High Altitude UPR across the Pacific

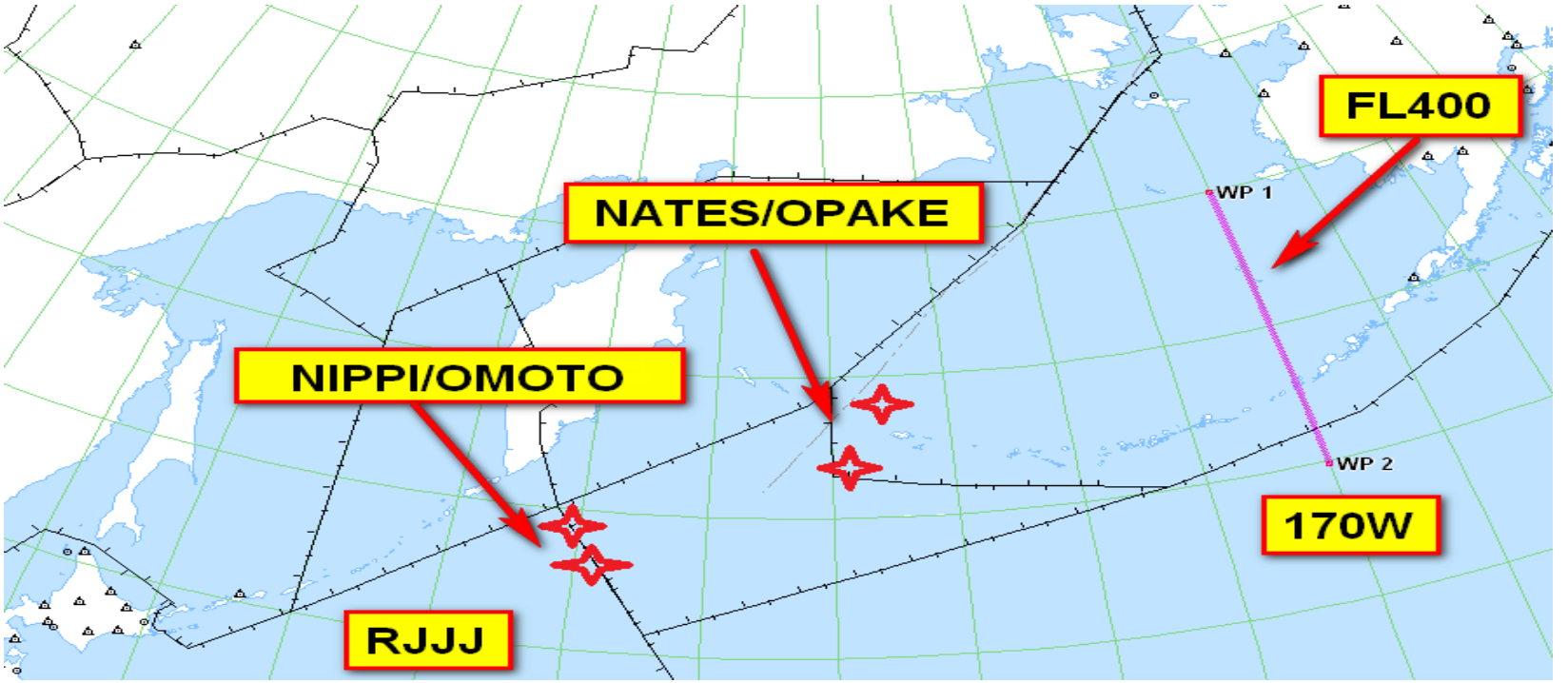
A STAR ALLIANCE MEMBER

UNITED

Westbound High Altitude UPR

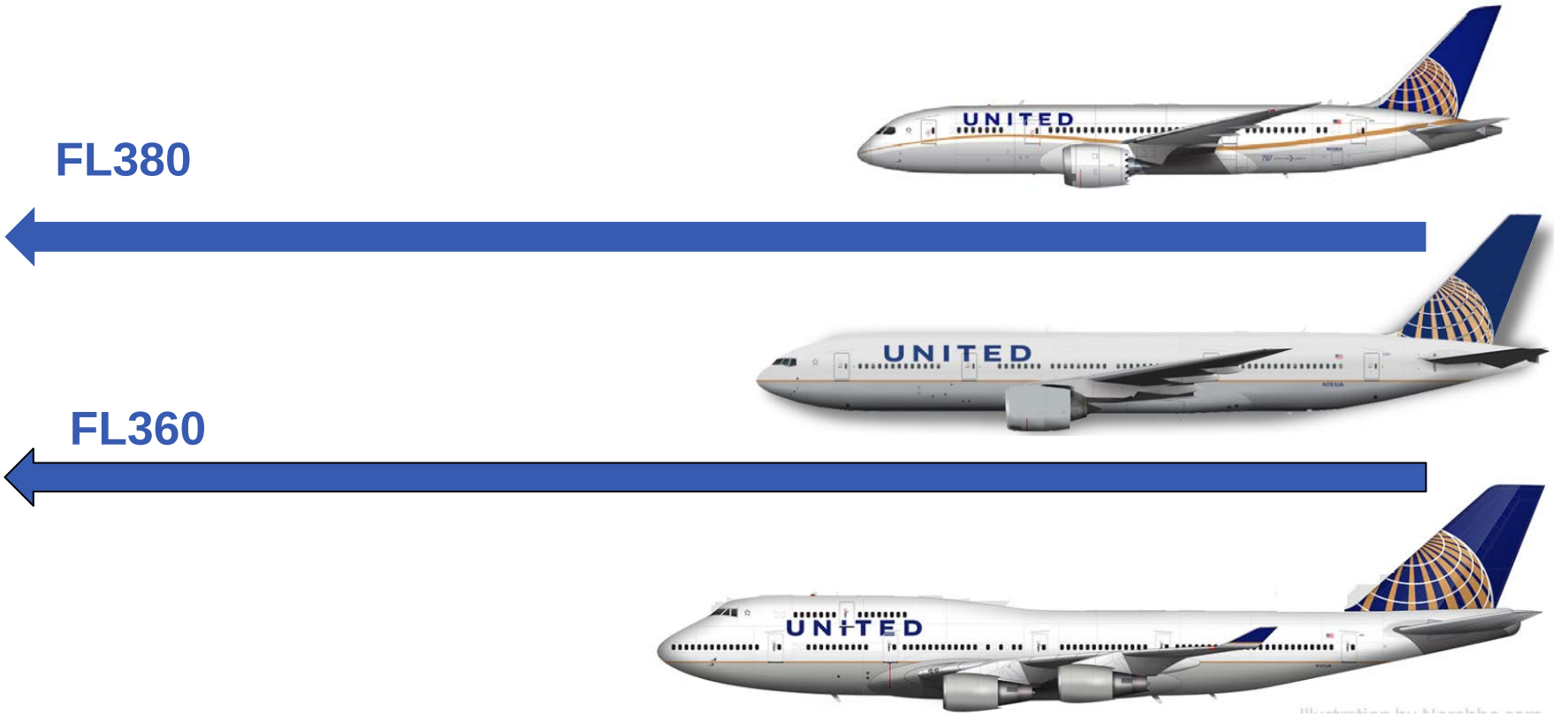
History – PAZA FIR Westbound UPR

- Anchorage ARTCC's high altitude UPR started back in 2014. The trial guidelines are published in PAZA A0075/16.
- Previously westbound flights joining NOPAC routes were required to join airways R220 and R580 by NATES/OPAKE. This was changed to NIPPI/OMOTO at Fukuoka FIR (RJJJ) boundary as long as the flight is capable of climbing to FL400 by 170W.



