A300-600

ETOPS TRAINING MANUAL

AIRBUS ETOPS COURSE

TRAINEE'S MANUAL

RTR: D0210T0

This document must be used
for training purpose only.

Under no circumstances
should this document be used as a reference.

1, rond-point Maurice Bellonte
31707 Blagnac Cedex
FRANCE

AIRBUS Environmental Recommendation

« Please consider your environmental responsibility before printing this document »

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ETOPS FFS

WEATHER

RWY 24 310°/19kt - G 25kt 10 km FEW 020
SCT 045 9°/1° QNH 1013 QFE 1012

INIT PAGE

FLT NBR		
[Airline ID] 101		
FROM	TO	ALTN
EINN	KJFK	KBOS
CO RTE		ALTN / CO RTE
-		-
CRZ FL		CRZ TEMP
FL 340		- 53°C
CI		TROPO
50		36090
TRIP WIND		TRIP DIST
HD 44 kt		2802 Nm

INIT NEXT PAGE A310

ZFW	112 t	ZFWCG	28 %
FOB	40 t	GW	152 t

INIT NEXT PAGE A300-600

ZFW	112 t	ZFWCG	24.1 %
FOB	43 t	GW	155 t

NOTES

RWY COND DRY
AIR COND ON
ANTI ICE ENG ON

F/PLN: See Computerized Flight Plan in Etops Training Manual

A310 PERF PAGE			A300-600 PERF PAGE		
V1	150	- TOGA	V1	146	- TOGA
VR	162	44 FLEX	VR	155	39 FLEX
V2	166		V2	157	
FLAPS	15		FLAPS	15	

Time	EVENTS
	1 - COCKPIT PREPARATION - INIT GATE EINN
	2 - ETOPS PREPARATION
	3 - OCEANIC CLEARANCE
	4 - ATC CLEARANCE
	5 - START
	6 - TAXI TO HOLDING POINT RWY 24
	7 - TAKEOFF
	8 - AFTER T/O
	9 - CLIMB
	10 - CRUISE : USE OF AIRBUS CHECK LIST APU CHECK NAVIGATION FAILURES
	11 - REPORTING WAYPOINT REVIEW
	12 - STRATEGIES ENGINE FAILURE REVIEW
	13 - ENGINE FAILURE BEFORE ETP 1
	14 - FUEL IMBALANCE
	15 - LOSS OF BOTH ENG GENERATORS
	16 - LANDING

F/PLN: Insert manually the Flight plan
Don't use the Data base
Use the CFP in the ETOPS training manual

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ETOPS FFS SESSION PREPARATION

01 - SESSION OBJECTIVE

- To train the crew for all aspects of ETOPS rules and practice the designed scenario according to EASA or FAA requirements.

02 - TRAINING TOPICS

A. REVIEW

- FMS preparation
- Fuel monitoring
- Engine failure
- Loss of generators
- Diversion

B. EXERCICES / REFERENCES

EVENTS	REF
• ETOPS FLIGHT PREPARATION	FCOM 2.18.70 ETOPS TRAINING MANUAL
• COCKPIT PREPARATION	ETOPS TRAINING MANUAL : ETOPS CHECK LIST
• ENGINE FAILURE IN CRUISE	FCOM 2.16.50 FIXED SPEED STRATEGY
• LOSS OF BOTH ENG GENERATORS	QRH 3.06 – 3.07

C. SUPPORT

- Airbus ETOPS Training Manual
- FCOM 2.18.70 Extended Range Operations
- FCOM VOL 2
- QRH

03 - SESSION PROFICIENCY CRITERIA

- Ability to demonstrate and to operate effectively the aircraft in an ETOPS environment according to ETOPS rules and specific SOPs.

ETOPS FFS SESSION GUIDE

Simulator A310-300-600

TOTAL SESSION 05H00

Briefing: 01H00

Simulator :
- Cockpit preparation 01H00
- Break 00H15
- FSS session 02H45

AT THE BRIEFING ROOM

DOCUMENTATION USED:
- ETOPS Booklet with the complete flight Folder
- North Atlantic Plotting Chart
- Jeppesen ATLANTIC 2 and 1 AT
- AIRBUS ETOPS Long Haul Check List
- FCOM 2.05.34 Navigation Procedures with failure

Flight from SHANNON to NEW YORK (EINN TO KJFK) - Refer to computerized flight plan

FORECAST and METAR are to be considered with a ETD at 13H00 Z

MMEL: APU INOP then last minute repaired by maintenance.
To be checked prior to ETOPS entry

ETOPS preparation*: CM 2 is PF for the start of the session*
- Maintenance Technical Log Book Check
- STAND BY GEN TEST (or covered by maintenance) FCOM 2.03.04 p2
- Preliminary Cockpit preparation use of AIRBUS Long Haul Check List
- Review of trip fuel, tracks, distances, ETOPS sector, period of suitability

REVIEW: the strategies “Engine Failure”
- FCOM 2.16.50 fixed speed strategies
- **For info and at instructor’s discretion, review the special Procedures for in-flight Contingencies in oceanic Airspace with the Jeppensen ATLANTIC chart 1 and 2 AT.*

COCKPIT PREPARATION:

Use of AIRBUS LONG HAUL ETOPS CHECK LIST

INIT GATE EINN with ATIS

- APU repaired - APU check to be performed in flight before ETOPS zone
- Slot Allocation: FFS session start time + 1h20
- FMS PREPARATION:

  - INIT PAGE: CI 50 - ACFT POSITION - AVRG TROP
  - FL PLAN: Insert manually the Flight Plan, don't use the Data Base - Check total GND Distance.
  - INIT PAGE 2: ZFW - BLOCK FUEL as training syllabi - Trip Wind as CFP
  - PROG PAGE: check accuracy
  - PERF PAGE: as TRAINING syllabi
  - SEC FL PLAN: Copy active. Select options.
  - REF INDEX: Insert and store ETP1- ETP2 – EEP as defined waypoint.

Review but to be inserted in Flight:
CRUISE WINDS using the WINDS ALOFT EINN-KJKF (inside the weather folder).

CROSSCHECKED ALL THE PARAMETERS

2 **ETOPS PREPARATION**:
REVIEW of trip fuel, Tracks and Distances for ETOPS sector.
Before ETOPS entry point requirement:to be reviewed with the ETOPS chek list.

3 **OCEANIC CLEARANCE: obtained via SHANON OCEANIC AREA CONTROL CENTER SNN OCA 121.70 as Jeppesen chart**

For info: *OCEANIC CLEARANCE are required for all flight within NORTH ATLANTIC controlled Airspace (at or above FL55). Pilots should request Oceanic Clearances from the ATC unit responsible for the first OCA within which they operate.*
Three elements to an Oceanic Clearance, route, Mach number and FL serve to provide elements of separation: lateral, longitudinal and vertical.

OCEANIC CLEARANCE: "airline ID 101 cleared to KJFK on Random Track :
"RESNO 56N20W 57N30W 57N40W 55N50W CARPE FL320 MACH .79 FROM RESNO"

4 **ATC CLEARANCE** : Shannon Ground 121.80
"(airline ID) 101 cleared to RESNO VIA ERABI CLIMB INITIALLY to 5000'- squawk 3615

***NOTE: a 10 minutes break is to be scheduled before the start sequence**

6 **TAXI**: TWR 118.70 “Taxi to holding point RWY 24”

7 **TAKE-OFF** “ID 101, Line up and Take-Off RUNWAY 24, wind 300/15“

8 **AFTER TAKE-OFF**: “Contact Departure on …”
“Climb to FL 320 to be level off at RESNO”

9 **CLIMB**: Oceanic clearance request if not done on ground
ETOPS ENTRY POINT: checked on ND
INSERTIONS OF: CRUISE WIND - TEMPERATURE
Check the ETP1 position on ND.
OPTIMUM ALT REVIEW : Weight, Temperature, Winds direct influences for accurate FMS computations

➢ ***Remind the mandatory LH ETOPS Requirements check before EEP.***

10 **CRUISE**: USE OF AIRBUS LONG HAUL CHECK LIST

- FOLLOW UP of Fuel on CFP, mandatory item for LH and ETOPS flight
- APU check requested by maintenance :
  - Start aborted, APU FAULT
- NAVIGATION FAILURES before EEP :
  - IRS 2 FAULT FCOM 2.05.34 p3
  - FMC independent operation FCOM2.05.34 p5
  - Loss of 1 FMS
  - Loss of both FMS FCOM 2.05.34 p5
  - RSVM MAX EXCURSION is 200’

Fly the cleared track with FPV / FPA VOR CRS. Maintain bird in the cage change TRK when needed of fly true TRK on ISDU. Verify frequently the A/C position.
A/P recovers in basic mode.

- Use FCOM 2.02.06 for RESET of C/Bs

11 **OVER A REPORTING WAYPOINT**
SWK HF 8879 11336 INTERPILOT 123.45

- Verify the Track, the turn to, the distance, the next way point
- Verify the fuel used, fuel remaining

Standard air ground message types and formats (see JEPPENSEN CHARTS)

Position report:

- FLIGHT IDENTIFICATION
- PRESENT POSITION
- TIME (over present position)
- FL
- NEXT POSITION ESTIMATED TIME (for next position)
- ANY FURTHER INFORMATION

↑ *13* **ENGINE 1 FAILURE** (before ETP1)

KEEP in mind where to go along the entire ETOPS sector

Reminder : *"The pilot should advise ATC as soon as practicable of the situation, reminding ATC of the type of aircraft involved, and request expeditious handling"*

Weather at EINN:
RWY 24 IN USE. 300/12 9999 FEW035 SCT070 09/01 1013 NOSIG

- ECAM ACTIONS LAND ASAP
- Set MCT
- Do not descent in TRK, Green Dot strategy, RVSM levels
- When out of track and approaching Green Dot: Drift down
  1. A/THR off
  2. SPD on FCU: Green Dot
  3. LVL / CHG to FL 170 initially
- Revert to an adequate strategy :
  1. SPD on FCU
  2. A/THR ON
  To accelerate as established before dispatch
  (Insist on reverting to another strategy depending on failure or emergency and fuel remaining on board)
- EMERGENCY CALL 121.5 and HF SWK 8879 or 11336
- Use of FMS page : ENG fail
  LEVEL OFF ALT depends on speed strategy adopted

For information and as briefed before:
Special procedures in oceanic airspace

- Leave the assigned route or track by initially turning at least 45 degrees right or left to aquire a same or opposite direction offset 15NM.

