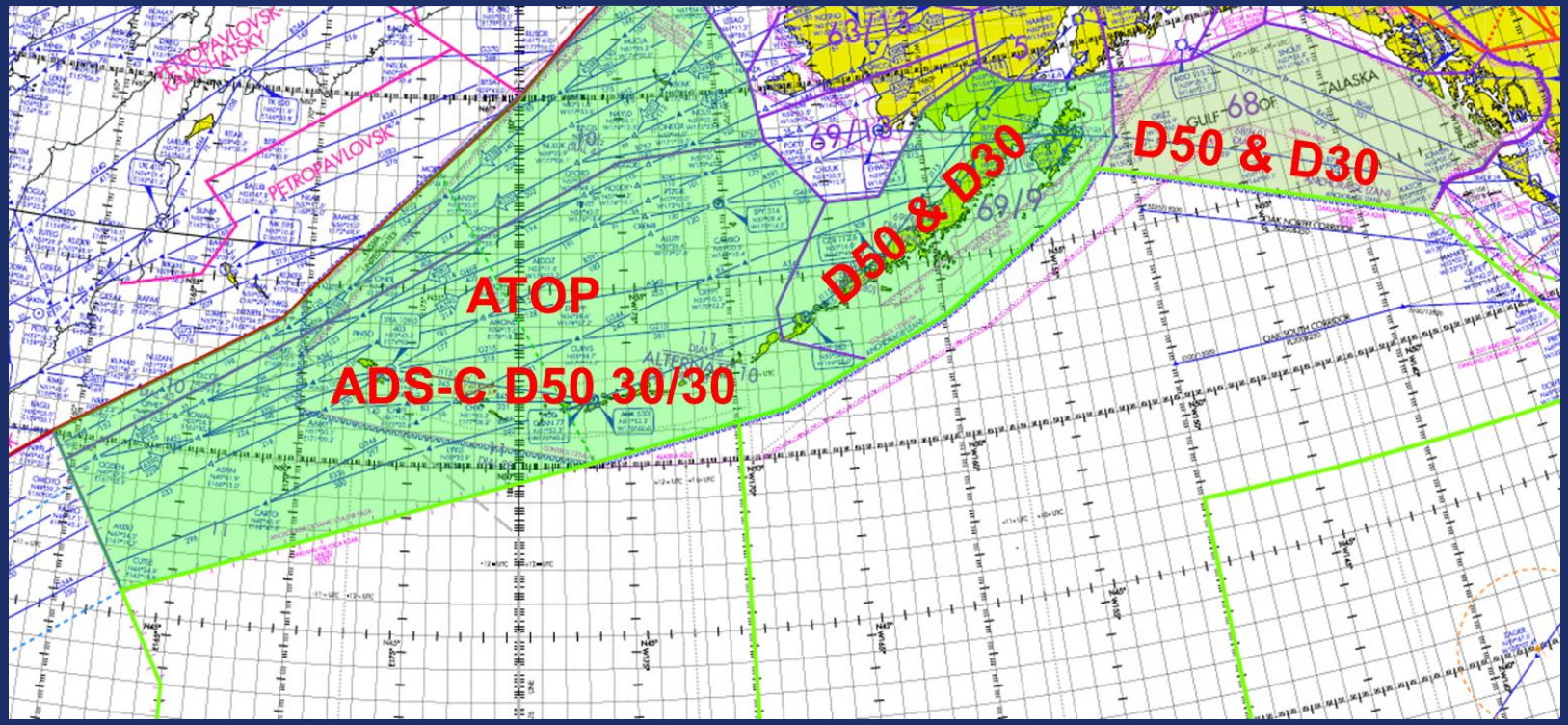
Shortfalls of Interest

Capability	Shortfall	Metric
Enhanced Conflict Probe for ATOP Surveillance Airspace	Manual conflict detection and resolution in surveillance airspace	Safety
		Fuel Burn



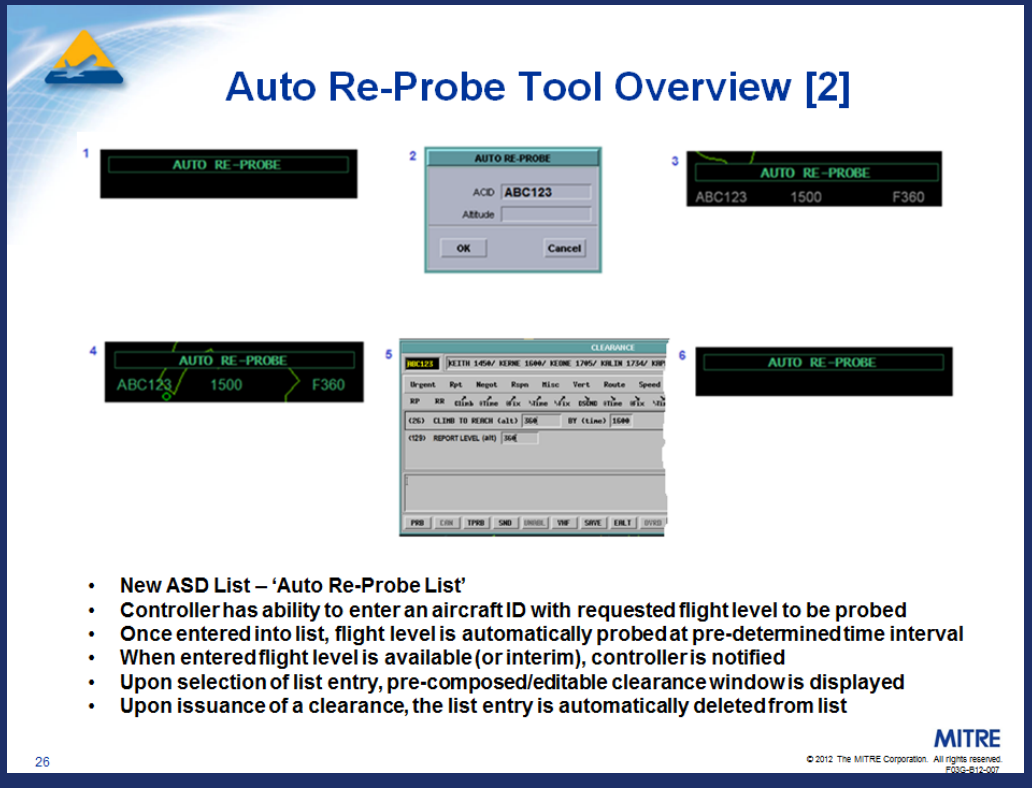
Shortfalls of Interest

Capability	Shortfall	Metric
ATOP in Stratified Surveillance Sectors	Inefficiencies in controller coordination between the ATOP system and operating systems of adjacent stratified surveillance sectors	Safety
		Fuel Burn



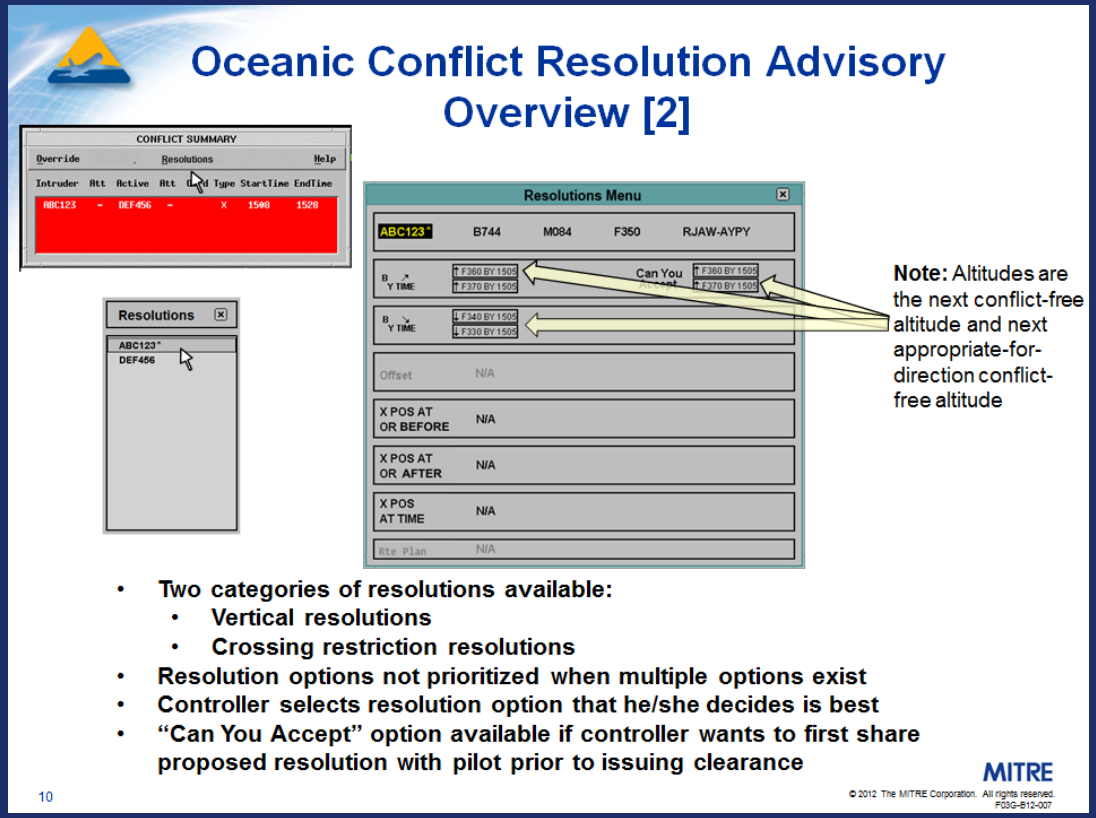
Shortfalls of Interest

Capability	Shortfall	Metric
Auto Re-Probe	Inefficient use of airspace capacity resulting from manual controller process to keep track of denied altitude clearance requests	Fuel Burn



Shortfalls of Interest

Capability	Shortfall	Metric
Conflict Resolution Advisory	Inefficient use of airspace capacity resulting from manual processing for conflict resolution	Fuel Burn



- Contact Information
- Kevin King
- 202-507-4609
- kmking@mcri.com


BOEING 777
ATC
FLIGHT INFORMATION
COMPANY
REVIEW
MANAGER
NEW MESSAGES
2319z
ATC UPLINK
AT N1400.0E17000.0 CLEARED
ROUTE CLEARANCE
ORIGIN:PGUM
DEST:PHNL
DEPARTURE:06
VIA
TO
DIRECT
N1330.0W18000.0
DIRECT
N1400.0W17400.0
DIRECT
N1800.0W16500.0
DIRECT
MCFLY
DIRECT
CHOKO
DIRECT
GECKO
DIRECT
HNL
ACCEPT
LOAD FMC
PRINT
DISPLAY REQUEST
REJECT REASONS
REJECT
RTE 2
2/3
VIA
TO
DIRECT
N14E170
DIRECT
N13W180
DIRECT
N14W174
DIRECT
N18W165
DIRECT
MCFLY
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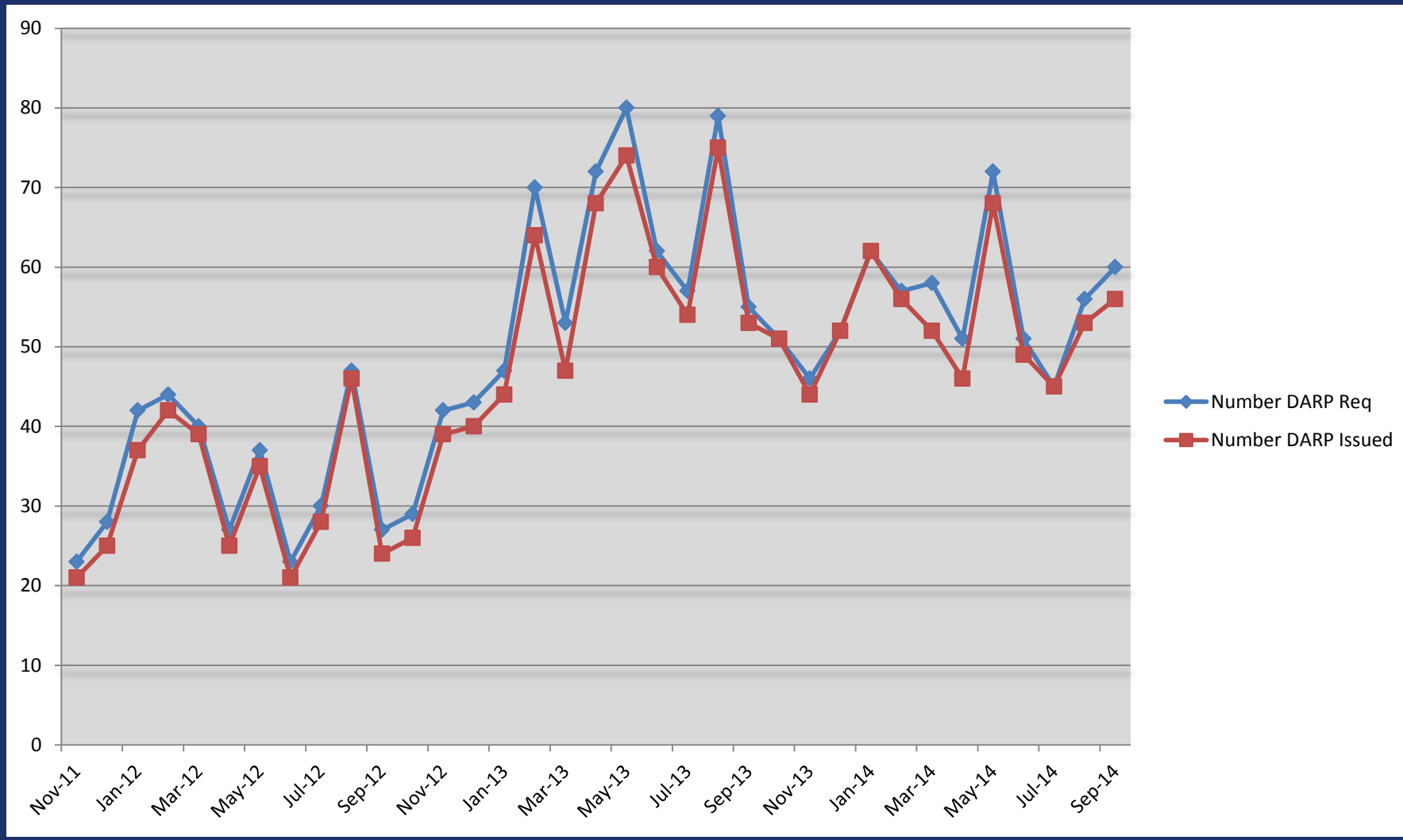
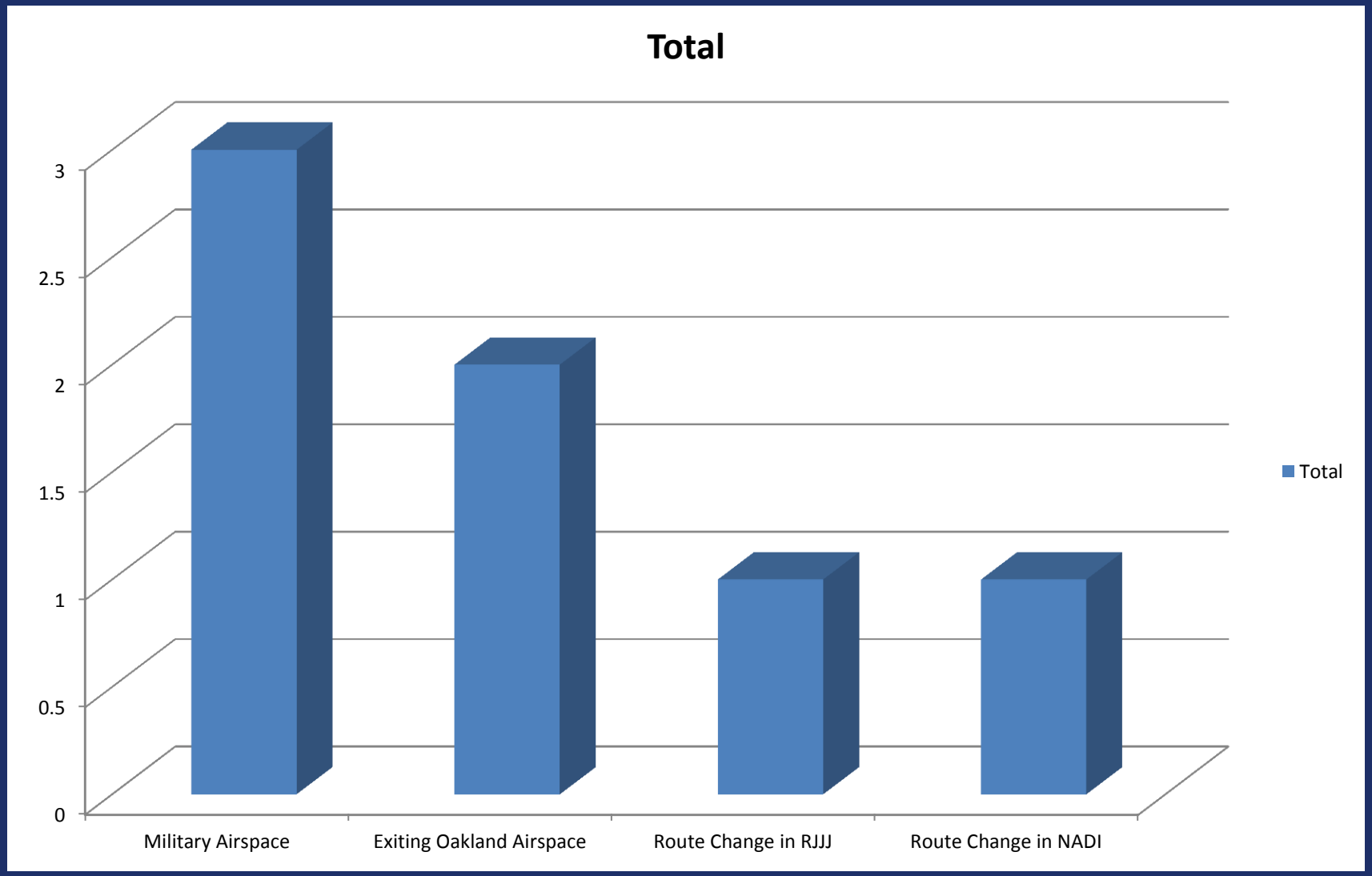
ACTIVATE>
ACT RTE 1 LEGS
084°
237NM
N14E170
081°
583NM
N14W180
071°
355NM
N15W174
055°
570NM
N19W165
046°
117NM
AJINK
<RTE 2 LEGS
DISARM
OFF
MAX AUTO
RTO