UAL Participation

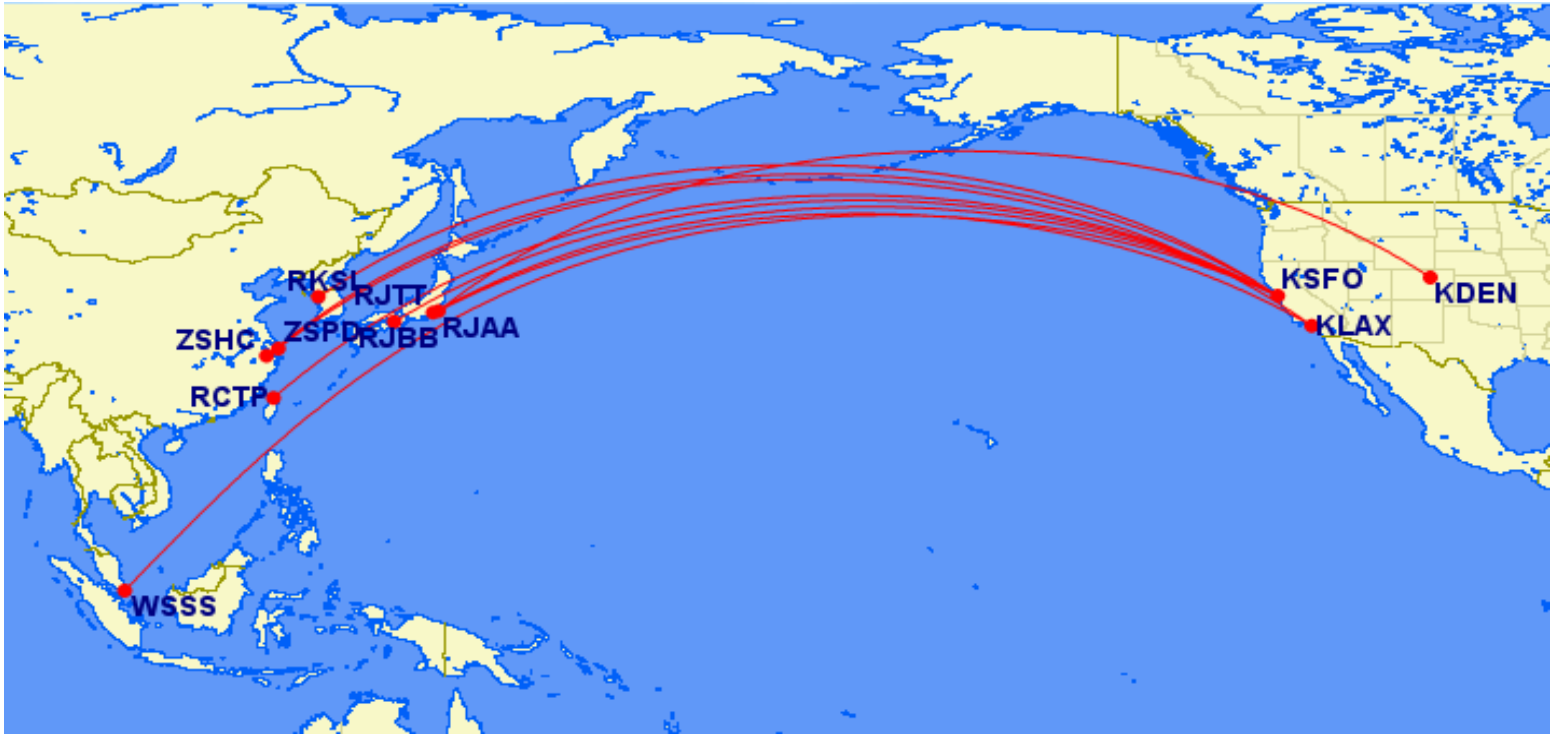
- This additional flight planning flexibility was only possible for UAL with B787-8 for its exceptional climb/cruise performance. Under normal conditions, it consistently operates within NOPAC at higher flight levels than other traffic, typically above FL380 to take advantage of NIPPI/OMOTO UPR. B777s and B747s are still limited to NATES/OPAKE UPR's.



UAL Expansion

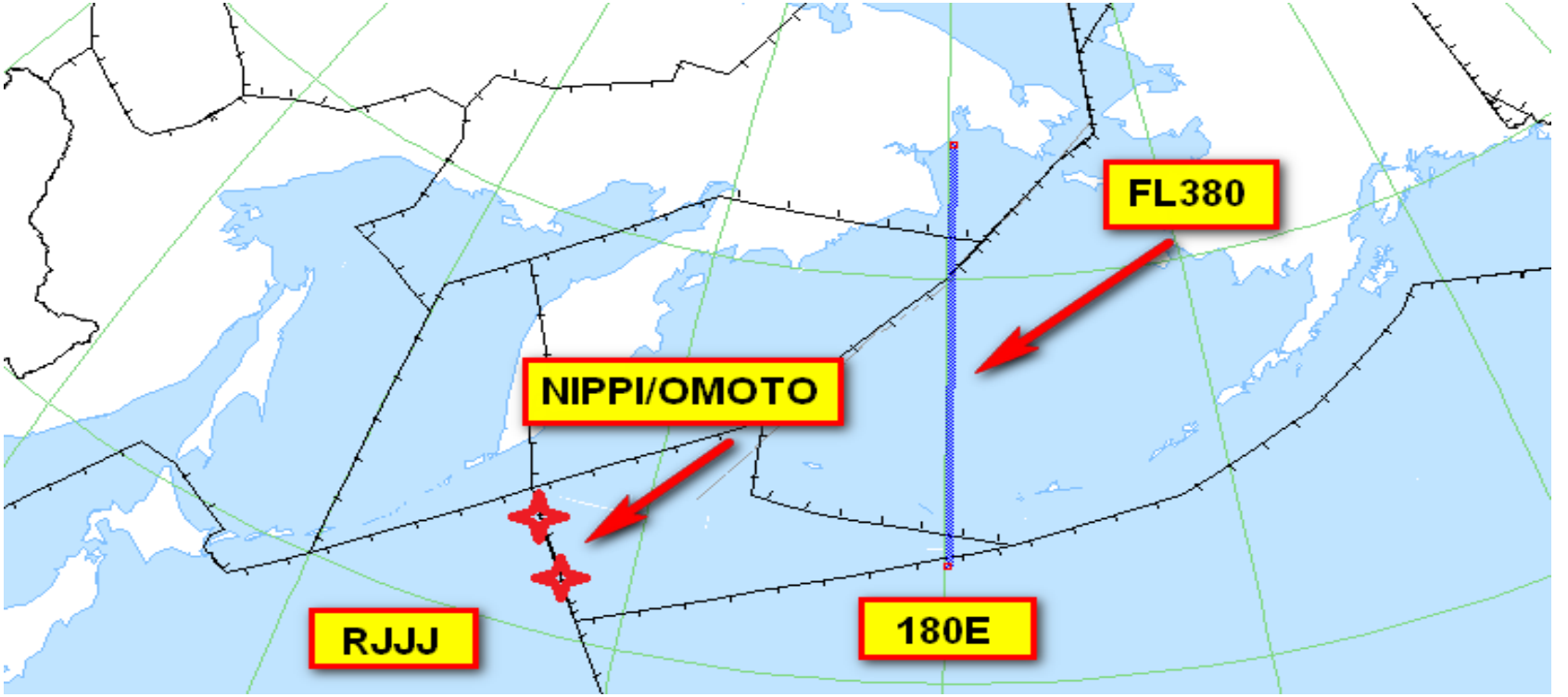
- To date, UAL has 30 787's that are mostly deployed to the pacific. Additional deliveries are scheduled well into 2018. As a general industry trend, new aircraft deliveries with better performance capability may allow access to higher flight levels earlier in flight.

