রেজিস্টার্ড নং ডি এ-১

বাংলাদেশ গেজেট

অতিরিক্ত সংখ্যা
কর্তৃপক্ষ কর্তৃক প্রকাশিত

মঙ্গলবার, এপ্রিল ৩০, ২০২৪

[বেসরকারি ব্যক্তি এবং কর্পোরেশন কর্তৃক অর্থের বিনিময়ে জারীকৃত প্রজ্ঞাপন]

Civil Aviation Authority of Bangladesh

Gazette

Dhaka, ১৭ ফাল্গুন, ১৪৩০/ 01 March, 2024

1. No, CAAB 30.31.0000.111.37.006-3 –In exercise of the power conferred by Section 47, read with Section 14 of the Civil Aviation Act, 2017 (Act No. 18 of 2017), hereinafter referred as the "Act", the Chairman of the Civil Aviation Authority of Bangladesh is pleased to issue the following Air Navigation Order (ANO).

2. It shall come into force from the date of gazette publication. For the purpose of implementation of this ANO, a transition period of twelve months shall be accepted for the holders of licence, certificate, permit and authorization. During this transition period ANO (OPS) A-8, ANO (OPS) A-9, ANO (OPS) B3, ANO (OPS) B7, ANO (OPS) B8, ANO (OPS) C1, ANO (OPS) A10, ANO(OPS) E6,ANO (OPS)E7, ANO (OPS) H-1, (CAD-PEL-OPS)13/2020, (CAD-OPS) 17/2021 and (CAC-OPS) 03/2020 shall sustain. Provided that new applicant(s) shall be obliged to comply with the terms and conditions of this ANO from the date of gazette publication.

Air Vice Marshal M Mafidur Rahman
BBP, BSP, BUP, ndu, afwc, psc
Chairman
Civil Aviation Authority of Bangladesh.

মূল্য : টাকা ২৪০.০০

ABBREVIATIONS AND SYMBOLS

(Used in this ANO)

Abbreviations:

AC	-	Alternating current
ACAS	-	Airborne collision avoidance system
ADRS	-	Aircraft data recording system
ADS	-	Automatic dependent surveillance
ADS-C	-	Automatic dependent surveillance — contract
AEO	-	All engines operative
AFCS	-	Automatic flight control system
AGA	-	Aerodromes, air routes and ground aids
AIG	-	Accident investigation and prevention
AIR	-	Airborne image recorder
AIRS	-	Airborne image recording system
AOC	-	Air operator certificate
APCH	-	Approach
APU	-	Auxiliary power unit
AR	-	Authorization required
ARINC	-	Aeronautical Radio, Incorporated
ASDA	-	Accelerate stop distance available
ASE	-	Altimetry system error
ASIA/PAC	-	Asia/Pacific
ATC	-	Air traffic control
ATM	-	Air traffic management
ATN	-	Aeronautical telecommunication network
ATS	-	Air traffic services
CARS	-	Cockpit audio recording system
CAS	-	Calibrated airspeed
CAT I	-	Category I
CAT II	-	Category II

CAT III	-	Category III
CDL	-	Configuration deviation list
CFIT	-	Controlled flight into terrain
cm	-	Centimeter
COMAT	-	Operator material
CPDLC	-	Controller-pilot data link communications
CVR	-	Cockpit voice recorder
CVS	-	Combined vision system
DA	-	Decision altitude
DA/H	-	Decision altitude/height
DC	-	Direct current
D-FIS	-	Data link-flight information services
DH	-	Decision height
DLR	-	Data link recorder
DLRS	-	Data link recording system
DME	-	Distance measuring equipment
DSTRK	-	Desired track
EDTO	-	Extended diversion time operations
EFB	-	Electronic flight bag
EFIS	-	Electronic flight instrument system
EGT	-	Exhaust gas temperature
ELT	-	Emergency locator transmitter
ELT(AD)	-	Automatic deployable ELT
ELT(AF)	-	Automatic fixed ELT
ELT(AP)	-	Automatic portable ELT
ELT(S)	-	Survival ELT
EPR	-	Engine pressure ratio
EUROCAE	-	European Organisation for Civil Aviation Equipment
EVS	-	Enhanced vision system
FANS	-	Future air navigation system

FDAP	-	Flight data analysis programmes
FDR	-	Flight data recorder
FL	-	Flight level
FM	-	Frequency modulation
ft	-	Foot
ft/min	-	Feet per minute
g	-	Normal acceleration
GCAS	-	Ground collision avoidance system
GNSS	-	Global navigation satellite system
GPWS	-	Ground proximity warning system
hPa	-	Hectopascal
HUD	-	Head-up display
IFR	-	Instrument flight rules
ILS	-	Instrument landing system
IMC	-	Instrument meteorological conditions
inHg	-	Inch of mercury
INS	-	Inertial navigation system
ISA	-	International standard atmosphere
kg	-	Kilogram
kg/m2	-	Kilogram per metre squared
km	-	Kilometre
km/h	-	Kilometre per hour
kt	-	Knot
kt/s	-	Knots per second
lb	-	Pound
lbf	-	Pound-force
LDA	-	Landing distance available
LED	-	Light emitting diode
m	-	Metre
mb	-	Millibar

MDA	-	Minimum descent altitude
MDA/H	-	Minimum descent altitude/height
MDH	-	Minimum descent height
MEL	-	Minimum equipment list
MHz	-	Megahertz
MLS	-	Microwave landing system
MMEL	-	Master minimum equipment list
MNPS	-	Minimum navigation performance specification
MOPS	-	Minimum operational performance specification
m/s	-	Metres per second
m/s2	-	Metres per second squared
N	-	Newton
N1	-	Low pressure compressor speed (two-stage compressor); fan speed (three-stage compressor)
N2	-	High pressure compressor speed (two-stage compressor); intermediate pressure compressor speed (three-stage compressor)
N3	-	High pressure compressor speed (three stage compressor)
NAV	-	Navigation
NM	-	Nautical mile
NVIS	-	Night vision imaging systems
OCA	-	Obstacle clearance altitude
OCA/H	-	Obstacle clearance altitude/height
OCH	-	Obstacle clearance height
OEI	-	One-engine-inoperative
PANS	-	Procedures for Air Navigation Services
PBC	-	Performance-based communication
PBN	-	Performance-based navigation
PBS	-	Performance-based surveillance
RCP	-	Required communication performance
RNAV	-	Area navigation
RNP	-	Required navigation performance
RSP	-	Required surveillance performance

RTCA	-	Radio Technical Commission for Aeronautics
RVR	-	Runway visual range
RVSM	-	Reduced vertical separation minima
SOP	-	Standard operating procedure
SST	-	Supersonic transport
STOL	-	Short take-off and landing
SVS	-	Synthetic vision system
TAS	-	True airspeed
TAWS	-	Terrain awareness warning system
TCAS	-	Traffic alert and collision avoidance system
TLA	-	Thrust lever angle
TLS	-	Target level of safety
TVE	-	Total vertical error
UTC	-	Coordinated universal time
V_D	-	Design diving speed
VFR	-	Visual flight rules
VMC	-	Visual meteorological conditions
V_{MC}	-	Minimum control speed with the critical engine inoperative
VOR	-	VHF omnidirectional radio range
Vs_0	-	Stalling speed or the minimum steady flight speed in the landing configuration
Vs_1	-	Stalling speed or the minimum steady flight speed in a specified configuration
VTOL	-	Vertical take-off and landing
WXR	-	Weather
Symbols		
°C	-	Degrees Celsius
%	-	Percent

CHAPTER-1. DEFINITIONS

When the following terms are used in the provisions for operation of aircraft in international commercial air transport, they have the following meanings:

Accelerate-stop distance available (ASDA)- means the length of the take-off run available plus the length of stop way, if provided.

