ICAO SAIOSEACG/4

Clim van der Weijden 范科林
ATM Regional Manager Asia
Clim-van-der.Weyden@klm.com

KLM Royal Dutch Airlines

Agenda

1. KLM history and business model
2. External factors affect route choices
3. Flight Dispatch example
4. How can you help airlines

KLM Royal Dutch Airlines

- **Founded 7 October 1919**

2024

- **Fleet 170 (incl. KLM Cityhopper)**
- **Passengers 34 million (~70% transfer)**
- **Destinations 157 (65 ICA / 92 EUR)**
- **~730 movements per day at Amsterdam Schiphol Airport**

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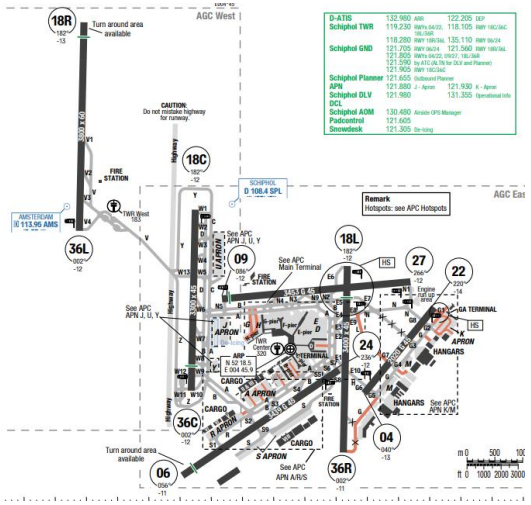
KLM Network overview and business model



Amsterdam Schiphol International Airport - AMS

One terminal concept Schiphol enables short connection times:

EUR-EUR: 40min

ICA-EUR+EUR-ICA: 50 min

Punctuality is very important!

KLM & partners

No airline flies everywhere

But....

The passenger wants to fly from anywhere to everywhere

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KLM needs Airline partnerships & Good connections (pax flows)

Market Amsterdam-Chengdu too small to fill the flight.
On average: only 25% is local traffic – not profitable!

KLM creates connections on its own hub Amsterdam, generating feeder traffic.

On average 70% is transfer traffic in Amsterdam.

KLM seeks partnerships with other airlines (e.g. Sichuan Airlines), to make connections at Chengdu or other (China) gateways.

Flights sold in code share (e.g. KLM sells 3U flight as being "KL"), and needing good and seamless connectivity!

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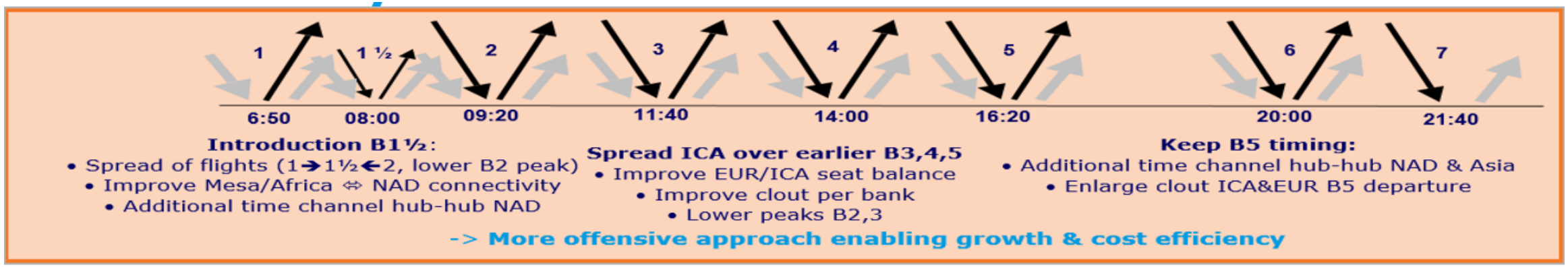
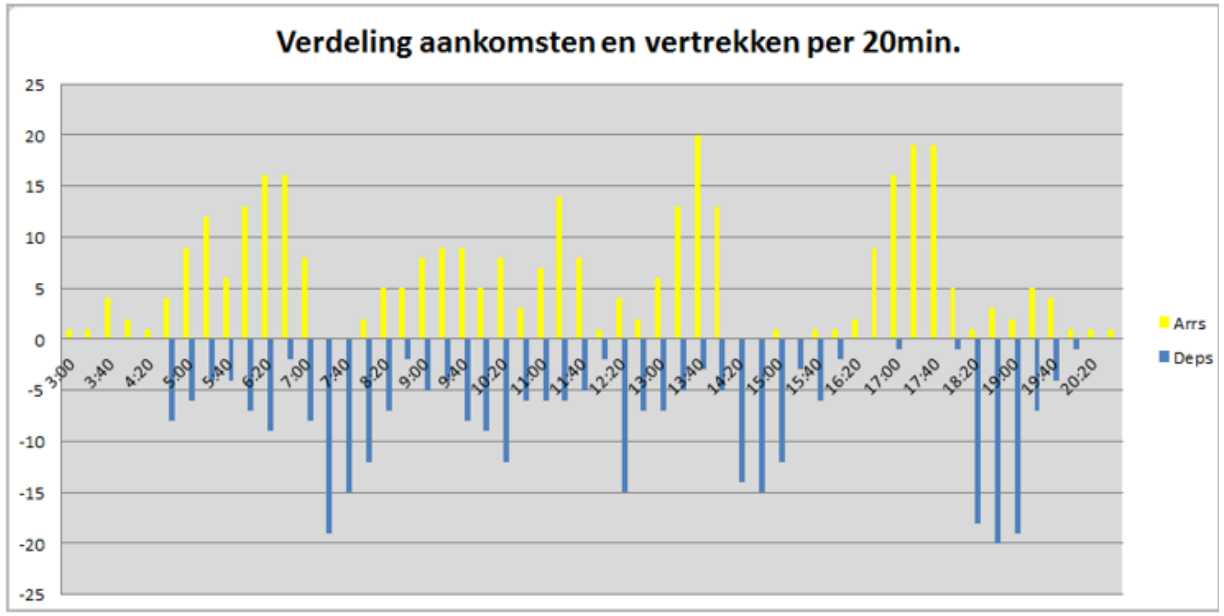
7 Wave system in AMS



Wave system to enable connection to Almost all EUR destinations in all banks

ICA schedules based on geographical situation and connections at Outstations



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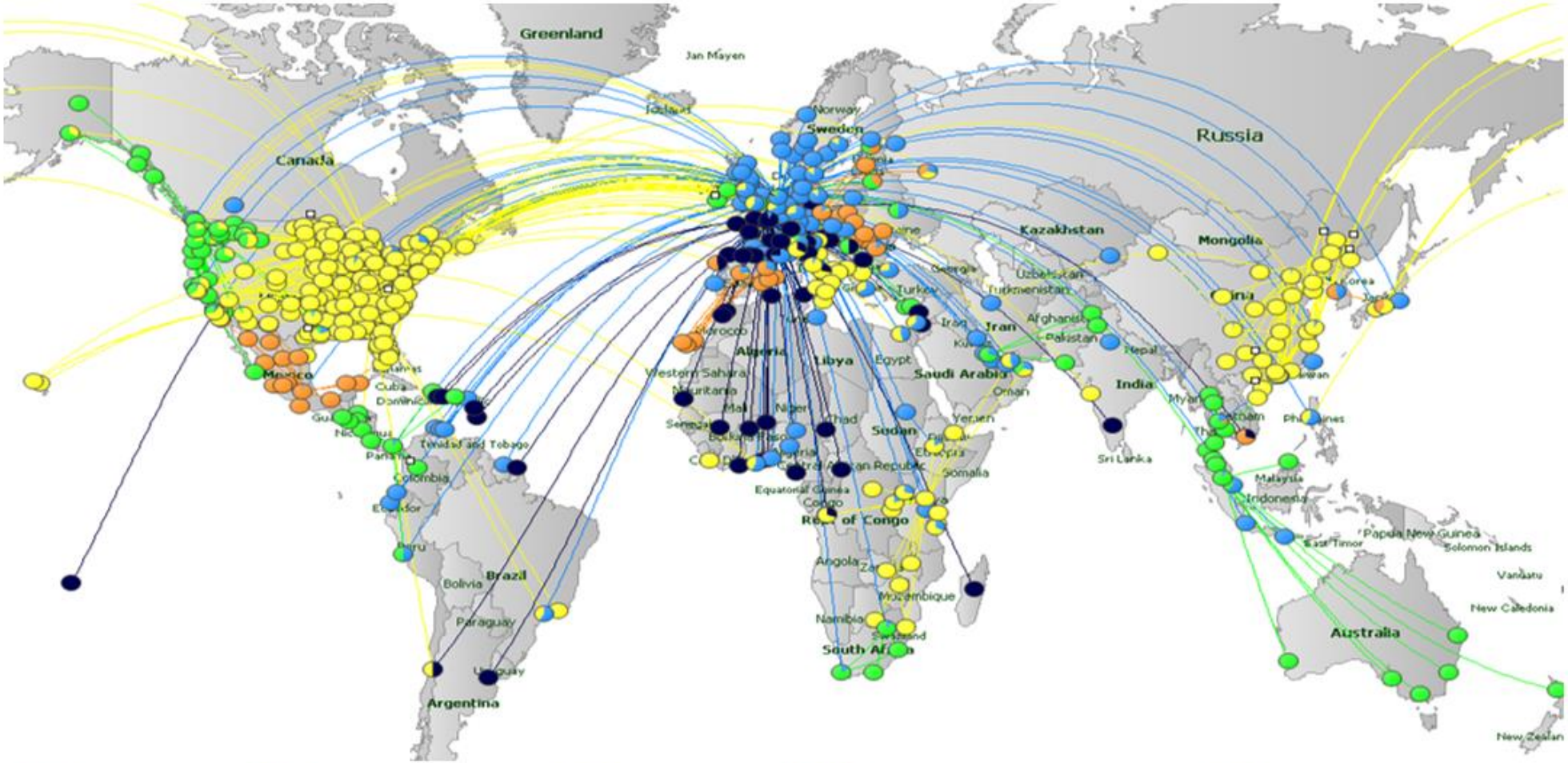
Extended world wide network



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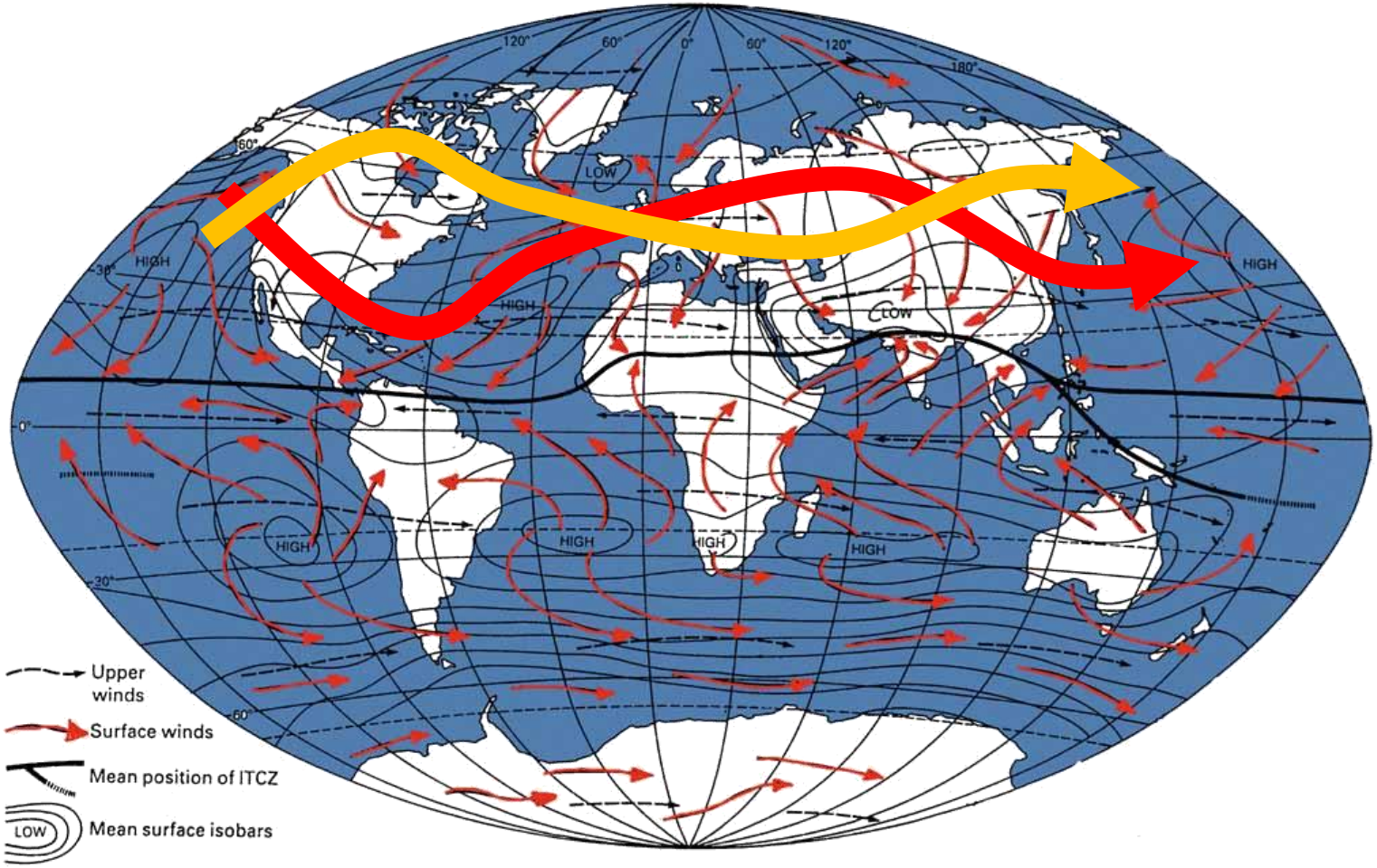
Flight planning (season vs day) influenced by external factors