Current and Future UAL 787 City Pairs Over NOPAC



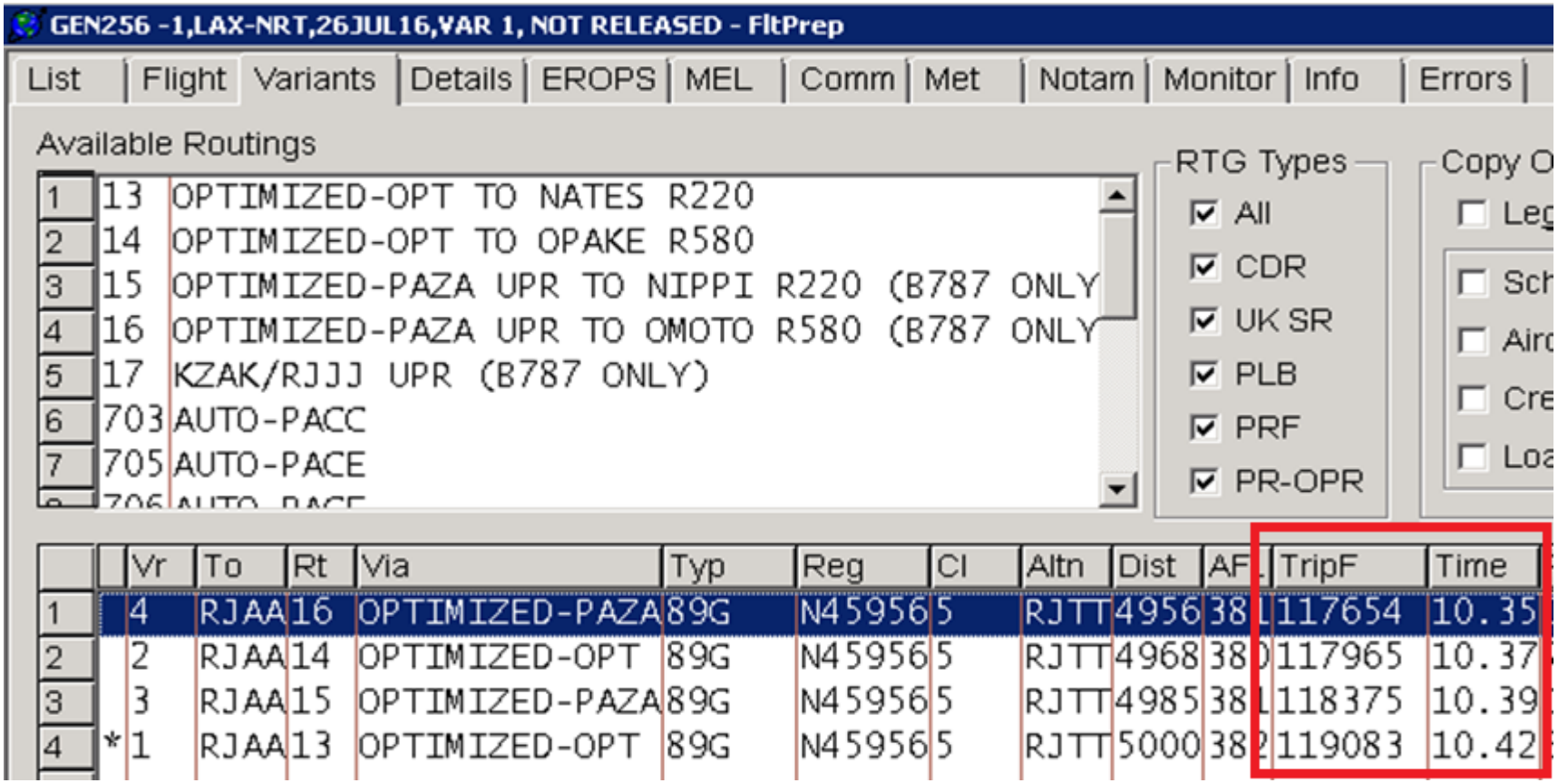
Recent Update

- B787-9 encountered some difficulty with the 170W requirement due to heavier weight for city pairs typically flown. Recent coordination allowed the FL expectation to be moved further west to 180E at or above FL380. It was quickly put in to effect in January of 2016 by Anchorage ARTCC. UAL believes this change is working well and provides flexibility to operators. This is a direct result of close coordination at IPACG.



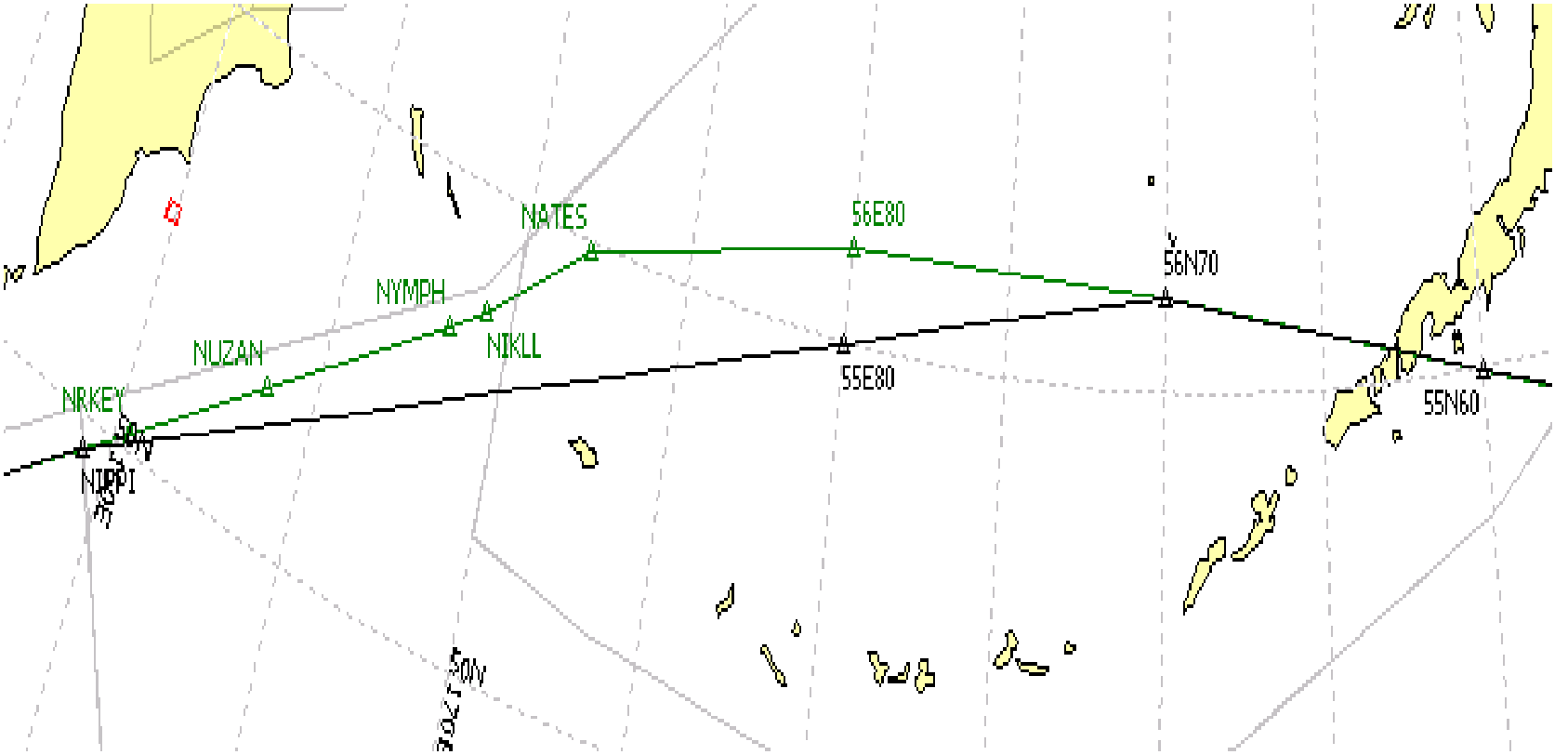
UAL Flight Planning Process

- Dispatchers are provided “variants” which optimize routes to NIPPI/OMOTO vs NATES/OPAKE. The flight planning system builds a comparison in terms of minimum cost, fuel and flight time. The minimum “total” cost route option is presented at the top which is then considered for dispatcher’s selection.



Understanding

- There is no requirement to force FL380 in the flight plan. The compliance is the reasonable expectation of climb capability to FL380 by 180E. The dispatcher will evaluate if a lower flight level is desired for safety reasons such as forecasted turbulence, or the weight of the aircraft, NATES/OPAKE route options are available for selection.



UAL Participation Over Time

- Total number of flights NIPPI/OMOTO UPR used.
- Highest number of usage are seen on US west coast – Asia city pairs

City Pairs	2014	2015	2016	TOTAL
DEN-NRT	28	53	19	100
LAX-NRT	54	90	46	190
LAX-PVG	65	92	14	171
SFO-HGH			4	4
SFO-HND			39	39
SFO-KIX	56	126	45	227
SFO-SIN			3	3
SFO-TPE			42	42
Others		6	2	8
TOTAL	203	367	214	784

UAL Estimated Savings Over Time

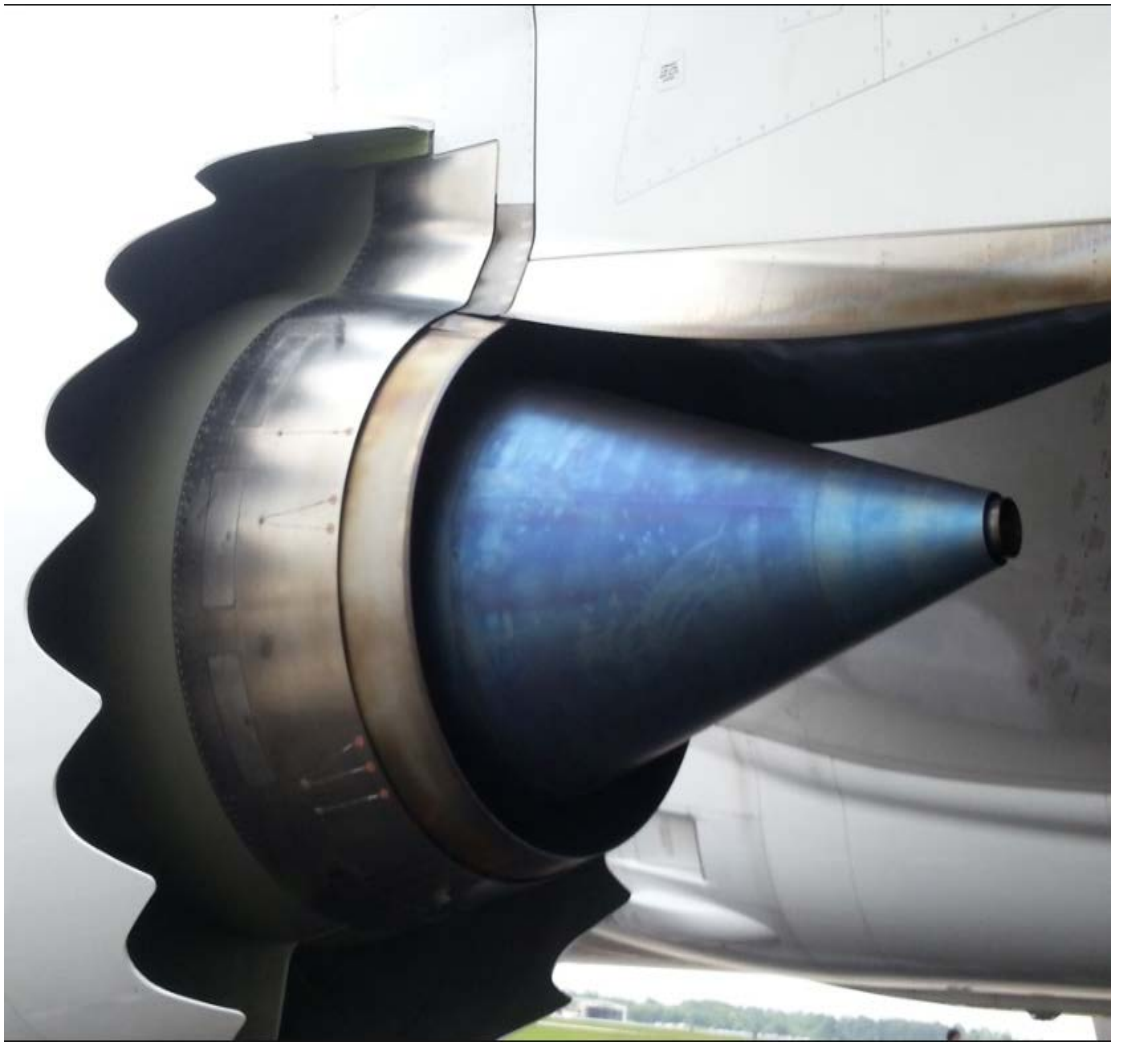
Average Flight Time Savings
Approximately 2-3 minutes