Advanced aircraft means an aircraft with equipment in addition to that required for a basic aircraft for a given take-off, approach or landing operations.

Aerial work- means an aircraft operation in which an aircraft is used for specialized services such as agriculture, construction, photography, surveying, observation and patrol, search and rescue, aerial advertisement, etc.

Aerodrome- means a defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

Aerodrome operating minima- means the limits of usability of an aerodrome for:

a) take-off, expressed in terms of runway visual range and/or visibility and, if necessary, cloud conditions.

b) landing in 2D instrument approach operations, expressed in terms of visibility and/or runway visual range, minimum descent altitude/ height (MDA/H) and, if necessary, cloud conditions; and

c) landing in 3D instrument approach operations, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H) as appropriate to the type and/or category of the operation.

Aeroplane means a power-driven heavier-than-air aircraft, deriving its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight.

Agreement summary means When an aircraft is operating under an Article 83 bis agreement between the State of Registry and another State, the agreement summary is a document transmitted with the Article 83 bis Agreement registered with the ICAO Council that identifies succinctly and clearly which functions and duties are transferred by the State of Registry to that other State.

Aircraft means any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

Aircraft operating manual means a manual, acceptable to CAAB, containing normal, abnormal and emergency procedures, checklists, limitations, performance information, details of the aircraft systems and other material relevant to the operation of the aircraft.

Note. — The *aircraft operating manual is part of the operations manual.*

Aircraft tracking means a process, established by the operator, that maintains and updates, at standardized intervals, a ground- based record of the four dimensional position of individual aircraft in flight.

Air operator certificate (AOC) means a certificate authorizing an operator to carry out specified commercial air transport operations.

Air traffic service (ATS) means a generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service).

Airworthy means the status of an aircraft, engine, propeller or part when it conforms to its approved design and is in a condition for safe operation.

Alternate aerodrome means an aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to or to land at the aerodrome of intended landing where the necessary services and facilities are available, where aircraft performance requirements can be met and which is operational at the expected time of use. Alternate aerodromes include the following:

Take-off alternate means an alternate aerodrome at which an aircraft would be able to land shall this become necessary shortly after take-off and it is not possible to use the aerodrome of departure.

En-route alternate means an alternate aerodrome at which an aircraft would be able to land in the event that a diversion becomes necessary while en route.

Destination alternate means an alternate aerodrome at which an aircraft would be able to land shall it become either impossible or inadvisable to land at the aerodrome of intended landing.

Note. — *The aerodrome from which a flight departs may also be an en-route or a destination alternate aerodrome for that flight.*

Altimetry system error (ASE) means the difference between the altitude indicated by the altimeter display, assuming a correct altimeter barometric setting, and the pressure altitude corresponding to the undisturbed ambient pressure.

Appropriate airworthiness requirements means the comprehensive and detailed airworthiness codes established, adopted or accepted by a Contracting State for the class of aircraft, engine or propeller under consideration.

Area navigation (RNAV) means a method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these.

***Note**. — Area navigation includes performance-based navigation as well as other operations that do not meet the definition of performance-based navigation.*

Basic aircraft means an aircraft which has the minimum equipment required to perform the intended take-off, approach or landing operation.

Cabin crew member means a crew member who performs, in the interest of safety of passengers, duties assigned by the operator or the pilot-in-command of the aircraft, but who shall not act as a flight crew member.

COMAT means operator material carried on an operators aircraft for the operators own purposes.

Combined vision system (CVS) means a system to display images from a combination of an enhanced vision system (EVS) and a synthetic vision system (SVS).

Commercial air transport operation means an aircraft operation involving the transport of passengers, cargo or mail for remuneration or hire.

Configuration deviation list (CDL) means a list established by the organization responsible for the type design with the approval of the State of Design which identifies any external parts of an aircraft type which may be missing at the commencement of a flight, and which contains, where necessary, any information on associated operating limitations and performance correction.

Contaminated runway means a runway is contaminated when a significant portion of the runway surface area (whether in isolated areas or not) within the length and width being used is covered by one or more of the substances listed in the runway surface condition descriptors.

Continuing airworthiness means the set of processes by which an aircraft, engine, propeller or part complies with the applicable airworthiness requirements and remains in a condition for safe operation throughout its operating life.

Continuing airworthiness records means records which are related to the continuing airworthiness status of an aircraft, engine, propeller or associated part.

Continuous descent final approach (CDFA) means a technique, consistent with stabilized approach procedures, for flying the final approach segment (FAS) of an instrument non-precision approach (NPA) procedure as a continuous descent, without level-off, from an altitude/height at or above the final approach fix altitude/height to a point approximately 15 m (50 ft) above the landing runway threshold or the point where the flare maneuver begins for the type of aircraft flown; for the FAS of an NPA procedure followed by a circling approach, the CDFA technique applies until circling approach minima (circling OCA/H) or visual flight maneuver altitude/height are reached.

Crew member means a person assigned by an operator to duty on an aircraft during a flight duty period.

Cruise relief pilot means a flight crew member who is assigned to perform pilot tasks during cruise flight, to allow the pilot-in- command or a co-pilot to obtain planned rest.

Cruising level means a level maintained during a significant portion of a flight.

Dangerous goods means articles or substances which are capable of posing a risk to health, safety, property or the environment and which are shown in the list of dangerous goods in the Technical Instructions or which are classified according to those Instructions.

***Note**. — Dangerous goods are classified in ANO 18.*

Decision altitude (DA) or decision height (DH) means a specified altitude or height in a 3D instrument approach operation at which a missed approach must be initiated if the required visual reference to continue the approach has not been established.

***Note 1**. — Decision altitude (DA) is referenced to mean sea level and decision height (DH) is referenced to the threshold elevation.*

***Note 2**. — The required visual reference means that section of the visual aids or of the approach area which shall have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path. In Category III operations with a decision height the required visual reference is that specified for the particular procedure and operation.*

***Note 3**. — For convenience where both expressions are used they may be written in the form - decision altitude/height and breved─DA/H.*

Dry runway means a runway is considered dry if its surface is free of visible moisture and not contaminated within the area intended to be used.

Duty means any task that flight or cabin crew members are required by the operator to perform, including, for example, flight duty, administrative work, training, positioning and standby when it is likely to induce fatigue.

Duty period means a period which starts when a flight or cabin crew member is required by an operator to report for or to commence a duty and ends when that person is free from all duties.

EDTO critical fuel means the fuel quantity necessary to fly to an en-route alternate aerodrome considering, at the most critical point on the route, the most limiting system failure.

EDTO significant system means an aeroplane system whose failure or degradation could adversely affect the safety particular to an EDTO flight, or whose continued functioning is specifically important to the safe flight and landing of an aeroplane during an EDTO diversion.

