



**THE FORTY-EIGHTH MEETING OF THE  
INFORMAL PACIFIC ATC COORDINATING GROUP  
(IPACG/49)**

Mita Kaigisho - Tokyo, Japan  
December 5, 2024

Agenda Item x: **Category**

**Unbalanced Utilization of NOPAC Airway Structure**

(Presented by North American carriers)

(Air Canada, American Airlines, Delta Air Lines, FedEx, Kalitta Air, United Airlines)

**SUMMARY**

The following paper provides information on the possible impact of the Japan preferred route structure on utilization of the North Pacific (NOPAC) route structure following the implementation of NOPAC Redesign Phase 2.

**1. Introduction**

- 1.1. An FAA presentation at the Oceanic Working Group meeting in July of this year highlighted the issue of unbalanced traffic on the NOPAC route structure following the implementation of the NOPAC Redesign Phase 2.
- 1.2. It was noted that, while there is heavy traffic congestion on westbound ATS route R220, there is light, under-utilization of M523 even though they are only 25nm apart. The same issue was noted eastbound with light use of R580 and heavy usage of A590.
- 1.3. Several possible mitigations were discussed including:
  - Relaxing UPR restrictions to allow joining M523 further to the southwest.
  - Allow PACOTS Track E to be generated onto M523.
  - Restricting use of R220 for flights departing California during identified time periods.
- 1.4. One possible cause is the difference in the routes that must be used when exiting R220 and M523 in Japanese airspace, particularly if a flight's destination is something other than a Tokyo area airport.
- 1.5. While the NOPAC Redesign is a positive for users of Anchorage FIR (PAZA) and Fukuoka FIR (RJJJ), through multi-state cooperation, there is potential for increased efficiency and airway balance which would benefit airspace users and ANSPs alike.

## 2. Impact on Operators

- 2.1. Operators are primarily planning R220 westbound due to onward connectivity efficiencies sought by flight planning systems. This results in the overloading of one airway resulting in separation challenges for ATC, along with inefficient use of airspace. This is contrary to the intent of the NOPAC Redesign. This will again be exacerbated with the future implementation of airway N507 once NOPAC Redesign Phase 3 is initiated.
- 2.2. These limitations impact all airlines using the NOPAC, whether directly, through potential efficiencies or indirectly through potential altitude restrictions imposed due to spacing requirements and congestion of R220.

## 3. Supporting Data

- 3.1. From M523 at IPGUD flying direct to DAIGU, the savings below highlight the value, and this change would also help balance M523 traffic compared to the published routes (Fig. 1)

Dep	Arr	Type	Route	NM	Fuel	Time	CO2
PAZA	VHHH	B777	IPGUD-DAIGU	15	210KG	2 Min	0.66T
PAZA	VHHH	B787	IPGUD-DAIGU	15	130KG	2 Min	0.44T

*Figure 1*

- 3.2 Adding new OTRs would provide planning flexibility and assist with additional route-out options, increasing flight safety when weather conditions dictate.

New westbound OTRs from R220 to M523 and from M523 across R220 to ESLUK would allow connections to existing Japanese route options.

New eastbound OTRs from A590 to R580 and from R580 to A590 would allow for increased flexibility from the Japanese route options to the NOPAC. (Fig. 2)