DARPS

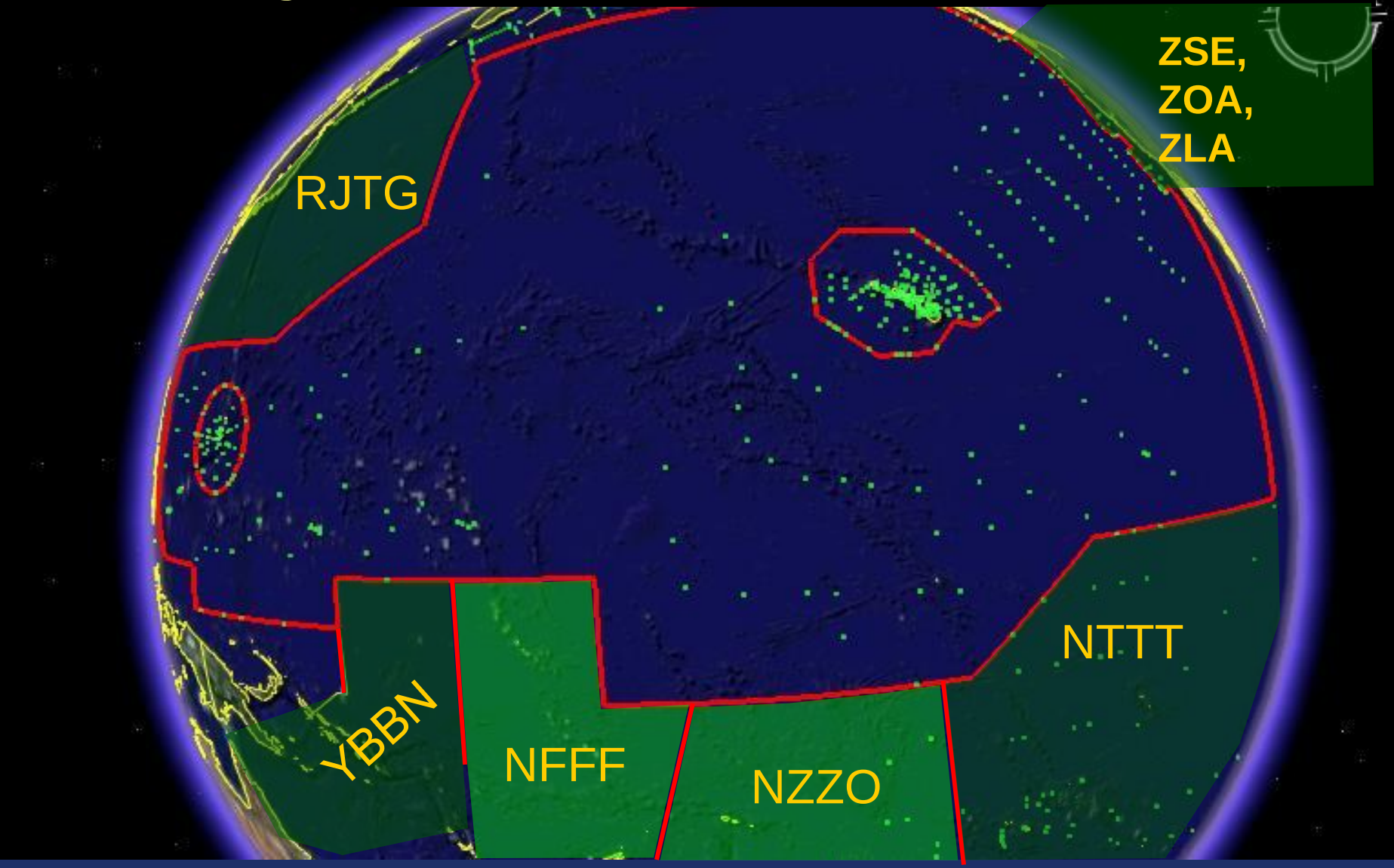
Oakland FIR DARP Usage



Oakland FIR DARP Usage



Dynamic Airborne Reroutes



Dynamic Airborne Reroutes

- DARP Procedure requires AIDC.
- AIDC is required between all facilities to destination.
- Do not request a DARP Reroute into FIRs that do not support the procedure.

JCAB DARP Operations

- **Requirements for DARP usage on flights to Hawaii.**

- **Pre-Coordinate DARP Flight Requests with ATMC:**
  - atmc_ocean@cab.mlit.go.jp

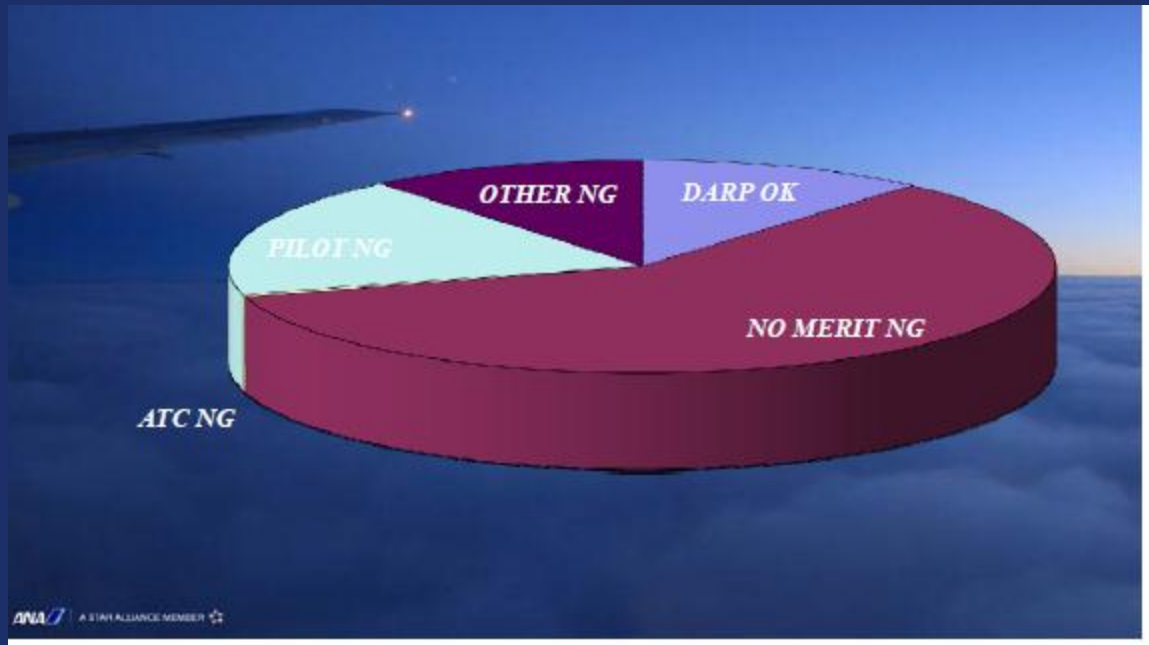
- **Operational CPDLC is required for aircraft requesting airborne DARP reroutes.**

Feed Back on the advantages of DARP Operation ANA

IPACG/39
Fukuoka, Japan
February 5-6, 2014

ANA | A STAR ALLIANCE MEMBER

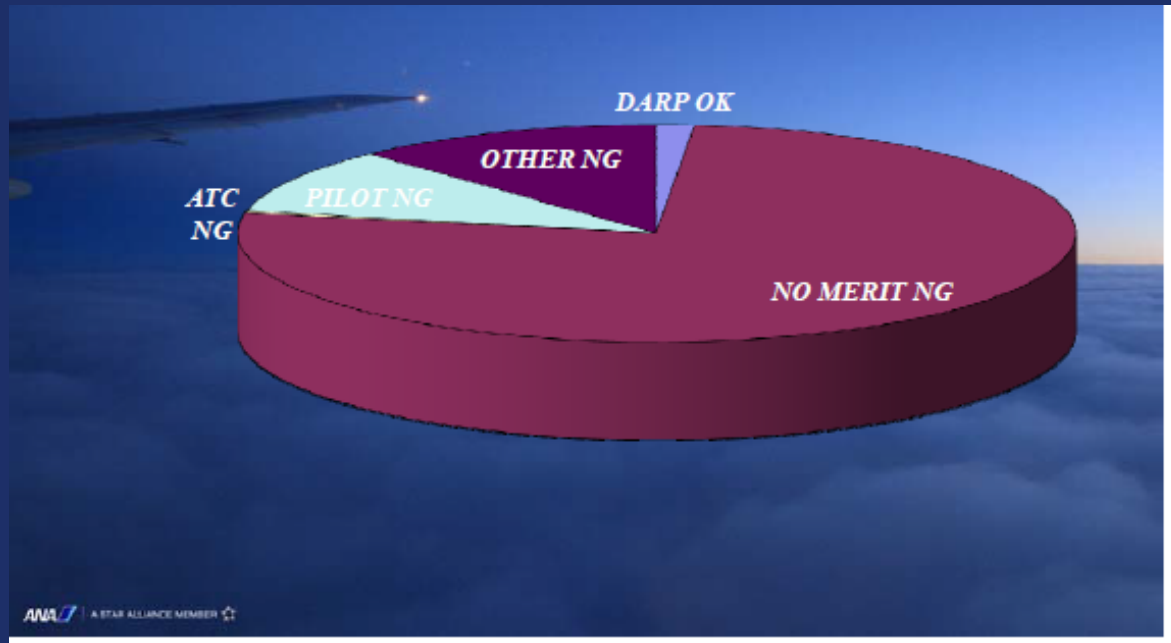
•Detail Result (HNL - TYO)



NH1051, NH1061		
25 DEC 2011 -	31JUL2014	
DARP OK	11%	214 Flts
NO MERIT NG	59%	1115 Flts
ATC NG	0%	8 Flts
PILOT NG	18%	346 Flts
OTHER NG	11%	206 Flts

		Fuel	Time
Saving	Total	148900 lbs	8:48
	Average	670 lbs	0:03
	Maximum	4200 lbs	0:23

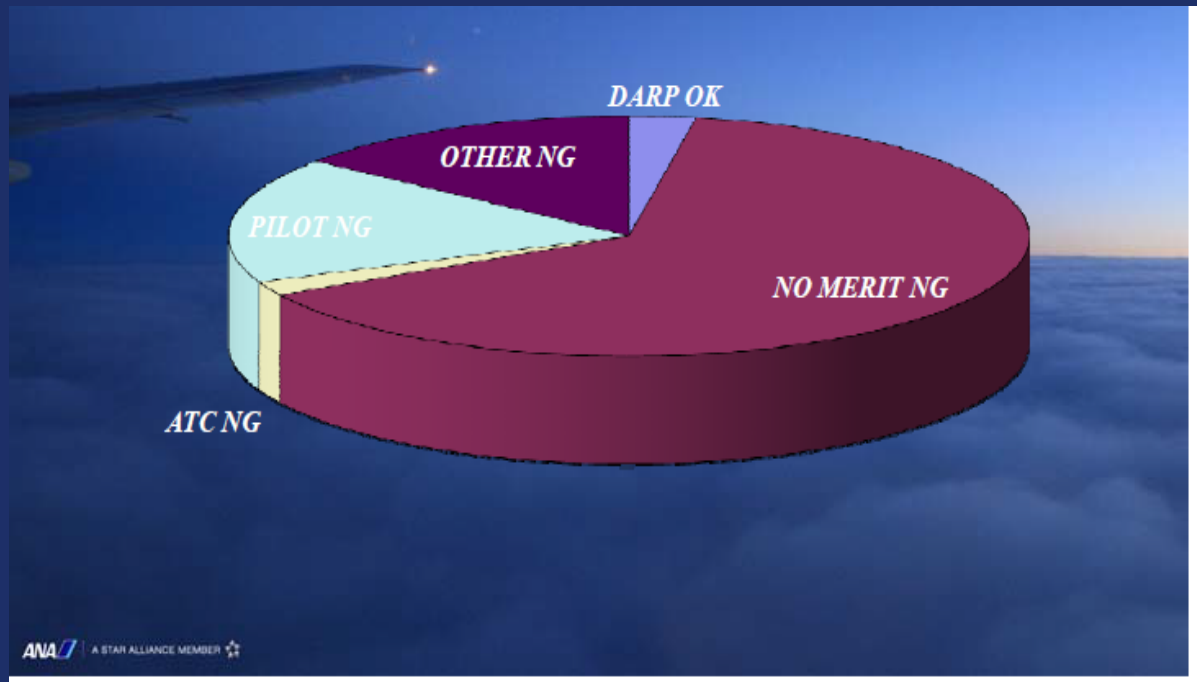
•Detail Result (TYO - HNL)