- If unable to maintain the assigned FL, initially minimize the rate of descent

↑ *14* **IN DESCENT TO DIVERSION AIRPORT**
FUEL MONITORING AND IMBALANCE

- FUEL IMBALANCE: Use of QRH mandatory to cover an eventual FUEL LEAK
- Review the Overweight procedure if needed

↑ *15* **LOSS OF BOTH ENG GENERATORS**
IDG OVHT or GEN 2 FAULT or GEN OVER FREQ
CHECK STBY GEN operation

- Declare EMERGENCY
- ECAM ACTIONS
- Review status and BUS EQT LIST for systems recovered with LAND RECOVERY ON
- If time permits, review FCOM 2.04.24 p1+2

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COMPUTERIZED F-PLN

PLAN 4657 COMPUTED 09:40 Z **ETOPS FLIGHT** 15/03/2012
300 ETOPS A306 M78/CI50 KGS **EINN TO KJFK** ETD 13:00Z

FLT/DAY	DEP / ARR	F.TIME	NAM	ROUTE	AVG WIND / AVG TEMP / AVG TT
AIB101/15	SNN/JFK	07:19	3164	SNNJFK1	M050 / M47 / 255

ETOPS 120 MIN FLIGHT RULES

		E.FUEL	A.FUEL	E.TME	NM	NAM	FL
DEST	KJFK	036106	……	07:19	2802	3164	320
RESV	0.05	001805	……	00:22			
ALT	KBOS	002290	……	00:28	0162	0130	250
HOLD		002091	……	00:30			
XTR		000000	……	00:00	CAPT.SIGN		
TOF		042292	……	08:39			
TAXI		000300	……				
BLOCK		042592	……	08:39	BLOCK FUEL……		
ALT2		KEWR	001300	00:13	0045	0052	080

FUEL BURN ADJUSTMENT FOR 1000KGS INCREASE/DECREASE IN TOW : 0291KGS

	E.MASS	CORR.	LIMIT	OPS	STRUC.	REASONS FOR OP.LIMIT
BASIC WT	080000	……				
EPLD	032000	……				
EZFW	112000	……	ZFW	……	130000 /	…….
TOF	042292	……				
ETOW	154292	……	OTOW	……	175000 /	…….
EB/O	036106	……				
ELAW	118186	……	LAW	……	140000 /	…….

EINN ERABI RESNO DCT 5620N DCT 5730N DCT 5740N
DCT 5550N DCT CARPE DCT YAY J580 YJT J581 ENE KJFK

FL 320/5730N 330/5740N 340/YGR 360

BLOCK IN	LDG
BLOCK OFF	T.OFF
BLOCK TIME	F.TIME

SELECTED ENROUTE ALTERNATES

EINN SHANNON	N52421 W008555	1457/1637	(……/……..)
BIKF KEFLAVIK	N63591 W022363	1512/1911	(……/……..)
CYQX GANDER INTL	N48562 W054341	1748/1858	(……/……..)

WPT AWY	FLT MSA	WIND OAT	S	TAS GS	ITT OTT	IMT OMT	DST RDST	NAM RNAM	E.T. C.T.	E.TA A.TA	ECBO ACBO	EFOB AFOB
EINN	ELEV 046FT						000 2802	000 3164	00:00 00:00	…… ……	000.3 ……	042.3 ……
ERABI					309	315	033		00:06	……	002.5	040.1
TOC					302	310	077		00:13	……	003.7	038.9
RESNO	320 010	210/064 M46	4	458 456	301 299	309 309	121 2543	122 2900	00:16 00:39	…… ……	005.5 ……	037.1 ……
EEP		/					2380		01:00	…… ……	007.2 ……	035.4 ……
5620N ..	320 010	250/026 M46	1	459 440	291 287	301 300	181 2362	188 2712	00:25 01:04	…… ……	007.8 ……	034.8 ……
ETP 1		/					2293		…… 01:12	…… ……	08.6 ……	034.0 ……
5730N ..	330 010	330/082 M51	6	453 402	285 276	298 295	336 2024	384 2328	00:56 02:00	…… ……	012.1 ……	030.5 ……
5740N ..	340 010	310/089 M59	4	445 378	274 266	293 287	328 1696	385 1943	00:52 02:52	…… ……	016.5 ……	026.1 ……
ETP 2		/					1604		03:06	…… ……	017.6 ……	025.0 ……
EXP		/					1372		03:25	…… ……	022.2 ……	022.4 ……
5550N ..	340 010	260/073 M57	0	447 477	254 246	275 269	357 1339	422 1521	00:57 03:49	…… ……	021.0 ……	021.6 ……
CARPE ..	340 010	210/063 M54	3	447 386	233 230	256 256	185 1154	213 1308	00:29 04:18	…… ……	023.4 ……	019.2 ……
YAY ..	340 031	190/064 M54	3	450 392	216 215	241 240	125 1029	143 1165	00:19 04:47	…… ……	025.0 ……	017.6 ……
YJT J580	340 040	200/090 M48	3	456 367	212 210	237 231	196 0833	243 0922	00:32 05:09	…… ……	027.5 ……	015.1 ……

YGR	360	210/091		457	242	263	143	173	00:22	……	029.3	013.3
J581	040	M47	3	375	240	260	0690	0749	05:31	……	……	……
YFC	360	220/049		460	246	266	213	236	00:31	……	031.7	010.9
J581	035	M44	3	414	243	264	0477	0513	06:02	……	……	……
TOPPS	360	230/038		459	240	261	065	071	00:09	……	032.4	010.2
J581	076	M45	0	422	239	258	0412	0442	06:11	……	……	……
BGR	360	240/042		459	239	257	057	065	00:09	……	033.2	009.4
J581	076	M45	2	418	222	239	0355	377	06:20	……	……	……
ODIKE	360	240/042		459	222	239	014	016	00:03	……	033.6	009.0
J581	076	M45	2	421	222	239	0341	361	06:23	……	……	……
ENE	360	240/047		459	222	239	099	113	00:15	……	034.7	007.9
	076	M45	2	415	223	240	0242	248	06:38	……	……	……
TOD	360	250/053		459	225	244	143	152	00:18	……	036.0	006.6
	076	M45	2	413	223	238	0099	0096	06:56	……	……	……
KJFK	ELEV				222	237	099		00:23	……	036.4	006.2
	013FT				221	235	0000	0000	07:19	……	……	……

ROUTES TO ALTERNATES

ALTERNATE: BOS KBOS - GEN EDWARD LAWRENCE LOGAN INTL
ROUTE : Direct
FL : 250
KJFK DCT KBOS

ALTERNATE : EWR KEWR - NEWARK LIBERTY INTERNATIONAL
ROUTE : Direct
FL : 080
KJFK DCT KEWR

WP NAME	CO-ORDINATES	WP NAME	CO-ORDINATES
EINN	N52 42.1 W008 55.5	ERABI	N53 00.9 W009 34.1
T-O-C	N53 42.4 W011 14.3	RESNO	N55 00.0 W015 00.0
EEP	N55 55.2 W019 36.3	5620N	N56 00.0 W020 00.0
ETP_1	N56 15.1 W021 51.7	5730N	N57 00.0 W030 00.0
5740N	N57 00.0 W040 00.0	ETP_2	N56 35.1 W042 33.2
EXP	N55 10.0 W049 15.1	5550N	N55 00.0 W050 00.0
CARPE	N53 05.0 W054 04.9	YAY	N51 23.6 W056 05.0
YJT	N48 34.9 W058 40.2	YGR	N47 25.8 W061 46.5
YFC	N45 53.7 W066 25.1	TOPPS	N45 20.4 W067 44.3
BGR	N44 50.5 W068 52.4	ODIKE	N44 40.1 W069 05.6
ENE	N43 25.5 W070 36.8	T-O-D	N41 43.9 W072 30.3
KJFK	N40 38.4 W073 46.7		

FIRS EGGX/0027 CZQX/0200 CZQX/0418 CZQM/0523 KZBW/0609
FIRS KZNY/0712

(FPL-AIB101-
-A306/
-EINN1300
-M078 F320 ERABI RESNO DCT 56N020W DCT 57N030W
M078F330 DCT 57N040W/M078F340 DCT
55N050W DCT CARPE DCT YAY/N0456F340 J580 YJT J581
YGR/N0457F360 J581 ENE TOPPS
-KJFK0719 KBOS KEWR
-EET/ERABI0006 EGGX0027 56N020W0104 57N030W0200
CZQX0200 57N040W0252 55N050W0349 CZQX0418 YAY0437 YJT0509
CZQM0523 KZBW0609 KZNY0712
REG/300ETO RMK/PTP NAV/RNVE99
-E/0839)

ETOPS DETAIL DATA

REFERENCE WEIGHT: 155T
THRHLD DIST: 420 NM
RULE DIST: 850 NM
1EO MCT/VMO TOTAL A/I ON
ALL ENG LRC TOTAL A/I ON

ETP1

LAT/LONG	N56151 W021517
ETP TIME	01:12
ETP DIST	507 NM
ETP FL	320
ETP FOB	032239
ETP FUEL REQ	007858
FUEL DEFICIT	000000
ETP WT	146044