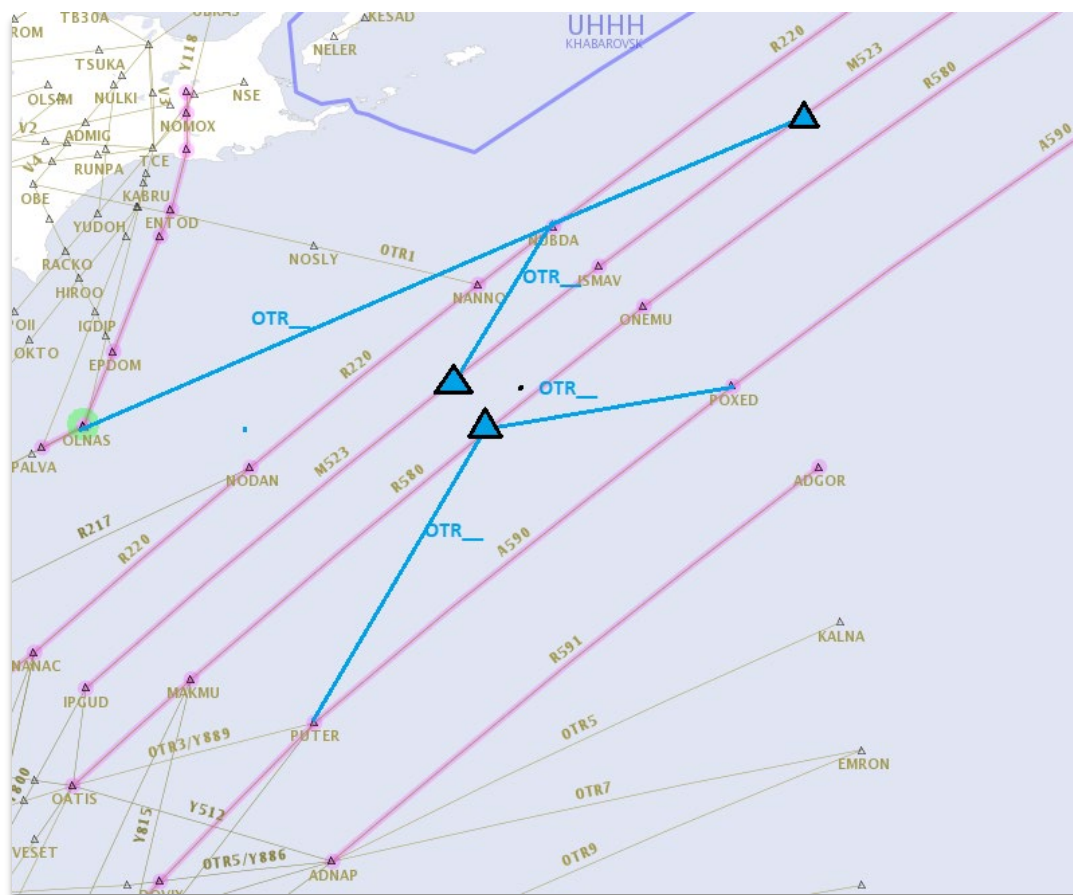


Figure 2

- 3.3 Traffic to Seoul's airports would be improved by the usage of R217 after R220 or a new OTR from NANNO. (Fig. 3)

Dep	Arr	Type	Route	NM	Fuel	Time	CO2
PAZA	ROK	B777	R217	40	500KG	3 Min	1.58T
PAZA	ROK	B787	R217	40	300KG	3 Min	0.95T
PAZA	ROK	B777	ESLUK	50	700KG	4 Min	2.21T
PAZA	ROK	B787	ESLUK	50	400KG	4 Min	1.26T
PAZA	ROK	B777	M523	-10	-150KG	-4 Min	-0.47T
PAZA	ROK	B787	M523	-10	-100KG	-4 Min	-0.32T

Figure 3

- 3.4. NOPAC Redesign Phase 3 introduces new airway N507. The numbers below are based on the use of potential new OTRs between R580 and A590. Connectivity between airways is important but does not inherently provide a major savings unless there are specific wind or weather conditions. However, the connectivity would prove to be valuable if mandatory routings prior to oceanic entry was not equitable and balanced from all origins in Asia.