Cumulative Fuel Savings (Since 2014)
784 flights X 300LBS = 235,200LBS
(136 KG) (106,684 KG)

Annual Fuel Savings (Average)
367 flights X 300LBS = 110100LBS
(136KG) (49,940 KG)

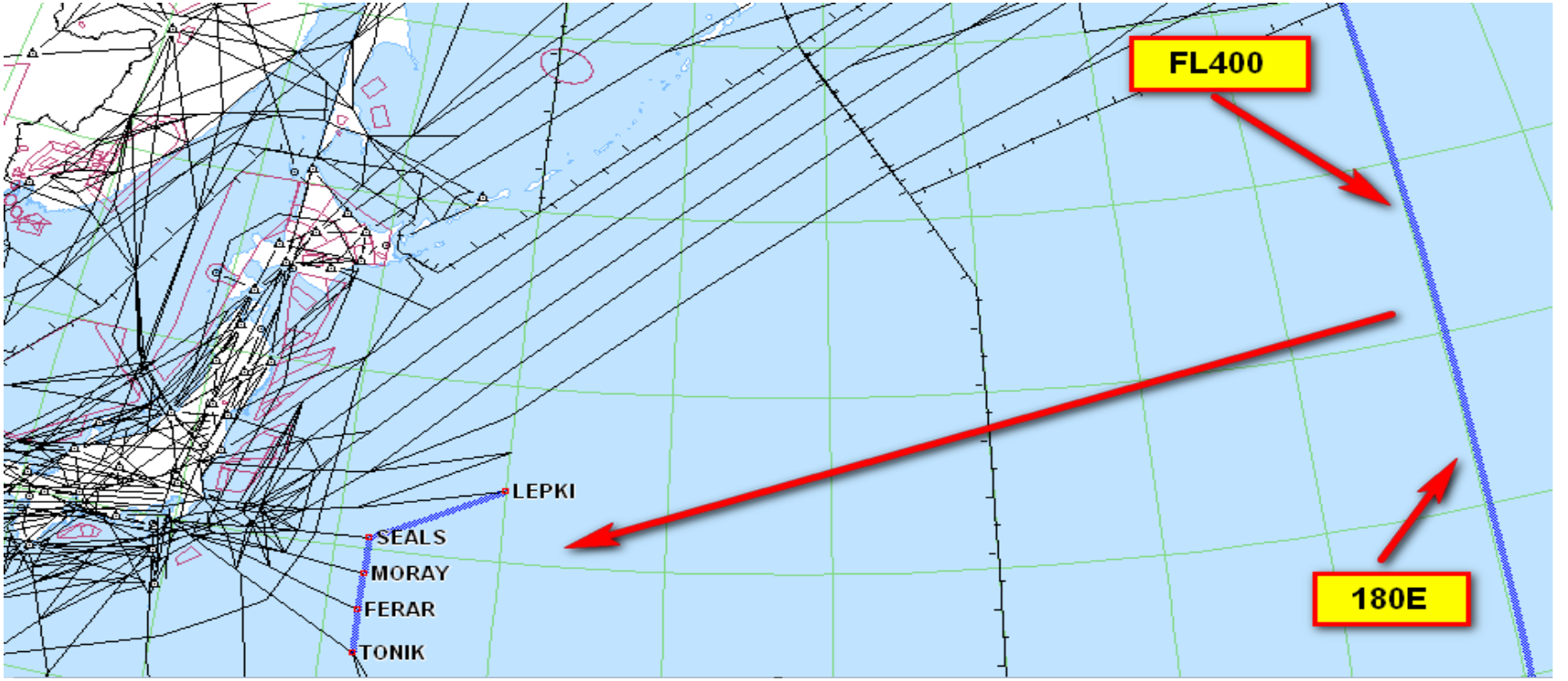
Associated reduction in CO2 emissions!

UNITED eco-skies
COMMITMENT TO THE ENVIRONMENT



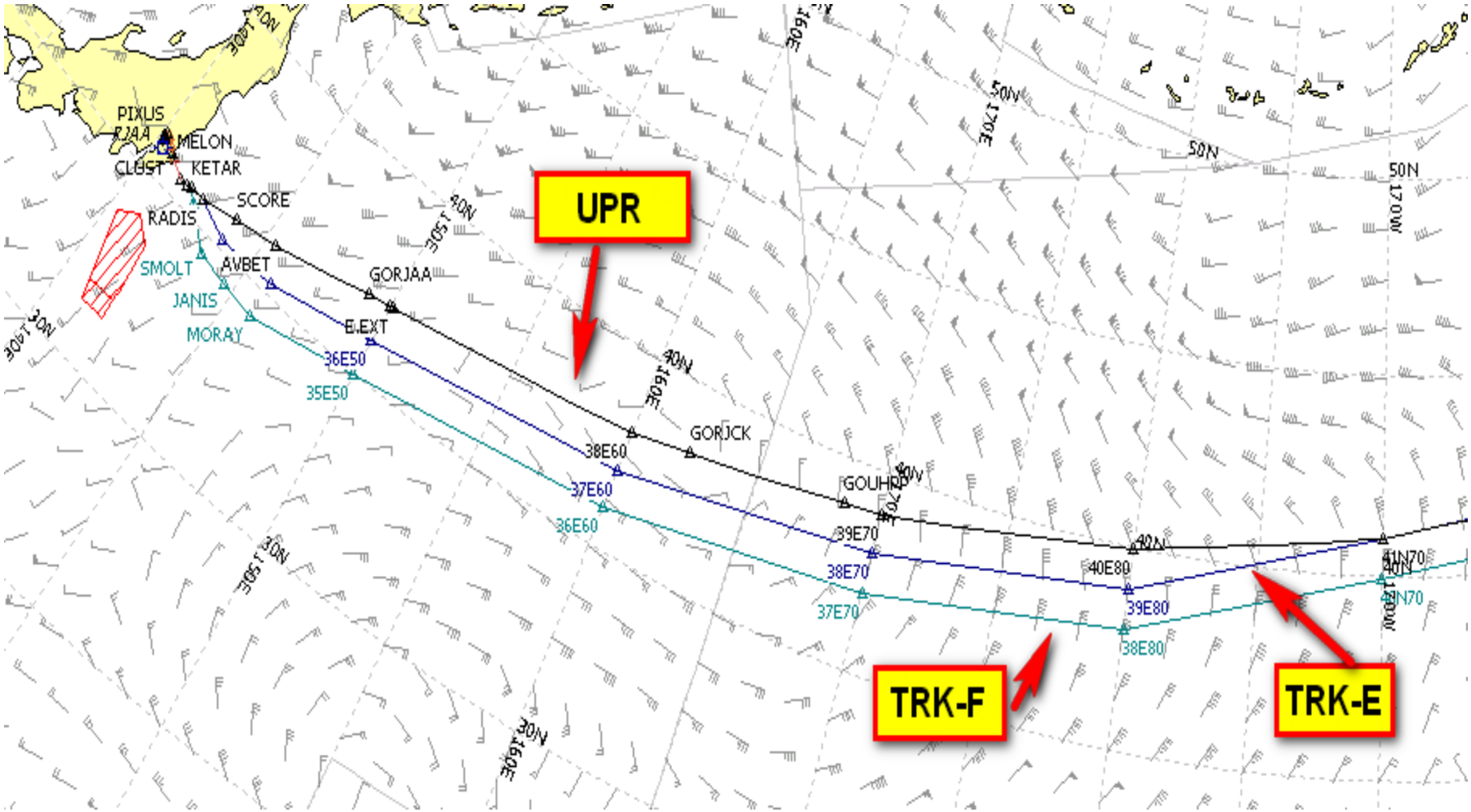
RJJJ FIR High Altitude UPR Trial

- In accordance with Japan AIC 009/16, UAL began participating in Fukuoka FIR's high altitude UPR operational trial for westbound effective June 2016.
- Much anticipated and welcomed trial.
- Flights must remain within Oakland and Fukuoka FIRs and must be capable of climbing to FL400 or above at 180E.