	EINN		BIKF	
BURN SUMARY FL 100	1ENG	2ENG	1ENG	2ENG
DIVERSION SPEED	335 KT	LRC	335 KT	LRC
G/C DIST	0497	0497	0464	0464
CRUISE DIST	0484	0483	0488	0489
ETP W/C	P010	P10	M018	M018
ENROUTE TEMP	M005	M005	M006	M006
MSA FL	049	049	078	078
TIME TO ALTERNATE	01:20	01:25	01:20	01:25
TOTAL	**007858**	007805	007854	007803

ETP2

LAT/LONG	N56351 W042332
ETP TIME	03:06
ETP DIS	1194 NM
ETP FL	340
ETP FOB	023220
ETP FUEL REQ	011436
FUEL DEFICIT	000000
ETP WT	137025

	BIKF		CYQX	
BURN SUMARY FL 100	1ENG	2ENG	1ENG	2ENG
DIVERSION SPEED	335 KT	LRC	335 KT	LRC
G/C DIST	0736	0736	0631	0631
CRUISE DIST	0706	0703	0719	0728
ETP W/C	P016	P016	M047	M047
ENROUTE TEMP	M002	M002	P001	P001
MSA FL	078	078	027	027
TIME TO ALTERNATE	01:54	02:05	01:53	02:04
TOTAL	011421	011252	**011436**	011258

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ERA AERODROME SELECTION FORM - EU OPS 1

AIRCRAFT: A300-600 Flight: AIB101/15 Date:MAY 15th, 2009 FROM:EINN TO:KJFK

ICAO Code / Airport Name	Runway Hdg Mag (true)	Approach Cat	Approach Type	Weather Minima En Route Ceiling	En Route Vis	ETOPS Ceiling	ETOPS Vis	NOTAM	Time Window FROM	Time Window TO
EINN Shannon	**06** 058 (052)	P	ILS	200	700	400	1500			
		NP	LOC	314	1400	714	2900			
		NP	VOR	314	1400	714	2900			
		NP	CIRCLING	604	2400	1004	3900			
	24 238 (232)	P	ILS	200	550	400	1350			
		NP	LOC	435	1000	835	2500			
		NP	VOR	435	1000	835	2500			
		NP	CIRCLING	604	2400	1004	3900			
BIKF Keflavik	**02** 018 (360)	P	ILS DME	200	1000	400	1800			
		NP	LOC	253	1600	653	3100			
		NP	VOR DME	263	1600	663	3100			
		NP	CIRCLING	609	2400	1009	3900			
	11 108 (090)	P	ILS DME	200	550	400	1350			
		NP	LOC	259	800	659	2300			
		NP	VOR DME	279	800	679	2300			
		NP	NDB	399	1000	799	2500			
		NP	CIRCLING	609	2400	1009	3900			
	20 198 (180)	P	ILS DME	200	550	400	1350			
		NP	LOC	287	800	687	2300			
		NP	VOR DME	337	1000	737	2500			
		NP	CIRCLING	609	2400	1009	3900			
	29 288 (270)	P	ILS DME	213	800	413	1600			
		NP	LOC	259	1400	659	2900			
		NP	VOR DME	329	1600	729	3100			
		NP	CIRCLING	609	2400	1009	3900			
BGSF Sondre Strom	**10** 094 (062)	NP	LOC DME	350	1400	750	2900			
		NP	NDB DME	1670	1800	2070	3300			
		NP	NDB	1780	1800	2180	3300			
		NP	CIRCLING	2335	2400	2735	3900			
CYYR Goose Bay	**08** 079 (055)	P	ILS DME	200	550	600	2050			
		NP	LOC	400	1600	800	3100			
		NP	CIRCLING	500	3200	900	4700			
	26 259 (235)	NP	LOC b crs	307	1600	707	3100			
		NP	NDB	447	1600	847	3100			
		NP	CIRCLING	500	3200	900	4700			
CYQX Gander	**03** 033 (011)	P	ILS DME	200	800	400	1600			
		NP	LOC	332	1600	732	3100			
		NP	CIRCLING	504	3200	904	4700			
	13 130 (108)	P	ILS	200	800	400	1600			
		NP	NDB	452	1609	852	3109			
		NP	LOC	392	1600	792	3100			
		NP	CIRCLING	504	3200	904	4700			
	21 213 (191)	NP	VOR	341	1600	741	3100			
		NP	CIRCLING	504	3200	904	4700			

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A300-600 MASTER MINIMUM EQUIPMENT LIST	AUXILIARY POWER UNIT	01-49 Pg 1 SEQ 100 REV 16

Mod : 6214

	1. SYSTEM AND SEQUENCE NUMBERS / ITEM	2. RECTIFICATION INTERVAL	3. NUMBER INSTALLED	4. NUMBER REQUIRED FOR DISPATCH	5. REMARKS OR EXCEPTIONS
	1 – **APU**	C	1	0	* (o) a) Except for ER operations beyond 120 minutes, may be inoperative.
					- or -
		D	1	0	* (o) (m) b) Except for ER operations beyond 120 minutes, may be inoperative provided the APU is deactivated or removed.
	2 – **Isolation Valve**	C	1	0	* (m) May be inoperative in the closed position. Refer to 49-1
					NOTE ***The following equipment are not required when the APU is not used or is inoperative.***
R	3 – **LP Fuel Pump**	C	1	0	* May be inoperative provided the APU is not used.
	4 – **Fuel Pump AUTO Mode**	C	1	0	* (o)
	5 – **Fuel Pump LO PR Light**	C	1	0	*
	6 – **Air Intake Flap**	C	1	0	* (m) a) May be inoperative in open position.
					- or -
R		C	1	0	(o) b) May be inoperative provided APU is not used.
	7 – **AVAIL Light**	C	1	0	* May be inoperative provided N indication is available on ECAM.
	8 – **FAULT Light**	C	1	0	* May be inoperative provided N and EGT indications are available on ECAM.
	9 – **ACCEL Light**	C	1	0	*
	10 – **ON Light**	C	1	0	*
	11 – **OVRD Light**	C	1	0	*
	12 – **LP VALVE**				
R	a) Valve	C	1	0	(m) May be inoperative in closed position provided the APU is not used.
	b) Flowbar/SHUT Light	C	2	0	* One or both may be inoperative provided associated indications are available on ECAM.
	13 – **Ind. and Control on Maintenance Panel**	C	–	0	
	14 – **Indication on ECAM System Display**	C	–	0	One or more may be inoperative provided procedures are not dependent upon their availability.

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++ OPMET REPORT ++

++ DEPARTURE ++

EINN SNN SHANNON

METAR 151000Z 30020KT 9000 FEW020 SCT045 09/01 Q1013 TEMPO 1400 BKN008

TAF 150600Z 1506/1606 30020KT 9999 SCT025 SCT035
BECMG 1506/1509 31020KT SCT020 BKN030 PROB30
TEMPO 1509/1511 3000 BR BKN008
TEMPO 1514/1517 6000 -RA SCT008 BKN020
BECMG 1515/1518 29015KT
BECMG 1517/1606 SCT015 BKN025

++ INTENDED DESTINATION ++

KJFK JFK JOHN F.KENNEDY INTL

METAR 150900Z 230651Z 27015G19KT 10SM FEW040 SCT120 SCT250 08/02 A2975=

TAF 150549Z 1506/1612 26014KT P6SM SCT100
FM151400 28018G27KT P6SM SCT040 BKN120
FM151900 29019G25KT P6SM SCT040 BKN120
FM160100 30016KT P6SM SKC
FM160400 29010KT P6SM SKC
FM160900 28006KT P6SM SKC=

++ INTENDED DESTINATION ALTERNATES ++

KBOS BOS GEN EDWARD LAWRENCE LOGAN INTL

METAR 150654Z 27012G16KT 10SM FEW015 BKN100 09/07 A2957=

TAF 150712Z 1507/1612 25017KT P6SM BKN080
FM151200 27019G30KT P6SM SCT030 BKN080
FM160100 27017KT P6SM SKC=

KEWR EWR NEWARK LIBERTY INTERNATIONAL

METAR 150651Z 27013G21KT 10SM SCT070 08/00 A2975=

TAF 150549Z 1506/1612 27010KT P6SM SCT100
FM151400 29018G25KT P6SM SCT040 BKN120
FM151900 32019G25KT P6SM SCT040 BKN120
FM160100 30014KT P6SM SKC
FM160400 28009KT P6SM SKC=

++ ENROUTE WEATHER ++

LFFF PARIS FIR / FRANCE UIR

WS151649 SIGMET 2 VALID 151700/151930 LFPS- LFFF PARIS FIR/UIR
EMBD TS OBS AND FCST SE OF LINE N4620 E00250 - N4720 E00420
TOP CB FL300 MOV SW NC =
WS151455 SIGMET 1 VALID 151505/151700 LFPS- LFFF PARIS FIR/UIR
EMBD TS OBS AND FCST SE OF LINE N4620 E00250 - N4720 E00420
TOP CB FL320 MOV SW INTSF =

++ SELECTED EN-ROUTE ALTERNATES ++

BIKF KEF KEFLAVIK

METAR 150700Z 07011KT 9999 FEW026 02/M02 Q0990=

TAF 150445Z 1506/1606 08010KT 9999 -SHRA FEW025 SCT035
BECMG 1509/1511 03020KT
TEMPO 1511/1518 03020G30KT 5000 RA BKN012 OVC030
BECMG 1523/1601 36030KT=

CYQX YQX GANDER INTL

METAR 150700Z 16013KT 20SM FEW014 OVC160 08/06 A3018 RMK SC2AC6 SLP226=

TAF 150555Z 2306/2406 18015KT P6SM BKN012
TEMPO 1506/1512 SCT012 FM231200 19020G30KT P6SM SCT008 OVC025
TEMPO 1512/1514 5SM -RA BR BKN008 OVC040
FM151400 18020G30KT P6SM -RA SCT008 OVC015
TEMPO 1514/1521 4SM -RA BR OVC008
FM152100 18025G40KT P6SM OVC012
TEMPO 1521/1524 6SM -RA BR
FM160000 19015KT P6SM SCT012
TEMPO 1600/1602 BKN012 RMK NXT FCST BY 151200Z=