Electronic flight bag (EFB) means an electronic information system, comprised of equipment and applications for flight crew, which allows for the storing, updating, displaying and processing of EFB functions to support flight operations or duties.

Emergency locator transmitter (ELT) a generic term describing equipment which broadcasts distinctive signals on designated frequencies and, depending on application, may be automatically activated by impact or be manually activated. An ELT may be any of the following:

Automatic fixed ELT (ELT AF) means an automatically activated ELT which is permanently attached to an aircraft.

Automatic portable ELT (ELT AP) means an automatically activated ELT which is rigidly attached to an aircraft but readily removable from the aircraft.

Automatic deployable ELT (ELT(AD) means an ELT which is rigidly attached to an aircraft, and which is automatically deployed and activated by impact, and, in some cases, also by hydrostatic sensors. Manual deployment is also provided.

Survival ELT (ELTS) means an ELT which is removable from an aircraft, stowed so as to facilitate its ready use in an emergency, and manually activated by survivors.

Engine means a unit used or intended to be used for aircraft propulsion. It consists of at least those components and equipment necessary for functioning and control, but excludes the propeller/rotors (if applicable).

Enhanced vision system (EVS) means a system to display electronic real-time images of the external scene achieved through the use of image sensors.

Note. *— EVS does not include night vision imaging systems (NVIS).*

Extended diversion time operations (EDTO) means any operation by an aeroplane with two or more turbine engines where the diversion time to an en-route alternate aerodrome is greater than the threshold time established by the CAAB.

Fatigue means a physiological state of reduced mental or physical performance capability resulting from sleep loss, extended wakefulness, circadian phase, and/or workload (mental and/or physical activity) that can impair a person's alertness and ability to perform safety related operational duties.

Fatigue Risk Management System (FRMS) means a data-driven means of continuously monitoring and managing fatigue-related safety risks, based upon scientific principles and knowledge as well as operational experience that aims to ensure relevant personnel are performing at adequate levels of alertness.

Final approach segment (FAS) means that segment of an instrument approach procedure in which alignment and descent for landing are accomplished.

Flight crew member means a licensed crew member charged with duties essential to the operation of an aircraft during a flight duty period.

Flight data analysis means a process of analyzing recorded flight data in order to improve the safety of flight operations.

Flight duty period means a period which commences when a flight or cabin crew member is required to report for duty that includes a flight or a series of flights and which finishes when the aircraft finally comes to rest and the engines are shut down at the end of the last flight on which he/she is a crew member.

Flight manual means a manual, associated with the certificate of airworthiness, containing limitations within which the aircraft is to be considered airworthy, and instructions and information necessary to the flight crew members for the safe operation of the aircraft.

Flight operations officer/flight dispatcher means a person designated by the operator to engage in the control and supervision of flight operations, whether licensed or not, suitably qualified in accordance with ANO 1, who supports, briefs and/or assists the pilot-in command in the safe conduct of the flight.

Flight plan means specified information provided to air traffic services units, relative to an intended flight or portion of a flight of an aircraft.

Flight recorder means any type of recorder installed in the aircraft for the purpose of complementing accident/incident investigation.

Automatic deployable flight recorder (ADFR) means a combination flight recorder installed on the aircraft which is capable of automatically deploying from the aircraft.

Flight safety documents system means a set of interrelated documentation established by the operator, compiling and organizing information necessary for flight and ground operations, and comprising, as a minimum, the operations manual and the operator's maintenance control manual.

Flight simulation training device means any one of the following three types of apparatus in which flight conditions are simulated on the ground:

A flight simulator, which provides an accurate representation of the flight deck of a particular aircraft type to the extent that the mechanical, electrical, electronic, etc. aircraft systems control functions, the normal environment of flight crew members, and the performance and flight characteristics of that type of aircraft are realistically simulated;

A flight procedures trainer, which provides a realistic flight deck environment, and which simulates instrument responses, simple control functions of mechanical, electrical, electronic, etc. aircraft systems, and the performance and flight characteristics of aircraft of a particular class;

A basic instrument flight trainer, which is equipped with appropriate instruments, and which simulates the flight deck environment of an aircraft in flight in instrument flight conditions.

Flight time — aeroplanes mean the total time from the moment an aeroplane first moves for the purpose of taking off until the moment it finally comes to rest at the end of the flight.

***Note**. — Flight time as here defined is synonymous with the term ―block to block time or ―chock to chock time in general usage which is measured from the time an aeroplane first moves for the purpose of taking off until it finally stops at the end of the flight.*

General aviation operation means an aircraft operation other than a commercial air transport operation or an aerial work operation.

Ground handling means services necessary for an aircraft's arrival at, and departure from, an airport, other than air traffic services.

Head-up display (HUD) means a display system that presents flight information into the pilot's forward external field of View.

Human Factors principles means principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance.

Human performance means human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations.

Instrument approach operations means an approach and landing using instruments for navigation guidance based on an instrument approach procedure. There are two methods for executing instrument approach operations:

a) a two-dimensional (2D) instrument approach operation, using lateral navigation guidance only; and

b) a three-dimensional (3D) instrument approach operation, using both lateral and vertical navigation guidance.

Note. *— Lateral and vertical navigation guidance refers to the guidance provided either by:*

a) a ground-based radio navigation aid; or

b) Computer-generated navigation data from ground-based, space-based, self- contained navigation aids or a combination of these.

Instrument approach procedure (IAP) means a series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding, or en-route obstacle clearance criteria apply. Instrument approach procedures are classified as follows:

Non-precision approach (NPA) procedure means an instrument approach procedure designed for 2D instrument approach operations Type A.

Approach procedure with vertical guidance (APV) means a performance-based navigation (PBN) instrument approach procedure designed for 3D instrument approach operations Type A.

Precision approach (PA) procedure- means an instrument approach procedure based on navigation systems (ILS, MLS, GLS and SBAS CAT I) designed for 3D instrument approach operations Type A or B.

Note. *— Refer to 4.2.8.3 for instrument approach operation types.*

Instrument meteorological conditions (IMC) means meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, less than the minima specified for visual meteorological conditions.

Note.—*The specified minima for visual meteorological conditions are contained in Chapter- 4 of ANO 2.*

Isolated aerodrome means a destination aerodrome for which there is no destination alternate aerodrome suitable for a given aeroplane type.

Landing distance available (LDA) means the length of runway which is declared available and suitable for the ground run of an aeroplane landing.

Large aeroplane means an aeroplane of a maximum certificated take-off mass of over 5700 kg.

Low-visibility operations (LVO) means approach operations in RVRs less than 550 m and/or with a DH less than 60 m (200 ft) or take-off operations in RVRs less than 400 m.

Maintenance means the performance of tasks on an aircraft, engine, propeller or associated part required to ensure the continuing airworthiness of an aircraft, engine, propeller or associated part including any one or combination of overhaul, inspection, replacement, defect rectification, and the embodiment of a modification or repair.

Maintenance programme means a document which describes the specific scheduled maintenance tasks and their frequency of completion and related procedures, such as a reliability programme, necessary for the safe operation of those aircraft to which it applies.

Maintenance release means a document which contains a certification confirming that the maintenance work to which it relates has been completed in a satisfactory manner in accordance with appropriate airworthiness requirements.