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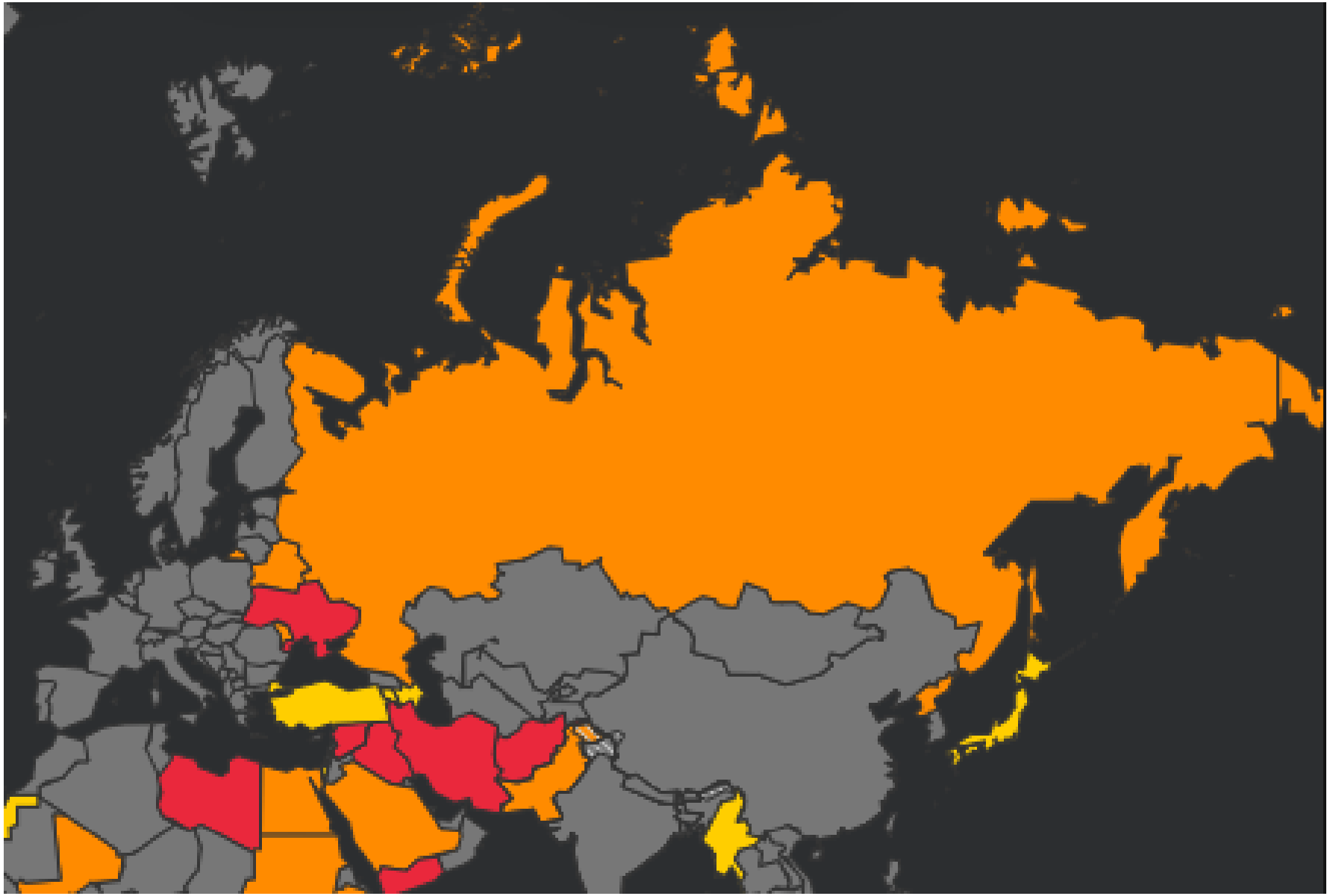
Political conflict zones affect route planning



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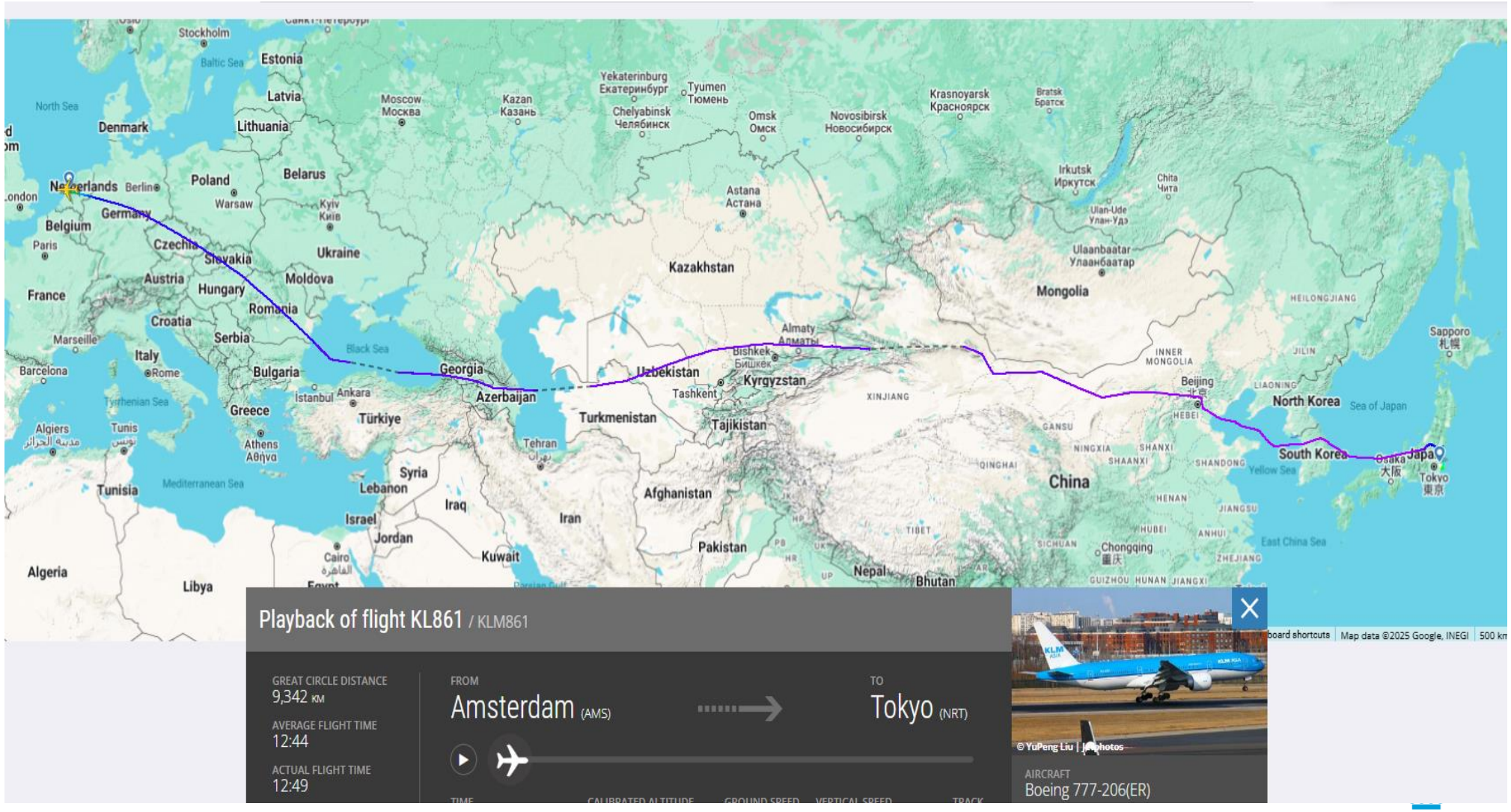
Airspace closures affect route planning



AMS-NRT

S19 11:10

S25 13:30

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Airspace closures affect route planning

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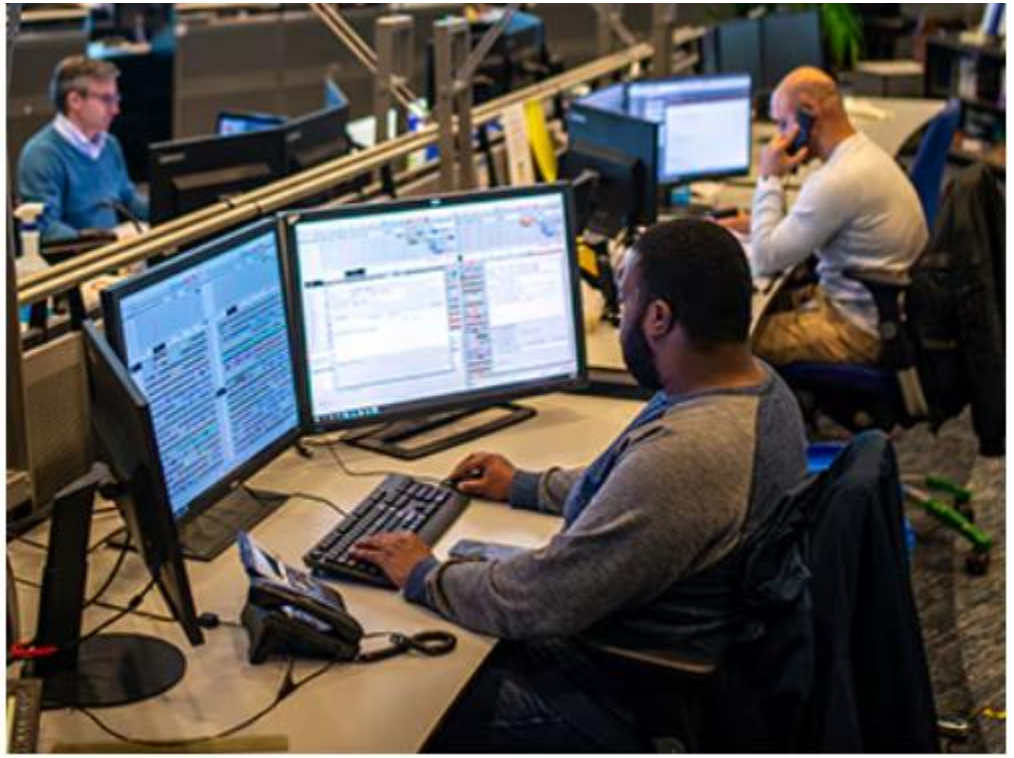
Flight Dispatch example