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WINDS ALOFT EINN-KJFK

March 15TH, 2012

	FL 100	FL 300	FL 340	FL 380	
5515N	355/40	320/ 60	330/65	315/ 68	-43
5620N	330/48	330/75	320/85	320/55	-42
5730N	335/21	320/ 75	310/80	305/76	-43
5740N	275/30	285/ 58	292/75	275/55	-55
5550N	195/24	240/38	230/ 60	248/45	-56
CARPE	180/33	188/48	196/60	200/51	-55
YAY	172/44	178/64	175/65	180/61	-55
YJT	120/20	145/55	160/58	155/30	-42
ENE	355/21	350/18	350/15	335/10	-41

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ETOPS DISPATCH CHECKLIST

AIRCRAFT **DATE** **ETD**	**REGISTRATION** **FLIGHT N°** **DESTINATION**
ETOPS STATUS	
ETOPS APPROVED : COMPANY	
ETOPS APPROVED : CREW	
ETOPS APPROVED : ROUTE	
MAINTENANCE RELEASE STATEMENT	
MEL/CDL	
NOTAMS	
Departure Airport	
Destination Airport	
En route alternates	
En route	
WEATHER FOLDER	
TAF METARS SIGMETS: Departure Airport Destination Airport En-route Alternate	
WINDS AND TEMP CHARTS Cruise FL Diversion FL	
TEMSI charts	
ICING FORECAST	
SUITABLE AIRPORT FORM	
SELECTION OF SUITABLE A/P	
SPECIFIC NAVIGATION REQUIREMENTS	
MNPS/ NOPAC/ TRANSPAC	
RVSM	
CAT II/ CAT III	
ROUTING	
2 PLOTTING CHARTS	
ETOPS AREA	
ETOPS COMPUTERIZED FLIGHT PLAN	
PERF FACTOR	
COST INDEX	
ETOPS SCENARIOS	
EN ROUTE ALTERNATE EEP ETP EXP CP	
PROVISION FOR ICING CONDITIONS	
CRITICAL FUEL SCENARIO	
EXTRA FUEL FOR ETOPS	
EXTRA FUEL MEL/CDL	
FINAL FUEL ORDER	

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AIRBUS ETOPS LONG HAUL CHECKLIST

ON GROUND

AT DISPATCH OFFICE

- Check the NOTAMS
- Take your CFPs
- Take the WEATHER folder with:
  - Destination, alternates, METARS and forecasts
  - The upper wind synoptic charts
  - The upper winds and temperature at your different route way points
  - Sigmets
- Take 2 plotting charts and draw or check your track drawn on the first one
- **For ETOPS flights**
  - Check if your are ETOPS approved for this flight, company, crew and aircraft
  - Check your MEL if A/C failures
  - Check your ETPs, EEP, CP and EXP
  - Check the VALIDITY, WEATHER and NOTAMS for your SUITABLE airports
  - Remember your increased weather minima and your runway crosswind limitations for pre-flight dispatch
  - Note the PERF factor applicable to your A/C
  - Verify, decide and CROSS CHECK your fuel uplift
    - Trip and block fuel Vs your CFP
    - Different flight / fuel scenarios
    - Critical fuel scenario, eventual additional ETOPS fuel
  - Check the Cost Index , MACH number and Flight speed scenario adopted for this flight
- Take, if available and necessary, an LRNS, a TRACK clearance and an ALTIMETER RVSM company check form

AT PILOTS ROOM

- Cross check your CFP Vs average WV component, GND dist, NAM and your accurate TRIP Fuel with FCOM vol 2 FUEL sheet
- Check your first FLPLAN CRZ LEVEL Vs your first PERF OPT FL possible
- Note your average TROPOPAUSE LEVEL and temperature on your CFP
- Compute and cross check the RTLOW limits of your to data

IN THE COCKPIT

- **For ETOPS flights**
  - Verify the technical log book for
    - ETOPS release by maintenance
    - Deferred items concerning the ETOPS MEL
- Prepare your MASTER CFP
- Check UTC time
- Check HF, ACARS and SELCAL
- Make a full alignment of your LRNSs
- **For ETOPS flights**
  - Check if the STBY GEN has been checked (1st flight)
  - Check the FUEL Xfeed
- **In the FMGS (FMGES for A330)**
  - Check or enter the PERF factor (ARM to change)
  - **Have an independent pilot gate position check, make a full alignment of your IRSs**
  - Enter the Cost Index, the first CRZ FL and temperature, average TROPOPAUSE
  - Fill up the FL Plan in the MCDU **and cross check with the other pilot**
  - Check the **total Ground distance** Vs your CFP
  - Enter the **Step Climbs** along your flight
  - Fill in the 2nd INIT page and the average Wind component
    - Wind and temperature can be entered for the entire flight, if time available
  - Cross check the **trip fuel** and the **trip time** Vs the CFP
- **For ETOPS flights**
  - If time available, enter as stored way points in data page
    - EEP, ETPs, EXP, CP

  Secondary FL PLAN copy active

  Make a print of your flight plan through the FMGS (FMGES for A330) if available

IN FLIGHT APPROACHING THE ETOPS ENTRY POINT

- **After ATC clearance reception NO alterations or changes are authorized on the PRIMARY / ACTIVE FLIGHT PLAN after it has been checked!**
- Copy the active flight plan on the secondary, make any change or information on this one
- If not inserted before
  - Insert temperature and the cruise winds at, or below and above your intended flight levels
  - For each leg of restricted segments to have correct ETAs
  - WV and temperature according to FCOM procedures afterwards

- Ask for your assigned primary and secondary HF frequencies, tune them and **make a SELCAL check**, listen to the HF frequency if negative SELCAL
- Cross check your **LRNSs** Vs ground navigation aids
- Cross check your **ALTIMETERS** (RVSM requirements)
- Check and / or plot your **cleared TRACK** on the plotting chart
- Select and listen to 121,50MHz on VHF1, XXX, XXMHz on VHF2, ACARS on VHF3
- Select A2000 or other assigned ATC code
- **For ETOPS flights**
  - If not introduced before
    - Insert as stored way points your EEP, ETPs, CP, EXP in the proper format
  - Verify that your **SUITABLE ARPTS** are still valid before the EEP
    - Vs your cleared track
    - Vs the weather forecasts (JEPESSEN or cpy min)
  - Verify your FUEL on board in accordance with the flight plan
  - All FUEL scenarios must be fulfilled before the EEP
  - **Appropriate course of action must be taken if ETOPS requirements are not fulfilled before the EEP**
  - **Contact your flight dispatch if needed**
- As reminders, insert in the FMGS as stored way points, A2000 and LL XSSING/INCR/N° points in the secondary flight plan, TIME reminders are also available
- Select EFIS way point button on PF side ,CSTR on PNF side, NAV on adequate range each side, TRUE NORTH ref, if needed
- **SELECT your cleared Mach number on the FCU if cleared so by ATC, otherwise use MANAGED SPD**
- **Make a print of your flight plan through the FMGS (FMGES for A330) if available**

APPROACHING AND OVER FLYING A WAY POINT

- **A short time before the crossing way point**
  - Check the present position ETA and the actual FOB
  - Verify the next 2 way point co-ordinates, track and distance Vs the CFP
  - **Check the aircraft turn, heading and track towards the new track**
- Check that the auto-pilot is still coupled on NAV
- Transmit the position report **read on the navigating MCDU**, send WX report if requested
- Report any over moderate or severe TURBULENCE at RVSM levels
- Make a survey of the weather at ALTERNATE and DESTINATION airports
- **For ETOPS flights**
  - Make a survey of your SUITABLE airports
  - Keep in mind the different scenarios Vs the ETPs and the status of the aircraft
  - Watch your FUEL on board Vs the ETPs and the CP
  - +/- 10' later check your position

APPROACHING THE LANDFALL OR THE ETOPS EXIT POINT

- Check the NAV accuracy and the updating of the LRNSs
- Deselect TRUE NORTH ref, if used

ON GROUND POST FLIGHT

- Check and report the LRNSs accuracy
- Report any failure that can affect the RVSM flights
- **For ETOPS flights**
  - Report any failure that can affect the ETOPS flights

MEMOS

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1. GENERAL

The system design and engine installation reliability of this airplane comply with the capability criteria for ETOPS flights of CTC 20 (DGAC), AC 120–42 A (FAA), CAP 513 (CAA UK) or AMJ 120-42/IL N°20 (draft, JAA) when configured, maintained and operated in accordance with the provisions of the relevant Airbus Industrie « Standard for Extended Range Operations », also referred to as the CMP document (Configuration, Maintenance and Procedure).

This statement of capability does not constitute an operational approval to conduct extended range operations.

The supplement 13 (section 6-02-13) to the Flight Manual refers to the approved Standard for Extended Range Operations and defines the applicable limitations, procedures and performance.

The operator has the responsability to also show compliance with his national regulation and to obtain operational approval from his national authorities.

2. OPERATIONAL LIMITATIONS

A. Definitions

For the purpose of AC 120-42 A and AMJ 120-42, Extended Range Operations are those intended to be conducted over a route that contains a point further than 60 minutes from an adequate airport at the selected one-engine-inoperative speed in still air and ISA (or prevailing delta ISA) conditions.

An adequate airport is an airport which satisfies the aircraft performance requirements applicable at the expected landing weight, and is sufficiently equipped to be safely used. In particular it should be expected that at the anticipated time of use it will be available and equipped with the necessary services including ATC, meteorological information and at least one let down aid for an instrument approach.

A suitable airport is a confirmed adequate airport which satisfies the dispatch weather minima requirements for ceiling and visibility within the required validity period. Airport conditions should also ensure that a safe landing with one engine and/or airframe system inoperative is possible.

