Lido methodology in calculating the weather suitability period

The reason for issuing this is to explain / clarify how Lido calculates the earliest and latest times of arrival at ETOPS / PET Suitable Airports

Calculation methodology:

The suitability times shown on the OFP have been questioned due to a difference in calculation when using the numbers in the ETOPS / ETP CRITICAL POINT INFORMATION.

The suitability times on the OFP are correct

It is important to note here that the times shown in the ETOPS / ETP CRITICAL POINT INFORMATION relates to the worst case fuel scenario. This is normally a scenario where both decompression and an engine out (DX) are encountered. The earliest and latest times the aircraft would reach a suitable alternate (SA) is not necessarily the time taken in a DX scenario. If the aircraft were to have to divert due to an engine failure (1X) only, the flight time to the SA is possibly less than it would be in a DX situation. It would, therefore, be wrong to base the earliest time of arrival at the SA on a DX scenario.

Example

Below is data for ETOPS flight ETD470/23Oct AUH/SIN

```
ETD0470   23OCT2011     OMAA-WSSS   A332 A6EYR   RELEASE 0129 23OCT11
OFP 5/0/1     ABU DHABI INTL-SINGAPORE/CHANGI
                        WX PROG 2306 2312 2318   OBS 2218 2218 2218

  ATC C/S    ETD470      OMAA/AUH   WSSS/SIN      CRZ SYS       CI26
23OCT2011    A6EYR       0620/0635  1343/1348     GND DIST      3258
A330-243/MSN975/RR TRENT 772B-60/F  STA  1420     AIR DIST      3254
                        CTOT:....                 G/C DIST      3185
                                                  AVG WIND   136/000
MAXIMUM     TOW 220.9   LAW 182.0  ZFW 170.0     AVG W/C       P001
ESTIMATED   TOW 202.8   LAW 163.9  ZFW 158.3     AVG ISA       P004
                                                  AVG FF KGS/HR 5444
                                                  FUEL BIAS    P01.5
ALTN WMKJ                                         TKOF ALTN   .......
FL STEPS OMAA/0370/LOSIM/0390/
-------------------------------------------------------------------
                        *** ETOPS/ETP FLIGHT ***
-------------------------------------------------------------------
DISP RMKS   NIL

-------------------------------------------------------------------
         PLANNED FUEL                        STAT CONT FUEL SUMMARY
-----------------------------------          -----------------------
FUEL            ARPT   FUEL   TIME           STAT         FUEL  TIME
-----------------------------------          -----------------------
TRIP             SIN  38869   0708           CONT99       1696  0019
CONT 3%          KUL   1166   0013           CONT95       1291  0014
ALTN             JHB   2156   0022           CONT90       1076  0012
FINRES                 2307   0030
ETOPS/ETP                 0   0000
FOD ADD                   0   0000      ANALYSED EXTRA FUEL SUMMARY
-----------------------------------          -----------------------
MINIMUM T/OFF FUEL    44498   0813           NO DATA
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T/OFF FUEL            44498   0813
TAXI             AUH    400   0015
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BLOCK FUEL       AUH  44898
```

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ETOPS/ETP CRITICAL POINT INFORMATION (ETOPS RULE TIME: 180MIN)
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     CRITICAL POINT FOR FUEL REQUIREMENTS: N0910.6 E09045.3