NH1052, NH1062		
19 SEP 2013 - 31JUL2014		
DARP OK	1%	9 Flts
NO MERIT NG	77%	464 Flts
ATC NG	0%	3 Flts
PILOT NG	10%	58 Flts
OTHER NG	12%	73 Flts

		Fuel	Time
Saving	Total	5500 lbs	0:36
	Average	610 lbs	0:04
	Maximum	2000 lbs	0:14

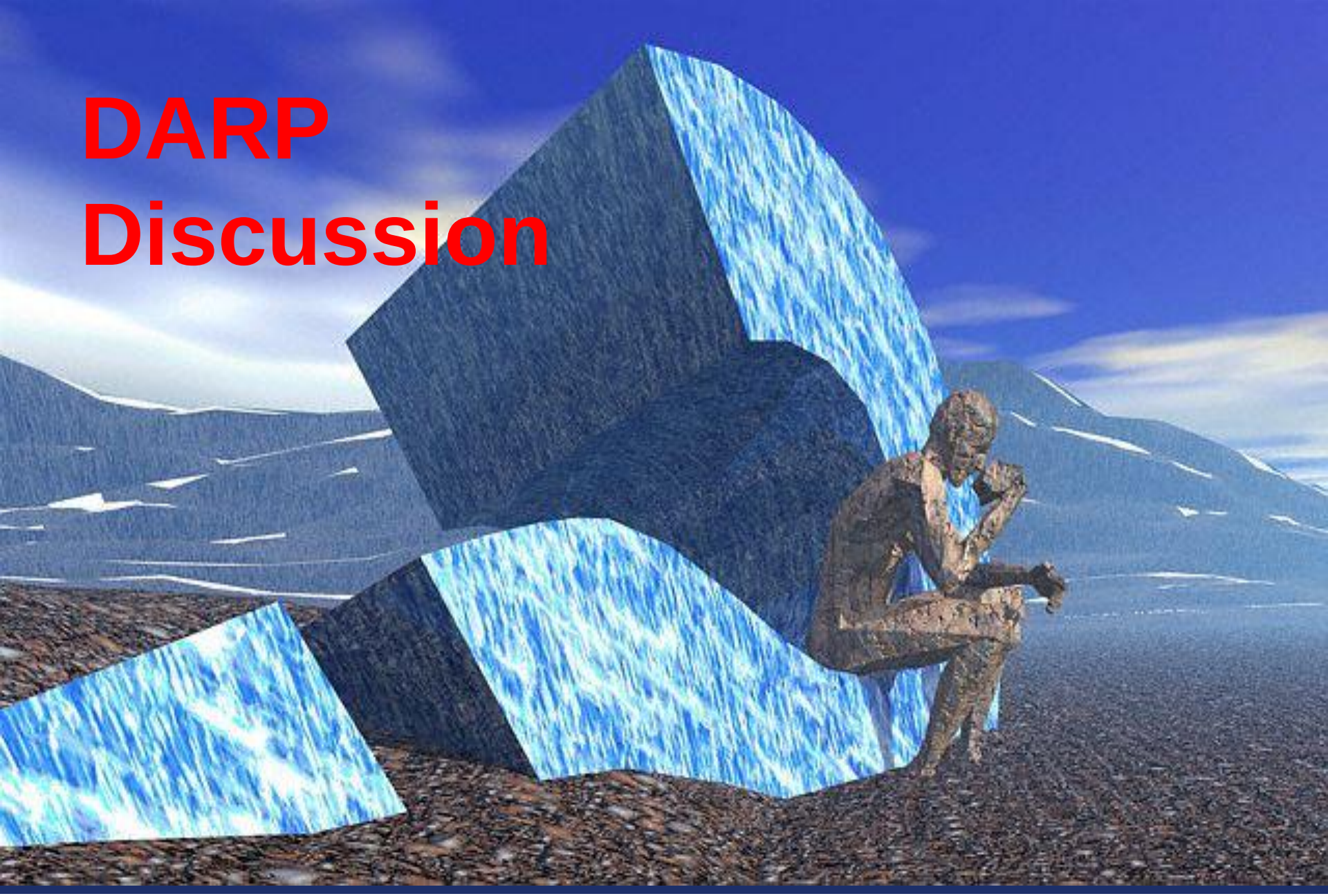
•Detail Result (TYO - LAX)



NH1006		
06 MAR 2014 - 30JUN2014		
DARP OK	3%	7 Fits
NO MERIT NG	64%	167 Fits
ATC NG	1%	3 Fits
PILOT NG	17%	44 Fits
OTHER NG	15%	38 Fits

		Fuel	Time
Saving	Total	5400 lbs	0:22
	Average	770 lbs	0:04
	Maximum	1600 lbs	0:05

DARP Discussion



Dennis Addison

Support Manager

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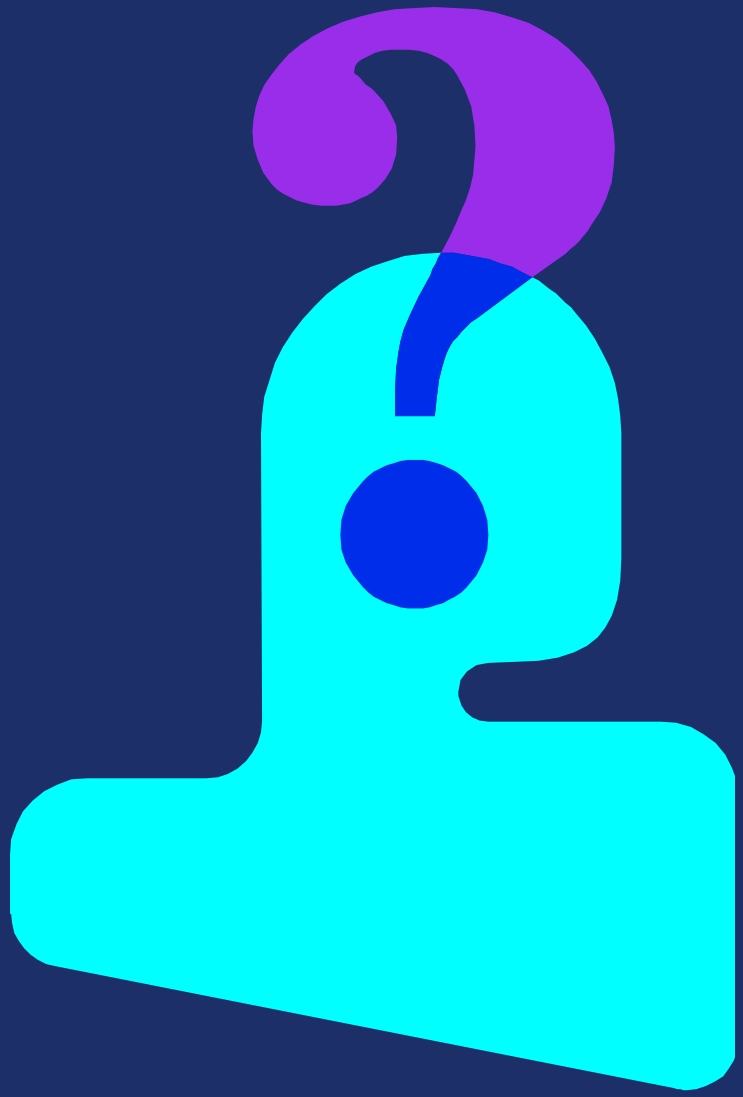


Oceanic Work Group Meeting

Boeing DARP Presentation

October 8, 2014

Federal Aviation Administration

Oceanic Work Group Meeting

Anchorage ARTCC Update

Steve Kessler, Support Manager, Airspace and Procedures

October 8, 2014

Federal Aviation Administration

Anchorage ARTCC (ZAN) Overview

- R220 and the PAZA / UHPP FIR Boundary
- ZAN ATOP and ADS-B
- Cross boundary use of 30/30 ADS-C
- ZAN Sector “64”
- Military Exercises
- Missile Launch Activity

R220 and PAZA / UHPP FIR Boundary

- ATC Separation Services in Oceanic Airspace utilizes the concept of “protected airspace volumes.”
- Each aircraft operating in the IFR system is allocated an airspace volume whose dimensions are derived, in part, according to the aircraft’s navigation capability.
- ATC effects aircraft separation by ensuring these volumes do not overlap, either vertically or horizontally.

R220 and PAZA / UHPP FIR Boundary

Examples:

- ***Vertically***
  - **RVSM – if an aircraft is approved for RVSM, and is operating in the RVSM stratum, the vertical dimensions of its "protected airspace volume" are 999' above and 999' below.**
  - **Non-RVSM – if an aircraft is not approved for RVSM, and is operating in the RVSM stratum, its vertical "protected airspace volume" is 1999' above and 1999' below.**

R220 and PAZA / UHPP FIR Boundary

- *Laterally*
  - **"Standard" Oceanic lateral is 50 NM either side of centerline - meaning the lateral dimension of an aircraft's protected airspace volume is 100 NM, centered on the aircraft's known route centerline – yielding 50 NM either side.**
  - **"RNP-10" approval is a "reduced" separation (reduced from the Standard, i.e. 50 NM either side). Aircraft with RNP-10 approval are provided a protected airspace volume of 25 NM either side of known centerline.**
  - **"RNP-4" approval is also a "reduced" separation. Aircraft with RNP-4 approval *and* FANS datalink equipage permitting Automatic Dependent Surveillance – Contract (ADS-C), are provided a protected airspace volume of 15 NM either side of known centerline.**

R220 and PAZA / UHPP FIR Boundary

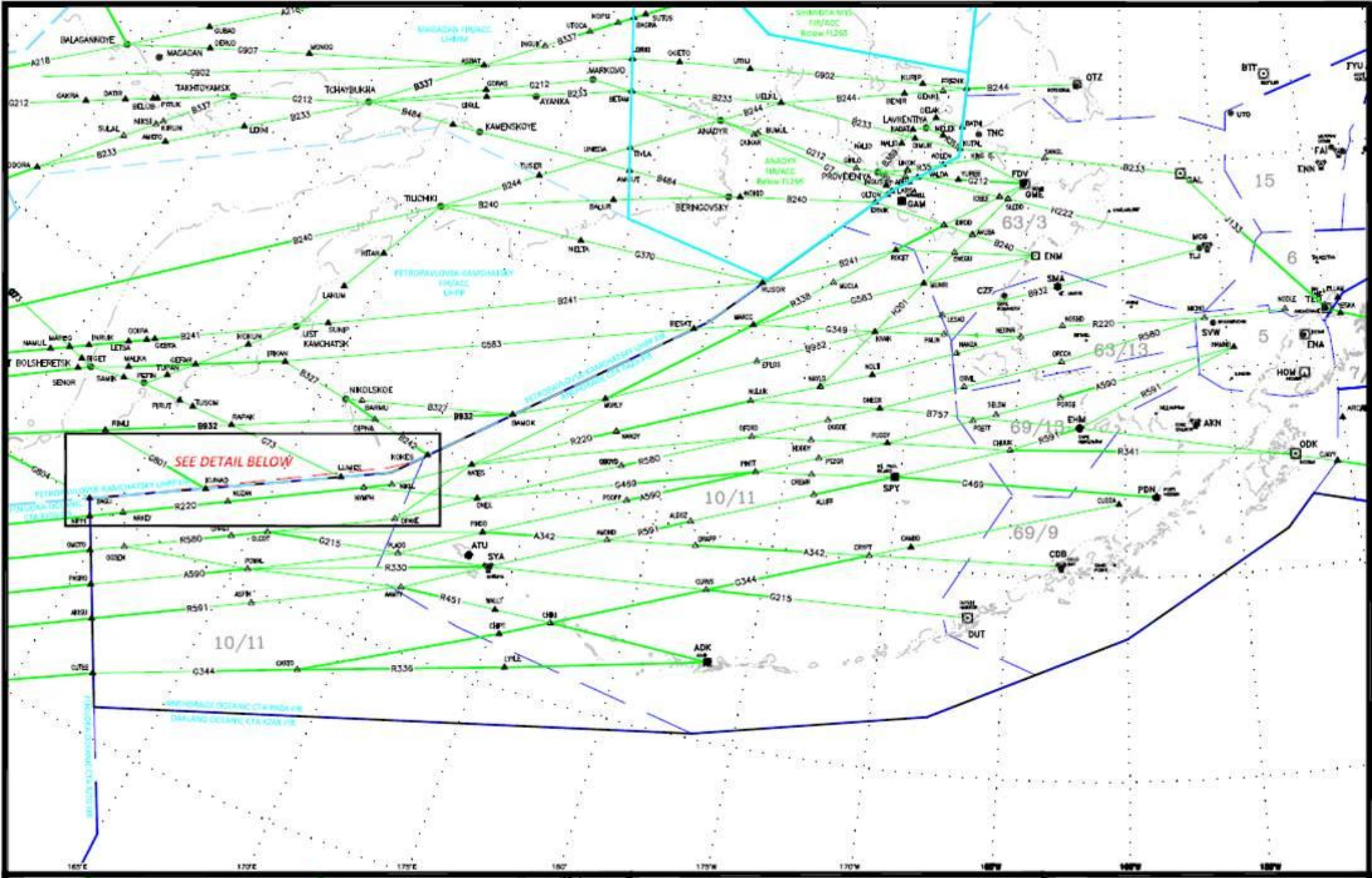
- *Longitudinally*
  - **"Standard" Oceanic longitudinal separation is 15 minutes between aircraft – i.e. no aircraft at the same altitude 14' 59" ahead of the aircraft and no aircraft at the same altitude 14'59" behind the aircraft.**
  - **"Mach Number Technique" is a reduced separation that reduces an aircraft's protected airspace volume to 9'59" ahead and behind, provided the aircraft and any leading or following aircraft are assigned the same Mach speed.**

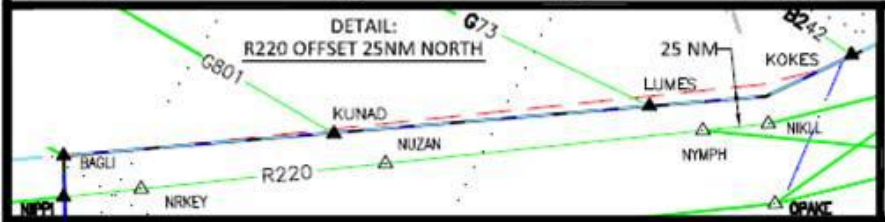
R220 and PAZA / UHPP FIR Boundary

- Each controller is assigned a specific airspace, or "sector," within which he/she provides ATC service.
- As an aircraft progresses along its route, it crosses into, and out of, many sectors.
- Each time the aircraft progresses from one sector to the next, controllers must coordinate the flight's conditions, i.e. assigned route, assigned altitude, etc.
- If an aircraft's known route takes it close to a sector boundary, but does not actually cross that boundary, the need for coordination depends upon the aircraft's "protected airspace volume".
- If the aircraft's protected airspace volume extends beyond the controller's sector boundary, he/she must coordinate the flight with the adjoining airspace controller.