Master minimum equipment list (MMEL) means a list established for a particular aircraft type by the organization responsible for the type design with the approval of the State of Design containing items, one or more of which is permitted to be unserviceable at the commencement of a flight. The MMEL may be associated with special operating conditions, limitations or procedures.

Maximum diversion time means maximum allowable range, expressed in time, from a point on a route to an en-route alternate aerodrome.

Maximum mass means maximum certificated take-off mass.

Minimum descent altitude (MDA) or minimum descent height (MDH) means a specified altitude or height in a 2D instrument approach operation or circling approach operation below which descent must not be made without the required visual reference.

Note 1*.—Minimum descent altitude (MDA) is referenced to mean sea level and minimum descent height (MDH) is referenced to the aerodrome elevation or to the threshold elevation if that is more than 2 m (7 ft) below the aerodrome elevation. A minimum descent height for a circling approach is referenced to the aerodrome elevation.*

Note 2*.—The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have assessed the aircraft position and rate of change of position, in relation to the desired flight path. In the case of a circling approach the required visual reference is the runway environment.*

Note 3*.—For convenience when both expressions are used, they may be written in the form minimum desce4nt altitude/height\\ and abbreviated—MDA/H*

Minimum equipment list (MEL) means a list which provides for the operation of aircraft, subject to specified conditions, with equipment inoperative, prepared by an operator in conformity with, or more restrictive than, the MMEL established for the aircraft type.

Modification means a change to the type design of an aircraft, engine or propeller.

Navigation specification means a set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace. There are two kinds of navigation specifications:

Required navigation performance (RNP) specification means a navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP, e.g. RNP 4, RNP APCH.

Area navigation (RNAV) specification means navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, e.g. RNAV 5, RNAV 1.

Note*.—The Performance-based Navigation (PBN) Manual (IHB 6-7)II, contains detailed guidance on navigation specifications.*

Night means the hours between the end of evening civil twilight and the beginning of morning civil twilight or such other period between sunset and sunrise, as may be prescribed by CAAB.

Note*. — Civil twilight ends in the evening when the center of the sun*s *disc is 6 degrees below the horizon and begins in the morning when the center of the sun*s *disc is 6 degrees below the horizon.*

Obstacle clearance altitude (OCA) or obstacle clearance height (OCH) means the lowest altitude or the lowest height above the elevation of the relevant runway threshold or the aerodrome elevation as applicable, used in establishing compliance with appropriate obstacle clearance criteria.

Note 1. —*Obstacle clearance altitude is referenced to mean sea level and obstacle clearance height is referenced to the threshold elevation or in the case of non-precision approach procedures to the aerodrome elevation or the threshold elevation if that is more than 2 m (7 ft) below the aerodrome elevation. An obstacle clearance height for a circling approach procedure is referenced to the aerodrome elevation.*

Note 2*.—for convenience when both expressions are used they may be written in the from-obstacle clearance altitude/height|| and abbreviated—OCA/H.*

Operational control- means the exercise of authority over the initiation, continuation, diversion or termination of a flight in the interest of the safety of the aircraft and the regularity and efficiency of the flight.

Operational flight plan means the operators plan for the safe conduct of the flight based on considerations of aeroplane performance, other operating limitations and relevant expected conditions on the route to be followed and at the aerodromes concerned.

Operational credit means a credit authorized for operations with an advanced aircraft enabling a lower aerodrome operating minimum that would normally be authorized for a basic aircraft, based upon the performance of advanced aircraft systems utilizing the available external infrastructure.

Operations Manual means a manual containing procedures, instructions and guidance for use by operational personnel in the execution of their duties.

Operations specifications means the authorizations including specific approvals, conditions and limitations associated with the air operator certificate and subject to the conditions in the operations manual.

Operator means the person, organization or enterprise engaged in or offering to engage in an aircraft operation.

Operator‘s maintenance control manual means a document which describes the operators procedures necessary to ensure that all scheduled and unscheduled maintenance is performed on the operator’s aircraft on time and in a controlled and satisfactory manner.

Performance based aerodrome operating minimum (PBAOM) means a lower aerodrome operating minimum, for a given take off, approach or landing operation, than is available when using a basic aircraft.

Note 1*. — The PBAOM is derived by considering the combined capabilities of the aircraft and available ground facilities. Additional guidance material on PBAOM may be found in the* Manual of All-Weather Operations *(ICAO Doc 9365).*

Note 2. *— PBAOM may be based on operational credits.*

Note 3. — *PBAOM are not limited to PBN operations.*

Performance-based communication (PBC) means communication based on performance specifications applied to the provision of air traffic services.

Note*. — An RCP specification includes communication performance requirements that are allocated to system components in terms of the communication to be provided and associated transaction time, continuity, availability, integrity, safety and functionality needed for the proposed operation in the context of a particular airspace concept.*

Performance-based navigation (PBN) means area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace.

Note.*—Performance requirements are expressed in navigation specifications (RNAV specification, RNP specification) in terms of accuracy, integrity, continuity, availability and functionality needed for the proposed operation in the context of a particular airspace concept.*

Performance-based surveillance (PBS) means surveillance based on performance specifications applied to the provision of air traffic services.

Note*.—An RSP specification includes surveillance performance requirements that are allocated to system components in terms of the surveillance to be provided and associated data delivery time, continuity, availability, integrity, accuracy of the surveillance data, safety and functionality needed for the proposed operation in the context of a particular airspace concept.*

Pilot-in-command means the pilot designated by the operator, or in the case of general aviation, the owner, as being in command and charged with the safe conduct of a flight.

Point of no return means the last possible geographic point at which an aircraft can proceed to the destination aerodrome as well as to an available en-route alternate aerodrome for a given flight.

Pressure-altitude means an atmospheric pressure expressed in terms of altitude which corresponds to that pressure in the Provision Atmosphere

Psychoactive substances mean Alcohol, opioids, cannabinoids, sedatives and hypnotics, cocaine, other psych stimulants, hallucinogens, and volatile solvents, whereas coffee and tobacco are excluded.

Repair the restoration of an aircraft, engine, propeller, or associated part to an airworthy condition in accordance with the appropriate airworthiness requirements, after it has been damaged or subjected to wear.

Required communication performance (RCP) specification means a set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based communication.

Required surveillance performance (RSP) specification means set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based surveillance.

Rest period means a continuous and defined period, after and/or prior to duty, during which flight or cabin crew members are free of all duties.

Runway visual range (RVR) means the range over which the pilot of an aircraft on the center line of a runway can see the runway surface markings or the lights delineating the runway or identifying its center line.

Safe forced landing means unavoidable landing or ditching with a reasonable expectancy of no injuries to persons in the aircraft or on the surface.

Safety management system (SMS) means a systematic approach to managing safety, including the necessary organizational structures, accountability, responsibilities, policies and procedures.

Small aeroplane means an aeroplane of a maximum certificated take-off mass of 5700 kg or less.

Specific approval means a specific approval is an approval which is documented in the Operations Specifications for commercial air transport operations or in the list of specific approvals for non-commercial operations.

State of Registry means the State on whose register the aircraft is entered.

State of the Aerodrome means the State in whose territory the aerodrome is located.

State of the Operator means the state in which the operator's principal place of business is located or, if there is no such place of business, the operators permanent residence.

Synthetic vision system (SVS) a system to display data-derived synthetic images of the external scene from the perspective of the flight deck.