Contact details 24/7: Dispatch supervisor +31203041101

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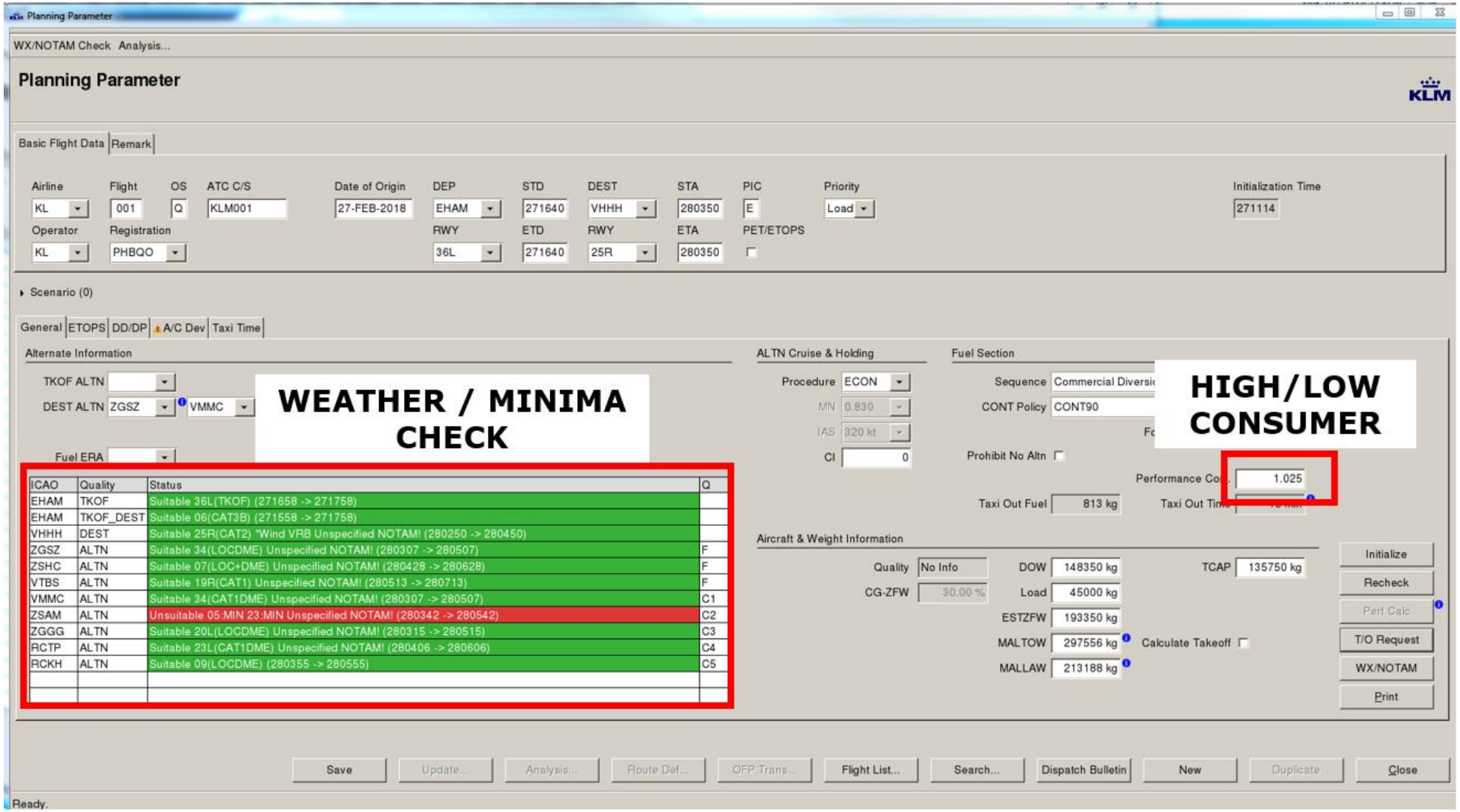
Flight Dispatch example

- Route choices will be made by Dispatchers based on:
  - Time (to arrive on time)
  - Costs (fuel and ATC)
  - Wind/ temperature
  - Available routes, flight levels and enroute Airports (closures due to Notams)

Flight Dispatch example – EHAM-VHHH



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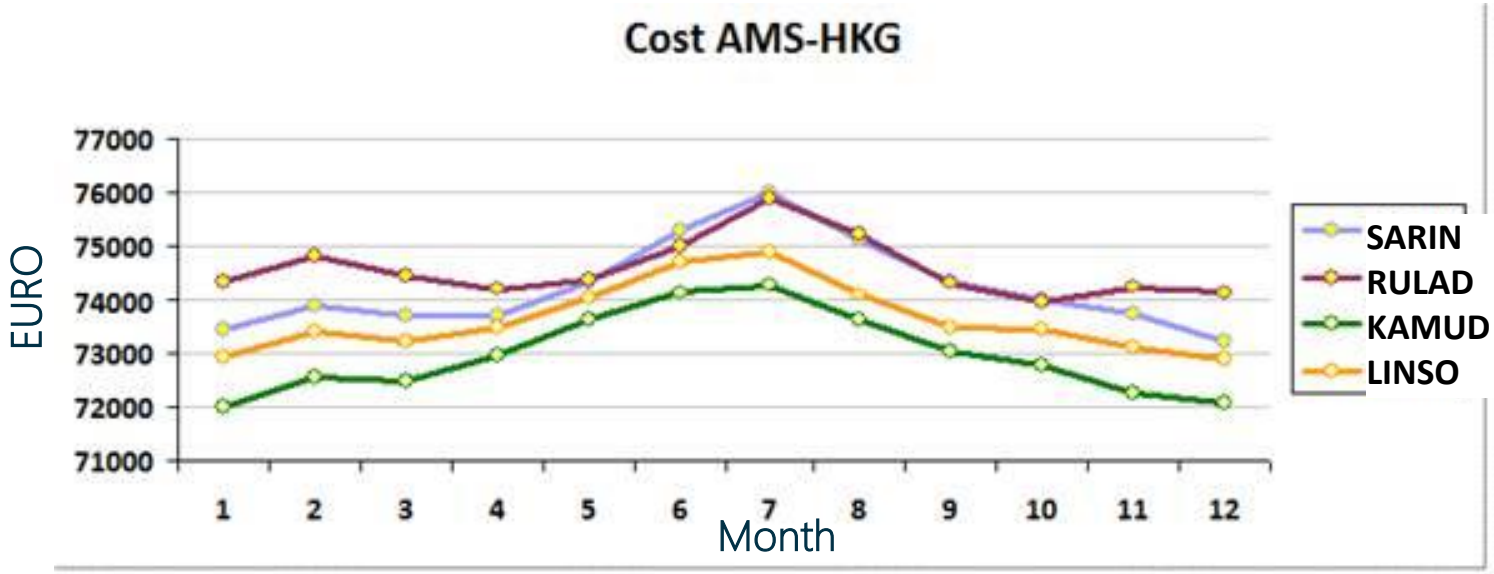
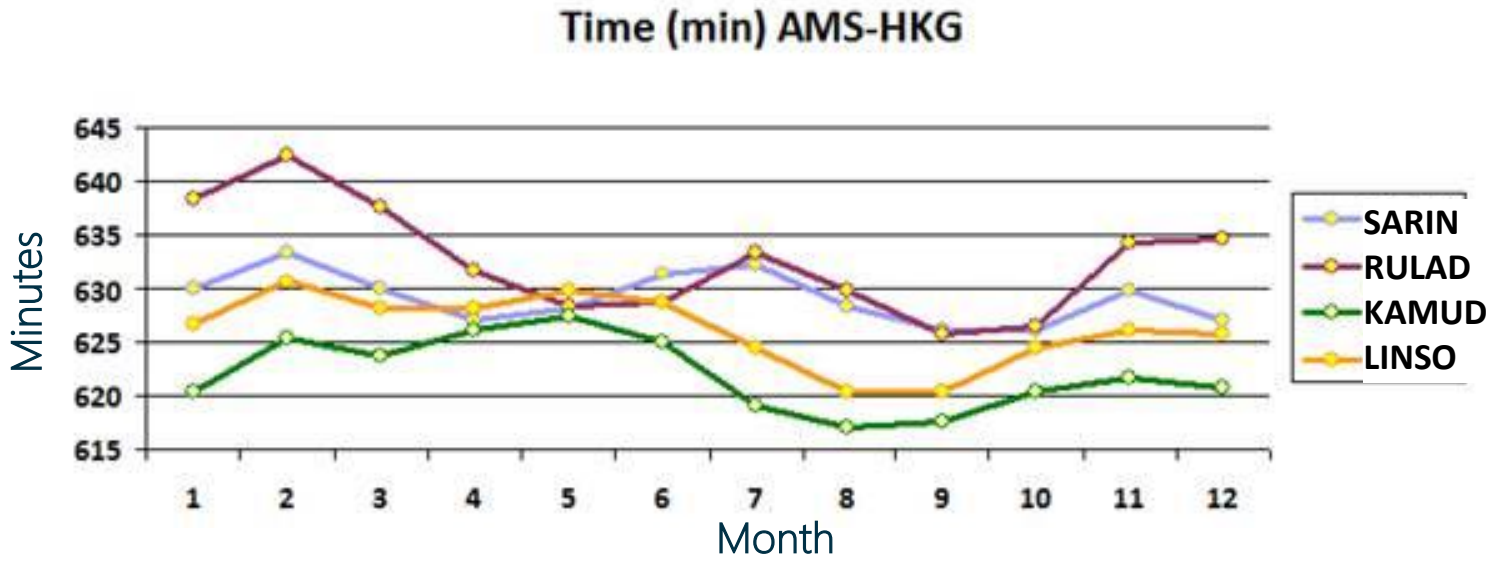
Flight Dispatch example

Route choice based on weather and ATC charges





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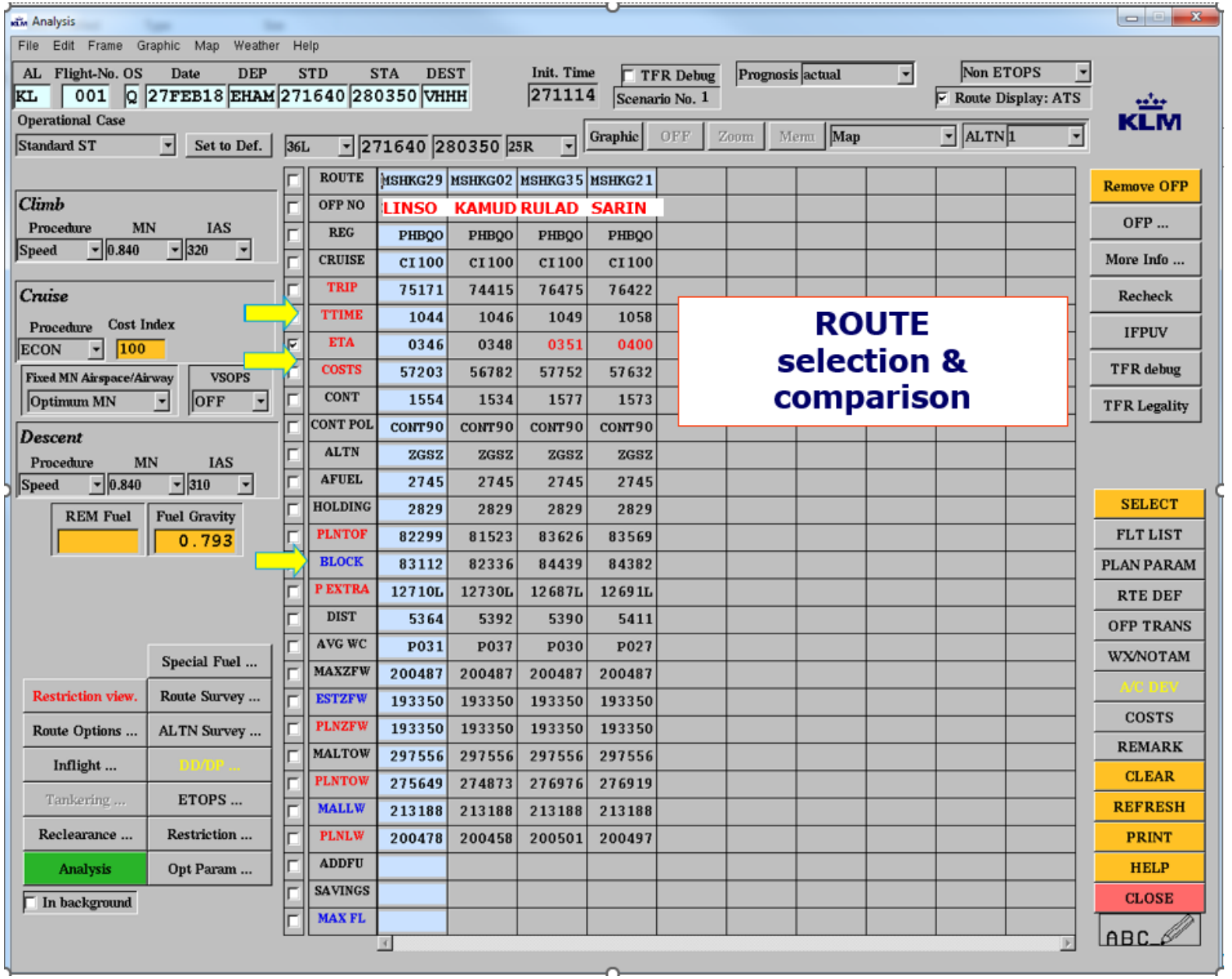
Flight Dispatch example