B. Area of operation

The maximum distance from an adequate airport must be determined for ISA (or prevailing delta ISA) and no wind conditions taking into account the aircraft performance with one engine inoperative and the other engine at not more than MCT.

To determine the maximum distance from an adequate airport, a diversion speed strategy must be defined as well as an aircraft reference weight for performance determination.

The same diversion speed strategy (refer to FCOM section 2.16) must be considered for :

- establishing the area of operation ;
- calculating the single-engine fuel planning,
- conducting the diversion in case of engine failure (conditions permitting).

The ETOPS reference gross weight is to be assessed by the operator for each route or area of operation and shall be a conservative representative value of the aircraft gross weight at the critical point of the route or at the various critical points of all the routes included in the area of operation.

The one engine inoperative descent and cruise speed law must be selected so that the associated net flight path clears the enroute obstacles with the regulatory margin.

The FCOM section 2.16.50 provides data for 3 speed schedules. The associated approved net flight path are published in the Flight Manual Supplement 13.

When the diversion strategy is selected, the maximum distance from a diversion airport, for different maximum diversion times, can be directly determined using the table provided in this section. The area of possible ETOPS operation can then be drawn on plotting charts.

Another method to determine the maximum distance to a diversion airport is to read the one-engine-inoperative TAS (at the FL for best TAS) in the cruise tables of section 2.16.50 taking into consideration the appropriate strategy and minimum altitude to clear obstacles. In that case the maximum distance to a diversion airport will be found in multiplying this one-engine-inoperative-TAS by the maximum diversion time.

Operators whose authorities require an approved one-engine-inoperative speed to be stated in the Flight Manual must use this speed.

3. DISPATCH CONSIDERATION

A. MMEL/MEL

The dispatch requirements applicable to an ETOPS flight are identified, in the Airbus Industrie MMEL, by the following provisos :

- "For ER operations...",
  or
- "Except for ER operations".

The ETOPS dispatch requirements are not to be considered once airborne (e.g. to assess the aircraft status prior to entering the ETOPS segment).

B. Communication and navigation facilities

The COM system design has provision to install 3 VHF and 2 HF transceivers, insuring full compliance with ETOPS requirements on any kind of routes.

The NAV system meets the ETOPS requirements for enroute or approach navigation.

The configuration defined by 2 IRS in conjunction with 2 FMS comply with the MNPS criteria and is approved as sole means of navigation for flight up to the maximum aircraft endurance.

Above 73°N, heading information will be lost or become unreliable depending on aircraft equipment.

Note : For operation within MNPS area, the approval from the national authorities must be obtained.

C. Fuel and oil supply

Fuel and oil supply must be determined considering both the engine and pressurization occuring failure or the pressurization failure alone occuring at the most critical point on the route. Forecast wind and temperature conditions must be considered as well as forecast icing conditions.

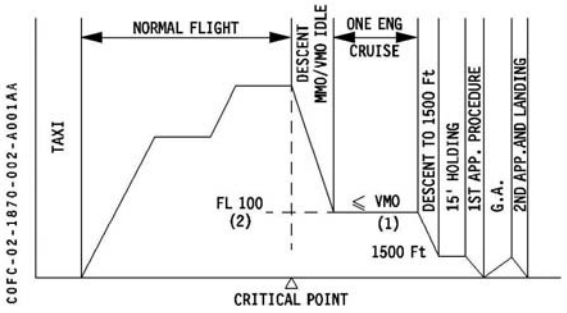
An ETOPS critical fuel planning, considering these two scenarios, must be established and compared to the standard fuel planning (non ETOPS).

D. ETOPS fuel scenarios

For establishing the ETOPS Critical Fuel planning, two diversion scenarios must be considered as follows :

1° Pressurization failure + engine failure

R
R



(1) Selected speed in accordance with the speed strategy selected for the ETOPS area of operation.

(2) or above if required by obstacle clearance and/or if supplementary oxygen is available.

2° Pressurization failure

Same flight profile, but with 2 engines operative and diversion cruise at LRC at FL 100 or above.

For each scenario, the required block fuel shall be computed in accordance with the operator's ETOPS fuel policy and with the regulatory ETOPS critical fuel reserves described hereafter.

Depending on the strategy and on the one-engine-inoperative speed selected for the single-engine diversion scenario, any one of these two scenarios may happen to result in the highest fuel requirement.

The scenario resulting in the highest fuel requirement is referred to as the ETOPS critical fuel scenario, the associated minimum block fuel requirement is referred to as the ETOPS critical fuel planning.

E. ETOPS critical fuel reserves

For the computation of the ETOPS critical fuel reserves and of the complete ETOPS critical fuel planning, the diversion fuel shall include the following fuel provisions :

- fuel burn-off from the critical point to the end of descent (e.g. 1500 ft) at the diversion airport,
- 5 % of the above fuel burn-off, as contingency fuel,
- 5 % fuel mileage penalty or a demonstrated performance factor,
- 15 minutes holding at 1500 ft at green dot speed,
- first (IFR) approach/go-around/second (VFR) approach,
- effect of any CDL and/or MEL item,
- if icing conditions are forecast :
  * effect of NAI + WAI systems,
  * effect of ice accretion on the unheated surfaces of the aircraft :

  The fuel provisions associated with the effects of NAI/WAI systems and the ice accretion on the unheated surfaces can be adjusted as a function of the forecast exposure time.

  The fuel provision for ice accretion on the unheated surfaces is in percentage three times the forecast exposure time in hours. For example, assuming a 1.5 hours total exposure time (en route to, and at the diversion airport), the fuel provision is 4.5 % of the fuel burnt during the considered exposure time. In case of moderate icing forecast, the above fuel provision is divided by two.
- For operations above 138 minute diversion time, if the above effect of ice accretion is less than 5 %, this effect should be rounded–up to 5 % to provide a provision for weather avoidance.
- APU fuel consumption, if required as a power source (MEL).

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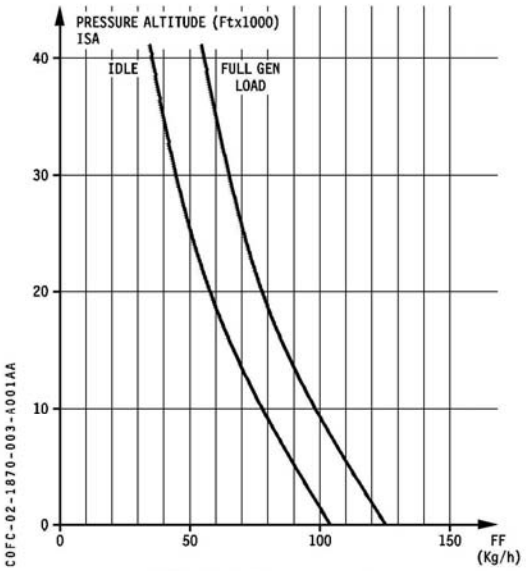

APU Fuel Consumption

Based on experience, it is Airbus Industrie recommendation to consider the following non mandatory fuel provisions :

- effect of a demonstrated performance factor, for all standard and ETOPS fuel requirement computations,
- carriage of contingency fuel from the departure to the CP, when computing the ETOPS critical fuel planning.

The complete ETOPS critical fuel planning for the ETOPS critical fuel scenario (i.e. from the departure to the CP and then from the CP to the diversion airport) shall be compared to the standard fuel planning (i.e. from the departure to the destination and alternate) computed in accordance with the company fuel policy and applicable operational requirements. The highest of both fuel requirements shall be considered as the minimum required block fuel for the subject flight.

F. Dispatch fuel requirement from Critical Point to landing

ETOPS diversion fuel requirements for dispach are provided at the end of this section. Data for the engine failure case alone are not provided as this scenario is never critrical.

G. Cockpit preparation

Additional system checks are required prior to each ETOPS flight. These checks are listed in the Standard Operating Procedures.

H. Dispatch weather minima

Weather forecasts for en route alternate must meet the operator's applicable weather minimum requirements. If the applicable requirement is AC 120-42A or AMJ 120-42, the following applies : R R R R

An airplane can be dispatched for an ETOPS flight provided the meteorological forecasts, at each enroute alternate airports, for a period starting one hour before the earliest expected time of landing and ending one hour after the latest expected time of landing, meet the following regulatory dispatch weather minima requirements.

Note 1 : Minima lower than following ones can be established taking into consideration the peculiarities of a specific route provided these minima have been agreed by the national operational authorities and reported in the route specification.

Note 2 : Once the aircraft is airborne, dispatch weather minima do not apply anymore. Normal or company minima apply to each enroute alternate.

1. AC 120-42A dispatch weather minima (FAA) : R

	Ceiling (ft)	Visibility (m)
• **Precision approach :**		
– 1 ILS/MLS	DH + 400	Greater of (3200 or PM + 1600)
– 2 ILS/MLS (separate runways)	DH + 200	Greater of (1600 or PM + 800)
• **Non precision approach**	Greater of (800 or MDH + 400)	Greater of (3200 or PM + 1600)

Notes : • PM = published minima
• DH = decision height
• MDH = minimum descent height
• Separate runways = runways which do not intersect each other

Note : Should a circling approach be anticipated at a given enroute alternate, the corresponding published circling minima must be considerd and increased by adding 400 ft to the published ceiling minima and 1600 m to the published visibility minima.

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R **2. AMJ 120-42/IL 20 dispatch weather minima (JAA)**

R The operator must use either table 1 or table 2, but not a combination of both.