RJJJ FIR UPR Sample 1

- UAL participation is limited to B787 only on 6 selected city pairs.



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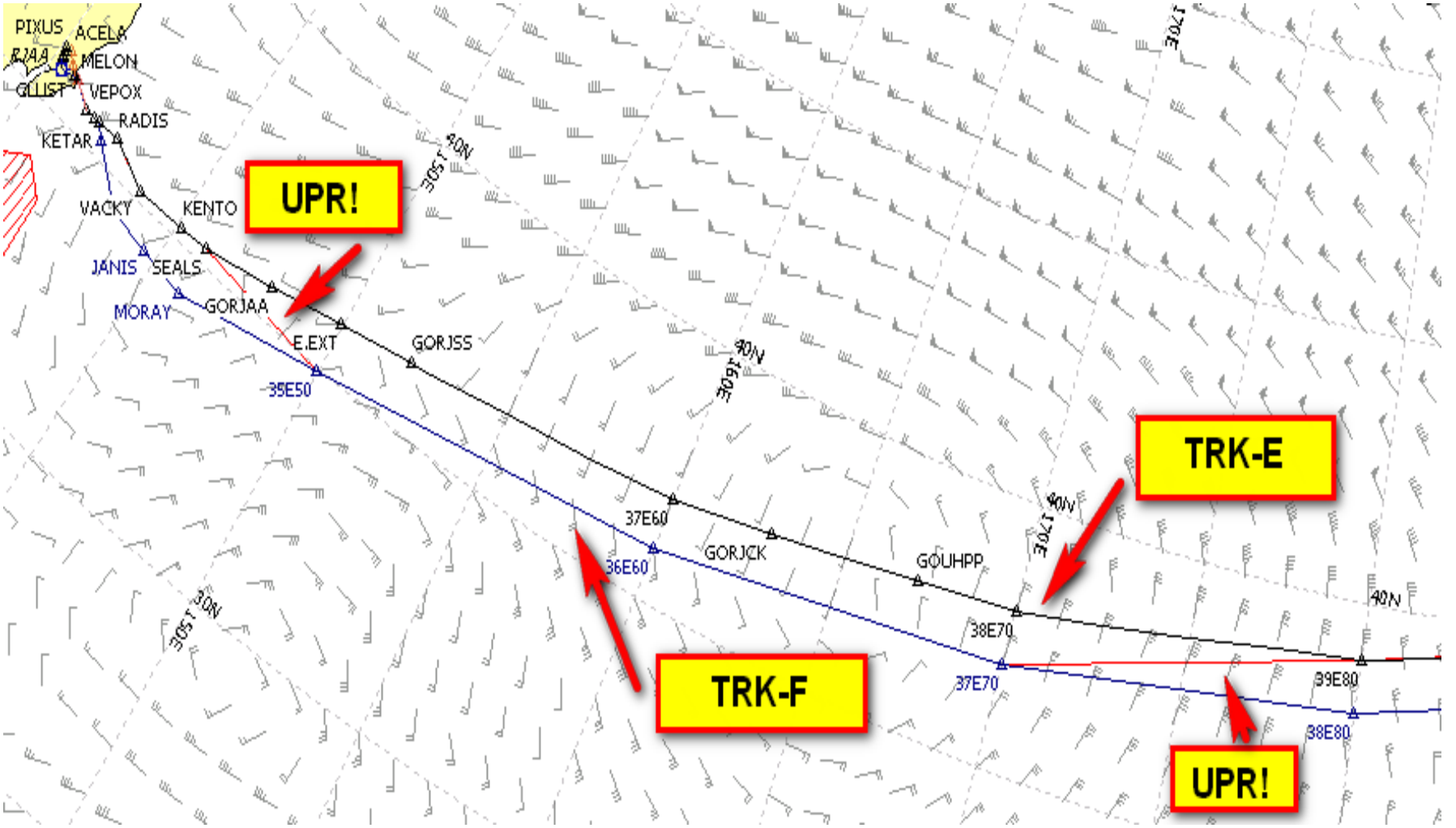
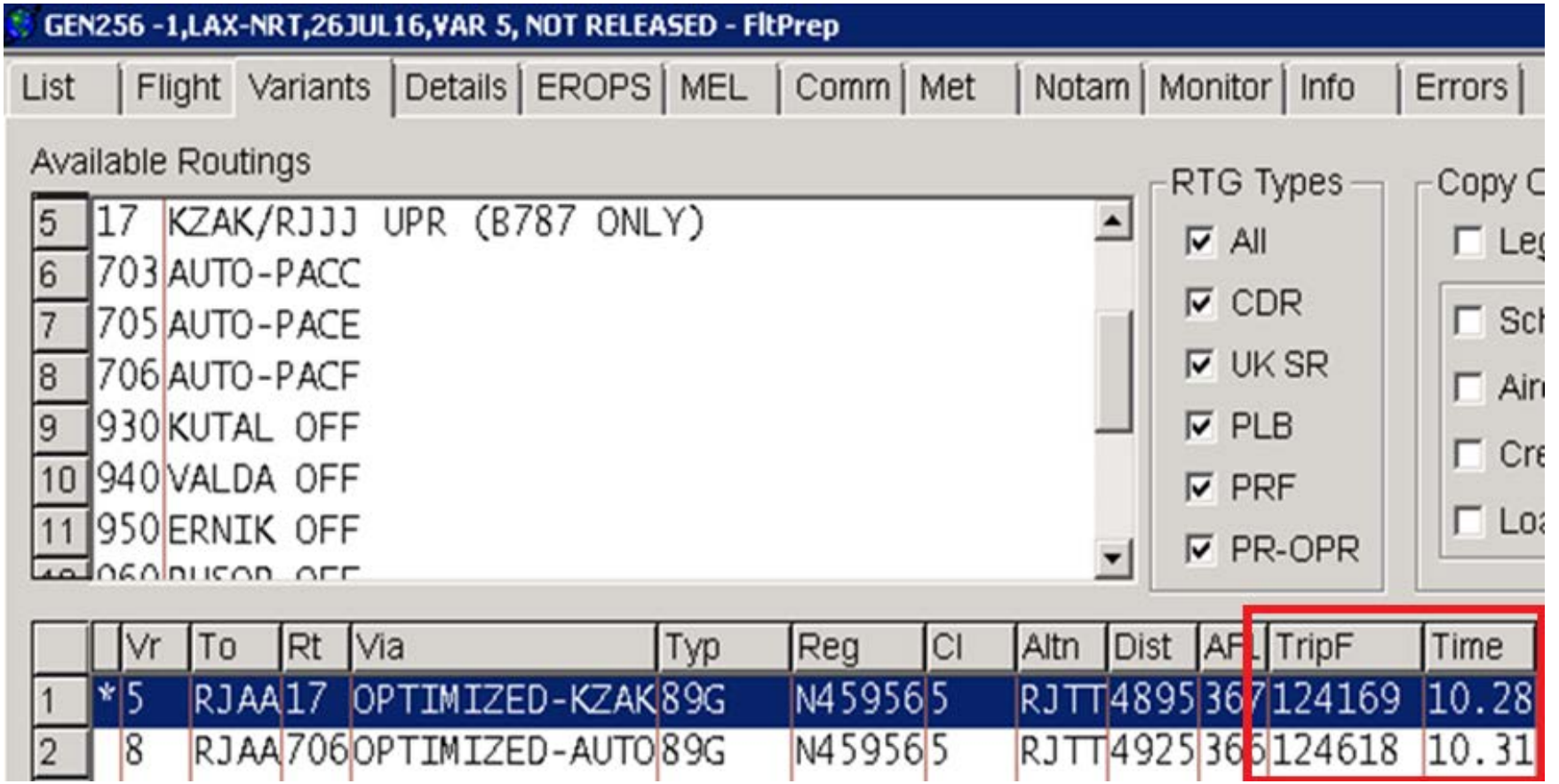
RJJJ FIR UPR Example 2