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Flight Dispatch example – checking weather enroute

Black line = Flight path
Red line = great circle

Check on Significant Weather enroute

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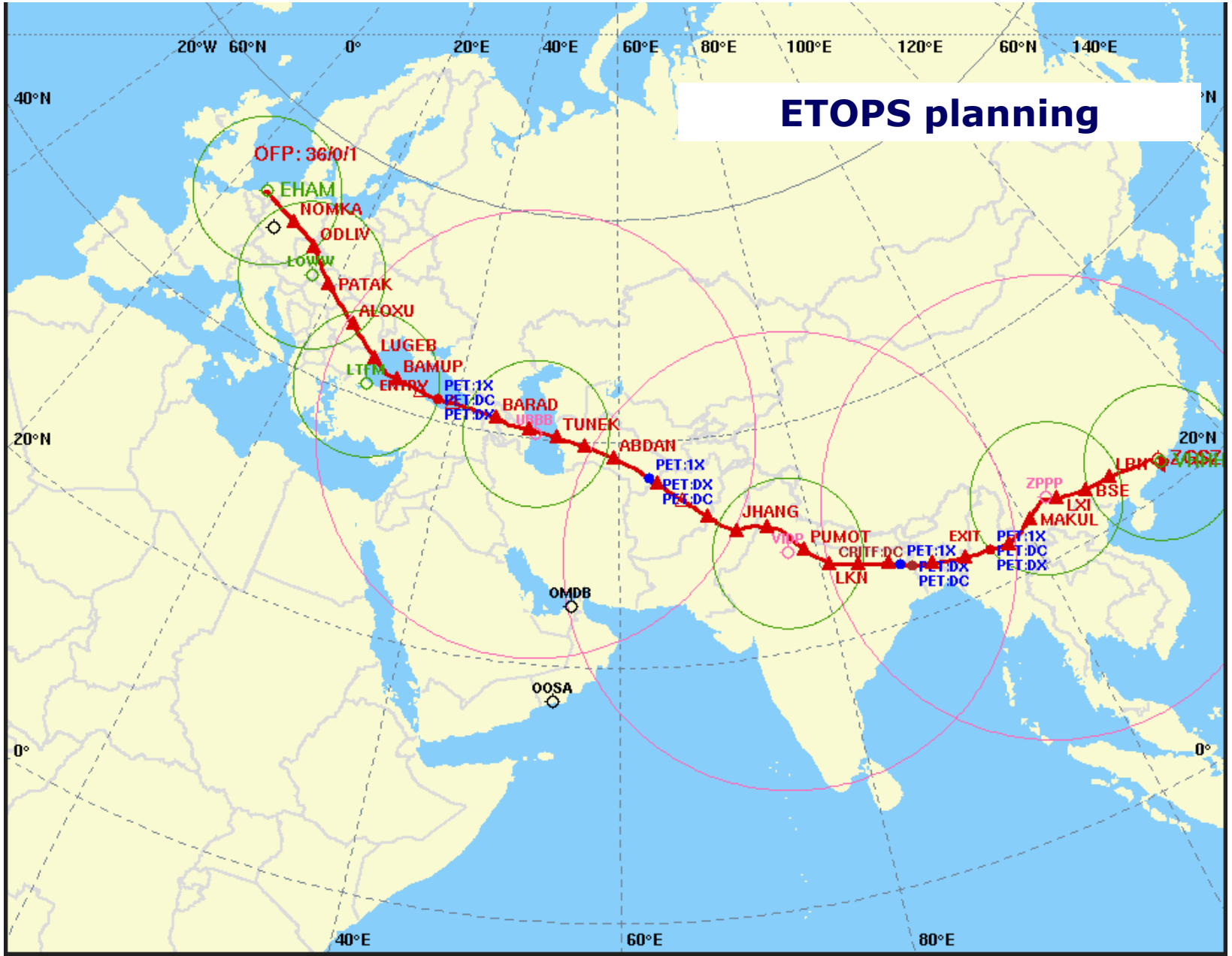
Flight Dispatch example – ETOPS choices



ETOPS 180min:

UBBB

VIDP

ZPPP

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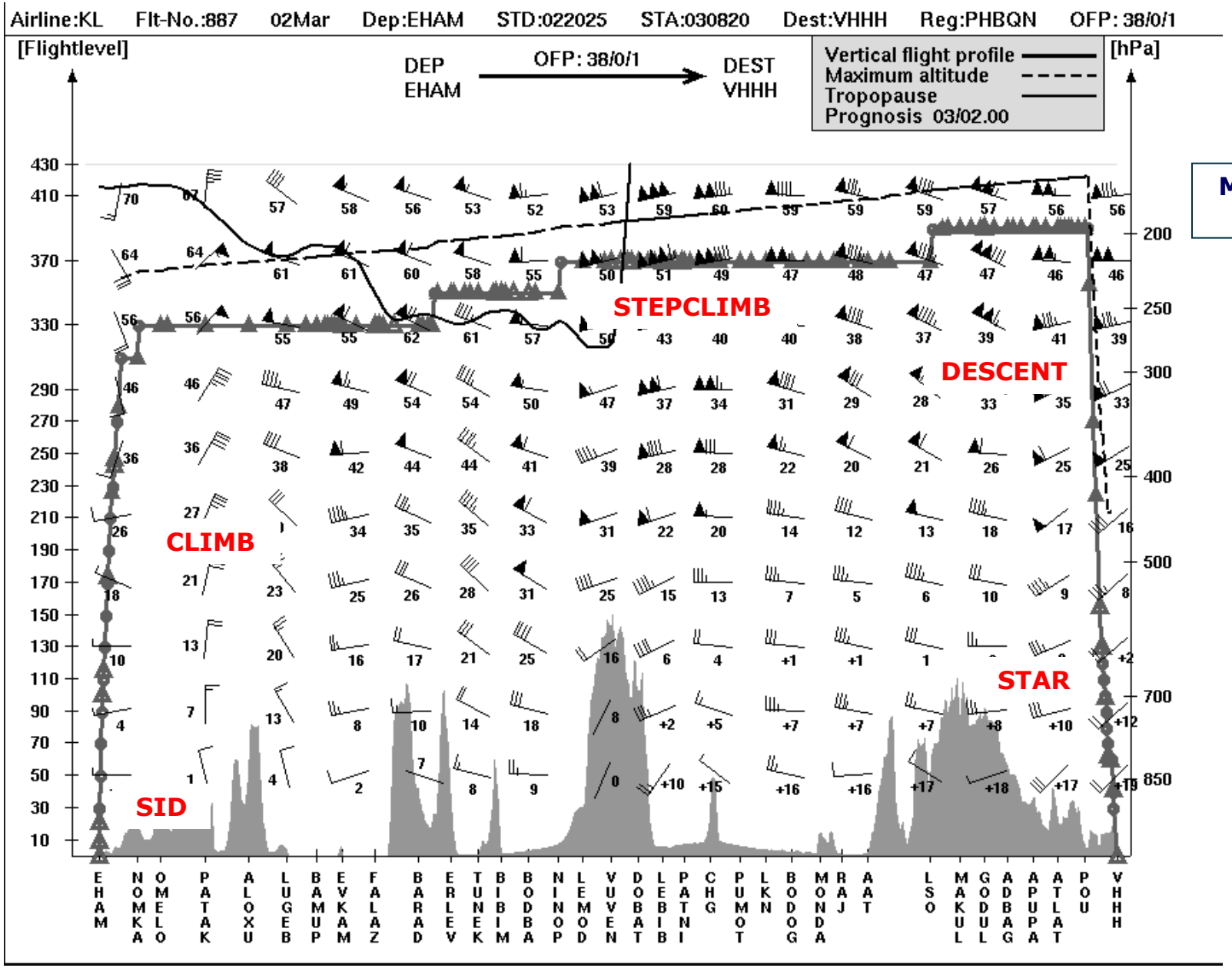
Flight Dispatch example – vertical profile



Max. cruise altitude (depending on a/c mass at T/O

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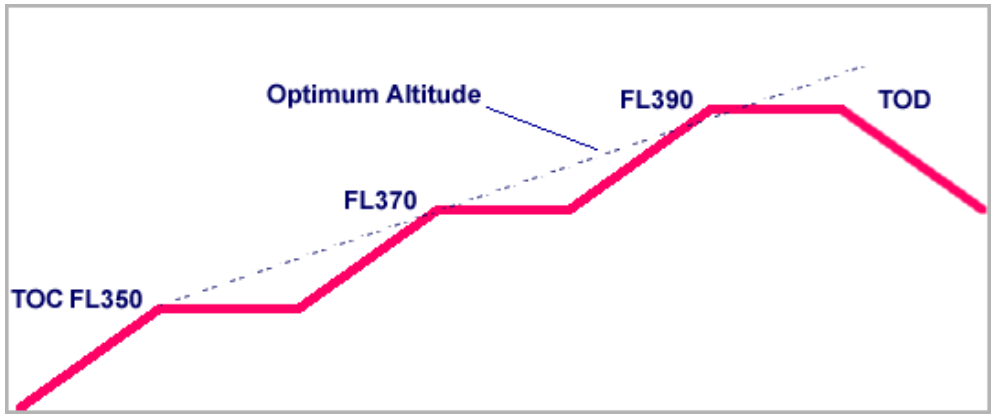
Flight Dispatch example- optimum vs not-optimum

FMC provides optimum and maximum altitude information



B777 AMS-PEK

Level in ft	Level in meters	trip fuel kgs	trip time min	Delta fuel	Delta time
Optimum level	Optimum level	82141	639		
-2000	-600	83505	641	1364	2
-4000	-1200	85738	648	3597	9
-6000	-1800	88154	662	6013	23
-8000	-2400	90377	679	8236	40

B787 AMS-PEK

Level in ft	Level in meters	trip fuel kgs	trip time min	Delta fuel	Delta time
Optimum level	Optimum level	57369	639		
-2000	-600	57832	639	463	0
-4000	-1200	58876	660	1507	21
-6000	-1800	60475	684	3106	45
-8000	-2400	62524	706	5155	67

