070 Operational Procedures

070-01 General Requirements

070-01-01 ICAO Annex 6

destination & alternate landing distance factors: turbojet: 0.6, turboprop: 0.7

take-off alternate should be within 1 hr with one engine

annex 6 part 1 is applicable to commercial air transport aeroplanes

070-01-02 Operational Requirements

Cat	MOPSC	MCTOW	diversion time without ETOPS
A	≤ 19	< 45360	120 min (180 min with approval for turbo-jet)
A	≥ 20	≥ 45360	60 min at OEI cruise
B, C			120 min or 300 nm

MOPSC	extinguishers
7-30	1
≤ 60	2
≤ 200	3
≤ 300	4
≤ 400	5
≤ 500	6
≤ 600	7
> 600	8

black	CO_2
blue	dry powder
cream	foam
green	vapourising liquids
red	water
yellow	wet chemical

MDH is referenced to TH elev if TH elev is 2 m below the aerodrome elev

MOPSC	megaphones
61-99	1
> 99	2

cat	V_{AT}
A	< 91
B	120
C	140
D	165
E	210

senior cabin crew: 1 year experience, training course, skill test

anex	part	name
I	FCL	Flight Crew Licenses
II	ARO	Authority Requirements for Air Operations
III	ORO	Organisation Requirements
IV	CAT	Commercial Air Transport Operations
V	SPA	Specific Approvals (dangerous goods, etc.)
VI	NCC	Non-Commercial with complex AC
VII	NCO	Non-Commercial with other-than-complex AC
VIII	SPO	Specialised Operations

FDR	25 hrs
CVR (accident: 60 days)	2 hrs
without life-rafts	90min/300nm
aircraft technical log	3 years
commander course	10 sectors
rest period before flight	10 hours

familiarization: additional knowledge	*differences*: additional knowledge & training on device or aircraft

oxygen	non-pressurized	pressurized / supply	
cockpit	> 10000’	> 13000’	entire time
		after 30 min > 10000’	30 min for below-FL250-AC 2h for above-FL250-AC
cabin crew	> 13000’	>13000’	30 min
	after 30 min > 10000’	after 30 min > 10000’	entire time
other crew / 100 % PAX	> 13000’	> 15000’	10 min
30 % of PAX	-	> 14000’	
10 % of PAX	-	after 30 min > 10000’	

undiluted oxygen for 2% of passengers, at least for one for the time above 8000ft

circle	vis(m)	mdh(ft)
A	1500	400
B	1600	500
C	2400	600
D	3600	700

visual approach RVR: 800m

DH/MDH	facility
350	NDB, VDF, SRA (2nm)
300	NDB/DME, VOR, SRA(1nm)
250	VOR/DME, LOC, LNAV, SRA(0.5nm)
200	ILS, MLS, GLS, LPV

CAT	DH(ft)	RVR(m)	remarks
I	200	550	
II	100	300	radio alt, 2 pilots
IIIA	100	200	
IIIB	-	150 125 75	fail passive fail passive fail-operational
IIIC	-	-	

LVTO: RVR < 400 m, LVP: 800m or less

planning minima for etops enroute alternate:

PA	DA/H +200ft RVR/VIS +800m
NPA/Circle	MDA/H +400ft RVR/VIS +1500m

life jacket: 50nm from shore or landing/approach over water

liferaft:

- 120 min (cruise) or 400 nm when OEI able
- 30 min (cruise) or 100 nm otherwise

survival equipment not required when X min from not-difficult-sar area

- X = 120 when AC can continue there with OEI
- X = 30 otherwise
- X = 90 with EASA CS-25

consecutive	duty period	operating
7 days	60	
14 days	110	
28 days	190	100
calendar year		900
12 months		1000

max flight duty extension: 3 hours

documents	keep
dangerous goods documentation	3 months
mass & balance	3 months
personell records (crew recency)	15 months

fuel	desc
trip	takeoff, climb, descent, approach, landing
contingency	5% of trip fuel or 3% of trip fuel with enroute alternate or 20 min, or statistical methods, or 5 min holding at 1500ft
alternate	missed approach, climb, descent, approach
final reserve	45min for reciprocating engines 30 min holding at 1500ft for turbines, except isolated aerodrome: 2 hours cruise
min additional	engine failure + 15 min hold
extra	discretion of the commander