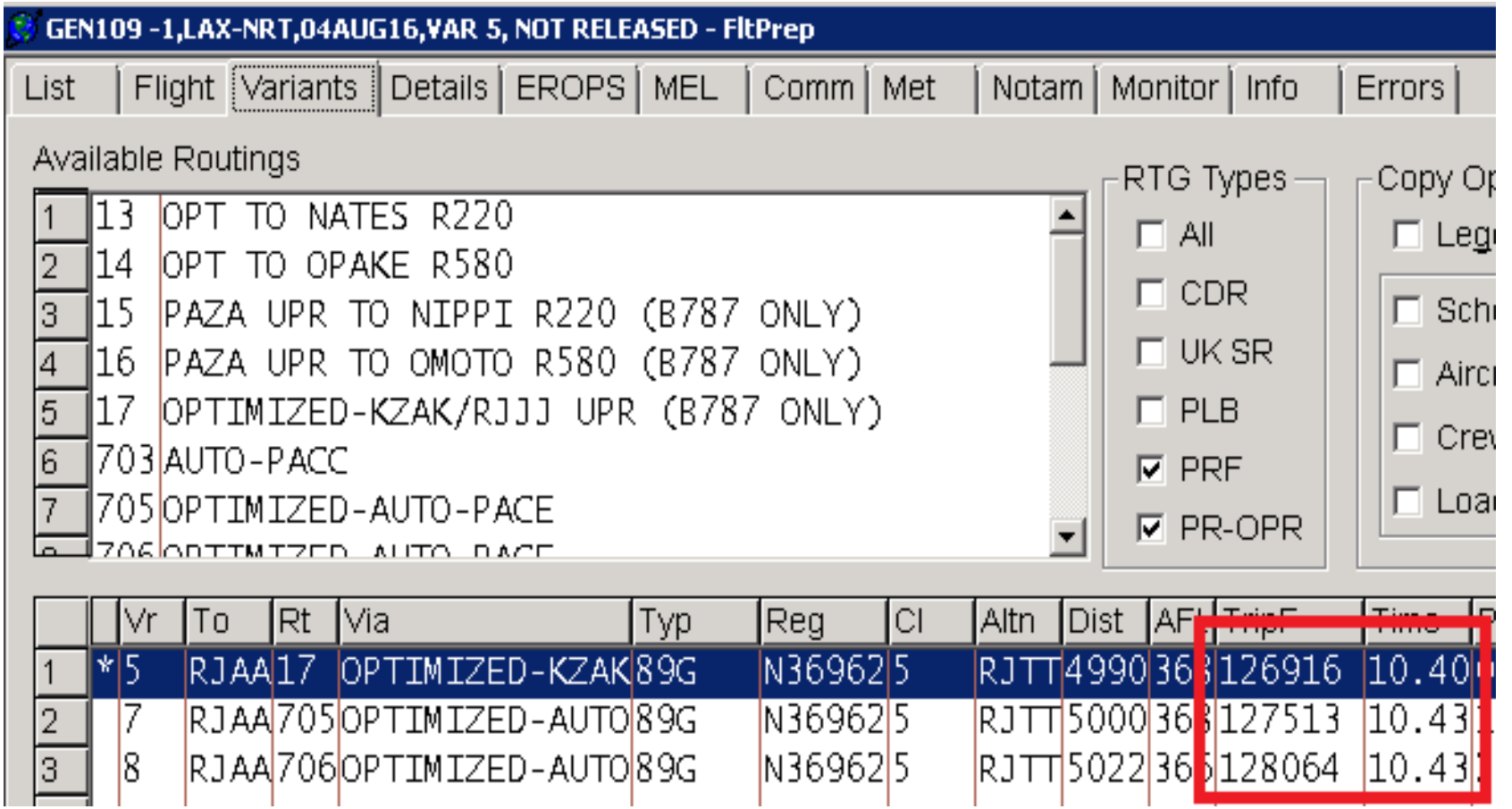
RJJJ FIR UPR Sample 1

- There are limited samples of flight plans to compile an extensive data, but fuel reduction of 300-400 LBS (136-180KG) and flight time reduction of 2-3 minutes are typically seen per flight.



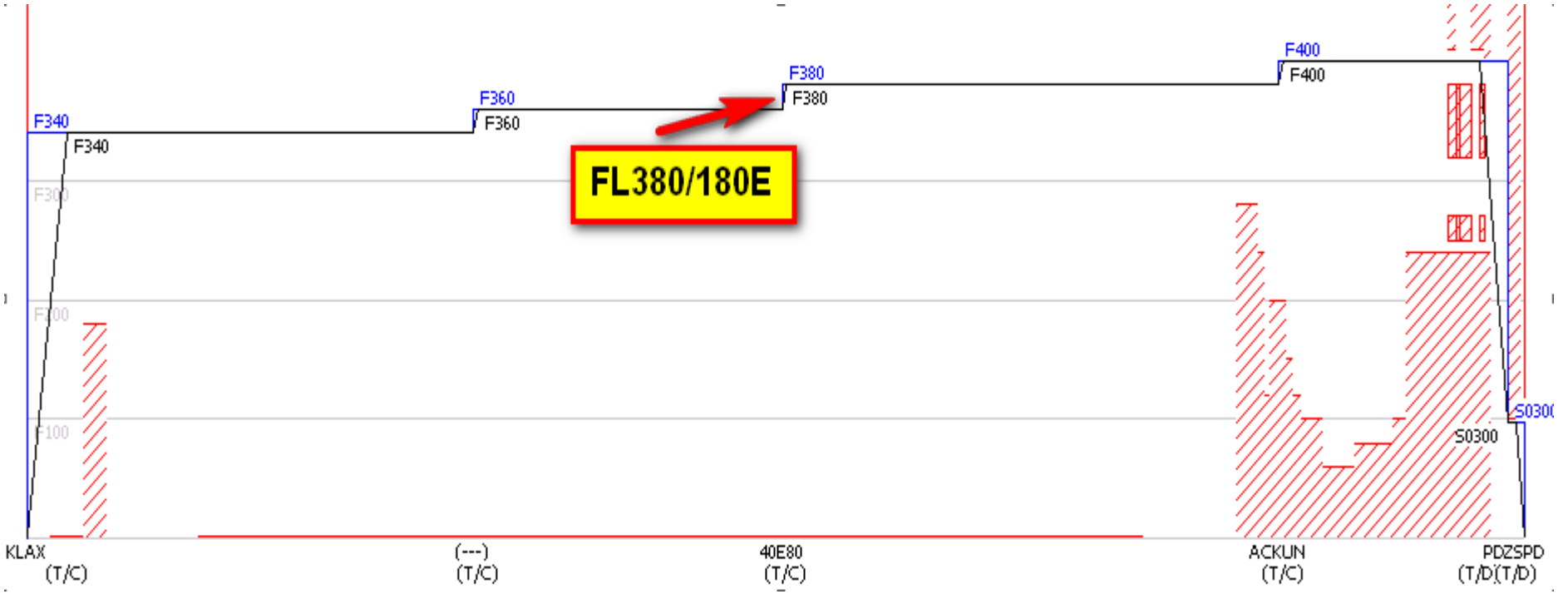
RJJJ UPR Example 2

- Some savings may be partially due to a comparison of route optimization based on 06Z wind data against TRK E and/or F route generation based on 00Z winds data.