R220 and PAZA / UHPP FIR Boundary

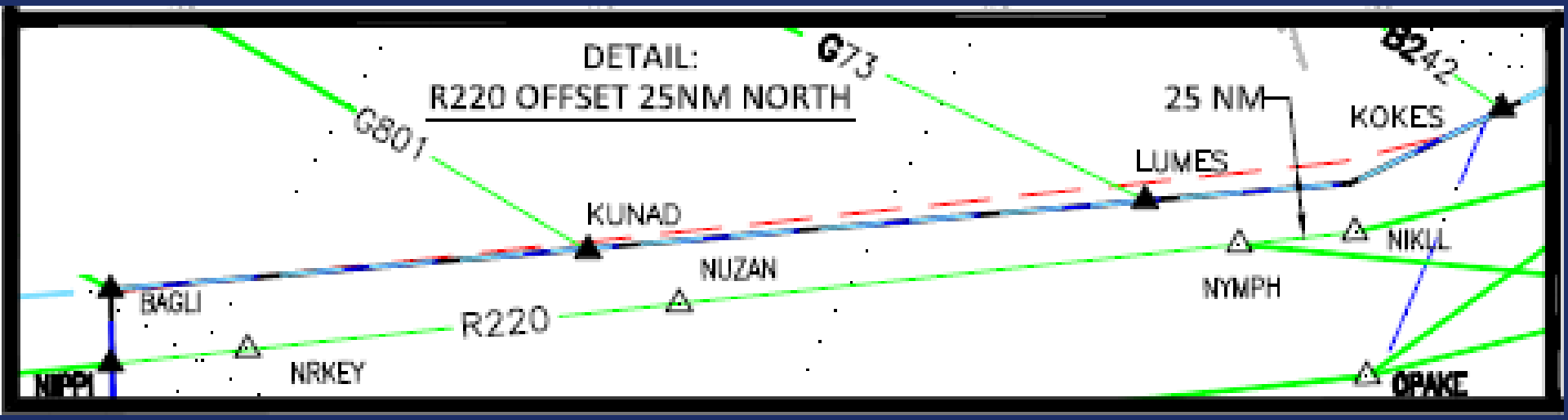
- As currently aligned, the segment of ATS Route R220 between position NATES and NRKEY falls within 25NM of the Petropavlovsk-Kamchatsky FIR.
- Based on the foregoing rules, all *non* RNP-4 aircraft must be coordinated with Petropavlosk-Kamchatsky ACC.





FIR to RUSOR:	47.6nm	FIR to MUCLA:	58.4nm
FIR to BESAT:	33.9nm	FIR to MARCC:	41.0nm
FIR to BAMOK:	39.6nm	FIR to MORLY:	36.7nm
FIR to KOKES:	29.6nm	FIR to NATES:	40.7nm
FIR to LUMES:	18.9nm	FIR to NIKLL:	17.3nm
FIR to KUNAD:	22.8nm	FIR to NYMPH:	18.1nm
FIR to NIPPI:	25.9nm	FIR to NUZAN:	22.1nm
		FIR to NRKEY:	25.2nm

R220 and PAZA / UHPP FIR Boundary



FIR to RUSOR:	47.6nm	FIR to MUCLA:	58.4nm
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FIR to KOKES:	29.6nm	FIR to NATES:	40.7nm
FIR to LUMES:	18.9nm	FIR to NIKLL:	17.3nm
FIR to KUNAD:	22.8nm	FIR to NYMPH:	18.1nm
FIR to NIPPI:	25.9nm	FIR to NUZAN:	22.1nm
		FIR to NRKEY:	25.2nm

R220 and PAZA / UHPP FIR Boundary

- ZAN's attempt to develop procedures for this coordination within the Anchorage ARTCC / Petropavlosk-Kamchatsky ACC Letter of Agreement (for either "blanket" or individual coordination) have not been successful.
- Accordingly, a different solution must be implemented to ensure flight safety.
- ZAN is considering two possible solutions which will ensure the integrity of aircraft protected airspace volumes on R220:
  A. Proscribe RNP4 and FANS 1/A equipage for R220 between NATES and NIPPI.
  B. Reorient portions of the NOPAC so as to achieve continuous, appropriate, lateral spacing with the UHPP FIR boundary.

R220 Solution "A"

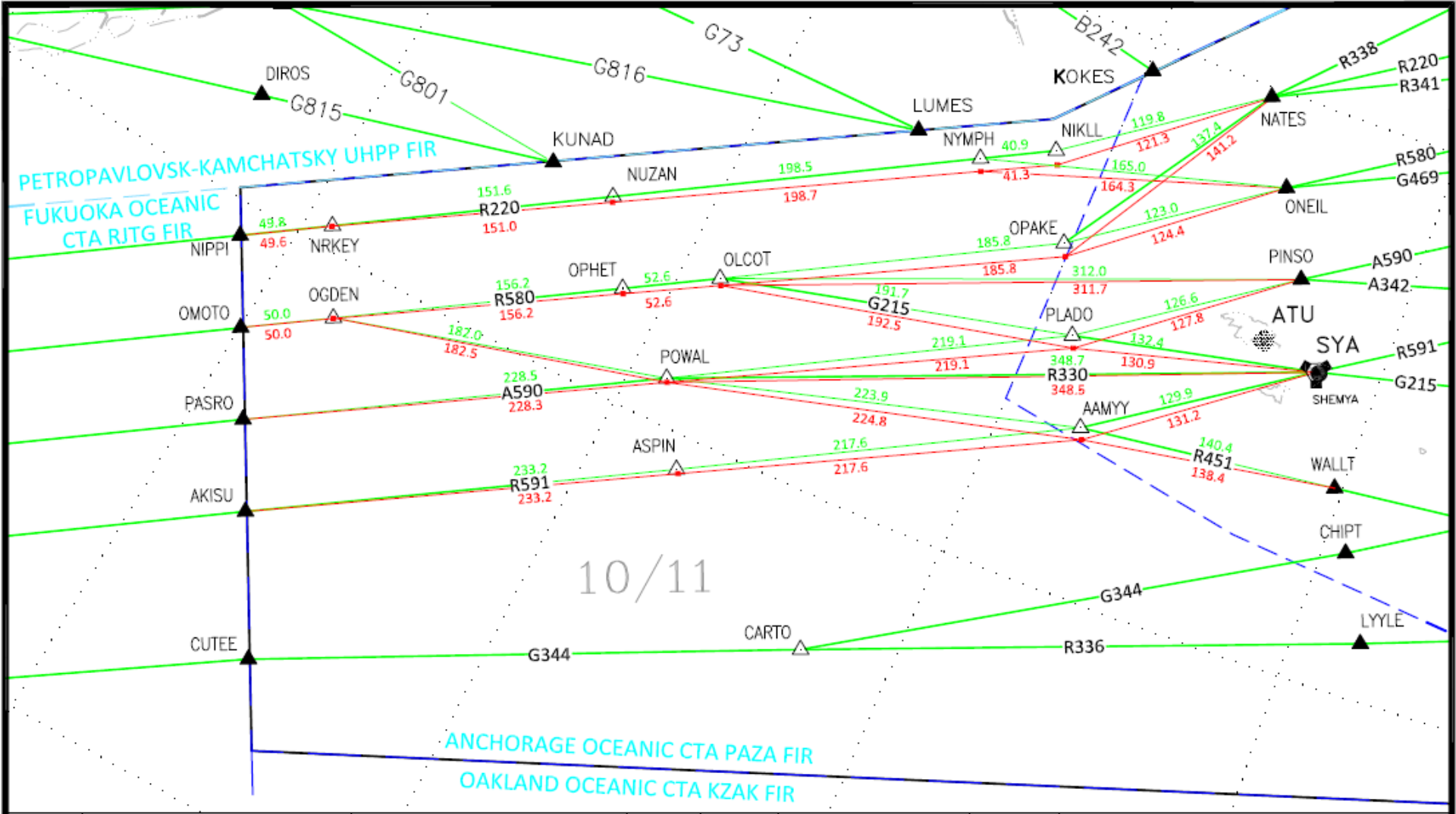
- In accordance with ICAO procedures, FAA would initiate coordination for a modification to ICAO DOC 7030 identifying a requirement for R220 traffic to file both* RNP4 and FANS 1/ A.
- Simultaneously, Anchorage ARTCC would publish an International NOTAM requiring RNP-4 Approval and FANS 1/A equipage for aircraft traversing the portion of ATS Route R220 between NATES and NIPPI.
- The above NOTAM would identify that aircraft not equipped or authorized for RNP-4 and ADS-C could route via R220 until NATES and then R338 OPAKE and onwards via R580.

*(Flight plans would indicate "R" and "J5", "J6" or "J7" in field 10a, "D1" in field 10b, and "PBN/L1" in field 18.)

R220 Solution "B"

- NOPAC routes R220, R580, A590 and R591 would be reoriented so as to achieve continuous lateral separation from the UHPP FIR boundary and to retain existing inter-track minimum separation (based on RNP-10*).
- The reorientation would add approximately 1.3 NM to the length of R220, 1.4 NM to R580, 1.0 NM to A590, and 1.3 NM to R591.
- An attempt would be made to retain the same waypoint names.
- Portions of transition routes R338, G469, A342, G215, R330 and R451 would also be slightly lengthened or shortened.

* Non-RNP aircraft are already restricted from navigating R220. See NOPAC "Flight Plans and Preferred Routes" in FAA publication "Supplement Alaska".



FIX	Current Latitude	Current Longitude	Proposed Latitude	Proposed Longitude	Distance (nm)
NIKLL	N 53°44'47.1"	E 169°13'54.5"	N 53°37'52.18"	E 169°20'8.7"	7.9
NYMPH	N 53°24'31.6"	E 168°14'23.4"	N 53°18'7.57"	E 168°19'23.14"	7.1
NUZAN	N 51°39'27.5"	E 163°38'41.8"	N 51°36'25.49"	E 163°40'22.29"	3.2
NRKEY	N 50°12'25.0"	E 160°22'39"	N 50°12'8.78"	E 160°22'28.69"	0.3
OPAKE	N 53°00'4.4"	E 169°53'33.9"	N 52°53'34.69"	E 169°59'17.06"	7.4
OLCOT	N 51°25'48.7"	E 165°33'20.7"	N 51°22'30.97"	E 165°36'31.55"	3.9
OPHET	N 50°57'26.7"	E 164°22'53.4"	N 50°54'59.79"	E 164°25'18.96"	2.9
OGDEN	N 49°29'12.9"	E 161°02'15.5"	N 49°28'58.44"	E 161°02'31.51"	0.3
PLADO	N 52°15'16.3"	E 170°32'02.1"	N 52°9'5.64"	E 170°37'13.49"	7.0
POWAL	N 50°24'20.6"	E 165°30'48.6"	N 50°22'25.92"	E 165°32'37.07"	2.2
AAMYY	N 51°30'18.8"	E 171°9'11.7"	N 51°24'24.97"	E 171°13'58"	6.6
ASPIN	N 49°41'56.1"	E 166°12'59.5"	N 49°40'10.52"	E 166°14'35.78"	2.0

AIRWAY	DISTANCE CURRENT	DISTANCE PROPOSED	PERCENT Diff(%)
R220	560.6	561.9	0.23
R580	567.6	569.0	0.25
A590	574.2	575.2	0.17
R591	580.7	582.0	0.22
R451	546.3	545.7	-0.11
G215	324.1	323.4	-0.22

Proposed
ZAN Oceanic Route
Adjustment
Modified August 27, 2014

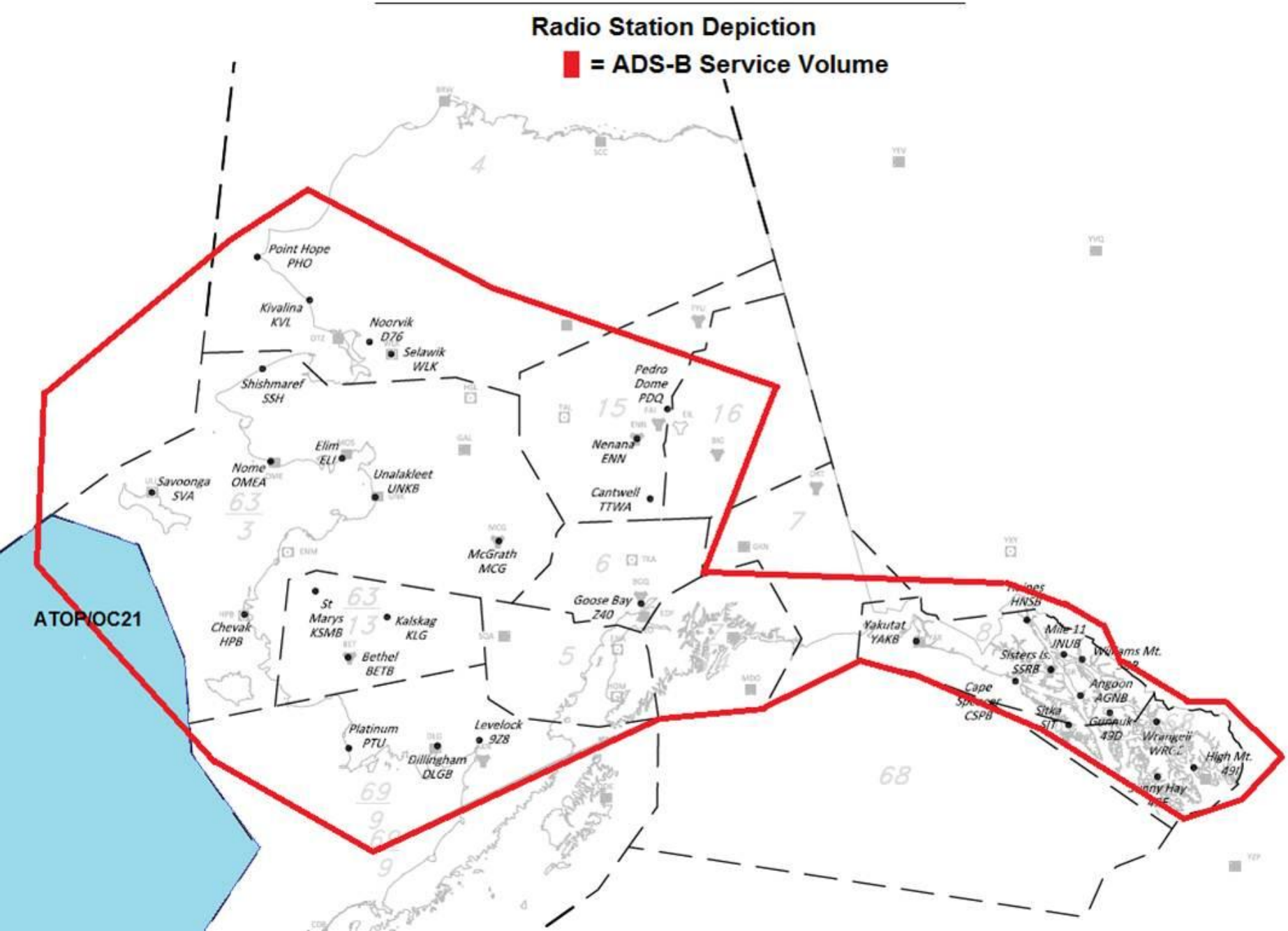
ZAN ATOP and ADS-B

Effective 9/29/2014, Anchorage ARTCC has begun utilizing Automatic Dependent Surveillance – Broadcast (ADS-B) data, (transmitted from suitably equipped aircraft* and captured by terrestrial ground based radio stations), as surveillance data for the provision of radar separation services within Anchorage's Advanced Technologies and Oceanic Procedures / Ocean 21 (ATOP/OC21) airspace.

Anchorage ARTCC also provides radar separation services, using ATS-B data, via the Micro Enroute Automated Radar Tracking System (MEARTS) in Anchorage Domestic Airspace.