R Table 1

Approach Facility Configuration	Alternate Airfield Ceiling	Weather Minima Visibility
For aerodromes with at least one operational navigation facility, providing a precision or non-precision runway approach procedure or a circling manoeuvre from an instrument approach procedure	A ceiling derived by adding 400 feet to the authorised DH, MDH (DA/MDA) or circling minima	A visibility derived by adding 1500 meters to the authorised landing minima
The weather minima below apply at airports which are equipped with precision or non-precision approaches on at least two separate runways (two separate landing surfaces)		
For airports with at least two operational navigation facilities providing a precision or non-precision runway approach procedure to separate suitable runways	A ceiling derived by adding 200 feet to the higher of the two authorised DH/MDH (DA/MDA) for the approaches	A visibility derived by adding 800 meters to the higher of the two authorised landing minima

R Table 2

Type of Approach	Planning Minima (RVR visibility required and ceiling if applicable)			
	Aerodrome with			
	at least 2 separate approach procedures based on 2 separate aids serving 2 separate runways	at least 2 separate approach procedures based on 2 separate aids serving 1 runway	or	at least 1 approach procedure based on 1 aid serving 1 runway
Precision Approach Cat II, III (ILS, MLS)	Precision Approach Cat I Minima	Non-Precision Approach Minima		
Precision Approach Cat I (ILS, MLS)	Non-Precision Approach Minima	Circling minima or, if not available non-precision approach minima plus 200 ft/1000 m		
Non-Precision Approach	The lower of non-precision approach minima plus 200 ft/1000 m or circling minima	The higher of circling minima or non-precision approach minima plus 200 ft/1000 m		
Circling Approach	Circling minima			

4. DIVERSION DURING EXTENDED RANGE OPERATIONS

A. Diversion decision making

The technical criteria governing a re-routing or diversion decision can be classified into four categories, as follows :

- loss of MNPS capability, before entering the MNPS area (as applicable)
- weather minima at diversion airport(s) going below the company/crew en-route minima, before reaching the ETOPS Entry Point, or diversion airport(s) becoming unsuitable for any reason,
- failure cases (refer to Note) requiring a diversion to the nearest airport (cases leading to a LAND ASAP message on the ECAM and/or in the QRH).

  Note : Failure cases requiring LAND ASAP
  - *IN FLT ENG FIRE*
  - *APU FIRE*
  - *SINGLE ENG OPERATION (Engine Shutdown or Continued Engine Operation at Idle Thrust)*
  - *LOSS OF BOTH ENG. GENERATORS*
  - *SMOKE/MIN EQPT BAY SMOKE/AVNCS SMOKE*
  - *BAT SMOKE (if applicable)*
  - *CARGO COMPT SMOKE (included only in the US AFM)*
  - *DUAL HYD. SYS LO PR.*
- failure cases resulting in increased fuel consumption, exceeding the available fuel reserves.

Comments and recommendations

- Electrical Generation

	AVAILABLE GENERATORS AT DISPATCH	AFTER 1st GEN FAILURE	AFTER 2nd GEN FAILURE or APU not available	AFTER 3rd GEN FAILURE
NORMAL DISPATCH	2 ENG. GEN 1 APU GEN 1 STBY GEN (b)	START APU (a) NO DIVERSION	NO DIVERSION REQUIRED (c)	DIVERSION REQUIRED
MEL OR * NORMAL	2 ENG GEN 1 APU GEN	NO DIVERSION REQUIRED (c)	DIVERSION REQUIRED	NOT APPLICABLE
* MEL DISPATCH	2 ENG GEN 1 STBY GEN (b)			
* MEL DISPATCH	1 ENG GEN 1 APU GEN 1 STBY GEN (b)			

(*) For operations with a diversion time greater than 120 minutes, all 4 electrical generators are required to be operative at dispatch.

R (a) For start limitation refer to Operating Limitations
R chapter.

(b) STBY GEN channel must be tested during cockpit preparation if a test of the STBY GEN channel is required for ETOPS operations.

(c) Crew may choose to divert after assessment of the overall situation.
Aircraft status in the present failure case, and if a subsequent generator failure occurs, must be considered taking into account actual meteorological conditions, suitable airport characteristics and approach facilities or any pertinent operational condition.

- Fire Protection

  In case of CARGO SMOKE warning, even if the Flight Manual does not require LAND ASAP, a diversion must be initiated, the nearest suitable airport should be selected irrespective of the fire suppression system protection time. Refer also to FCOM 2.04.10 page 1 on this subject.

- Fuel System

  Some failure cases may lead to fuel gravity feeding which implies unusable fuel quantity and flight at lower altitude. Due consideration of fuel remaining available and fuel consumption may necessitate diversion.

- Hydraulic system

  In case of green system failure STBY GEN is lost. After first electrical ENG GEN subsequent failure : Start APU. Diversion decision is identical to the dispatch without STBY GEN.

B. Diversion performance data

The FCOM section 2.16 provides descent and cruise procedures, and associated performance data for the following diversion strategies :

- Standard strategy.
- Obstacle strategy.
- Fixed speed strategy.

For ETOPS operations, any one of the above diversions strategies can be used provided that the selected strategy and speed schedule is used in :
- establishing the Area of Operation (maximum diversion distance),
- calculating the diversion fuel requirements for the single-engine ETOPS fuel scenario,
- demonstrating the applicable obstacle clearance requirements (net flight path and net ceiling).

During the diversion, the flight crew is expected to use the planned speed schedule. However, based on the evaluation of the actual situation, the pilot in command has the authority to deviate from this planned one-engine-inoperative speed.

C. Guidelines for diversion procedure

The following guidelines should be followed in case of diversion :

- Complete the related failure procedure,
- Inform ATC,
- Initiate the descent,
- Determine the nearest suitable alternate,
- Divert to the selected enroute alternate,
- Apply the pre-planned diversion strategy and speed schedules or adjust the speed as dictated by the assessment of the present situation.

D. Determination of 60 minutes maximum diversion distance (JAR-OPS 1.245).

Use the distance given below to decide if a route is an ETOPS one according to JAR-OPS 1.245

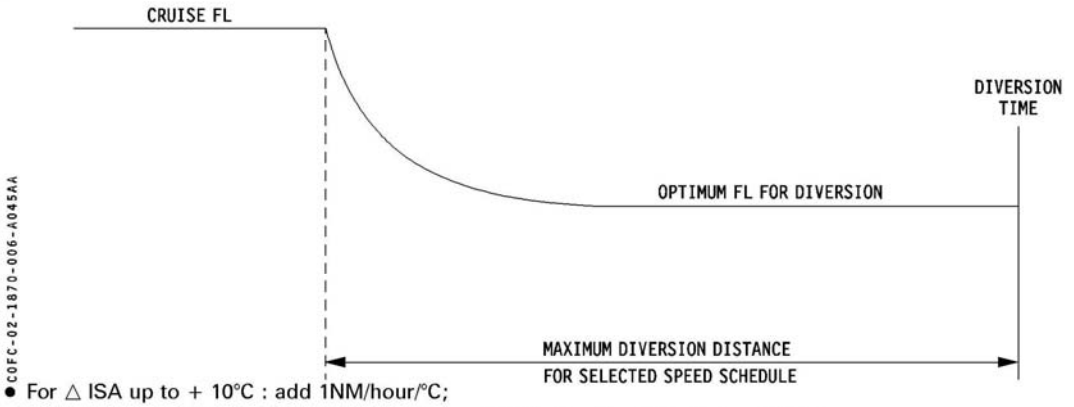
MTOW (kg)	Maximum Diversion Distance (NM)
167800	429
170500 to 171700	427

The following computation conditions have been used in accordance with the interpretation of the JAR-OPS 1.245.
- Reference weight : the aircraft gross weight after one hour of flight having taken off at sea level at the maximum structural takeoff weight given by the flight manual.
- ISA conditions
- No wind
- Diversion level after engine failure : FL 170
- Single engine diversion speed schedule : VMO/MMO

Note : Using the JAR-OPS 1.245 method, obstacles have not to be considered to determine if a route is or is not an ETOPS route.

R **E. Maximum distance (still air and ISA) to diversion airport, in nautical miles**

SPEED SCHEDULE	REFERENCE GROSS WEIGHT (KG)	OPTIMUM FL FOR DIVERSION	DISTANCE (NM) Diversion time (min) 60	90	120	150	180
M.78 / 300 kt	95 000	250	435	645	860		
	110 000	230	425	635	845	1055	1265
	125 000	220	420	625	835	1040	1245
	140 000	210	415	620	820	1025	1230
	155 000	200	410	610	810	1010	1210
	170 000	180	400	595	790	985	1180
M.78 / 320 kt	95 000	220	440	660	875		
	110 000	210	435	655	870	1085	1300
	125 000	200	435	645	860	1070	1285
	140 000	190	430	640	850	1060	1270
	155 000	180	425	630	835	1045	1250
	170 000	170	415	615	815	1020	1220
M.78 / 335 kt	95 000	190	445	665			
	110 000	190	445	660	880	1100	1315
	125 000	180	440	655	870	1090	1305
	140 000	170	435	650	860	1075	1285
	155 000	170	430	645	855	1065	1280
	170 000	160	430	635	845	1055	1265



R • For △ ISA up to + 10°C : add 1NM/hour/°C;

R • For △ ISA > + 10°C : Check effect of △ ISA on TAS in Section 2.16.30 thru 2.16.50.