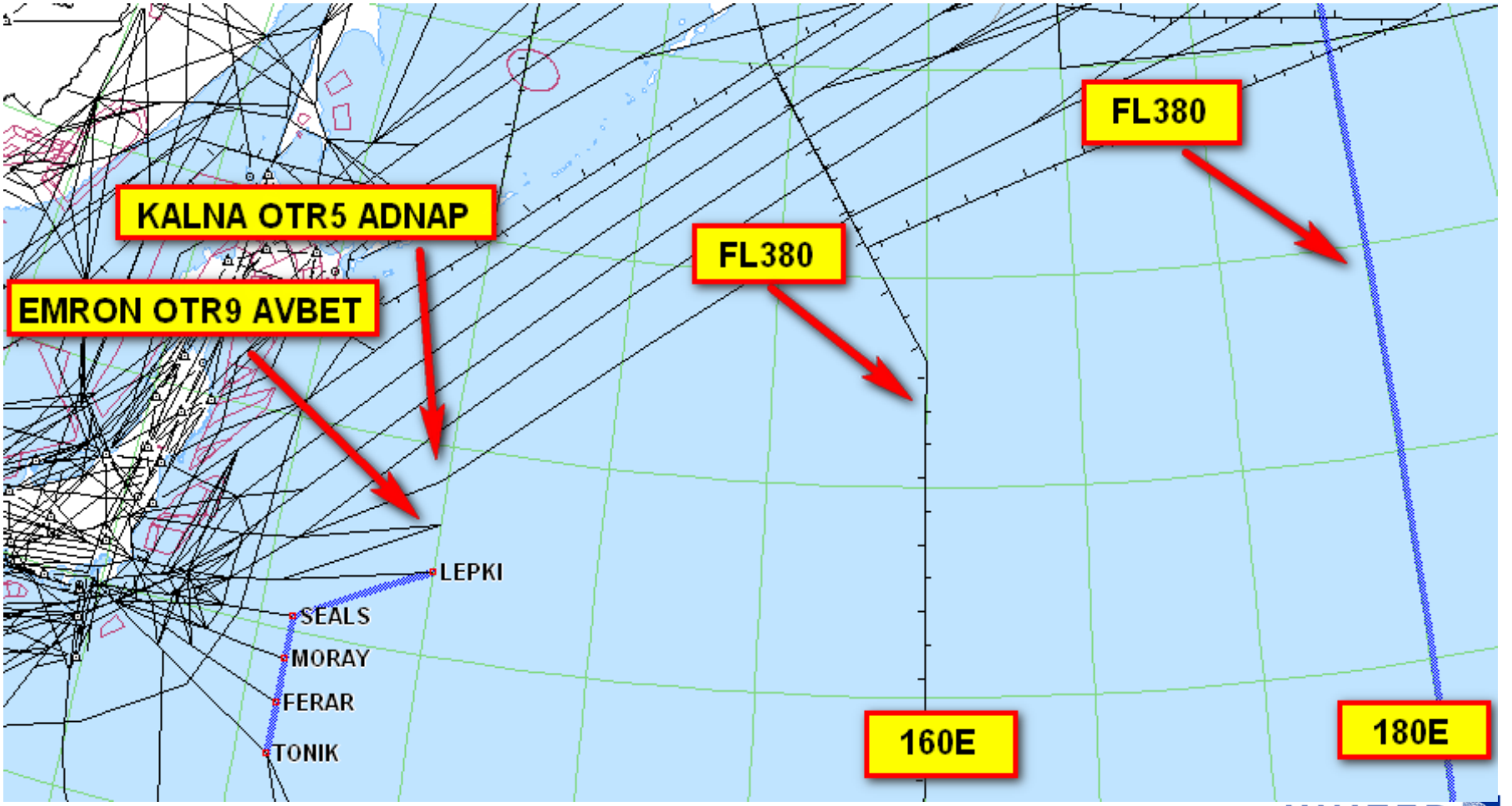
Initial UAL Observation

- Most B787-8 should be able FL400 at 180E but B787-9 would be dependent on weight/conditions based on city pairs flown.
- This is a similar observation and experience with PAZA westbound UPR when it initially requested FL400 at 170W.



UAL Recommendation For Future

- To allow more participation in Fukuoka FIR high altitude UPR trial, additional flexibility may be desired. UAL recommends FL380 at 180E and additional access to domestic Japanese airspace possibly via KALNA and EMRON



Eastbound High Altitude UPR

Russian Trans East Routes

- Significant progress by rationalizing the flight planning requirement found in Alaska Supplement for both eastbound and westbound traffic.

1. Flight planned routes must comply with the current Anchorage (PAZA) Arctic FIR NOTAM.

B. RUSSIAN TRANS EAST ROUTES:

Westbound Transitions:

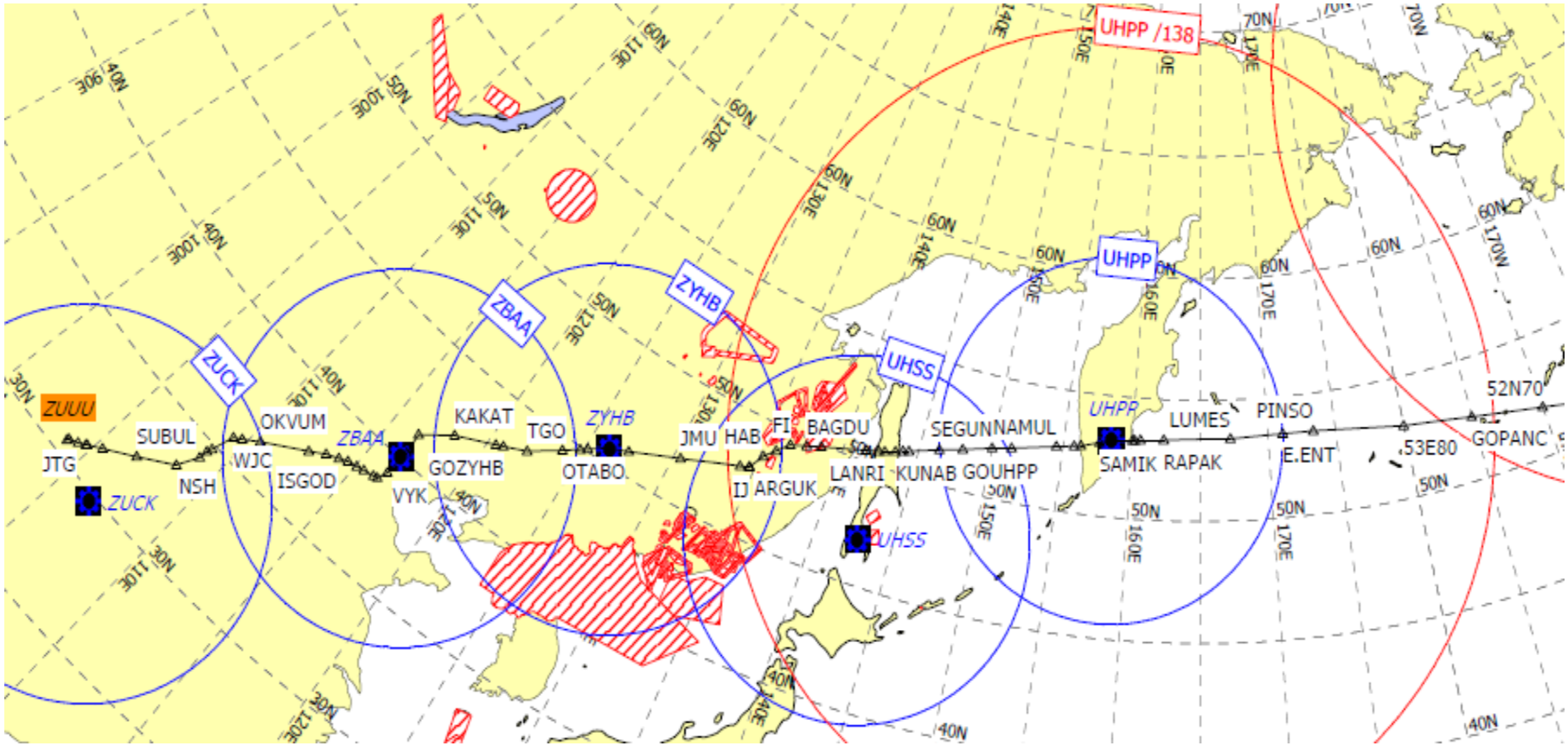
1. **FRENK, KUTAL, VALDA** and **ERNIK** have no restrictions.
2. **RUSOR** file over or south of ROCET *and* over or north of PALIN **thence** direct RUSOR
3. **BESAT** file over (or south of) ROCET *and* over (or north of) NANZA, **thence** direct BESAT
4. **BAMOK** file "PALIN G349 KIVAK B932 BAMOK" **or** "LESAD B932 BAMOK" **or** "NOLTI direct EPLOS B932 BAMOK" **thence** B932
5. **KOKES** file "NATES direct KOKES" **thence** B242
6. **LUMES** file "NYMPH direct LUMES" **thence** G73
7. **KUNAD** file "NUZAN direct KUNAD" **thence** G801

Eastbound Transitions:

1. **FRENK** file "FRENK B244 OTZ" **thence** via UPR
2. **KUTAL** file "KUTAL B233 SANGL" **thence** via UPR
3. **VALDA** file "VALDA H222 ICEEE" **thence** via UPR
4. **ERNIK** file "ERNIK B240 IDROD" **thence** via UPR
5. **RUSOR** file "RUSOR B241 ROCET" **thence** via UPR
6. **BESAT** file "BESAT G583 MARCC" then R338 ROCET (or a route that remains south of a BESAT direct ROCET line) **thence** via UPR
7. **BAMOK** file "BAMOK B932 LESAD" **thence** via UPR
8. **KOKES** file "KOKES direct ONEIL" **thence** via UPR to remain south of route R580. (Eastbound transition via KOKES is restricted by time of day and by altitude. Consult current PAZA NOTAMs for further information.)