Target level of safety (TLS) is a generic term representing the level of risk which is considered acceptable in particular circumstances.

Threshold time means the range, expressed in time, established by the State of the Operator, to an en-route alternate aerodrome, whereby any time beyond requires specific approval for EDTO from CAAB.

Total vertical error (TVE) means the vertical geometric difference between the actual pressure altitude flown by an aircraft and its assigned pressure altitude (flight level).

Visual meteorological conditions (VMC) mean meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, equal to or better than specified minima.

***Note**. — The specified minima are contained in ANO 2.*

Wet runway means the runway surface is covered by any visible dampness or water up to and including 3 mm deep within the intended area of use.

CHAPTER- 2. APPLICABILITY

ANO 6-1 prescribes the requirements for:

i. Operations conducted by a flight crew member certificated in Bangladesh while operating aeroplane registered in Bangladesh;

ii. Operation of foreign registered aircraft operated by a Bangladeshi AOC holder.

iii. For operations outside, all pilots and operators certificated in Bangladesh shall comply with these requirements unless compliance would result in a violation of the laws of the State in which the operation is conducted; and

iv. Operations conducted by foreign operators to and from Bangladesh shall comply with the provisions of this ANO Chapter 3, 3.2.

***Note 1.**—The provisions applicable to international general aviation operations with aeroplanes are to be found in ANO 6-2.*

***Note 2.**—The provisions applicable to international commercial air transport operations or international general aviation operations with helicopters are to be found in ANO 6-3.*

***Note 3**.— Chapter 3, 3.5, is applicable on and after 8 November 2018.*

CHAPTER- 3. GENERAL

3.1 COMPLIANCE WITH LAWS, REGULATIONS AND PROCEDURES

3.1.1 The operator shall ensure that all employees, when abroad know that they must comply with the laws, regulations and procedures of those States in which operations are conducted.

3.1.2 The operator shall ensure that all pilots are familiar with the laws, regulations and procedures, pertinent to the performance of their duties, prescribed for the areas to be traversed, the aerodromes to be used and the air navigation facilities relating thereto. The operator shall ensure that other members of the flight crew are familiar with such of these laws, regulations and procedures as are pertinent to the performance of their respective duties in the operation of the aeroplane.

***Note**. — Information for pilots and flight operations personnel on flight procedure parameters and operational procedures is contained in PANS-OPS (Doc 8168), Volume I. Criteria for the construction of visual and instrument flight procedures are contained in PANS-OPS (Doc 8168), Volume II.*

3.1.3 The operator or a designated representative shall have responsibility for operational control.

***Note.** — The rights and obligations of a State in respect to the operation of aeroplanes registered in that State are not affected by this provision.*

3.1.4 Responsibility for operational control shall be delegated only to the pilot-in- command and to a flight operations officer/flight dispatcher if the operator‘s approved method of control and supervision of flight operations requires the use of flight operations officer/flight dispatcher personnel.

***Note.** — Guidance on the operational control organization and the role of the flight operations officer/flight dispatcher is contained in the CA Procedures Document on recruitment and Training of Operations Inspector (CPD 6-1), Certification and Continued Surveillance in CA procedure document on surveillance – Operations (CPD 6-7). Detailed guidance on the authorization, duties and responsibilities of the flight operations officer/flight dispatcher is contained in the Preparation of an Operations Manual in App 2 of this ANO & ANO (OPS) B1. The requirements for age, skill, knowledge and experience for licensed flight operations officers/flight dispatchers are contained in ANO 1.*

3.1.5 If an emergency which endangers the safety of the aeroplane or persons becomes known first to the flight operations officer/flight dispatcher, action by that person in accordance with 4.6.2 shall include, where necessary, notification to the appropriate authorities of the nature of the situation without delay, and requests for assistance if required.

3.1.6 If an emergency that endangers the safety of the aircraft or persons necessitates the taking of action that involves a violation of local regulations or procedures, the Pilot in Command (PIC) shall:

a) Notify the appropriate local Authority without delay;

b) Submit a report of the circumstances, if required by the State in which the incident occurs; and Submit a copy of this report to CAAB or to the State of Registry, if in general aviation;

c) Submit reports to the CAAB as soon as possible and normally within ten days.

3.1.7 Operators shall ensure that pilots-in command have available on board the aeroplane all the essential information concerning the search and rescue services in the area over which the aeroplane will be flown.

Note. *— This information may be made available to the pilot by means of the operations manual or such other means as is considered appropriate.*

3.1.8 Operators shall ensure that flight crew members demonstrate the ability to speak and understand the language used for radiotelephony communications as specified in ANO 1.

3.2 COMPLIANCE BY A FOREIGN OPERATOR WITH LAWS, REGULATIONS AND PROCEDURES OF BANGLADESH

3.2.1 When a case is identified as noncompliance or suspected non-compliance by a foreign operator with laws, regulations and procedures applicable within Bangladesh's territory, or a similar serious safety issue with that operator, then Civil Aviation Authority of Bangladesh (CAAB) shall immediately notify the operator and, if the issue warrants it, the State of the Operator. Where the State of the Operator and the State of Registry are different, such notification shall also be made to the State of Registry, if the issue falls within the responsibilities of that State and warrants a notification.

3.2.2 In the case of notification to States as specified in 3.2.1, if the issue and its resolution warrant it, Civil Aviation Authority of Bangladesh (CAAB) shall engage in consultations with the State of the Operator and the State of Registry, as applicable, concerning the safety standards maintained by the operator.

Note.—*The Manual of Procedures for Operations Inspection, Certification and Continued Surveillance (ICAO Doc 8335) provides guidance on the surveillance of operations by foreign operators. The manual also contains guidance on the consultations and related activities, as specified in 3.2.2, including the ICAO model clause on aviation safety, which, if included in a bilateral or multilateral agreement, provides for consultations among States, when safety issues are identified by any of the parties to a bilateral or multilateral agreement on air services.*

3.3 SAFETY MANAGEMENT

***Note**.—ANO 19 includes safety management provisions for air operators. Further guidance is contained in the Safety Management Manual (SMM) of operators approved by CAAB.*

3.3.1 **Recommendation. —** *The operator of an aeroplane of a certificated take-off mass in excess of 20 000 kg should establish and maintain a flight data analysis programme as part of its safety management system.*

3.3.2 The operator of an aeroplane of a maximum certificated take-off mass in excess of 27000 kg shall establish and maintain a flight data analysis programme as part of its safety management system.

***Note.**—The operator may contract the operation of a flight data analysis programme to another party while retaining overall responsibility for the maintenance of such a programme.*

3.3.3 A flight data analysis programme shall be non-punitive and contain adequate safeguards to protect the source(s) of the data in accordance with Appendix 2 of ANO 19.

***Note**.—Guidance on the establishment of flight data analysis programmes is included in the Manual on Flight Data Analysis Programmes (FDAP) (ICAO Doc 10000).*

3.3.4 No one shall be allowed to use the recordings or transcripts of CVR, CARS, Class A AIR and Class A AIRS for purposes other than the investigation of an accident or incident as per ANO 13, except where the recordings or transcripts are:

a) related to a safety-related event identified in the context of a safety management system; are restricted to the relevant portions of a de-identified transcript of the recording; and are subject to the protections accorded by ANO 19;

b) sought for use in criminal proceedings not related to an event involving an accident or incident investigation and are subject to the protections accorded by ANO 19; or

c) used for inspections of flight recorder systems as provided in Section 7 of Appendix 8.