***I.E. Equipped with Mode S transponder and/or Universal Access Transceiver (UAT)**

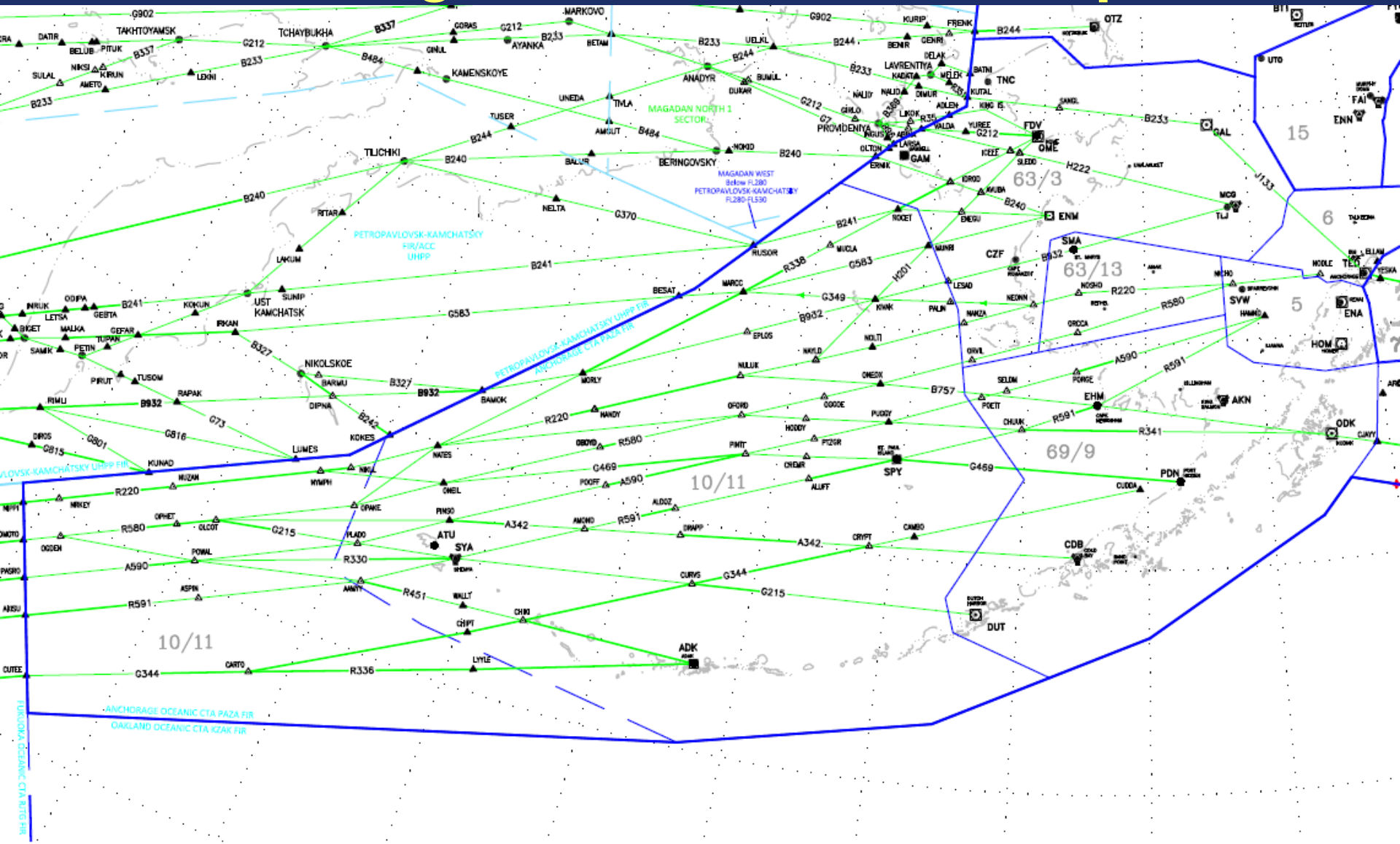
ADS-B SURVEILLANCE AREA



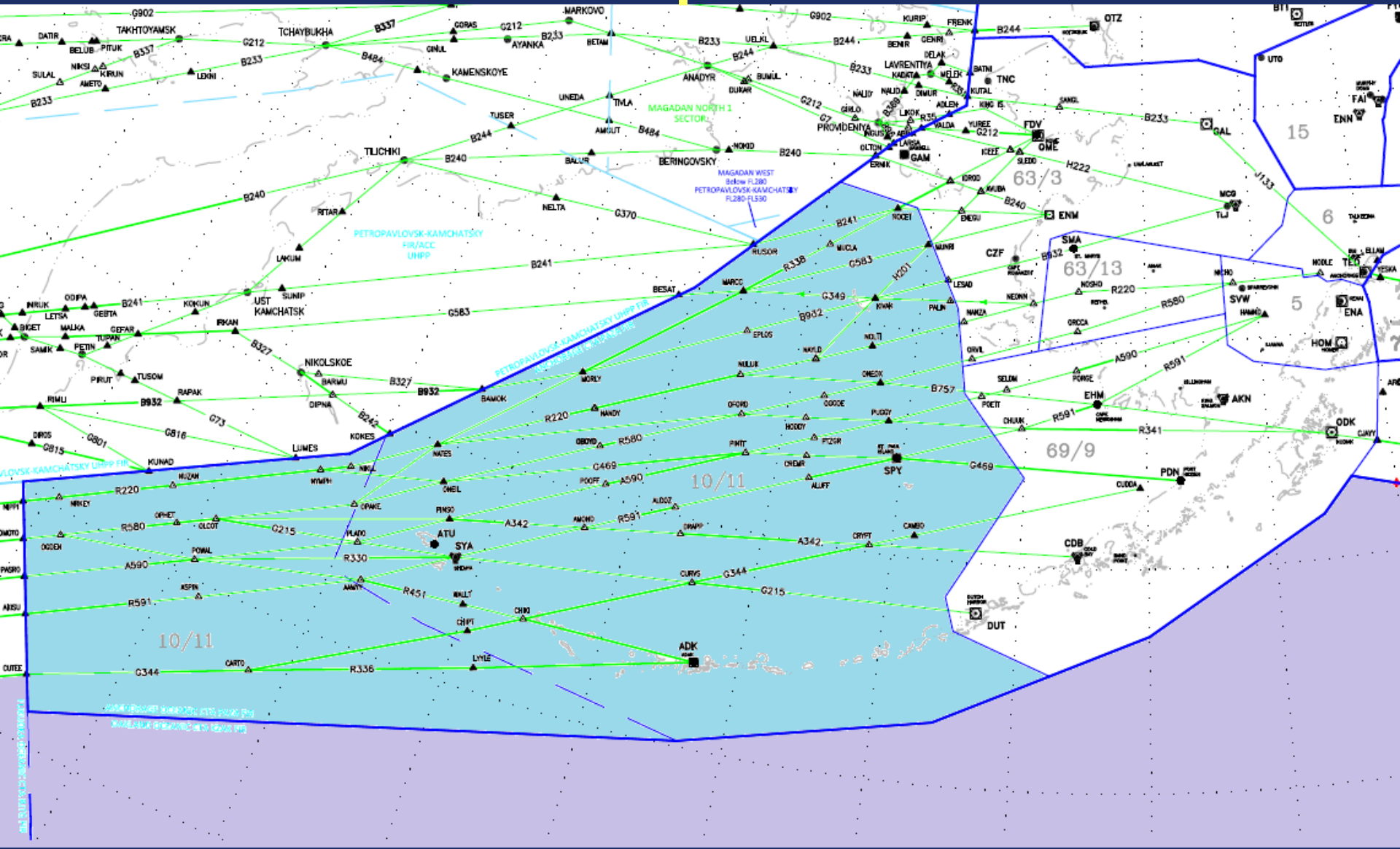
Cross boundary use of ADS-C 30/30

- The FAA and JCAB have utilized reduced oceanic separation minima (30nm lateral / 30nm longitudinal) through the use of the Future Air Navigation System (FANS) procedures and the Required Navigation Performance 4 (RNP-4) specification. The ability to apply reduced separation on cross boundary aircraft has led to a more efficient system and a significant reduction in carbon dioxide emissions.
- Since November 2012, ZAN and ZOA have applied reduced separation minima (Automatic Dependent Surveillance-Contract, or ADS-C, 30/30) for aircraft separation on transfers along their common Flight Information Region (FIR) boundary where both facilities employ the Ocean 21 / Advanced Technologies and Oceanic Procedures (ATOP) automation system. This area of the FIR boundary falls west of the 164º West meridian.

Anchorage ARTCC NOPAC Airspace



= 30/30 Airspace in PAZA



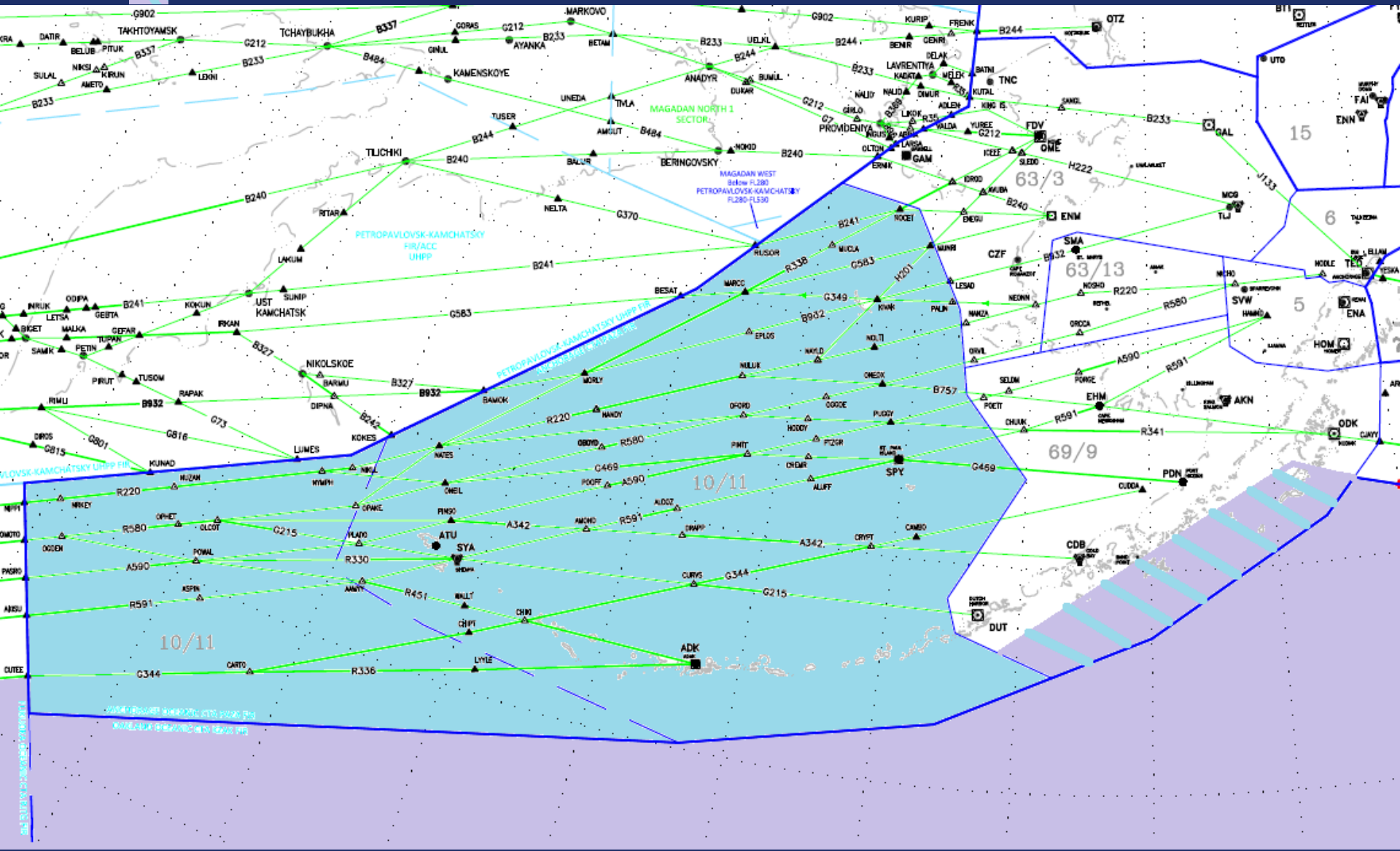
Cross boundary use of ADS-C 30/30

- Anchorage ARTCC utilizes the Flight Data Processor 2000 (FDP2000) automation system in the airspace east of the 164º West meridian. Due to the two facilities' experience level with the 30/30 separation minima, and certain operating limitations within the FDP2000 system, the initial use of ADS-C 30/30 for cross boundary transfers between Oakland and Anchorage did not include that portion of the common FIR boundary where FDP2000 is used.

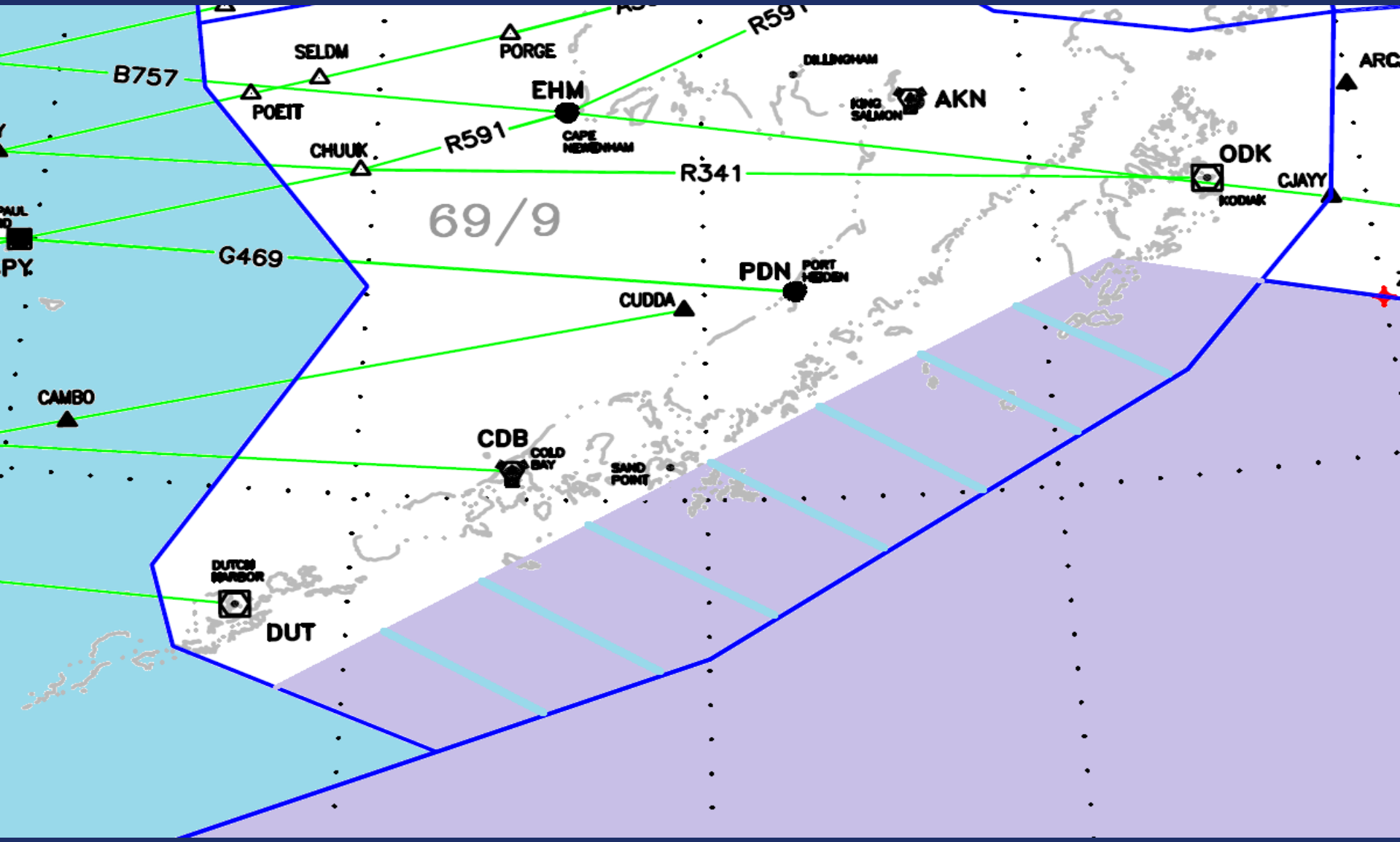
Cross boundary use of ADS-C 30/30

- Operational experience gained since November 2012 has led to the facilities' determination that the ADS-C 30/30 minima can be used along the FDP2000 FIR boundary. Consequently, since February 19, 2014, Oakland and Anchorage ARTCC have been utilizing the ADS-C 30/30 minima for *longitudinal* separation between aircraft crossing the Oakland Ocean21 and Anchorage FDP2000 boundary. The initial implementation was hampered by a long term outage of the Cold Bay Air Route Surveillance RADAR system (CDB ARSR) but since its return to service, in June 2014, the 30nm longitudinal separation minima has been providing significant benefits to aircraft flying PACOTS tracks and User Preferred Routings (UPRs).