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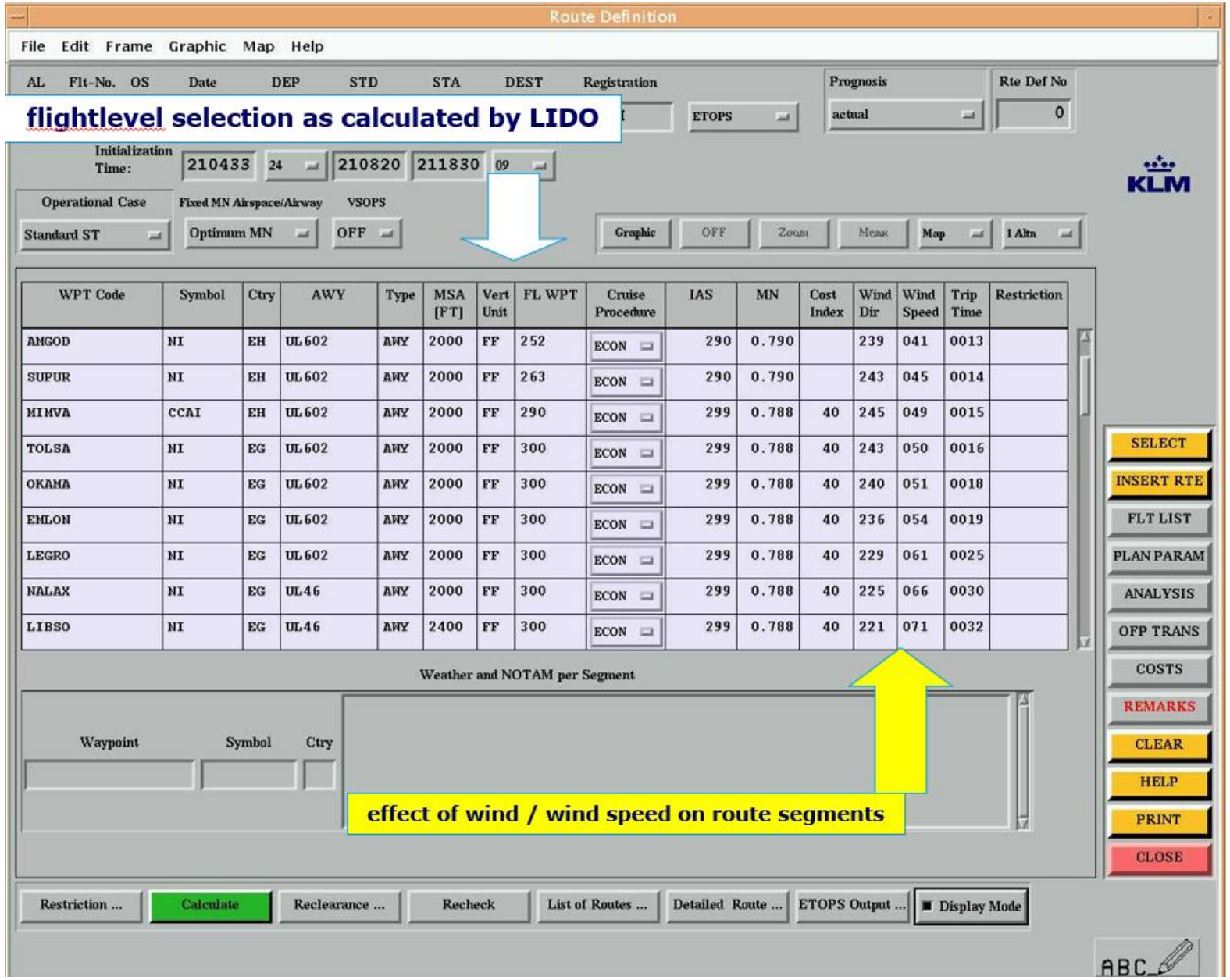
Flight Dispatch example – Vertical profile by Lido



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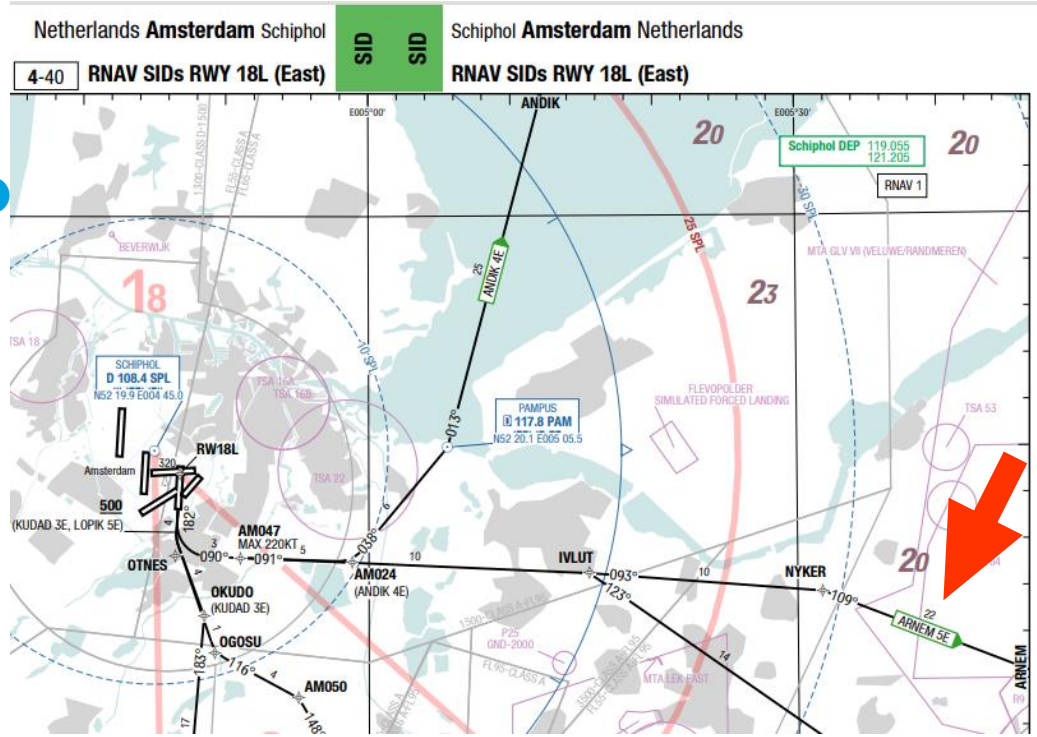
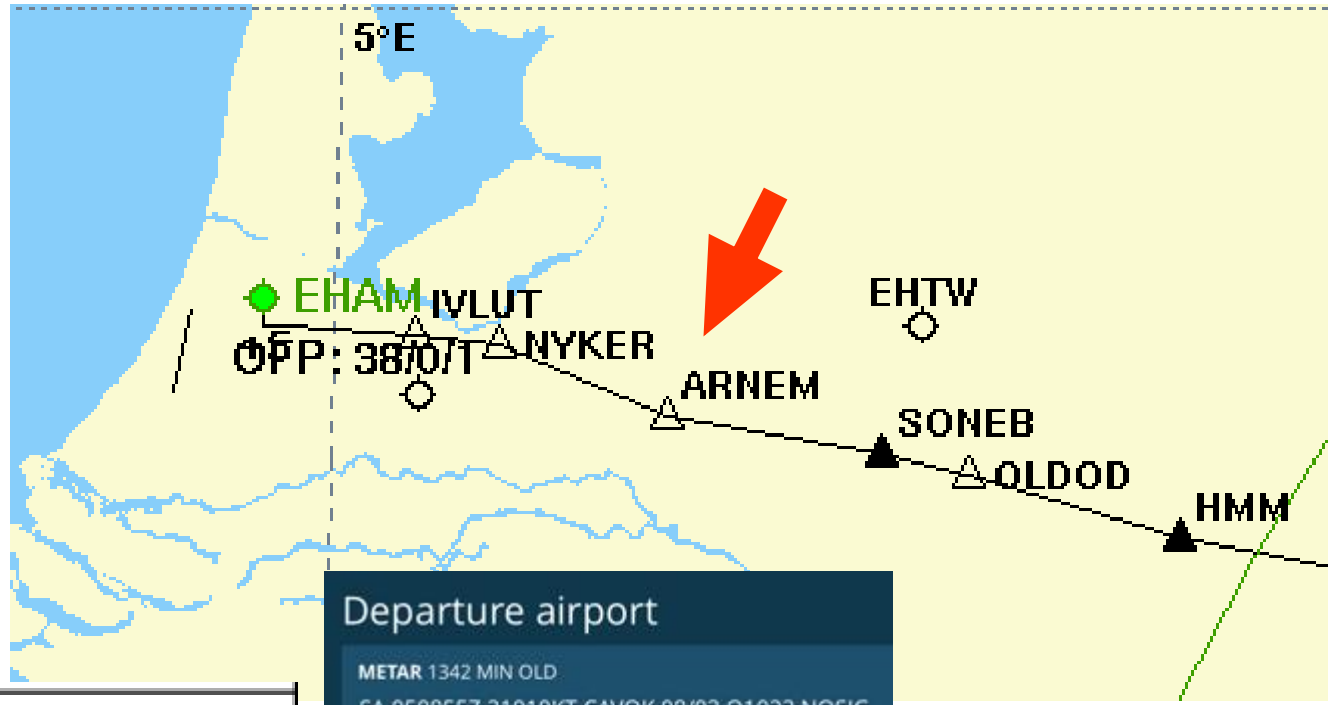
Flight Dispatch example – EHAM RWY & SID planning



Standard Instrument Departure



ARNEM 5E **119.055** ①	RW18L - OTNES - AM047 [K220-] - IVLUT - NYKER - ARNEM	initial climb **FL60**

Departure airport

METAR 1342 MIN OLD

SA 050855Z 21010KT CAVOK 08/03 Q1023 NOSIG

TAF

FT 050505Z 0506/0612 19007KT 6000 NSC
BECMG 0507/0509 CAVOK
BECMG 0510/0512 23010KT
BECMG 0514/0517 27007KT
PROB30 0602/0609 6000

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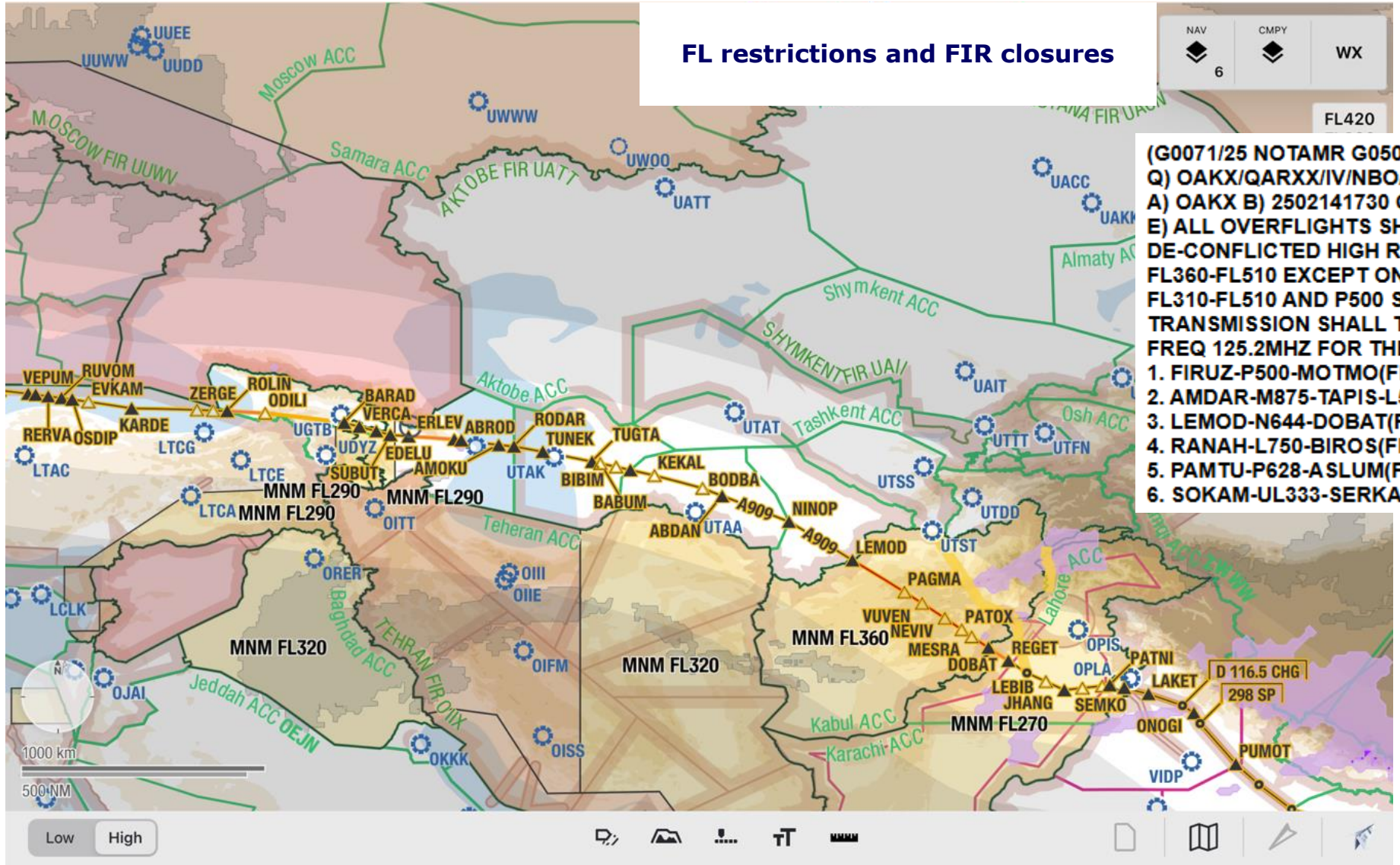
Flight Dispatch example – FL restrictions