Dep	Arr	Type	Route	NM	Fuel	Time	CO2
ROK	PAZA	B777	580 OTR 590	10	0KG	1 Min	0T
ROK	PAZA	B787	580 OTR 590	10	0KG	1 Min	0T
ROK	PAZA	B777	590 OTR 580	10	0KG	1 Min	0T
ROK	PAZA	B787	590 OTR 580	10	0KG	1 Min	0T

- 3.5 A detailed analysis of these impacts on one particular (Kalitta Air) is provided at the end of this paper. (Appendix 1)

#### 4. Conclusion

- 4.1 The meeting is invited to note the information provided.



# FUKUOKA FUEL ANALYSIS

ARTHUR DENYS- DISPATCH ROUTE PLANNER

ETHAN MANCHESTER- SENIOR MANAGER OF FLIGHT OPERATIONS



PAZA  RJJJ  RCAA

DESTINATION  
HKG

777F  
Annual Winds  
90,718KG of cargo

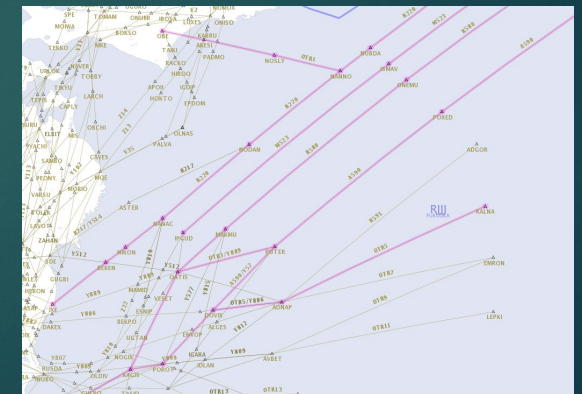
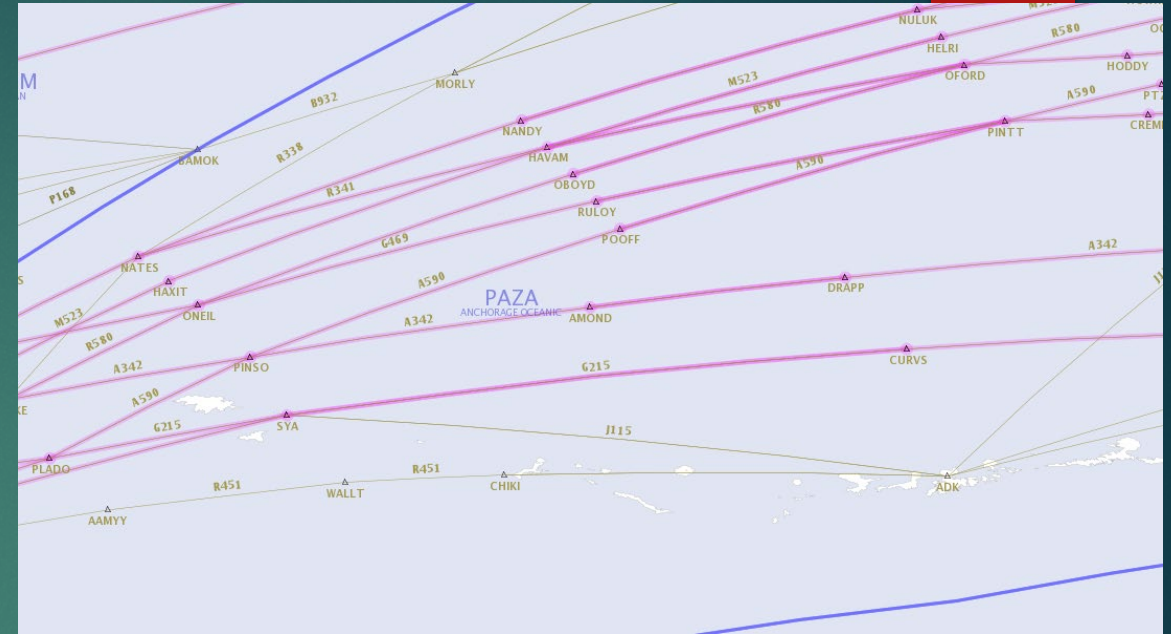


# TRANSITION ROUTES

► Request additional OTR routes including connections between NOPAC routes. Similar build to the transition routes in PAZA.