10% of fuses for each rating, minimum 3

power supply for standby AI: 30 min, emergency lighting system: 10 min

takeoff alternate

- two engines: 60 min away (OEI) or the approved ETOPS diversion time, max 120 min
- 3 or 4 engines: 120 min (OEI)

after a ZFTT type rating, start line flying under supervision not later than 21 days after

weather radar: pressurized or MCTOM>5700 or MOPSC>9

single-pilot IFR

- recency: 5 IFR flights, 3 instrument approaches in preceding 90 days
- autopilot required

slides when higher than 1.83m

interphone for MCTOM>15000 or MOPSC>19

cabin crew required for MOPSC>19 and at least 1PAX, 1 cabin crew member per 50 seats

windshield wipers MCTOM>5700

public address MOPSC>19

one pilot has to wear oxygen mask at all times when >=FL410

when a pilot flies helicopters & airplanes, she is limited to one type of each

report dangerous goods accident 72hours later

ACAS for MCTOM>5700 or MOPSC>19

line check validity: 12 months

flight data monitoring programme for MCTOM>27000

070-01-03 Long-range flights

NAT: report every 20° north of 70N, every 10° south of 70N, when estimates change by 3 min (boundary)

bad weather: climb when deviating south, descend when deviating north

other difficulties: turn 45°, parallel track 15nm and climb/descend, 1000‘ above FL410, 500‘ below FL410

ICAO Document 7030 (additional regional procedures)

OTS, at 30°: Daytime 1130Z-1900Z: Nighttime 0100Z-0800Z

astronomic precession = 15 * hrs * sin(lat) ……. positive (wander to the right) in NH

transport precession = chlong * sin(lat) ……. positive in NH and eastbound

MNPS is between FL285 and FL420, from 27°N to 90°N

separation in MNPS is 15 min, or min 5 min if preceding is faster

compass shift = magnetic heading – gyro heading

070-02 Special Operational Procedures and Hazards (General Aspects)

070-02-01 Operations Manual

A	General/Basic	fuel, incident reports, wab, dangerous goods, de-icing, TCAS
B	Aircraft Operating Matters (Type Related)	flight planning, known-icing, contaminated runways, mass & balance, abnormal/emergencies, MEL/CDL, emergency evacuation
C	Route/Role/Area and Aerodrome/Operating Site Instructions and Information	
D	Training	

070-02-02 Icing Conditions

deicing with type I, anti-icing with type II, III & IV

070-02-03 Bird Strike Risk and Avoidance

60% below 500ft, 90% below 1500 ft, almost 100% below 3500ft

IBIS – ICAO Bird Strike Information System

070-02-04 Noise Abatement

ICAO Doc 8168, no more noise abatement when: tailwind 5kt or crosswind 15kt or 500ft ceiling, AIP/AD2

070-02-05 Fire and Smoke

A	solids
B	liquids
C	gases
D	metals
E	electrical
F	oil & fat

water	A, not ok for B
foam	A, B, not ok for E (but safter than water)
dry powder	A, B, C, D (best for B)
CO_2/halon	ok for A (limited), B, ideal for E, not for D
wet chemical	F

wheel fire – dry-powder

070-02-06 Decompression of Pressurised Cabin

warning at 10000ft, oxygen masks at 15000ft, pure oxygen at FL320

070-02-08 Wake Turbulence

preceding	succeeding	separation	non-radar
HEAVY	HEAVY	4 nm	2 min
	MEDIUM	5 nm	2 min
	LIGHT	6 nm	3 min
MEDIUM	LIGHT	5 nm	3 min

070-02-11 Fuel Jettisoning

15 min

070-02-12 Transport of Dangerous Goods

CAO Annex 18, Doc 9284 („Technical Instructions“)

class	description
1	Explosives
2	Gases
3	flammable liquids
4	flammable solids
5	oxidizing substances and organic peroxide
6	toxic and infectious substances
7	radioactive material
8	corrosives
9	miscellaneous dangerous goods

UN-Number .. 4 digit number

070-02-13 Contaminated Runways

H)	braking action	coeff
5	good	≥ 0.40
4	medium/good	≥ 0.36
3	medium	≥ 0.30
2	medium/poor	≥ 0.26
1	poor	≥ 0.25
9	unreliable	9

D) cleared length of runway in meters (4 digits)

T) uncleared part of runway (plain language)

F)	contamination
1	damp
2	wet
3	rime or frost (less than 1 mm)
4	dry snow
5	wet snow
6	slush
7	ice
8	compacted or rolled snow
9	frozen ruts or ridges

contaminated	> 25% of runway, > 3mm water/slush/snow, compacted snow, ice, wet ice
wet	< 3mm water, reflective, no standing water
damp	not dry, but not shiny
dry	neither wet nor contaminated

dynamic hydroplanning (takeoff): $V = 34 \times \sqrt{P(\text{bar})}$ $V = 9 \times \sqrt{P(\text{psi})}$

viscous hydroplanning (landing): $V = 7.7 \times \sqrt{P(\text{ psi})}$