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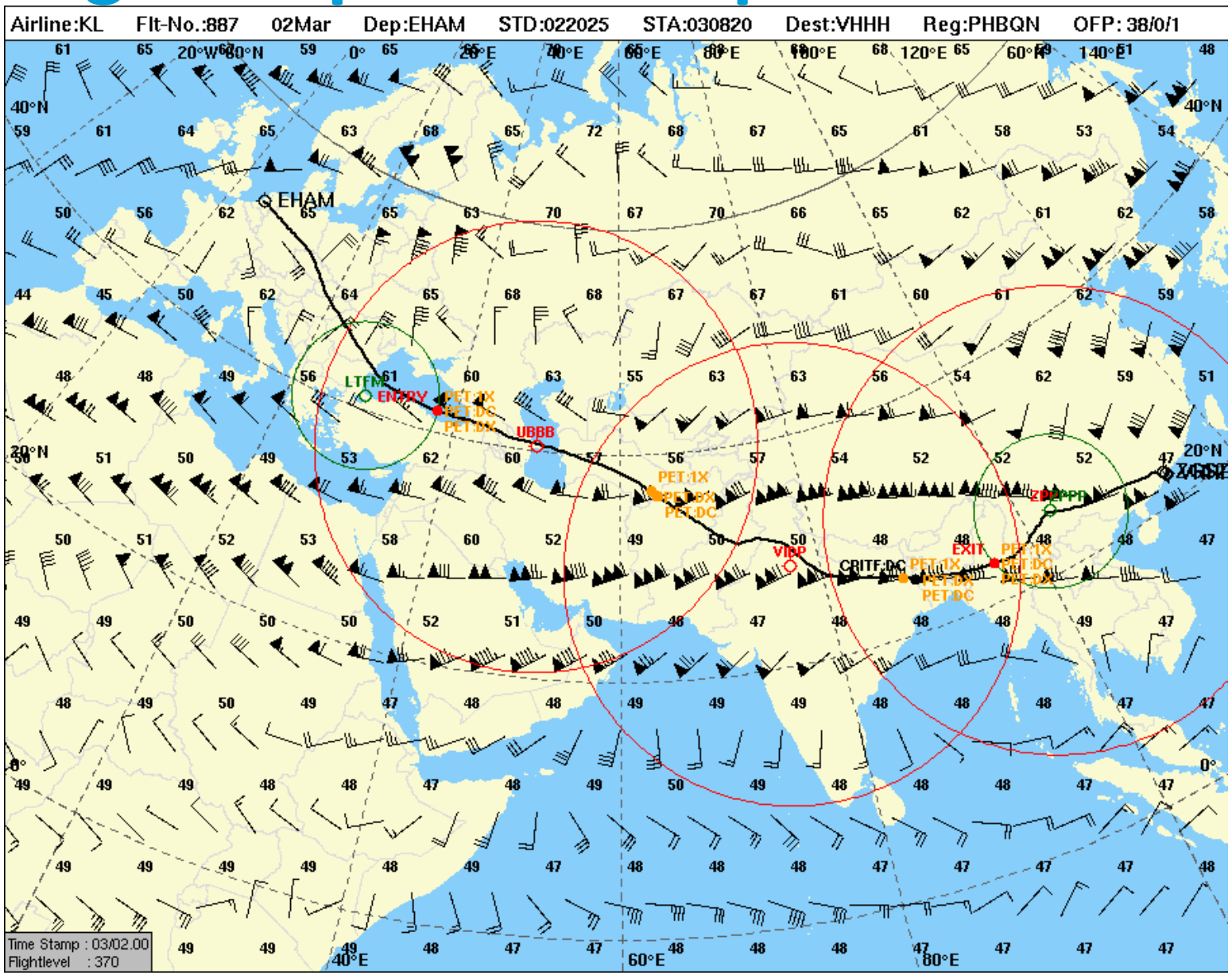
Flight Dispatch example- ETOPS & wind for crew



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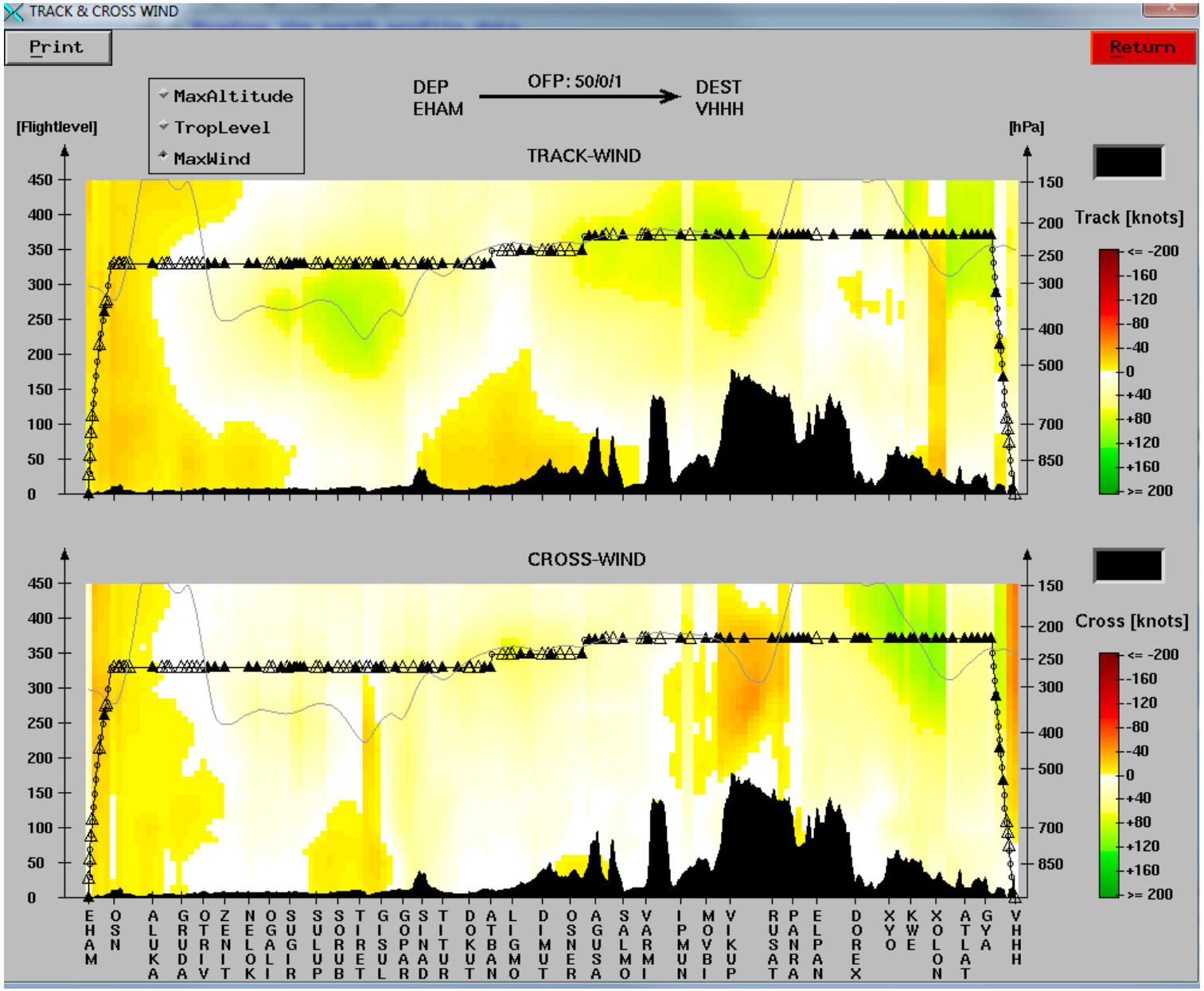
Flight Dispatch example- wind for crew



Profile check

Sometimes Lido creates a yo-yo effect In the vertical profile based on wind effects on different flight levels. Dispatch will check and correct if the changes in flight levels are undesirable

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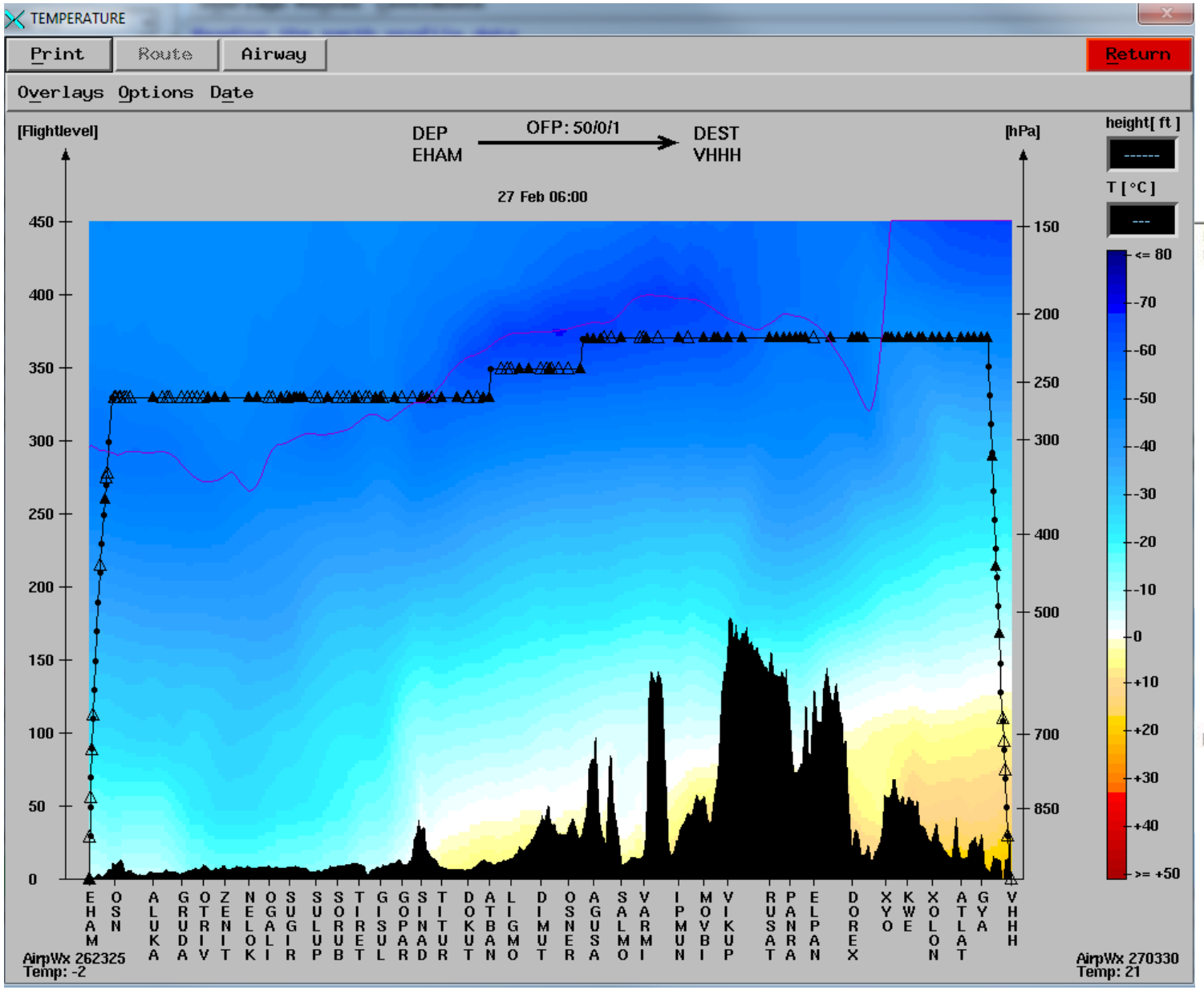
Flight Dispatch example – Temperature for crew



Cold fuel check

2 types of messages possible.