► Benefits include

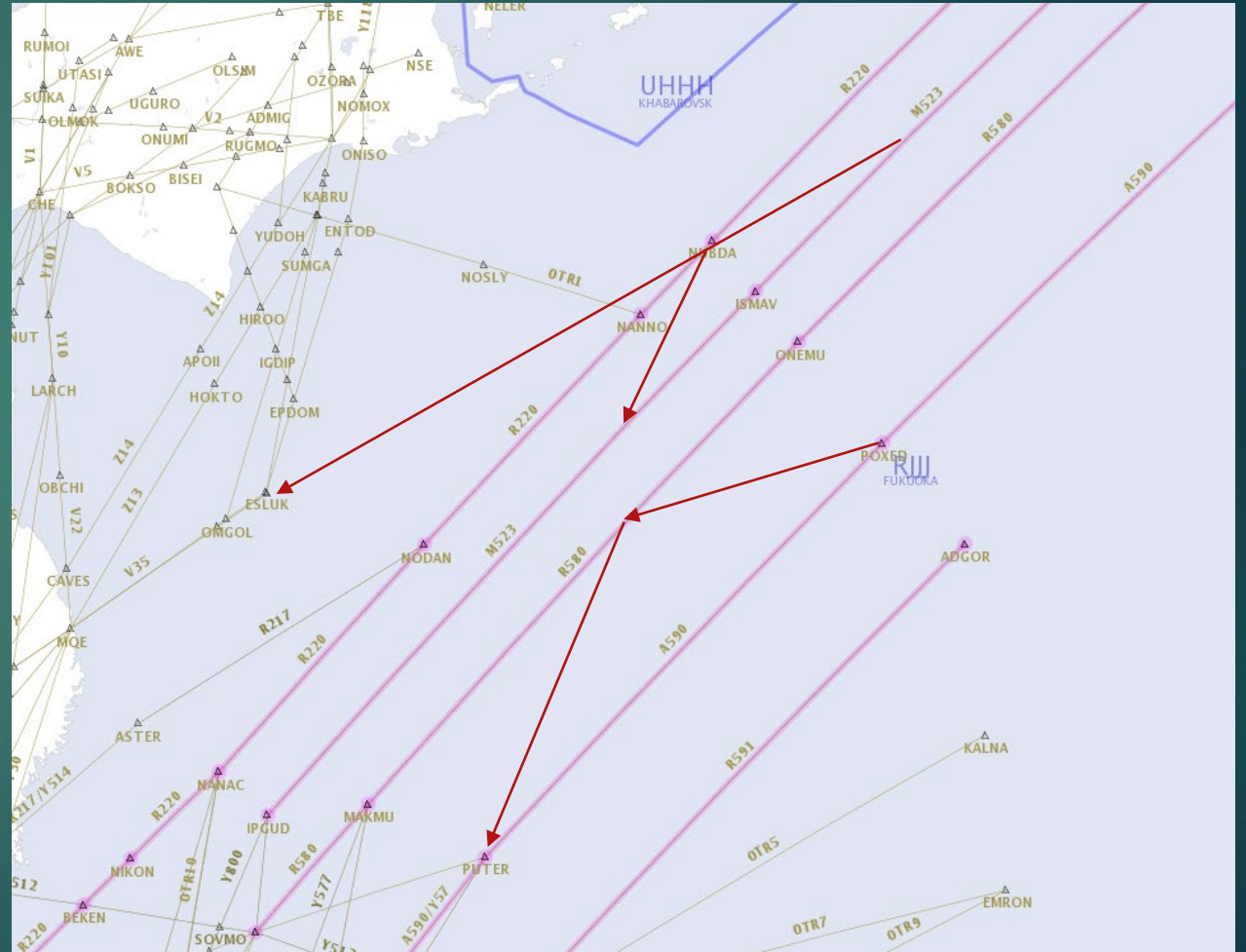
- Easier transition and more choices from the NOPAC to Pacific Preferred Routes
- More routing choices through Central Japan avoiding Tokyo airspace