= PAZA Airspace 30/30 ADS-C Transition to 5 NM Radar



Detail view

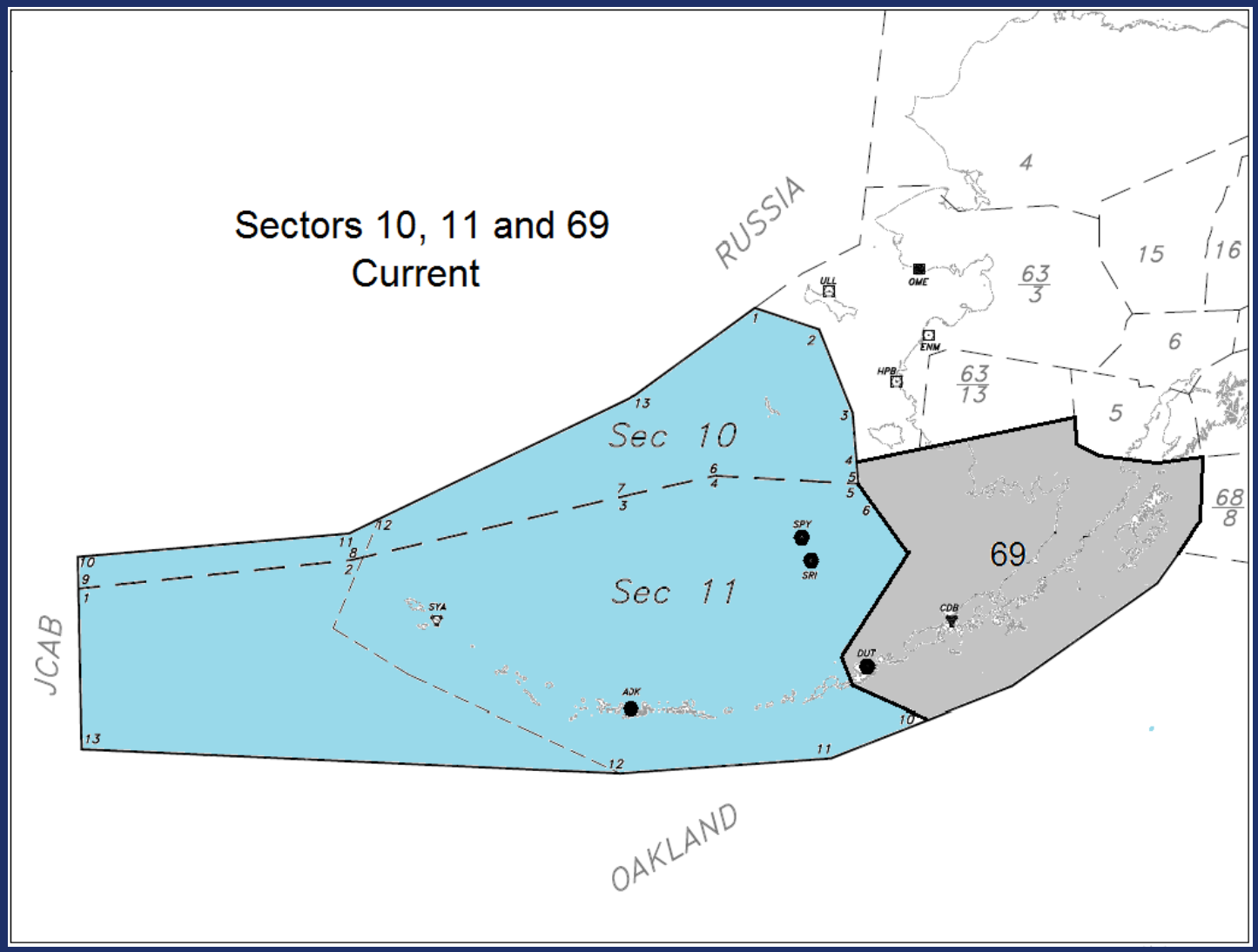

B757
SELDM
PORGE
POEIT
EHM
CAPE NEWENHAM
DILLINGHAM
KING SALMON
AKN
R591
CHUUK
R341
ODK
KODIAK
CJAYY
69/9
G469
PDN
PORT HEIDEN
CUDDA
CAMBO
CDB
COLD BAY
SAND POINT
DUTCH HARBOR
DUT

Cross boundary use of ADS-C 30/30

- Anchorage ARTCC is now working on a project to extend the use of the Ocean21 system into the airspace east of the 164ºW meridian. The expansion of the Ocean21 system into Anchorage's "Sector 69" will provide for an even more seamless operation for aircraft crossing the Anchorage / Oakland FIR boundary. The completion date of this project has not yet been determined, but updates will be provided as, and when, they become available.

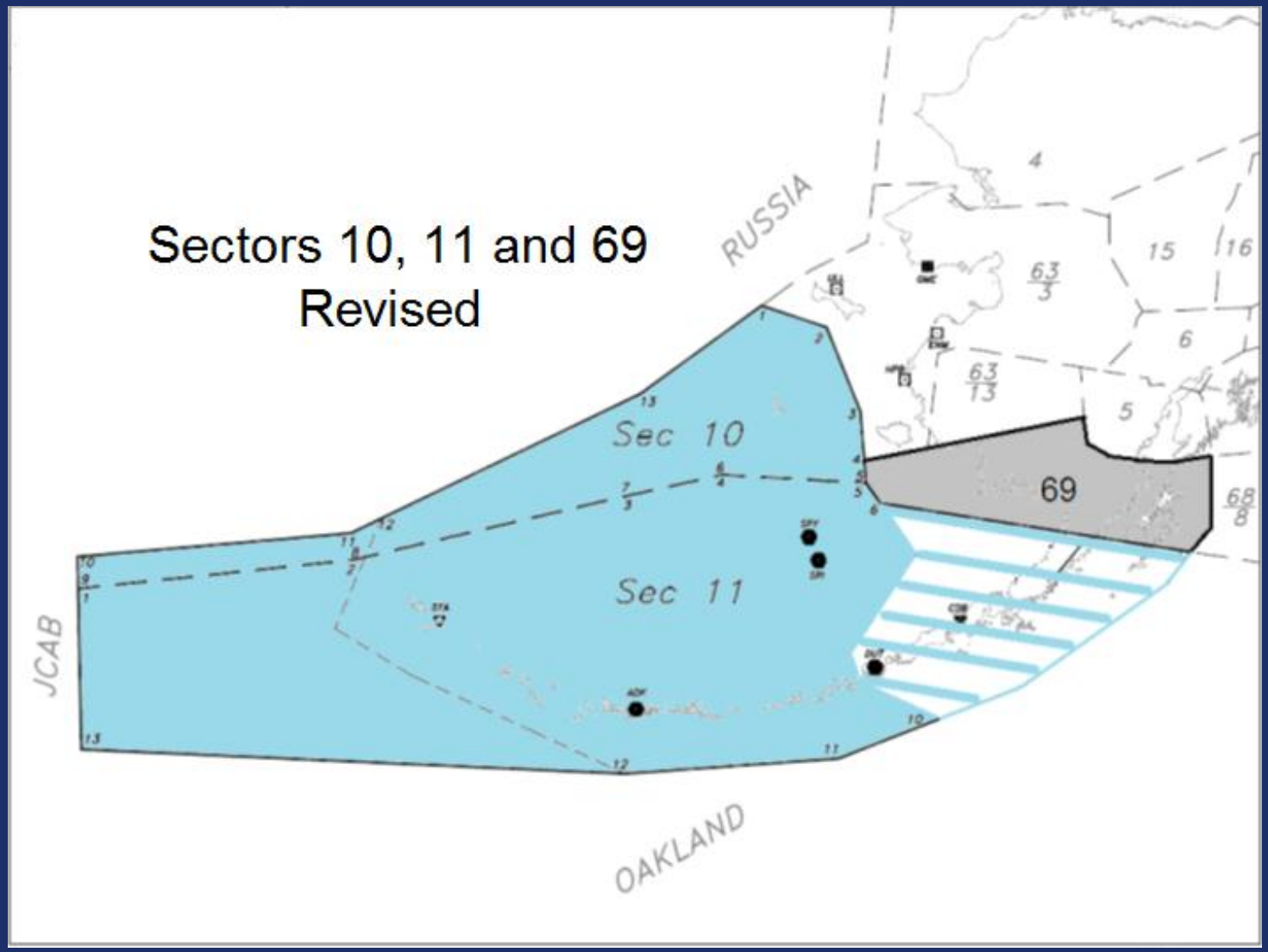
Cross boundary use of ADS-C 30/30

Revision of Sectors 11 & 69

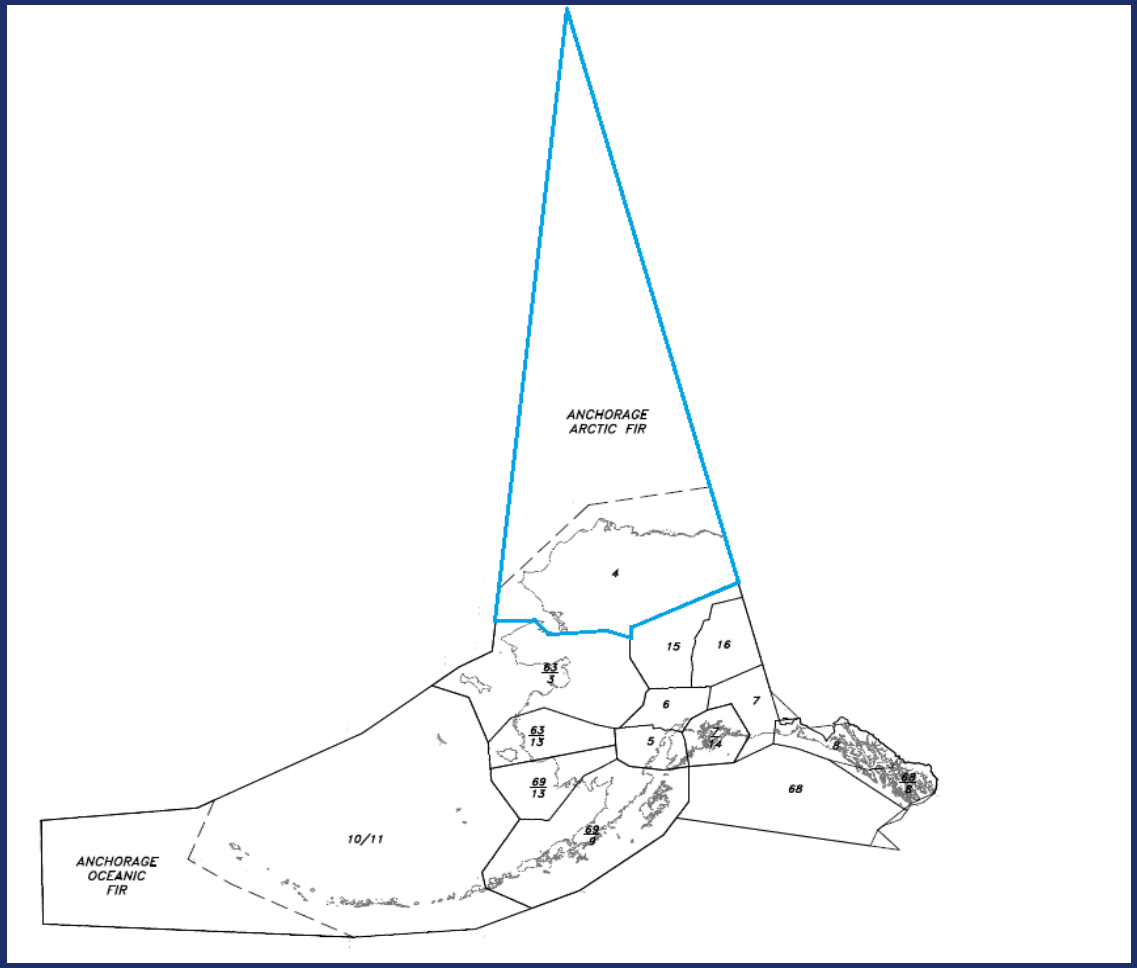


•Cross boundary use of ADS-C 30/30

Revision of Sectors 11 & 69

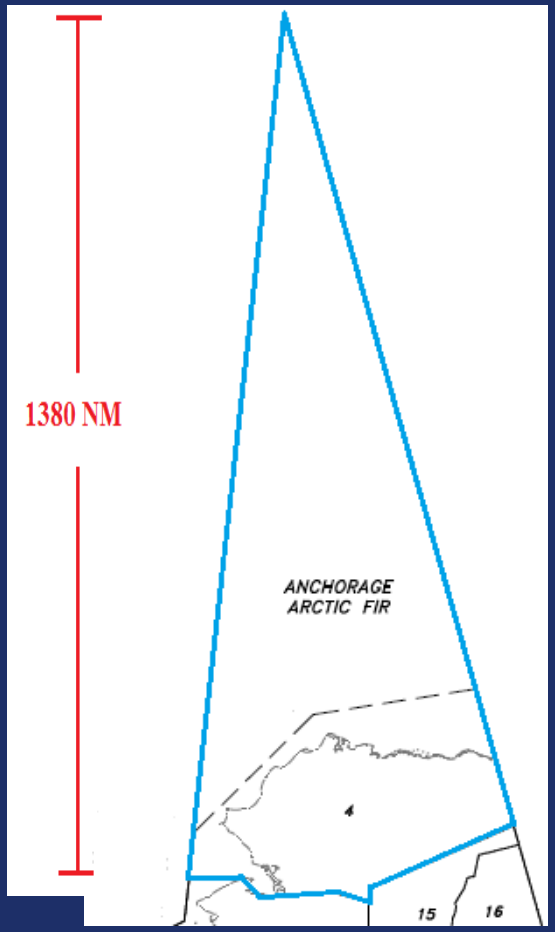


ZAN Sector “4” to “4 and 64”