Examples for NATL flights:

```
FTPP-
NOK     #### WARNING: Extreme low en-route temperature predicted ####
        Model: A332 FLIGHT PLAN KL__682_03MAR2025CYVREHAM OFP15/0/1
        FUEL FREEZING ISSUES ENCOUNTERED. DETAILS FOLLOW.

        THE FOLLOWING FUEL TRANSFER PROCEDURES WERE INVOKED:
        FCOM PROCEDURE PRO-ABN-28 - FUEL LO_TEMP FOR INNER TANKS BETWEEN WAYPOINTS ERKIT AND SUGOL
        FCOM PROCEDURE PRO-ABN-28 - FUEL LO_TEMP FOR OUTER TANKS BETWEEN WAYPOINTS DOLAS AND LAMSO

        FUEL FREEZING IN INNER TANKS BETWEEN WAYPOINTS ODNEK AND SUGOL
        FUEEL FREEZING IN THE OUTER TANKS BETWEEN WAYPOINTS TLA and ETPOS
        MINIMUM OAT :  197.1K / -76.0C OCCURS NEAR WAYPOINT  TLA
        MINIMUM TAT :  223.0K / -50.2C OCCURS NEAR WAYPOINT  TLA

        MINIMUM TANK TEMPERATURES:
        TANK    TEMPERATURE          BETWEEN WAYPOINTS
        L_OUTER  232.8K / -40.4C      B_O_D       ENITO
        L_INNER  236.0K / -37.1C      BUKUT       LAMSO
        CT       Remains empty for whole flight
        R_INNER  236.0K / -37.1C      BUKUT       LAMSO
        R_OUTER  232.8K / -40.4C      B_O_D       ENITO
        TRIM     255.3K / -17.8C      EXIT1       ETILO
```

```
FTPP-OK ---- INFO: No extreme low en-route temperature predicted ----
        Fuel Temperature Prediction Program - KLM Version 4.1(p1031b03)
       KL__606_04MAR2025KSFOEHAM OFP7/0/1 B789
        Note: The Lowest Temperature Predicted is -6.5C at 554 Minutes
```

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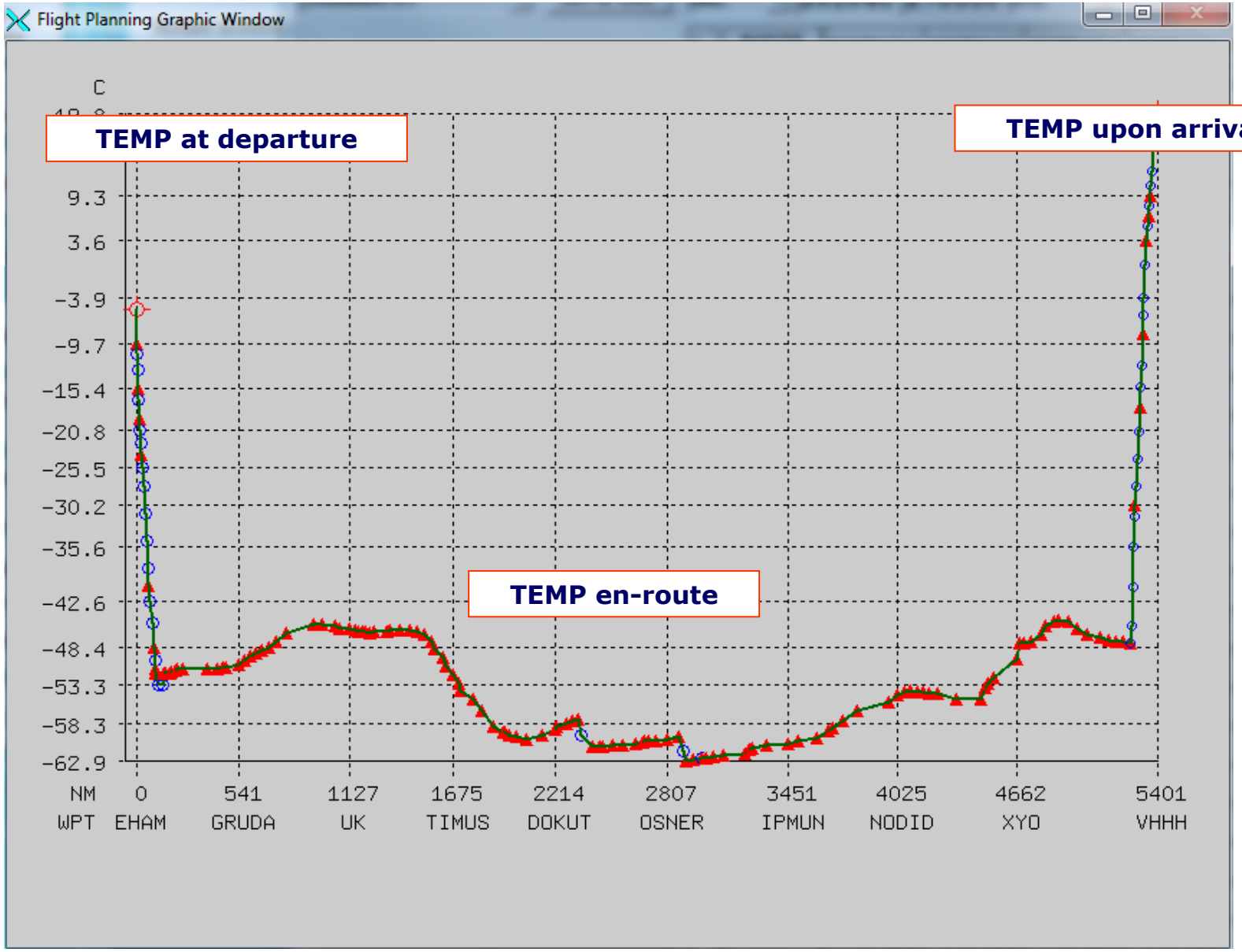
Flight Dispatch example – Temperature for crew



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Flight Dispatch example – STAR & alternate route planning

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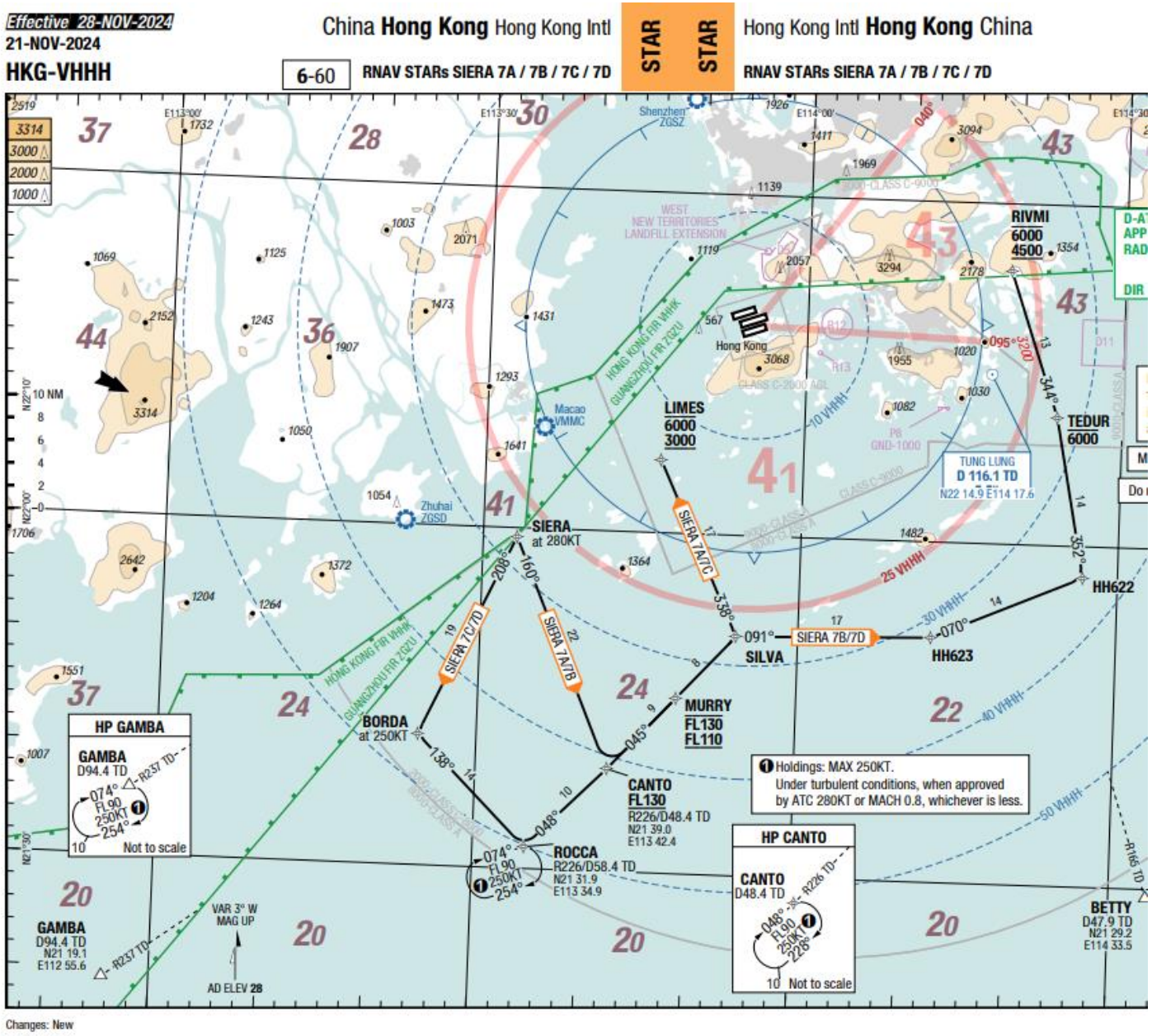
Flight Dispatch example- STAR and RWY planning