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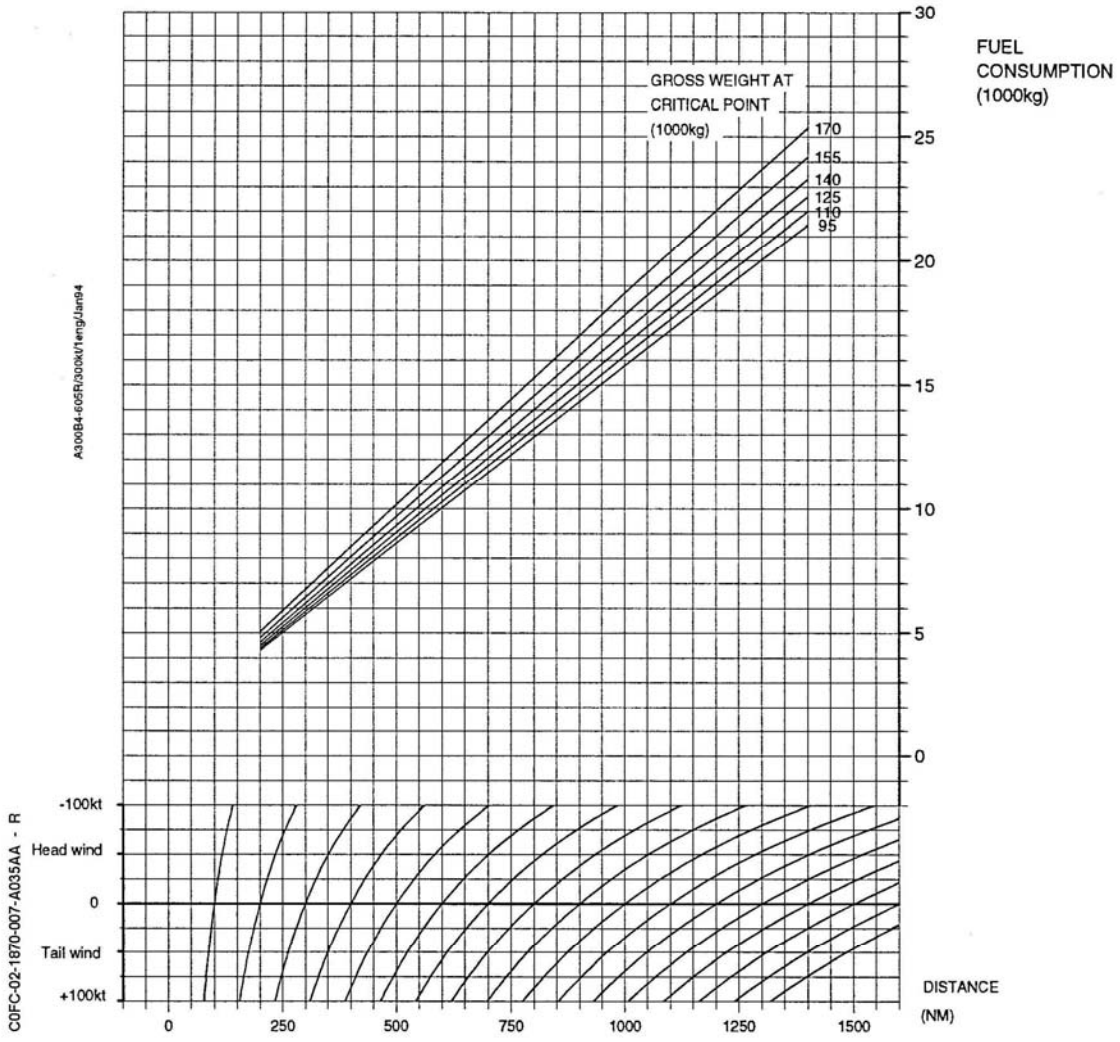
ETOPS FUEL REQUIREMENT FROM CRITICAL POINT TO LANDING
ONE ENGINE OUT – CRUISE AT 300 KT
Including : emergency descent – cruise 300kt at FL 100
final descent 250kt – holding 15 min at FL 15
IMC procedure – Go Around – 2nd IMC procedure
5% allowance for wind errors – APU fuel burn



GE Eng. : 80C2A5

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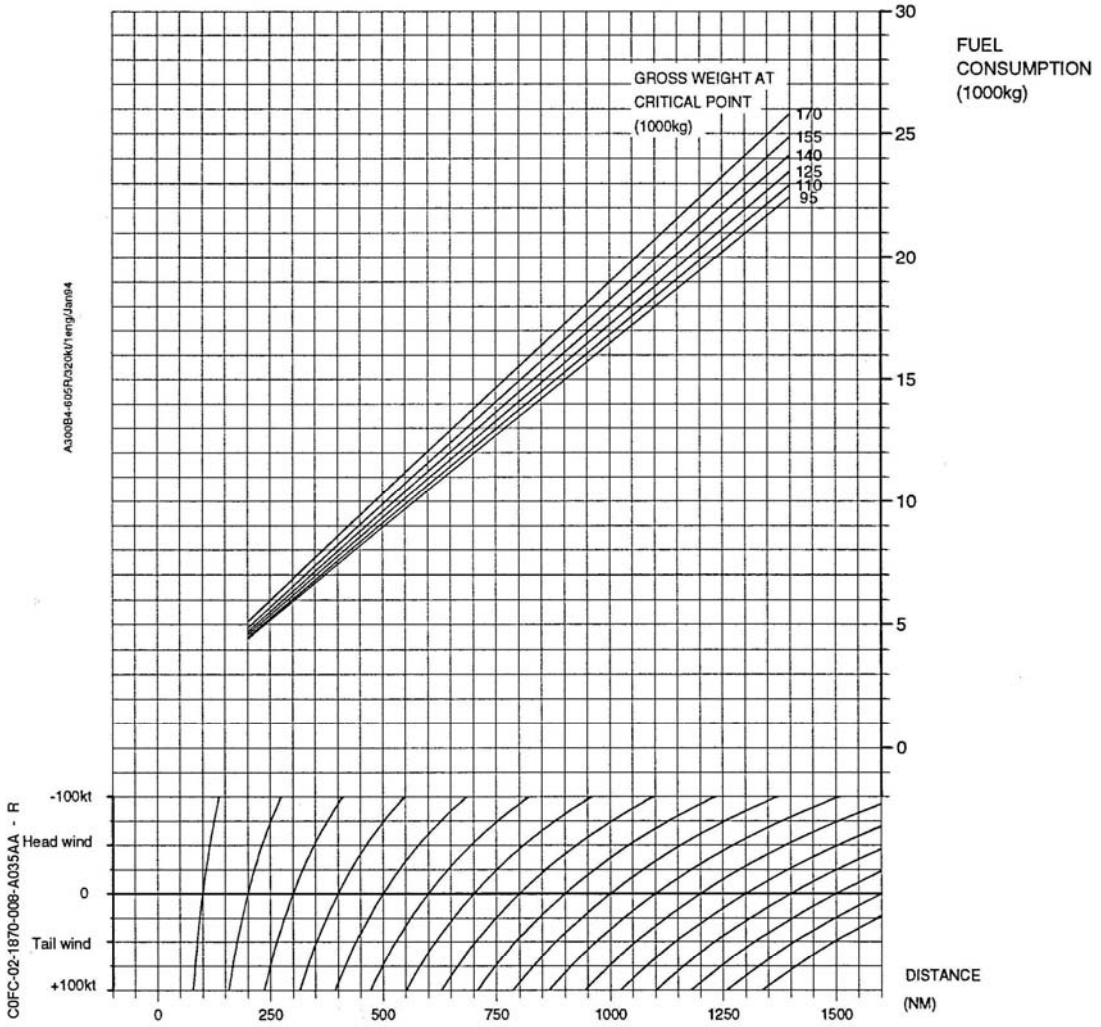
ETOPS FUEL REQUIREMENT FROM CRITICAL POINT TO LANDING
ONE ENGINE OUT – CRUISE AT 320 KT
Including : emergency descent – cruise 320kt at FL 100
final descent 250kt – holding 15 min at FL 15
IMC procedure – Go Around – 2nd IMC procedure
5% allowance for wind errors – APU fuel burn



GE Eng. : 80C2A5

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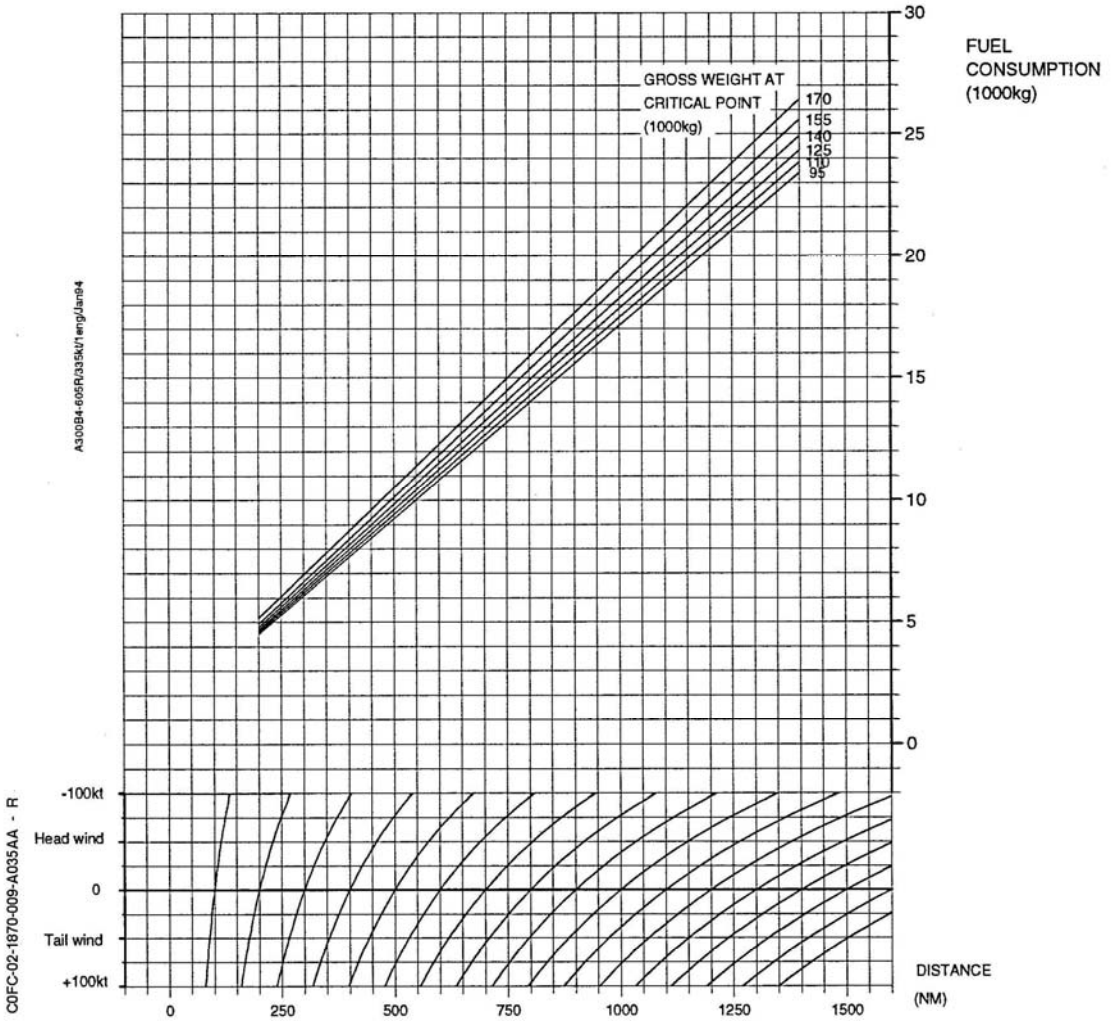
ETOPS FUEL REQUIREMENT FROM CRITICAL POINT TO LANDING
ONE ENGINE OUT – CRUISE AT 335 KT
Including : emergency descent – cruise 335 kt at FL 100
final descent 250kt – holding 15 min at FL 15
IMC procedure – Go Around – 2nd IMC procedure
5% allowance for wind errors – APU fuel burn