Current Airspace

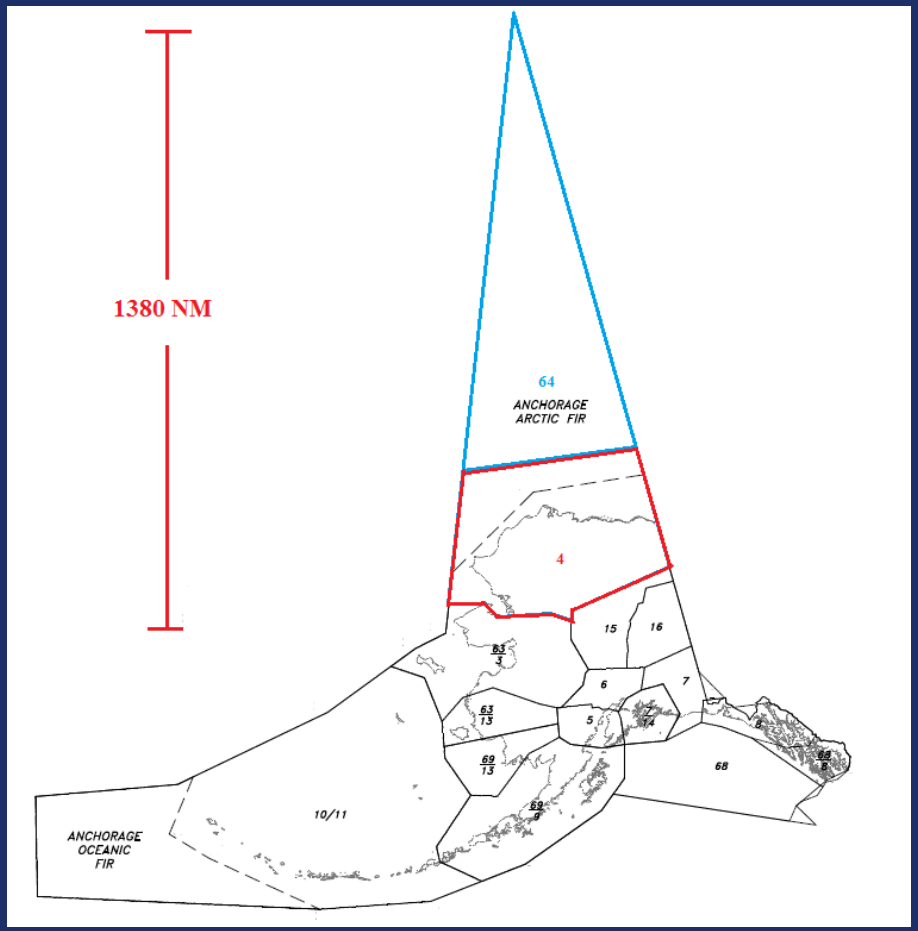
Current - ZAN Sector “4”



- Current Sector 4 utilizes Flight Data Processor 2000 (FDP2K) and Micro En Route Automated Radar Tracking System (MEARTS).
- FDP2K supports Controller / Pilot Data Link (CPDLC) and Air Traffic Services Inter-facility Data Coordination (AIDC).
- MEARTS radar surveillance limited to land based radar sensors.
- FDP2K does not provide conflict detection. MEARTS provides short term, (tactical), conflict “alert.”
- FDP2K does not support FANS Automatic Dependent Surveillance – Contract (ADS-C).
- Unique geometry limits the scale of paper diagrams, i.e. controller charts, thereby limiting the controller’s ability to chart flight paths and determine lateral conflicts and/or flight path de-confliction points.

Result – the need, in the Arctic FIR, for proceduralized airspace.

Future – ZAN Sectors “4” and “64”



- Sector 4 divided into Sectors 4 and 64.
- Division line tentatively set at 73° N.
- Sector 4 continues with FDP2K and MEARTS
- Sector 64 will utilize Advanced Technologies and Oceanic Procedures Ocean 21 system, (ATOP/OC21).
- ATOP supports CPDLC, AIDC and ADS-C.
- Implementation of Sector 64 requires controller staffing + controller training + modification of systems’ adaptation (i.e. database) + system testing (stand alone and inter-facility) + correction of any discovered deficiencies.
- Sum total of above variables yields tentative implementation date 2nd Qtr. CY 2015.

Military Exercises

Military Exercises

- **Large scale military exercises for CY 2014 and CY 2015:**
  - "Red Flag 15/01" currently ongoing thru 10/17/14
  - "Red Flag 15/02" 4/30/2015 – 5/15/2015
  - "Northern Edge 15" 6/11/2015 – 6/26/2015
  - "Red Flag 15/03 8/6/2014 – 8/21/2015
- **Exercises involve 50 plus aircraft and numerous Military Operations Areas (MOAs), ATC Assigned Airspaces (ATCAAs), and Restricted Areas.**
- **Traffic Management Initiatives (TMIs) issued to accommodate non-participating aircraft.**

Military Exercises

Red Flag TMIs

1) ALL WESTBOUND FLIGHTS ENTERING THE ANCHORAGE FIR NORTH OF 62N141W MUST BE ESTABLISHED ON ONE OF THE FOLLOWING ROUTES: (A) ON OR NORTH OF NCA30 (B) OVER OR SOUTH OF ORT.

IF ROUTING VIA ORT, UTILIZE ONE OF THE FOLLOWING TRANSITIONS:

(1) ORT J124 BGQ NODLE R220

(2) ORT J124 BGQ NODLE NICHO R580

(3) ORT J124 GKN 6140N151W MCG

2) ALL EASTBOUND FLIGHTS TRANSITING THE ANCHORAGE FIR SHALL FLIGHT PLAN VIA ONE OF THE FOLLOWING:

(A) ON OR NORTH OF FYU J167 POTAT NCA30

(B) OVER OR SOUTH OF ANC J511 GKN J124 ORT

Military Exercises

Red Flag TMIs

3) THE FOLLOWING ROUTES ARE <u>NOT</u> AVAILABLE:

(**A**) NCA28, NCA24, NCA19 AND NCA22

(**B**) J167 BETWEEN GKN AND FYU

(**C**) J502/J515 BETWEEN FAI AND ORT

(**D**) V481 BETWEEN BIG AND FYU

(**E**) J507 BETWEEN ORT AND FYU

4) FROM 1700-1800 UTC, 2030-2100 UTC, 2300-0000 UTC AND 0230-0300 UTC WEEKDAYS, AIRCRAFT LANDING/DEPARTING FAI (AND LOW ALTITUDE AIRCRAFT FILED BETWEEN BIG AND ORT OR BIG AND GKN**) WILL BE RESTRICTED AT OR BELOW 17000 MSL**.

Military Exercises

Red Flag TMIs

5) FROM 1800-2030 UTC AND 0000-0230 UTC WEEKDAYS, THE FOLLOWING ROUTES ARE NOT AVAILABLE:

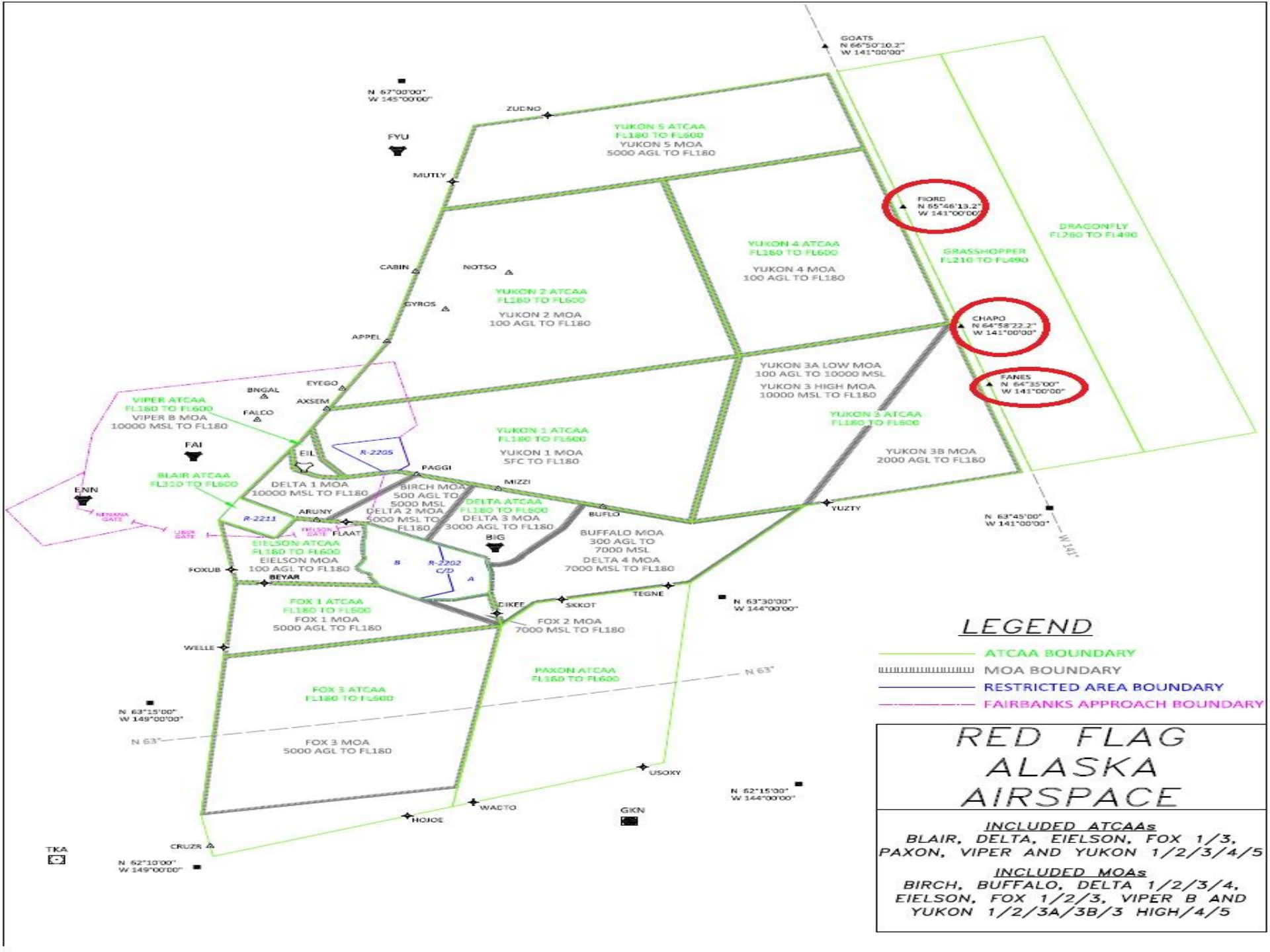
(A) A2, A15 AND B25

(B) V444, V481 AND V515

(C) T232 AND T226

(D) DIRECT ROUTES OVER OR IN THE VICINITY OF BIG.

6) FROM 1800-2030 UTC AND 0000-0230 UTC, IFR ARRIVALS/DEPARTURES TO/FROM ALLEN AAF ARE UNAVAILABLE.