# Four possible new OTR Routes

- ▶ West Bound
  - ▶ Connecting M523 to R220 & Central Japan for overflights
  - ▶ Connecting R220 to M523
- ▶ East Bound
  - ▶ Connecting A590 for R580
  - ▶ Connecting R580 to A590





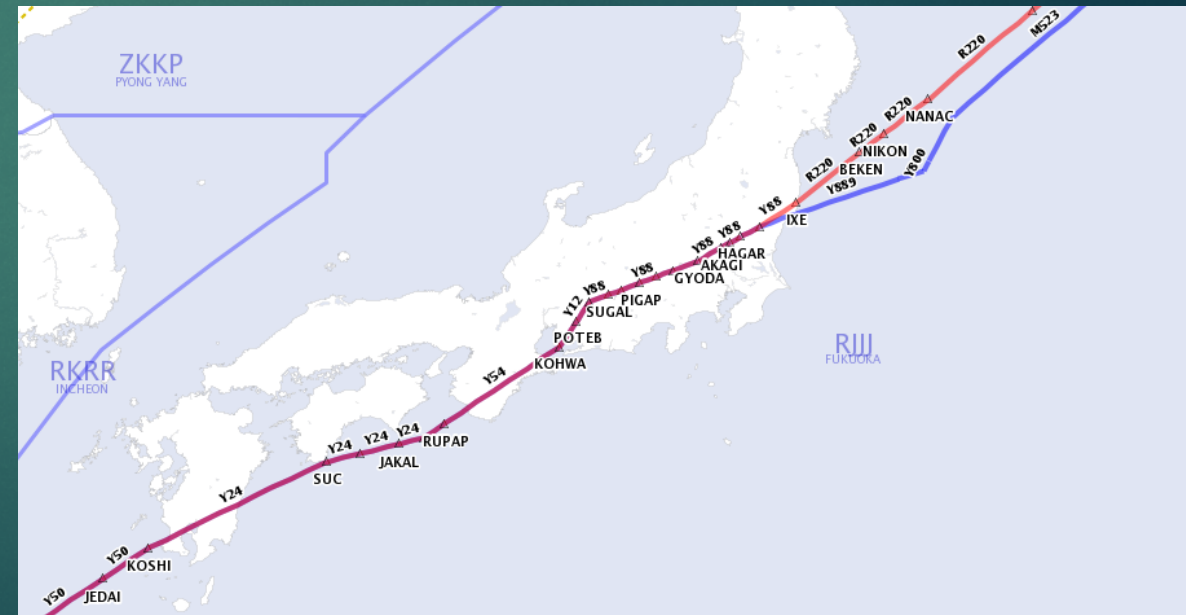
# R220 PREFERRED ROUTE

# M523 PREFERRED ROUTE

NANAC R220 IXE Y88 NAKTU Y12 KOHWA Y54 TURFY Y24 KOSHI Y50 IGMON A1 BULAN

IPGUD Y800 MUBTO Y889 DAIGO Y88 NAKTU Y12 KOHWA Y54 TURFY Y24 KOSHI Y50 IGMON  
A1 BULAN

Route	Time	Fuel	Differences
R220 Preferred	02:55	25,220KG	
M523 Preferred	02:58	25,560KG	2 mins 703KG



# NUBDA DCT BULAN

NUBDA (NEW OTR) ESLUK Y112 OMGOL Y111 MQE Y124 GTC V30 KMC Y382 WAKIT Y282 POPPY Y34 SUKMO Y50 HKC A1 BULAN

Route	Time	Fuel	Differences
R220 Preferred	03:37	30,663KG	5 mins 590KG
DCT Route	03:32	30,073KG	
Proposed Route	03:33	30,119KG	1 min 46KG