Note.—*Provisions on the protection of safety data, safety information and related sources are contained in Appendix 2 to ANO 19. When an investigation under ANO 13 is instituted, investigation records are subject to the protections accorded by ANO 13.*

3.3.5 No one shall be allowed to use the recordings or transcripts of FDR, ADRS as well as Class B and Class C AIR and AIRS for purposes other than the investigation of an accident or incident as per ANO 13, except where the recordings or transcripts are subject to the protections accorded by ANO19 and are:

a) used by the operator for airworthiness or maintenance purposes.

b) used by the operator in the operation of a flight data analysis programme required in this ANO.

c) sought for use in proceedings not related to an event involving an accident or incident investigation.

d) de-identified; or

e) disclosed under secure procedures.

Note.—*Provisions on the protection of safety data, safety information and related sources are contained in Appendix 2 to ANO 19.*

3.3.6 An operator shall establish a flight safety documents system, for the use and guidance of operational personnel as part of its safety management system.

Note.— *Provisions on the protection of safety data, safety information and related sources are contained in Appendix 2 to ANO 19.*

3.4 USE OF PSYCHOACTIVE SUBSTANCES

(a) No person may act or attempt to act as a crew member of a civil aircraft:

1. within 12 hours after the consumption of any alcoholic beverage;
2. While under the influence of alcohol; or
3. While using any psychoactive substance that affects the person's faculties in any way contrary to safety.

(b) A crew member shall, up to 12 hours before or immediately after acting or attempting to act as a crew member, on the request of a law enforcement officer or the Authority, submit to a test to indicate the presence of alcohol or other psychoactive substances in the blood;

(c) Whenever there is a reasonable basis to believe that a person may not be in compliance with this subsection and upon the request of the Authority, that person shall furnish the Authority, or shall authorize any clinic, doctor, or other person to release to the Authority, the results of each blood test taken for the presence of alcohol or narcotic substances up to 12 hours before or immediately after acting or attempting to act as a crew member;

(d) Any test information provided to the Authority under the provisions of this section may be used as evidence in any legal proceeding.

***Note**. — Provisions concerning the use of psychoactive substances are contained in ANO 1, 1.2.7 and ANO 2, 2.5.*

3.5 AIRCRAFT TRACKING

3.5.1 An operator shall establish an aircraft tracking capability to track aeroplanes throughout its area of operations.

***Note.** —Guidance on aircraft tracking capabilities is contained in the Aircraft Tracking Implementation Guidelines (ICAO Cir 347).*

3.5.2 **Recommendation.** — *The operator should track the position of an aeroplane through automated reporting at least every 15 minutes for the portion(s) of the in-flight operation(s) under the following conditions:*

a. the aeroplane has a maximum certificated take-off mass of over 27 000 kg and a seating capacity greater than 19; and

b. where an ATS unit obtains aeroplane position information at greater than 15 minute intervals.

***Note.** —See ANO 11, Chapter 2, for coordination between the operator and air traffic services providers regarding position report messages.*

3.5.3 An operator shall track the position of an aeroplane through automated reporting at least every 15 minutes for the portion(s) of the in-flight operation(s) that is planned in an oceanic area(s) under the following conditions:

a) the aeroplane has a maximum certificated take-off mass of over 45500 kg and a seating capacity greater than 19; and

b) where an ATS unit obtains aeroplane position information at greater than 15- minute intervals.

Note 1. *— Oceanic area, for the purpose of aircraft tracking, is the airspace which overlies waters outside the territory of Bangladesh.*

Note 2. *—See ANO 11, Chapter 2, for coordination between the operator and air traffic services providers regarding position report messages.*

Note 3*.—Operational procedures for monitoring the aircraft tracking information are contained in PANS-OPS, Volume III, Section 10.*

3.5.4 Notwithstanding the provisions in 3.5.2 and 3.5.3, the CAAB may, based on the results of an approved risk assessment process implemented by an operator, allow for variations to automated reporting intervals. The process shall demonstrate how risks to the operation, resulting from such variations, can be managed and shall include at least the following:

a) capability of the operator's operational control systems and processes, including those for contacting ATS units;

b) overall capability of the aeroplane and its systems.

c) available means to determine the position of, and communicate with, the aeroplane;

d) frequency and duration of gaps in automated reporting.

e) human factors consequences resulting from changes to flight crew procedures. and

f) specific mitigation measures and contingency procedures.

Note. *— Guidance on development, implementation and approval of the risk assessment process, which allows for variations to the need for automatic reporting and the required interval, including variation examples, is contained in the Aircraft Tracking Implementation Guidelines (ICAO Cir 347).*

3.5.5 An operator shall establish procedures, approved by the Civil Aviation Authority of Bangladesh for the retention of aircraft tracking data to assist SAR in determining the last known position of the aircraft.

Note. *— Refer to 4.2.1.3.1 for operator responsibilities when using third parties for the conduct of aircraft tracking under 3.5.*

CHAPTER- 4. FLIGHT OPERATIONS

4.1 OPERATING CONSIDERATIONS AND FACILITIES

4.1.1 No person may commence a flight unless it has been determined by every reasonable means available that the ground and/ or water areas and facilities available and directly required for such flight and for the safe operation of the aircraft are adequate, including communication facilities and navigation aids.

Note 1. *— Reasonable means in this provision is intended to denote the use, at the point of departure, of information available to the operator either through official information published by the aeronautical information services or readily obtainable from other sources*.

4.1.2 An operator shall ensure that a flight will not commence or continue as planned unless it has been ascertained by every reasonable means available that the airspace containing the intended route from aerodrome of departure to aerodrome of arrival, including the intended take-off, destination, and en route alternative aerodromes, can be safely used for the planned operation. When intending to operate over or near conflict zones, a risk assessment shall be conducted and appropriate risk mitigation measures taken to ensure a safe flight.

Note 1*.— "Reasonable means" in this Standard is intended to denote the use, at the point of departure or while the aircraft is in flight, of information available to the operator either through official information published by the aeronautical information services or readily obtainable from other sources.*

Note 2*. — Guidance on safety risk assessments is contained in the Safety Management Manual (SMM).*

Note 3.*—The Risk Assessment Manual for Civil Aircraft Operations Over or Near Conflict Zones (ICAO Doc 10084) contains further guidance on risk assessment for air operators when flying over or near conflict zones.*

4.1.3 Any inadequacy of facilities observed in the course of operations is to be reported to the authority responsible for them, without undue delay.

4.1.4 CAAB will ensure that subject to their published conditions of use, aerodromes and their facilities shall be kept continuously available for flight operations during their published hours of operations, irrespective of weather conditions.

4.1.5 An operator shall, as part of its safety management system, assess the level of rescue and firefighting service (RFFS) protection available at any aerodrome intended to be specified in the operational flight plan in order to ensure that an acceptable level of protection is available for the aeroplane intended to be used.

Note. *— ANO 19 includes safety management provisions for air operators. Further guidance is contained in the Safety Management Manual (ICAO Doc 9859).*

4.1.6 An operator shall ensure that Information related to the level of RFFS protection that is deemed acceptable shall be contained in the operations manual.