GE Eng. : 80C2A5

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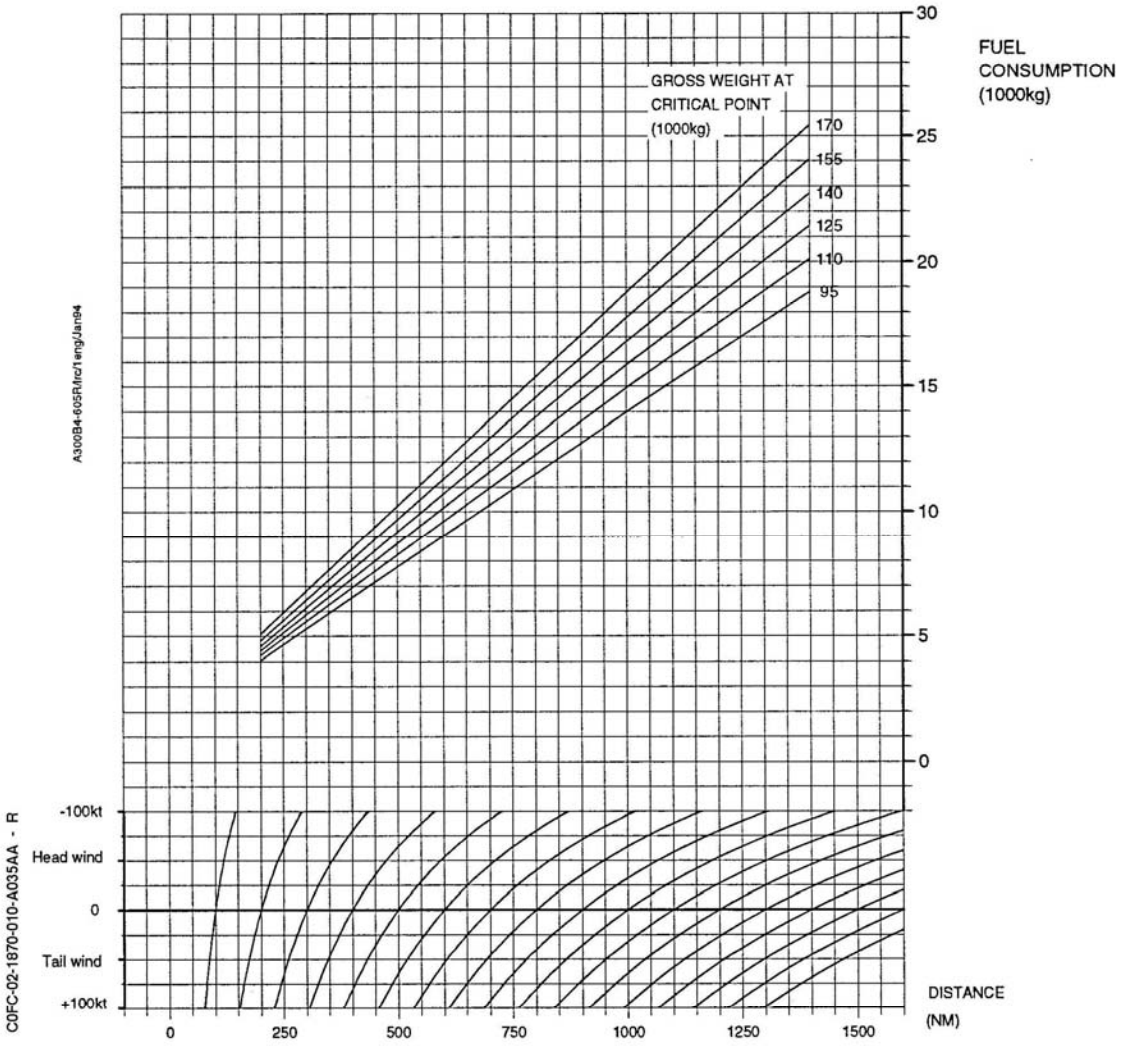
ETOPS FUEL REQUIREMENT FROM CRITICAL POINT TO LANDING
ONE ENGINE OUT – LONG RANGE CRUISE
Including : emergency descent – long range cruise at FL 100
final descent 250kt – holding 15 min at FL 15
IMC procedure – Go Around – 2nd IMC procedure
5% allowance for wind errors – APU fuel burn



GE Eng. : 80C2A5

AIRBUS TRAINING A300-600 SIMULATOR FLIGHT CREW OPERATING MANUAL	SPECIAL OPERATIONS	2.18.70
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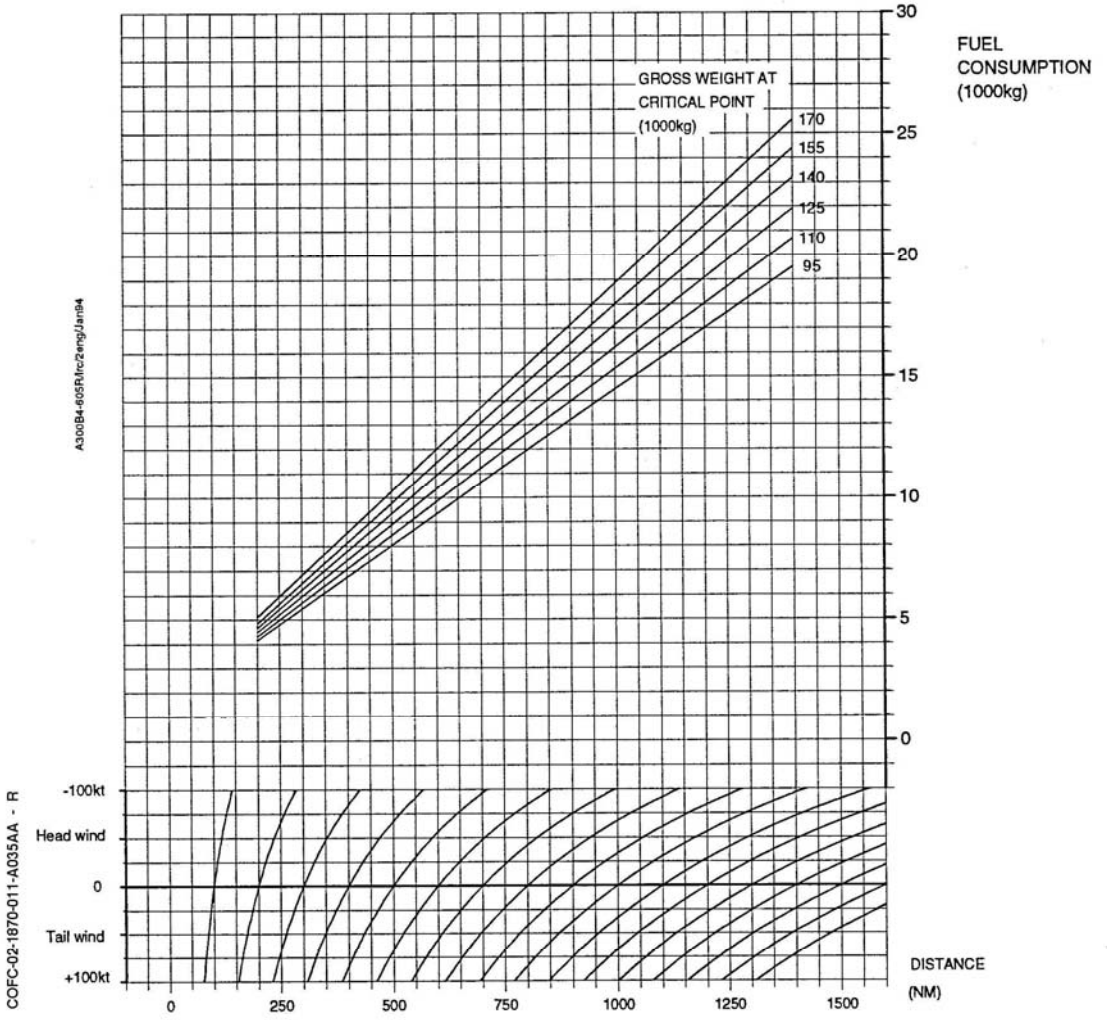
	EXTENDED RANGE OPERATIONS	REV 18 SEQ 035

ETOPS FUEL REQUIREMENT FROM CRITICAL POINT TO LANDING
ALL ENGINES – LONG RANGE CRUISE
Including : emergency descent – long range cruise at FL 100
final descent 250kt – holding 15 min at FL 15
IMC procedure – Go Around – 2nd IMC procedure
5% allowance for wind errors



GE Eng. : 80C2A5

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