RCAA  RJJJ  PAZA

DESTINATIONS  
PANC, KORD, KCVG, KJFK

777F  
Annual Winds  
90,718KG of cargo

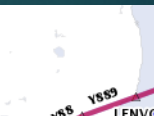


## R580 PREFERRED ROUTES

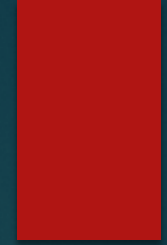
- | Route | Time  | Fuel     | Differences  |
|-------|-------|----------|--------------|
| 1.)   | 03.56 | 33,475KG |              |
| 2.)   | 03.54 | 33,203KG |              |
| 3.)   | 03.55 | 33,339KG |              |
| 4.)   | 03.59 | 33,883KG | 5 mins 680KG |
| 5.)   | 03.54 | 33,203KG |              |
| 6.)   | 03.55 | 33,339KG | 1 min 136KG  |



389 OA







RKRR  RJJJ  PAZA  
(LANAT TO NOPAC)  
RKSI TO  
PANC KORD KCVG KJFK

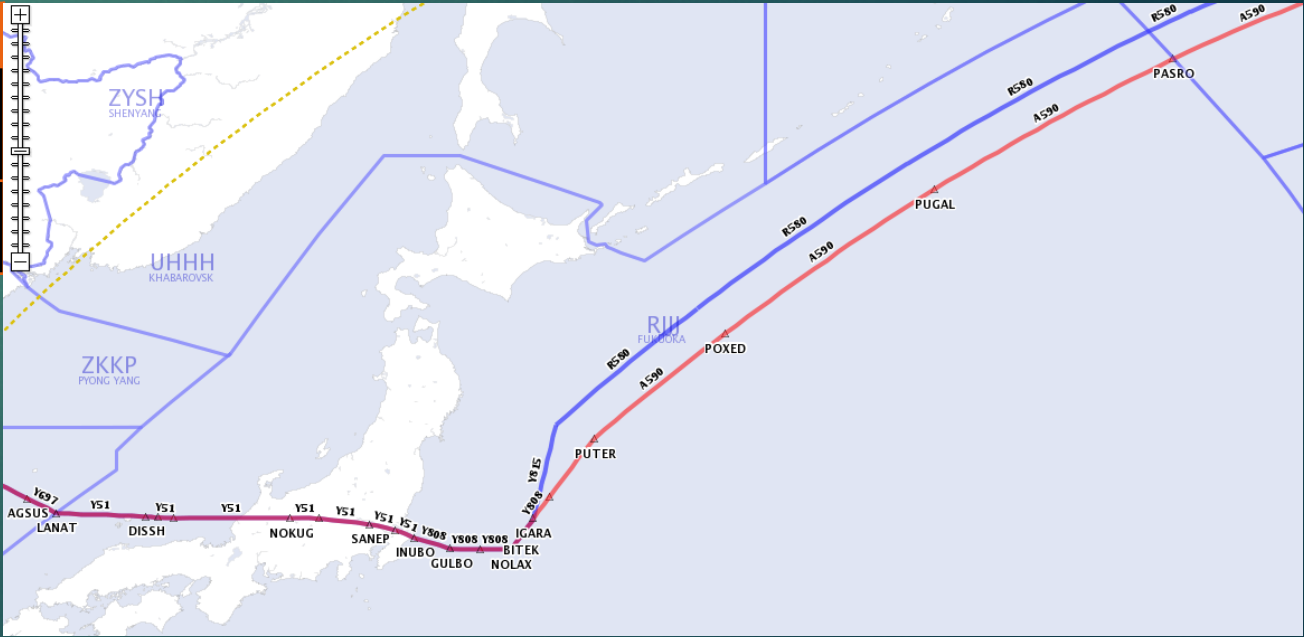
777F  
Annual Winds  
90,718KG of cargo



# LANAT TO NOPAC PREFERRED ROUTES

- 1.) LANAT Y51 INUBO Y808 PUTER A590 PASRO
- 2.) LANAT Y51 INUBO Y808 IGARA Y815 MAKMU R580 OMOTO

Route	Time	Fuel	Differences
1.)	02.59	24,948KG	
2.)	03.04	25,492KG	5 Mins 456KG



LANAT Y51 INUBO Y808 IGARA Y815 MAKMU R580 OMOTO