LEGEND

- ATCAA BOUNDARY
- MOA BOUNDARY
- RESTRICTED AREA BOUNDARY
- FAIRBANKS APPROACH BOUNDARY

RED FLAG ALASKA AIRSPACE

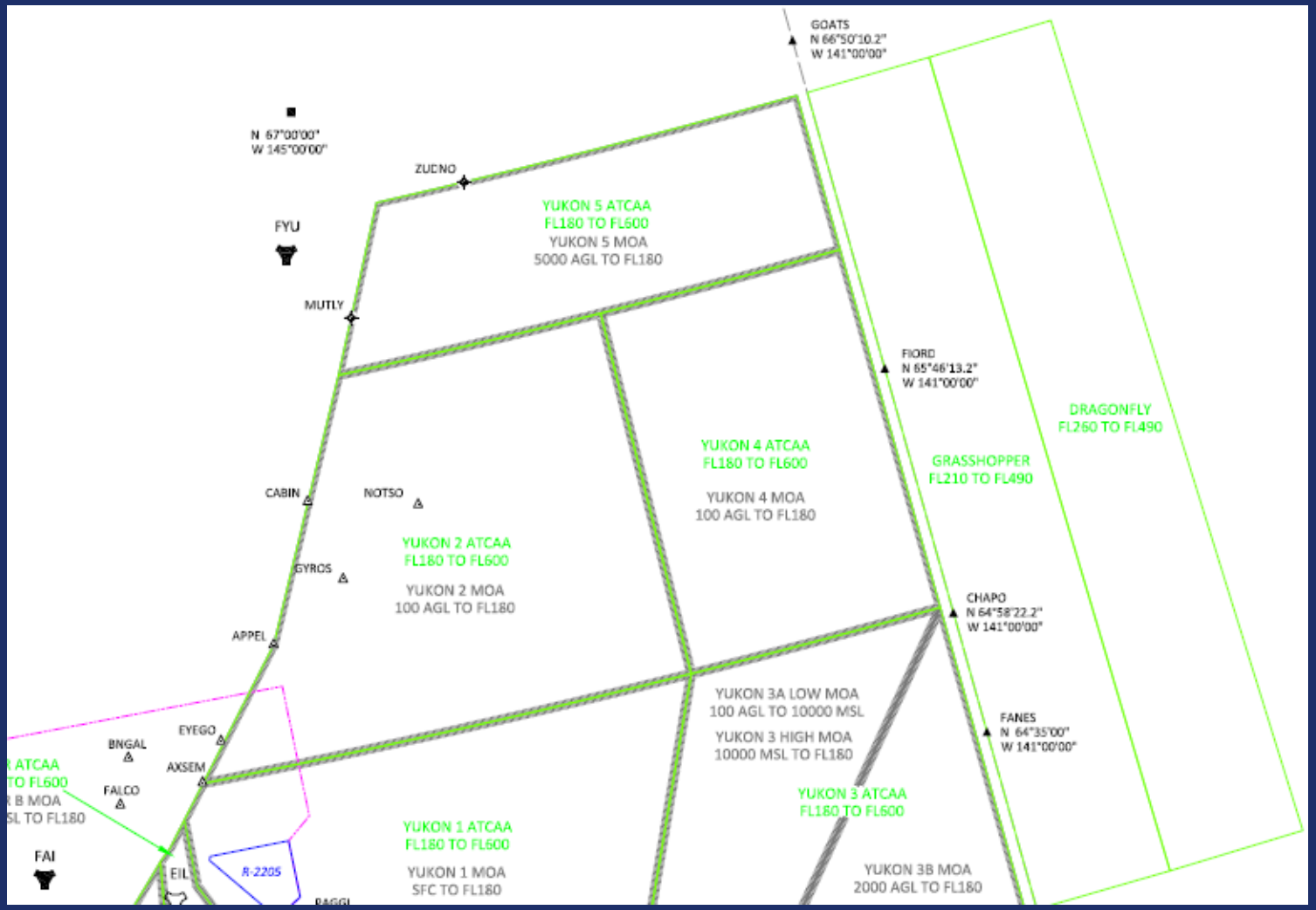
INCLUDED ATCAAs

BLAIR, DELTA, EIELSON, FOX 1/3, PAXON, VIPER AND YUKON 1/2/3/4/5

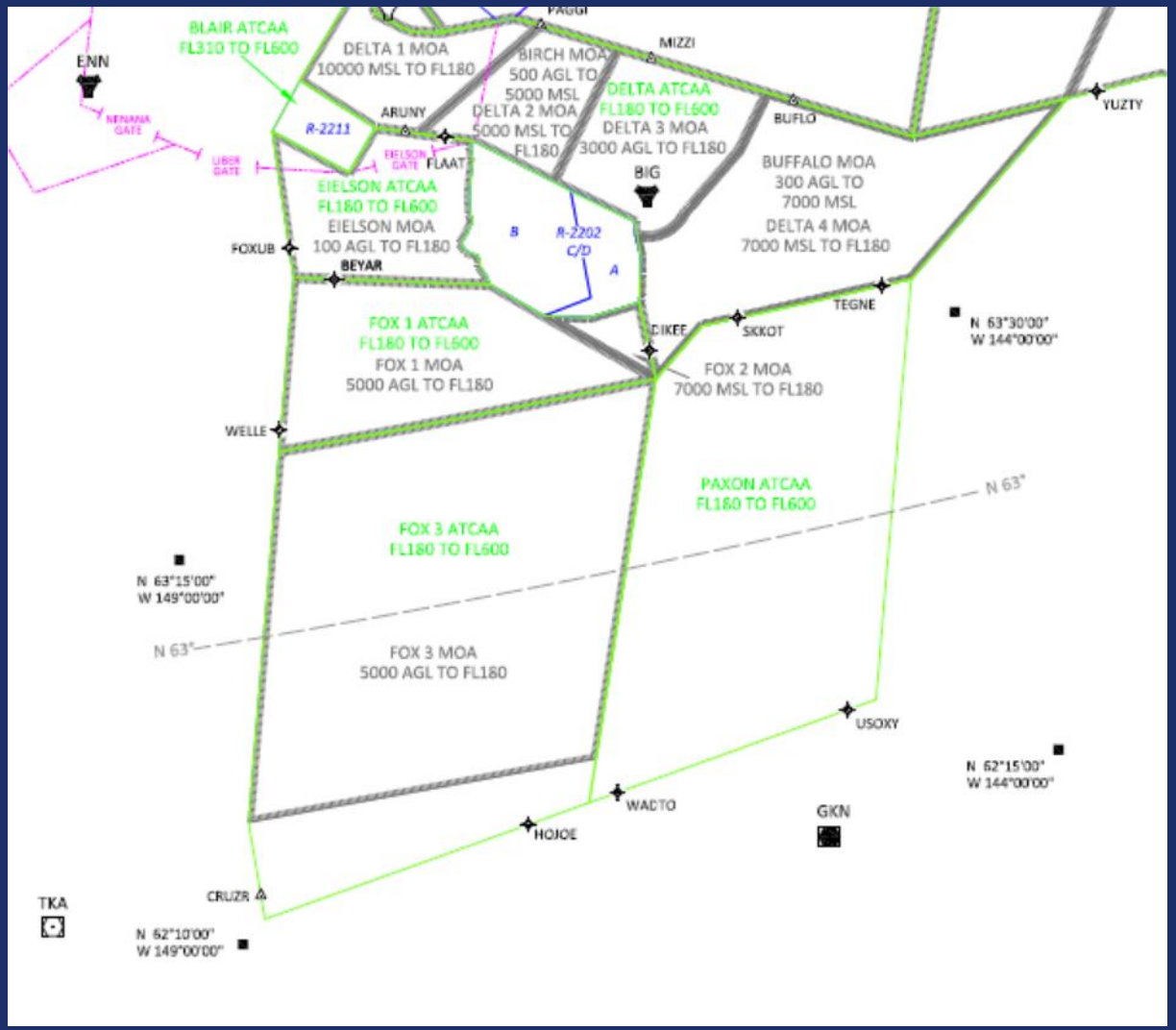
INCLUDED MOAs

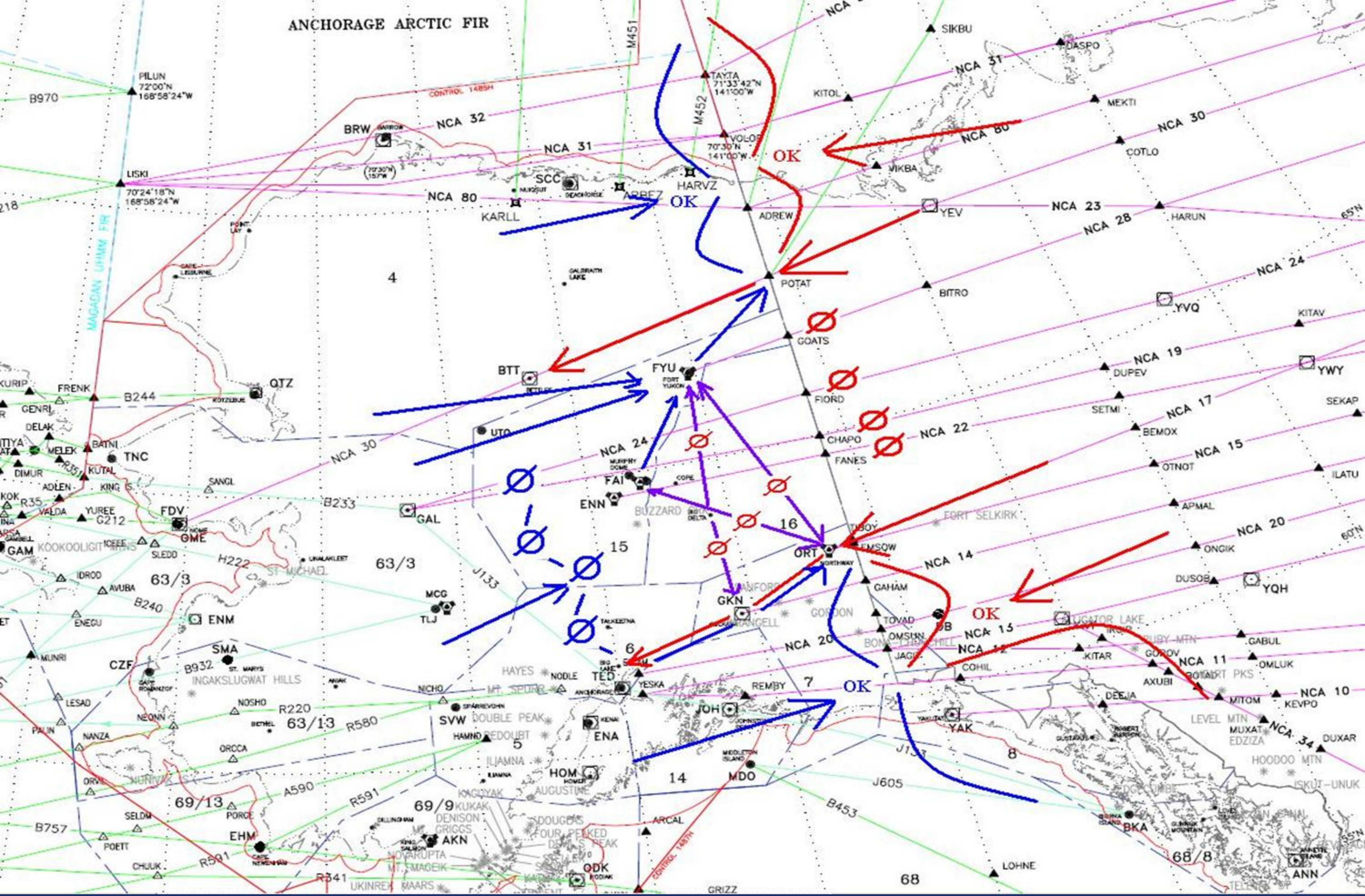
BIRCH, BUFFALO, DELTA 1/2/3/4, EIELSON, FOX 1/2/3, VIPER B AND YUKON 1/2/3A/3B/3 HIGH/4/5

Red Flag Airspace



Red Flag Airspace




ANCHORAGE ARCTIC FIR
OK
OK
OK
OK
MAGADAN UHHM FIR
NCA 80
NCA 31
NCA 32
NCA 30
NCA 23
NCA 28
NCA 24
NCA 19
NCA 17
NCA 15
NCA 22
NCA 20
NCA 14
NCA 10
BRW
SCC
KARLL
HARVZ
TAYTA
VOLOR
ADREW
POTAT
GOATS
FIORD
CHAPO
FANES
FYU
BTT
FAI
ENN
GKN
ORT
TNC
QTZ
OME
GAL
SVW
ENA
HOM
AKN
EHM
YAK
YEV
BITRO
SIKBU
KITOL
MEKTI
COTLO
HARUN
LISKI
PILUN
B970
B244
J133
J605
B453

Military Exercises

Refer to NOTAMs and FAA's "SUA" website for updated Special Use Airspace information - http://sua.faa.gov

Kodiak Launch Facility

Courtesy www.akaerospace.com

Kodiak Launch Facility

No known launch activity planned for this period.


Questions?
FedEx


NAV CANADA

Honolulu Control Facility

Operations

Honolulu Control Facility

Federal Aviation Administration

Oceanic and Offshore Operations

AJE-32

OWG Charter Update

Federal Aviation Administration

OWG Charter Update
Proposed

Overall Roles and Responsibilities

•The Oceanic Work Group (OWG) has been in place since the early 1990's as a user/provider working group, partnering to provide for the continued development of effective, streamlined oceanic operations with the goal of increased capacity and the overall efficiency of service within the Pacific Region.

Responsibilities

•To support the activities of the Informal South Pacific Air Traffic Services Coordinating Group (ISPACG), Informal Pacific Air Traffic Services Coordinating Group (IPACG) and the Cross Polar Work Group (CPWG) and make recommendations when appropriate.

•To serve as a user-provider forum working to improve the safety and efficiency of oceanic air traffic services in the Pacific Region.

OWG Charter Update
Proposed
Members

OWG membership is open to:

•Airspace users in the Pacific Region.

•The International Air Transport Association (IATA).

•Interested air navigation service providers (ANSP).

•FAA Air Traffic Control System Command Center (ATCSCC).

•Ancillary Aviation Services providers (e.g., Rockwell Collins ARINC, Mitre Corporation, etc.).

•Professional Labor Organizations (e.g. IFALPA, IFATCA, etc.)

•When necessary, an OWG sub-group (OWGSG) made up of representatives from the general membership may be formed to address major issues brought forward during a meeting. The OWGSG membership will be determined based on the specific issue(s) to be reviewed. The OWGSG is empowered by the OWG to establish Ad Hoc working groups, as necessary, to deal with issues requiring on-going detailed review and evaluation.

OWG Charter Update Proposed
Meetings

•OWG Meetings:

•Meetings will be held at least twice a year. An optional third meeting may be added midway between the two, if deemed necessary.

•Oakland Air Route Traffic Control Center (ARTCC) will chair OWG meetings.

- •The agenda for each meeting will be developed through input from all members.
- •The chair will distribute a call for agenda items followed by the distribution of the proposed agenda prior to the meetings.
- •A tentative location for the meeting will be determined by the chair and agreed to by the members.
- •In addition to the physical meeting, a virtual meeting will be broadcast with an associated telephone conference line for those wishing to participate, but unable to attend in person. The meeting URL and conference number and passcode will be included with the agenda.

OWG Charter Update
Proposed
Meetings

•OWGSG Meetings:

•The chairperson for the OWGSG will be selected from the sub-group membership at the time of formation.

•Meetings will be held either face-to-face or online, as agreed to by the sub-group membership.

•A quorum is required for OWGSG recommendations. As a minimum, a quorum consists of two representatives from the airspace users and two ANSP representatives.

•The sub-group will provide updates on their progress at subsequent OWG meetings.

OWG Charter Update
Proposed

Issues/Recommendations

•Issues/recommendations may be provided to the OWG through any member. Members may bring subject matter experts as required by the issues.

•The OWG will prioritize issues and develop recommendations as a whole, or through sub-group activity, as necessary.

•Upon consensus of the group, recommendations for action or review will be forwarded to either the ANSP or ISPACG/IPACG.

OWG Charter Update Proposed

Reports

- The membership will receive the following:
- The PowerPoint presentation(s) developed for the OWG meeting.
- The synopsis from the OWG meeting.
- Reports and recommendations received from the OWGSG.

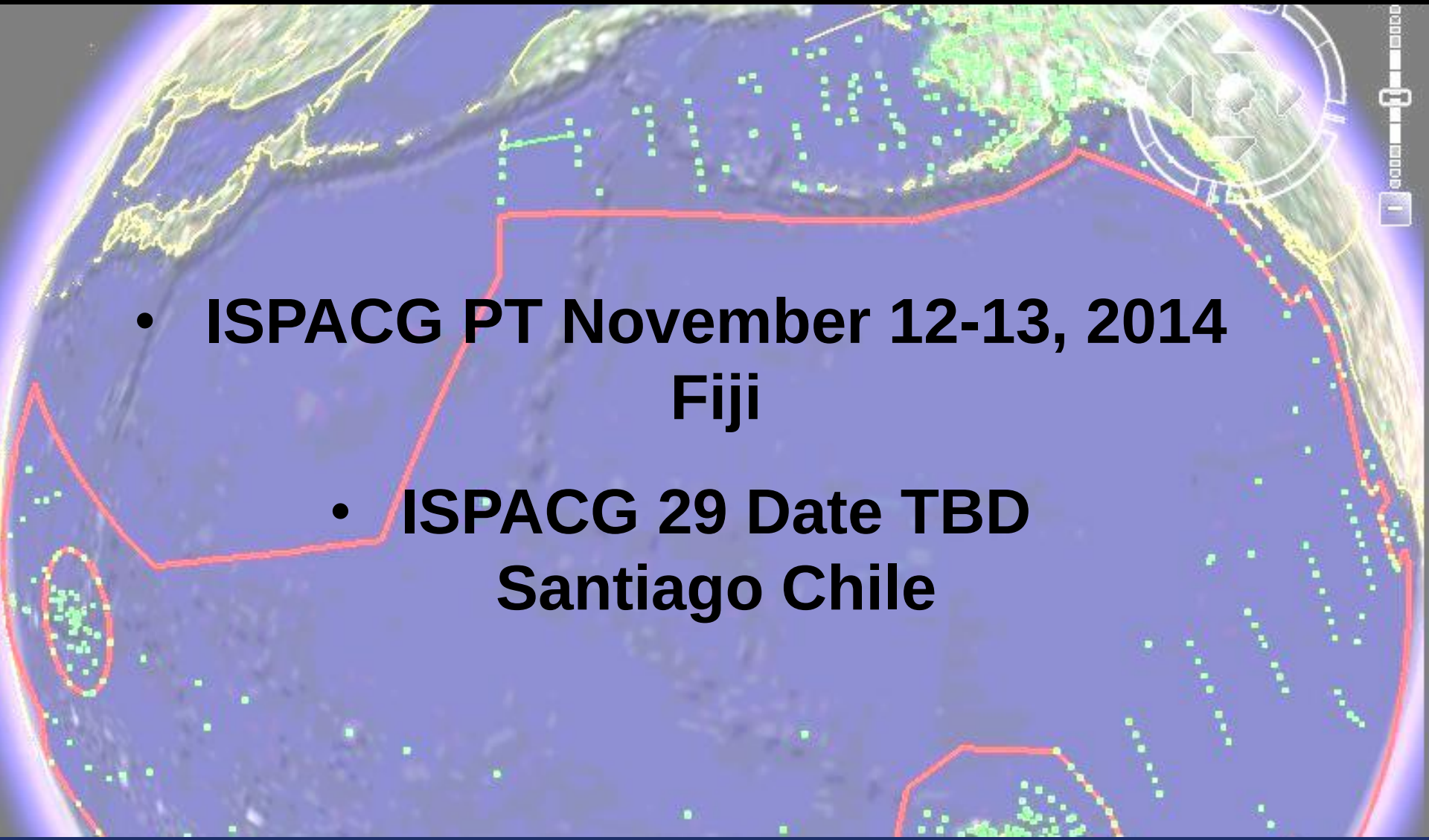
Charter Adoption

This Charter was reviewed and adopted at the regular meeting of the OWG held on October 8, 2014 and supersedes the OWG Charter dated May 13, 1997.

Action Item 03-06

- OWG members to provide known status on island airport.

Other Meetings



- **ISPACG PT November 12-13, 2014 Fiji**
- **ISPACG 29 Date TBD Santiago Chile**

Next OWG Meeting