SIERA7A STAR
distance from SIERA is 121 NM

TT	GDIS	EET
157	121	00:24

INFO
MT 160 25L RNAV_STAR SIERA7B N2218.5 E11354.9 M 0.84 TROP 526 ISA 12

Destination airport

DEST VHHH - HKG - HONG KONG INTL

METAR 1307 MIN OLD
SA 050930Z 11006KT 9999 FEW007 SCT012 BKN040 19/17 Q1012 NOSIG

TAF
FT 050800Z 0509/0615 06015KT 7000 FEW008 SCT015 BKN040 TX20/0509Z TN15/0523Z BECMG 0516/0518 36010KT

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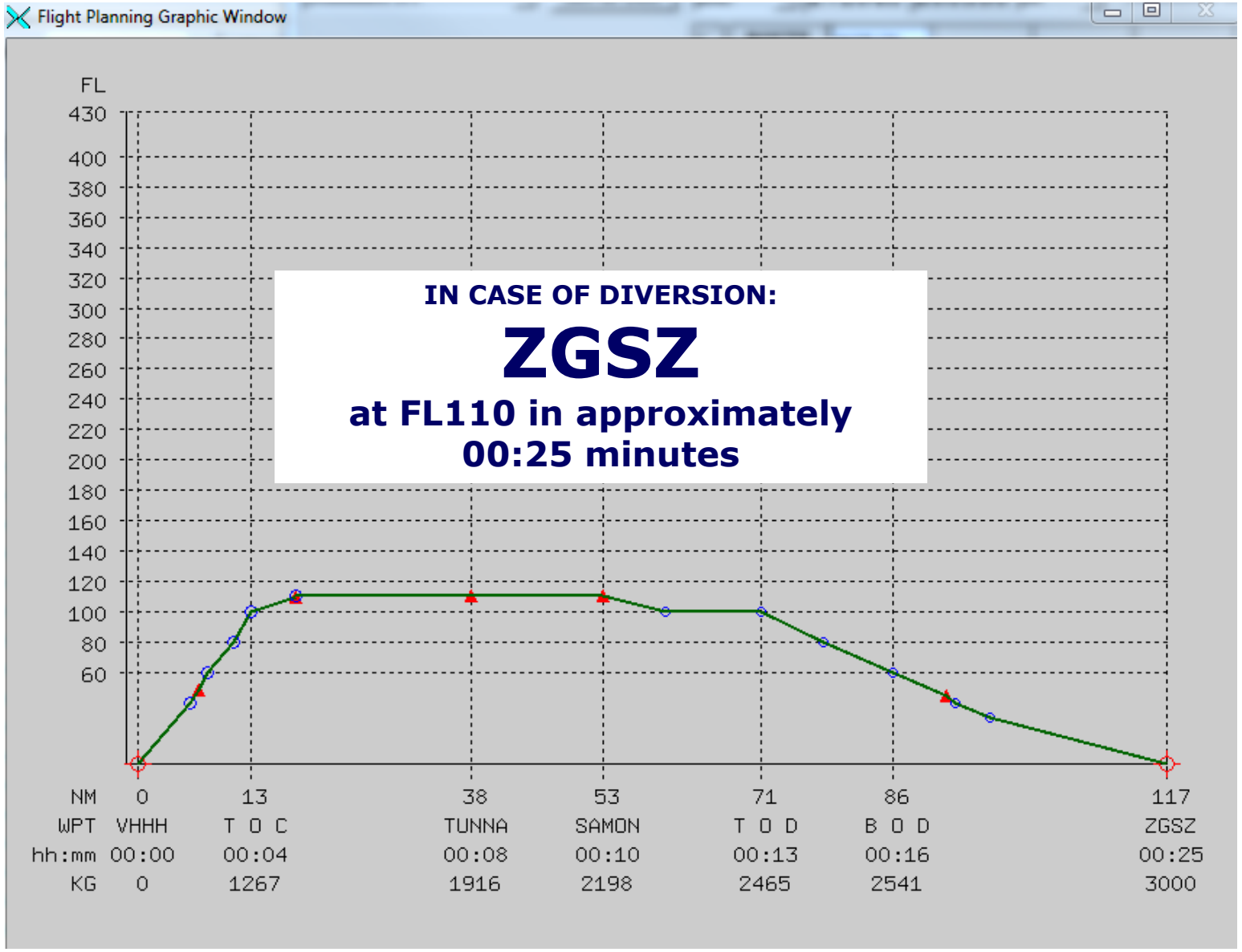
Flight Dispatch example – destination alternate



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Flight Dispatch example – Send OFP

Flight plan preparation complete

Send OFP to ATC

Send OFP to Cockpit crew members via Ipad

Ready to fly!

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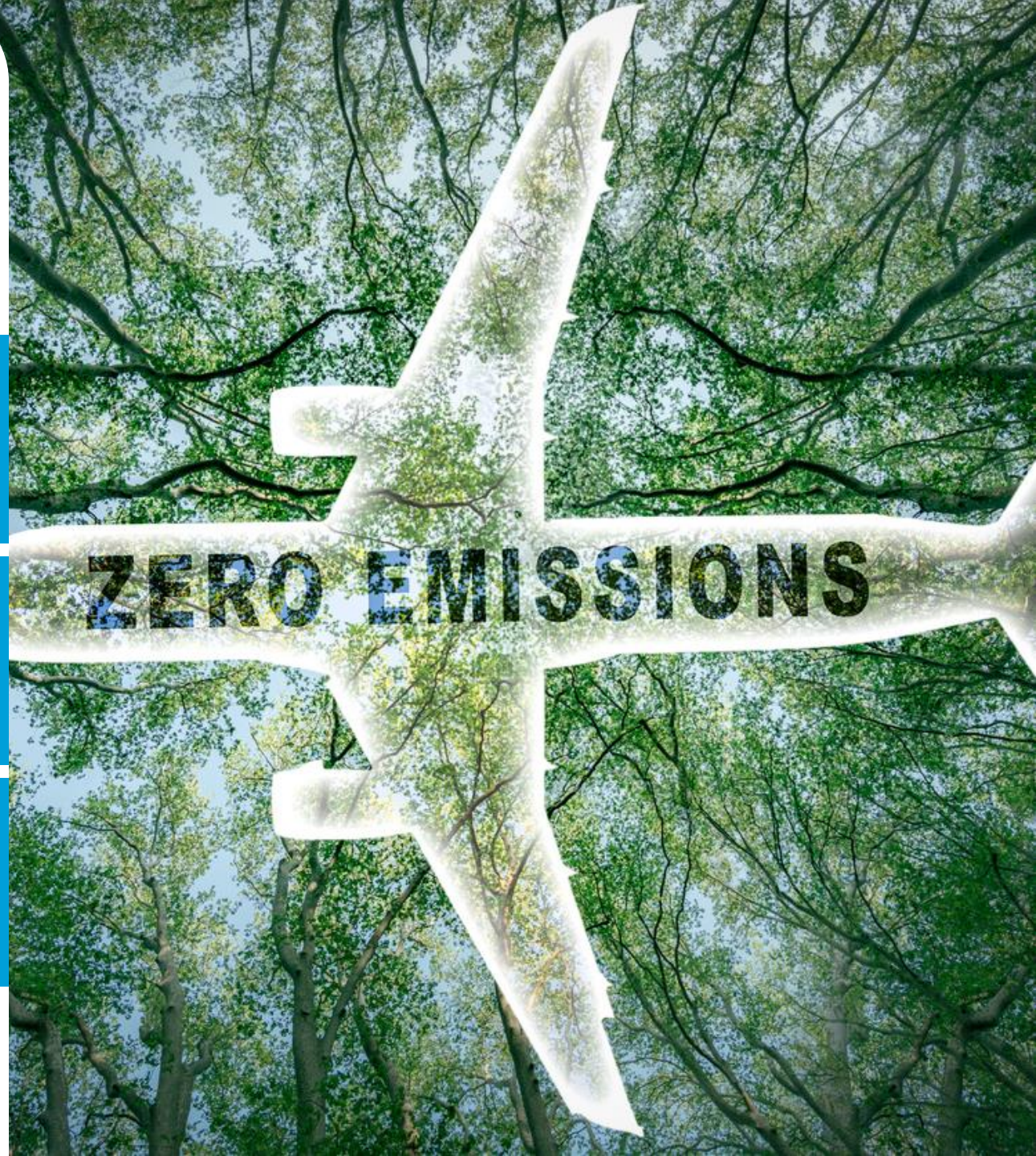
How can you help airlines

Help airlines to improve efficiency, actively promote Directs to crew or give feedback on our OFP

Introduce UPR, FRA or other means if flexibility in route choice

ANSPs and airline need collaboration to reach Net Zero goals for a sustainable future for aviation



Eurocontrol Network Manager Portal

Flight Details | Airspace Profile | Point Profile | Flight Management | e-Helpdesk | Slot Swap | Ops Log | History | IFPS History

Flight plan | Plot | Extra addressing - Enter up to 100 AFTN addresses

```
(FPL-KLM23F-IS
-E190/M-SDE2E3FGIJ1RWY/HB1
-EHAM0820
-N0442F390 EDUPO Z739 MISGO DCT TIVUN DCT NEGIX DCT DINKU M867 XERUM DCT BAVAX DCT RADIZ/N0417F370
DCT ALIVO DCT NUPSO
-LDSP0147 LDZD
-PBN/A1B1D1O1S2 DOF/230504 REG/PHEXC EET/EDVV0012 EDUU0024 LOVV0057 LJLA0109 LDZO0119 CODE/485085
RVR/175 IFP/MODESASP OPR/KLC ORGN/EHAMKLMF PER/C RMK/TCAS)
```

STATUS: **Filed - Targeted**

Validate | Apply reroute | Send CHG | Send DLA | Send CNL

Result

EOBT VALIDITY	CTOT	DELAY
+ 12:20	08:58	25

RAD Homepage

MESSAGE	DETAIL	ACTION
Caught in measure	KLK3C04M	Avoid ☑

Propose route | ☐ Show the full route catalogue

Route proposal criteria

Route proposal results

	ORIGINAL ROUTE	CDR	ERROR	TOT	DELAY	EET	NM	FCI	RCI	EV	REGUL+
▸	EHAM LDSP 1		OK	08:58	25	110	762	3361	843	+ 12:20	KLK3C04M

	PROPOSED ROUTE ID	CDR	ERROR	TOT	DELAY	EET	NM	FCI	RCI	EV	REGUL+	TYPE	ROUTE ACTIONS
▸	EHAM LDSP 5004		Overload			103	727	3244	843	+ 12:20		STANDARD	Copy FPL / Copy F15 / Validate
▸	EHAM LDSP 5024		Overload			104	727	3244	843	+ 12:20		STANDARD	Copy FPL / Copy F15 / Validate
▸	EHAM LDSP 5003		Overload			108	736	3322	851	+ 12:20		STANDARD	Copy FPL / Copy F15 / Validate
▸	EHAM LDSP 5021	CDR1	Overload	08:34	0	104	768	3321	871	+ 12:20	KD3C04M	STANDARD	Copy FPL / Copy F15 / Validate
▸	EHAM LDSP 5005		Overload			108	748	3326	843	+ 12:20		STANDARD	Copy FPL / Copy F15 / Validate

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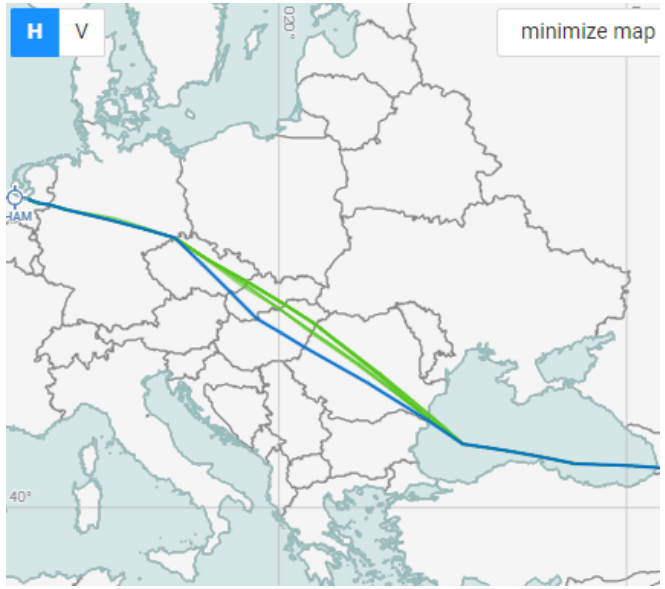
Eurocontrol Network Manager Portal

	ORIGINAL ROUTE	TOT	DELAY	EET	NM	FCI	RCI	EV	REGUL+
▼	EHAM VIDP 1			446	3810	60195	5324	+ 15:20	

N0477F330 ARNEM L620 HMM DCT NOMKA DCT OMELO DCT ODNEM DCT ERGOM DCT BUDOP DCT UDROS/N0471F350 UM859 KARDE UN644 ROLIN/N0472F350 N644 C
USETU G500 BUTRA L181 DAROW Z767 VAJEN G500 FIRUZ/N0480F350 P500 PS T400 NONIB L509 SULOM/M083F350 A466 ELKUX ELKUX6C

PROPOSED ROUTES

	EXEC TIME	REROUTING NOTE	DELAY	EET	NM	FCI	RCI	EV	OPP ACTIONS	ROUTE ACTIONS
▶	20-07:57	KLM 3 WIDE		445	3801	60093	5356	15:20		Copy FPL Copy F15 Validate
▶	20-07:57	KLM 3 WIDE		445	3801	60110	5356	15:20		Copy FPL Copy F15 Validate
▶	20-07:57	KLM 3 WIDE		445	3802	60123	5357	15:20		Copy FPL Copy F15 Validate
▶	20-07:57	KLM 3 WIDE		445	3801	60125	5368	15:20		Copy FPL Copy F15 Validate
▶	20-07:57	KLM 3 WIDE		445	3801	60125	5368	15:20		Copy FPL Copy F15 Validate



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Conclusion

- **Airlines need as much flexibility as possible to deal with wind variation. Impact on:**
  - Passenger connections
  - Fleet connections
  - Crew working hours
- **Necessity of having contingency routes is essential for making choices due to abnormal situations**
- **Opening additional entry and exits into airspace to create flexibility: flexible overflying permits needed**
- **Free Route Airspace (FRA) or User Preferred Route (UPR) development supported by airlines**

All these points will leat to emission reduction for airlines which helps us reach our global aviation commitment to achieve net zero carbon in 2050

Thank you for your attention

Clim van der Weijden 范科林

ATM Regional Manager Asia

Clim-van-der.Weyden@klm.com

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