LANAT Y51 SAMON Y142 GTC R217 SDE Y512 OATIS Y889 PUTER PASRO

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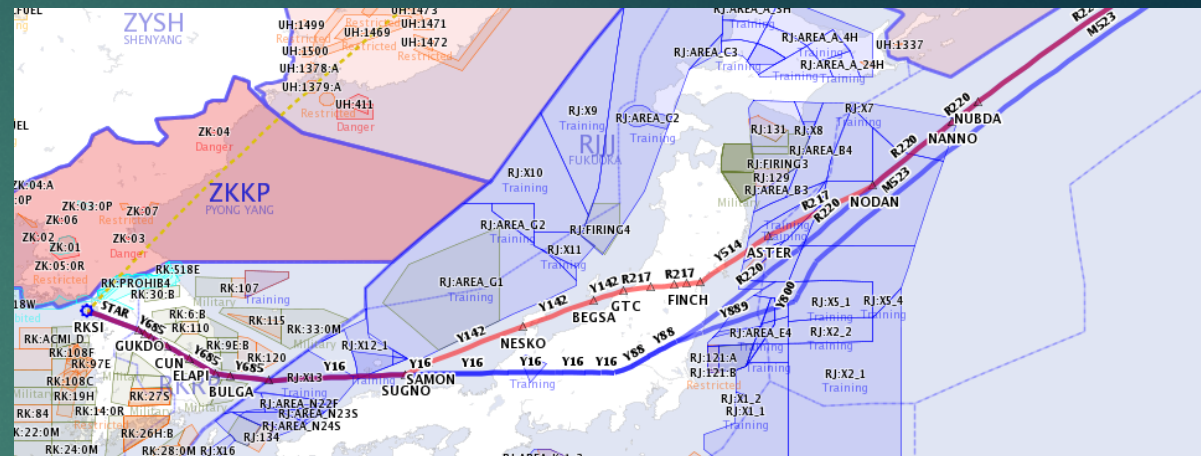
PAZA FIR TO RKRR



# PAZA to RKSJ

(PANC-RKSI, straight flight plan, 150,000bs payload, N776CK)

- ▶ R220 PREFERRED ROUTE
- ▶ M523 PREFERRED ROUTE
- ▶ R220 ALTERNATE PREFERRED ROUTE
- ▶ NODAN R220 IXE Y88 TEPEX Y16 SAPRA
- ▶ IPGUD Y800 MUBTO Y889 DAIGO Y88 TEPEX Y16 SAPRA
- ▶ NODAN R217 ASTER Y514 SDE R217 GTC Y142 SAMON Y14 SUGNO Y16 SAPRA



Route	Time	Fuel	Differences
R220 Alternate	2:34	18,506kg	
R220 Preferred	2:37	20,003kg	3 mins, 1497kg
M523 Routing	2:43	22,500kg	9 mins, 3994kg

# Potential Savings Route VIA L512

- ▶ Using L512 through Japan



- ▶ NODAN R217 ASTER Y514 SDE R217 GTC L512 TENAS Y437 KAE  
Y697 KARBU KARBU1A RCSI

Route	Time/Fuel	Difference
Most efficient Pref rte	2+34, 18,506KG	
L512 route	2+31, 18,007KG	3 mins, 499kg







# Alternate Options

- ▶ ISMAV DCT NODAN or similar points to use M523 for traffic congestion but crossover to R220