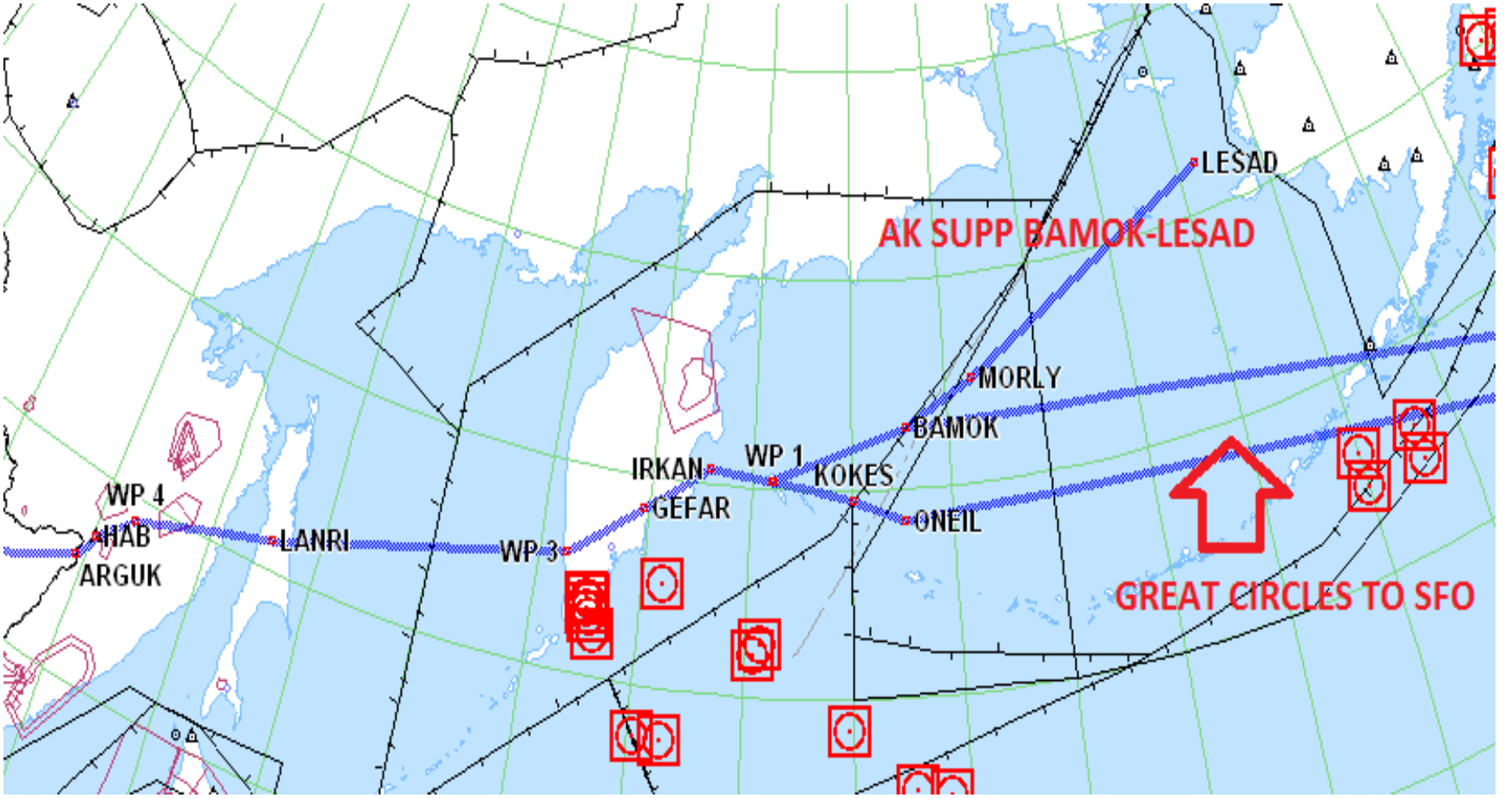
Recent Update – Eastbound PAZA UPR

- Eastbound KOKES/LUMES/KUNAD transition allowed by PAZA NOTAM A0075/16.
- LUMES/KOKES used for UAL8 out of Chengdu, China to San Francisco.
- Participation is on limited basis, as route permission from China is restrictive.



Eastbound via BAMOK

- Current flight planning requirement via BAMOK B932 LESAD is restrictive.
- Looking for an open discussion if able UPR from BAMOK to West Coast.

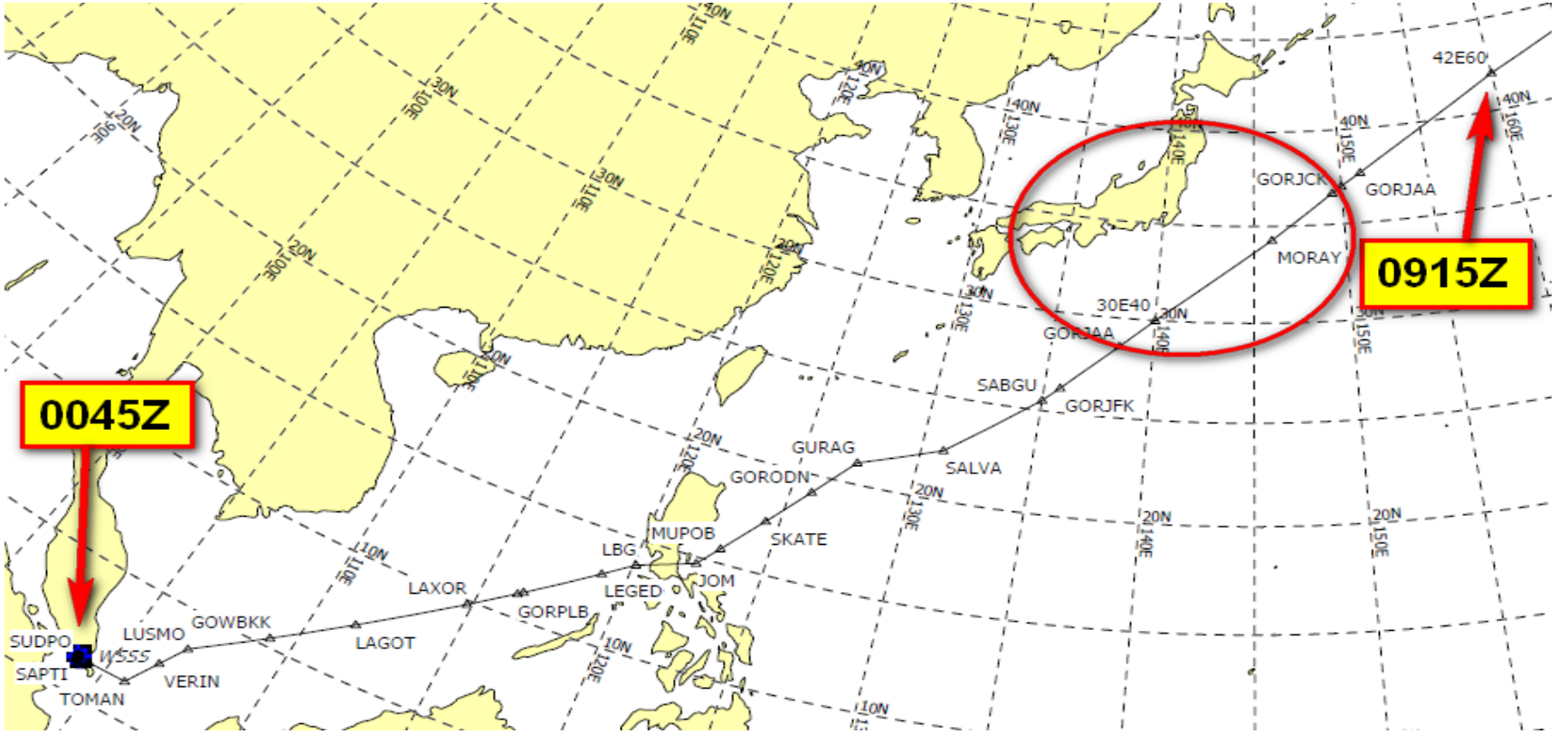


United’s New Route

- United Airlines launched San Francisco to Singapore route effective June 2016, operated by B787-9.
- It is one of longest routes operated by a U.S. carrier.
- Scheduled winter block time is approximately 17:25 westbound, 15:00 eastbound.

Lessons Learned From SIN-SFO Eastbound

- With earlier departure time from SIN at 0045Z, but technically subject to PACOTS, flight planning computer has difficulty processing the coordinates in time for flight planning.
- Manual process/correction may be required, a deviation from preferred optimized routing = loss in efficiency.



In closing - Recommendations for the future

- Progressive expansion of high altitude UPR trial to eastbound traffic departing Asia transitioning through Fukuoka FIR.
- Review of eastbound PACOTS/UPR procedures including the valid time especially for city pairs considered outside of scope as the optimized routing may often conflict with PACOTS.
- IATA/United Airlines would like to express great appreciation to FAA and JCAB for their support for UPR in general.
- IATA/United Airlines actively look forward to the staged implementation and expansion of UPR initiatives across the pacific working in a collaborative manner as means of achieving the objectives of the Pacific Project.