ETOPS INFORMATION ELTME TIME   DIST      MORA     ICE CFUEL  FOB  COND
                               ISA       W/C

ETOPS ENTRY1 VCBI  0421 0115    481       078     0.6  10.5  18.0  DX
N1058.1 E08700.7                P15      P012

ETP1    VCBI/WMKP  0454 0142  659/615  083/048  0.9  14.3  15.2  DX
N0910.6 E09045.3              P15/P15 P013/M014

EXIT1   WMKP       0458 0136    579       048     0.9  13.5  14.8  DX
N0855.6 E09117.5                P15      M014
-------------------------------------------------------------------
ENRTE ALTNS  (WEATHER SUITABILITY PERIOD)
VCBI  11:04  14:29    WX MIN:  540-2000     FCST WX:  1600-7000
WMKP  12:01  14:29    WX MIN: 1090-4800     FCST WX:  9999-4000
-------------------------------------------------------------------
```

PET / ETOPS Output

Flight Details	AL	Flt-No.	OS	ATC C/S	Date	DEP	ETD	ETA	DEST	Registration
	EY	0470		ETD470	23OCT11	OMAA	230620	231420	WSSS	A6EYR

Condition

Rule	1X TAS	Border	Decompression Flight Level	Qualifier	
180	420	60	100	N	Equal Time Policy (PET)

Area

AA Entry	ETOPS Entry	AA Exit	ETOPS Exit
VOMM	105805N0870043E	VTSP	085533N0911730E

Critical Position

1st Suit Airport	Critical Fuel Point	ADDFU	Weight Lim	Flight Case	2nd Suit Airport
VCBI	091037N0904518E	0	T	DX	WMKP

Critical Points and Suitable Airports

Fltt PET	Fltt SA	Fuel (Icing)	Rem Fuel	1st Suit Airport	Icing Additional	PET/EFP	Case	Icing Additional	2nd Suit Airport
0454	0134	11142	14308	VCBI	6.686	090952N0904655E	1X	6.681	WMKP
0454	0200	13381	14267	VCBI	9.005	090821N0905010E	DC	9.013	WMKP
0454	0141	14318	14328	VCBI	7.073	091037N0904518E	DX	7.089	WMKP
0421	0109	7615	17203	VCBI	5.448	105805N0870043E	1X	5.448	VCBI
0458	0129	10395	13916	WMKP	6.432	085533N0911730E	1X	6.432	WMKP
0421	0127	9859	17203	VCBI	7.360	105805N0870043E	DC	7.360	VCBI
0458	0154	12717	13916	WMKP	8.724	085533N0911730E	DC	8.724	WMKP
0421	0115	10482	17203	VCBI	5.759	105805N0870043E	DX	5.759	VCBI
0458	0136	13481	13916	WMKP	6.807	085533N0911730E	DX	6.807	WMKP

1. Earliest time of arrival at first Suitable Airports (SA)

Formula for calculating the earliest arrival time at the first SA is

STD + Planned Taxi Time + Time to PET / ETOPS entry point + Time from PET / ETOPS entry point to SA - 1 hour.

If we base this on the ETOPS / ETP CRITICAL POINT INFORMATION (the DX scenario) the earliest arrival time is;

06:20 + 00:15 + 04:21 + 01:15 – 01:00 = 11:11z

However, the PET / ETOPS Output screenshot shows that the time from the PET / ETOPS entry point to the SA in the case of a 1X scenario is 01:09. This gives the earliest arrival time as

06:20 + 00:15 + 04:21 + 01:09 – 01:00 = **11:05z**

(Seconds are rounded in the calculations which accounts for the difference of 1 minute)

Latest time of arrival at first Suitable Airports (SA)

Formula for calculating the latest arrival time at the first SA is

STD + Planned Taxi Time + Time to “Point Of Equal Time” (PET) + Time from PET to SA + 1 hour.

Based on the ETOPS / ETP CRITICAL POINT INFORMATION

06:20 + 00:15 + 04:54 + 01:42 + 01:00 = 14:11

The PET / ETOPS Output screenshot shows that the time from the PET point to the SA in the case of a Decompression (DC) only is 02:00. This gives the latest arrival time as

06:20 + 00:15 + 04:54 + 02:00 + 01:00 = **14:29**

2. Earliest time of arrival at second Suitable Airports (SA)

Formula for calculating the earliest arrival time at the second SA is

STD + Planned Taxi Time + Time to PET / ETOPS exit point + Time from PET / ETOPS exit point to SA - 1 hour.

If we base this on the ETOPS / ETP CRITICAL POINT INFORMATION (the DX scenario) the earliest arrival time is;

06:20 + 00:15 + 04:58 + 01:36 – 01:00 = 12:09z

However, the PET / ETOPS Output screenshot shows that the time from the PET / ETOPS exit point to the SA in the case of a 1X scenario is 01:29. This gives the earliest arrival time as

06:20 + 00:15 + 04:58 + 01:29 – 01:00 = **12:02z**

(Seconds are rounded in the calculations which accounts for the difference of 1 minute)

Latest time of arrival at second Suitable Airports (SA)

Formula for calculating the latest arrival time at the second SA is

STD + Planned Taxi Time + Time to “Point Of Equal Time” (PET) + Time from PET to second SA + 1 hour.

Based on the ETOPS / ETP CRITICAL POINT INFORMATION

06:20 + 00:15 + 04:54 + 01:42 + 01:00 = 14:11

The PET / ETOPS Output screenshot shows that the time from the PET point to the SA in the case of a Decompression (DC) only is 02:00. This gives the latest arrival time as

06:20 + 00:15 + 04:54 + 02:00 + 01:00 = **14:29**