Note 1*.—Attachment F contains guidance on assessing an acceptable level of RFFS protection at aerodromes.*

Note 2. *— It is not intended that this guidance limit or regulate the operation of an aerodrome. The assessment performed by the operator does not in any way affect the RFFS requirements of ANO 14, Volume I, for aerodromes.*

4.2 OPERATIONAL CERTIFICATION AND SUPERVISION

4.2.1 The air operator certificate

4.2.1.1 The operator shall not engage in commercial air transport operations unless in possession of a valid air operator certificate issued by the Civil Aviation Authority of Bangladesh.

Note*.—refer to ANO (AOC) chapter 1.1.12-Air operator's certification phase and Appendix D Certification flow chart*

4.2.1.2 The air operator certificate shall authorize the operator to conduct commercial air transport operations in accordance with the operations specifications.

Note*.—Provisions for the content of the air operator certificate and its associated operations specifications are contained in 4.2.1.5 and 4.2.1.6.*

4.2.1.3 The issue of an air operator certificate by the Civil Aviation Authority of Bangladesh shall be dependent upon the operator demonstrating an adequate organization, method of control and supervision of flight operations, training programme as well as ground handling and maintenance arrangements consistent with the nature and extent of the operations specified.

Note. *—Attachment B contains guidance on the issue of an air operator certificate.*

4.2.1.3.1 The operator shall develop policies and procedures for third parties that perform work on its behalf.

4.2.1.4 The continued validity of an air operator certificate shall depend upon the operator maintaining the requirements of 4.2.1.3 under the supervision of Civil Aviation Authority of Bangladesh.

4.2.1.5 The air operator certificate shall contain at least the information and shall follow the layout of ANO (AOC)

4.2.1.6 The operations specifications associated with the air operator certificate shall contain at least the information listed ANO (AOC).

Note.—*Attachment B, paragraph 3.2.2, contains additional information that may be listed in the operations specifications associated with the air operator certificate.*

4.2.1.7 Follow the layouts of ANO (AOC)

4.2.1.8 The Civil Aviation Authority of Bangladesh (CAAB) establishes a system for both the certification and the continued surveillance of the operator in accordance with Appendix 5 to this ANO and "Chapter 3" to ANO 19 to ensure that the required provisions of operations established in 4.2 are maintained.

4.2.2 Surveillance of operations by a foreign operator

4.2.2.1 No foreign operator shall operate a flight to Bangladesh without a valid AOC issued by any contracting state provided that the requirements under which the certificate was issued are at least equal to the applicable provisions specified in this ANO and ANO 19.

4.2.2.2 All foreign operators are subjected to surveillance as per the requirements set by CAAB and in order to preserve safety when necessary CAAB may also take appropriate action for any deficiency.

4.2.2.3 All foreign operators shall meet and maintain the requirements established by the Civil Aviation Authority of Bangladesh (CAAB).

Note.—*Guidance on the surveillance of operations by foreign operators may be found in the CA Procedure document on Surveillance of foreign operator in CPD – 40.*

4.2.3 Operations Manual

4.2.3.1 An operator shall provide, for the use and guidance of operations personnel concerned, an operation manual in accordance with Appendix 2. The operations manual shall be amended or revised as is necessary to ensure that the information contained therein is kept up to date. All such amendments or revisions shall be issued to all personnel that are required to use this manual.

4.2.3.2 An operator shall provide CAAB a copy of all the parts operations manual together with all amendments and/or revisions, for review and acceptance and, where required, approval. The operator shall incorporate in the operations manual such mandatory material as required by Appendix 2 of this manual.

Note 1*.—Requirements for the organization and content of an operations manual are provided in Appendix 2/ANO(AOC)1.3.2/ ANO (OPS) B1.*

Note 2.*—Specific items in the operations manual require the approval of The Civil Aviation Authority of Bangladesh (CAAB) in accordance with the provisions in 4.2.8, 6.1.3, 9.3.1, 12.4 and 13.4.1.*

4.2.4 Operating instructions - general

4.2.4.1 All operations personnel are required to be properly instructed in their particular duties and responsibilities and the relationship of such duties to the operation as a whole.

4.2.4.2 An aeroplane shall not be taxied on the movement area of an aerodrome unless the person at the controls:

a) has been duly authorized by the operator or a designated agent.

b) is fully competent to taxi the aeroplane.

c) is qualified to use the radiotelephone; and

d) has received instruction from a competent person in respect of aerodrome layout, routes, signs, marking, lights, air traffic control (ATC) signals and instructions, phraseology, and procedures, and is able to conform to the operational standards required for safe aeroplane movement at the aerodrome.

4.2.4.3 **Recommendation**.—*The operator should issue operating instructions and provide information on aeroplane climb performance with all engines operating to enable the pilot-in-command to determine the climb gradient that can be achieved during the departure phase for the existing take-off conditions and intended take-off technique. This information should be included in the operations manual.*

4.2.5 In-flight simulation of emergency situations

4.2.5.1 No flight crew member shall perform any duties during a critical phase of flight except those required for the safe operation of the aircraft.

4.2.5.2 No PIC shall permit a flight crew member to engage in any activity during a critical phase of flight that could distract or interfere with the performance of his or her assigned duties.

4.2.6 Checklists

4.2.6.1 The checklists provided in accordance with 6.1.4 shall be used by flight crews prior to, during and after all phases of operations, and in emergency, to ensure compliance with the operating procedures contained in the aircraft operating manual and the aeroplane flight manual or other documents associated with the certificate of airworthiness and otherwise in the operations manual. The design and utilization of checklists shall observe Human Factors principles.

Note. *— Guidance material on the application of Human Factors principles can be found in the Human Factors Training Manual (ICAO Doc 9683).*

4.2.7 Minimum flight altitudes

4.2.7.1 No operator shall be permitted to establish minimum flight altitude for those routes flown and for which a minimum flight altitude has been established by the state flown over or the responsible state, provided they shall not be less than those established by CAAB.

4.2.7.2 In routes where CAAB has not established any minimum flight altitude, an operator shall include a method to determine such minimum flight altitudes in the operations manual. The minimum flight altitudes determined in accordance with the above method shall not be lower than specified in ANO 2.

4.2.7.3 **Recommendation.—***The method for establishing the minimum flight altitudes should be approved by Civil Aviation Authority of Bangladesh (CAAB).*

4.2.7.4 **Recommendation.**—*Civil Aviation Authority of Bangladesh (CAAB) should ensure before approval of such method only after careful consideration of the probable effects of the following factors on the safety of the operation in question:*

a) the accuracy and reliability with which the position of the aeroplane can be determined;

b) the inaccuracies in the indications of the altimeters used;

c) the characteristics of the terrain (e.g. sudden changes in the elevation);

d) the probability of encountering unfavorable meteorological conditions (e.g. severe turbulence and descending air currents);

e) possible inaccuracies in aeronautical charts; and

f) airspace restrictions.

4.2.8 Aerodrome operating minima

4.2.8.1 An operator shall establish aerodrome operating minima for each aerodrome to be used in operations and the method of determination of such minima requires prior approval from CAAB.

CAAB shall require that the operator establish aerodrome operating minima for each aerodrome to be used in operations and shall approve the method of determination of such minima. Such minima shall not be lower than any that may be established for such aerodromes by the State of the Aerodrome, except when specifically approved by that State.

Note. *— This provision does not require the State of the Aerodrome to establish aerodrome operating minima.*

4.2.8.1.1 Operational credit(s) for operations with aeroplanes equipped with automatic landing systems, a HUD, or equivalent displays, EVS, SVS or CVS requires approval by CAAB. Where the operational credit relates to low visibility operations, the CAAB shall issue a specific approval. Such authorizations shall not affect the classification of the instrument approach procedure.

Note 1. *—Operational credit includes:*

a) for the purposes of an approach ban (4.4.1.2), a minimum below the aerodrome operating minima.

b) reducing or satisfying the visibility requirements; or

c) enquiring fewer ground facilities as compensated for by airborne capabilities.

Note 2.— *Guidance on operational credit and how to express the operational credit in the Operations Specifications is contained in the Manual of All-Weather Operations (ICAO Doc 9365).*

Note 3*.— Information regarding a HUD or equivalent displays, including references to RTCA and EUROCAE documents, is contained in the Manual of All-Weather Operations (ICAO Doc 9365).*

4.2.8.1.2 While applying for any specific approval for the operational credit, the applicant shall ensure that the:

a) aeroplane meets the appropriate airworthiness certification requirements.

b) information necessary to support effective crew tasks for the operation is appropriately available to both pilots where the number of flight crew members specified in the operations manual is more than one;

c) operator has carried out a safety risk assessment of the operations supported by the equipment.

d) operator has established and documented normal and abnormal procedures and MEL.

e) The operator has established a training programme for the flight crew members and relevant personnel involved in the flight preparation.

f) operator has established a system for data collection, evaluation and trend monitoring for low visibility operations for which there is an operational credit; and

g) operator has instituted appropriate procedures in respect of continuing airworthiness (maintenance and repair) practices and programmes.

Note 1. *— Guidance on safety risk assessments is contained in the CAAB Safety Management Manual ANO-19.*

Note 2. *— Guidance on operational approvals is contained in the ANO (OPS) Part-SPA.*

4.2.8.1.3 For operations with operational credit with minima above those related to low visibility operations, the criteria published in AIP Bangladesh shall be followed for the safe operation of the aeroplane.

Note*.—Guidance on operational credit for operations with minima above those related to low visibility operations is contained in the ANO (OPS) Part SPA.*

4.2.8.2 The Civil Aviation Authority Bangladesh (CAAB) requires that in establishing the aerodrome operating minima which will apply to any operation, the operator shall take full account of:

a) the type, performance and handling characteristics of the aeroplane and any conditions or limitations stated in the flight manual.

b) the composition of the flight crew, their competence and experience.

c) the dimensions and characteristics of the runways may be selected for use;

d) the adequacy and performance of the available visual and non-visual ground aids;

e) the equipment available on the aeroplane for the purpose of navigation, acquisition of visual references and/or control of the flight path during the approach, landing and the missed approach.

f) the obstacles in the approach and missed approach areas and the obstacle clearance altitude/height for the instrument approach procedures;

g) the means used to determine and report meteorological conditions

h) the obstacles in the climb- out areas and necessary clearance margins.

i) The conditions prescribed in the operations specifications; and

j) Any minima that may be promulgated by the State of the Aerodrome.

Note.—*Guidance on the establishment of aerodrome operating minima is contained in the ANO (OPS) Part SPA*

4.2.8.3 Instrument approach operations shall be classified based on the designed lowest operating minima below which an approach operation shall only be continued with the required visual reference as follows:

a) Type A: a minimum descent height or decision height at or above 75 m (250 ft); and

b) Type B: a decision height below 75 m (250 ft). Type B instrument approach operations are categorized as:

1) **Category I** (CAT I): a decision height not lower than 60 m (200 ft) and with either a visibility not less than 800 m or a runway visual range not less than 550 m;

2) **Category II** (CAT II): a decision height lower than 60 m (200 ft) but not lower than 30 m (100 ft) and a runway visual range not less than 300 m; and

3) **Category III** (CAT III) a decision height lower than 30 m (100 ft) or no decision height and a runway visual range less than 300 m or no runway visual range limitations.;

Note 1*.—Where decision height (DH) and runway visual range (RVR) fall into different categories of operation, the instrument approach operation would be conducted in accordance with the requirements of the most demanding category (e.g. an operation with a DH in the range of CAT III but with an RVR in the range of CAT III would be considered a CAT III operation or an operation with a DH in the range of CAT II but with an RVR in the range of CAT I would be considered a CAT II operation). This does not apply if the RVR and/or DH has been approved as operational credits.*

Note 2. *— The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have assessed the aircraft position and rate of change of position, in relation to the desired flight path. In the case of a circling approach operation, the required visual reference is the runway environment.*

Note 3*.—Guidance on approach classification as it relates to instrument approach operations, procedures, runways, and navigation systems is contained in the ANO (OPS) Part-SPA.*

4.2.8.4 Specific approval is issued by CAAB for instrument approach operations in low visibility provided RVR information is available.

Note. *— Guidance on low visibility operations is contained in the ANO (OPS) Part-SPA.*

4.2.8.5 For take-off in low visibility, issuance of specific approval for the minimum take-off RVR shall be required from CAAB.

Note. —In general, visibility for take-off is defined in terms of RVR. An equivalent horizontal visibility may also be used.

4.2.8.6 **Recommendation.—***For instrument approach operations, aerodrome operating minima below 800 m visibility should not be authorized unless RVR information is provided.*

4.2.8.7 The operating minima for 2D instrument approach operations using instrument approach procedures shall be determined by establishing a minimum descent altitude (MDA) or minimum descent height (MDH), minimum visibility and, if necessary, cloud conditions.

***Note**.—For guidance on applying a continuous descent final approach (CDFA) flight technique on non-precision approach procedures, refer to PANS-OPS (ICAO Doc 8168), Volume I, Part II, Section 5.*

4.2.8.8 The operating minima for 3D instrument approach operations using instrument approach procedures shall be determined by establishing a decision altitude (DA) or decision height (DH) and the minimum visibility or RVR.

4.2.9 Threshold Crossing height for 3D instrument approach operations

An operator shall establish operational procedures designed to ensure that an aeroplane being used to conduct 3D instrument approach operations crosses the threshold by a safe margin with the aeroplane in the landing configuration and attitude.

4.2.10 Fuel and oil records

4.2.10.1 An operator shall maintain fuel records to enable the Civil Aviation Authority of Bangladesh (CAAB) to ascertain that, for each flight, the requirements of 4.3.6 and 4.3.7.1 have been complied with.

4.2.10.2 An operator shall maintain oil records to enable the Civil Aviation Authority of Bangladesh (CAAB) to ascertain that trends for oil consumption are such that an aeroplane has sufficient oil to complete each flight.

4.2.10.3 Fuel and oil records shall be retained by the operator for a period of three months.

4.2.11 Crew

4.2.11.1 Pilot-in-command. For each flight, an operator shall designate one pilot to act as pilot-in- command.

4.2.11.2 For each flight of an aeroplane above 15000 m (49000 ft), an operator shall maintain records so that the total cosmic radiation dose received by each crew member over a period of 12 consecutive months can be determined.

Note. *— Guidance on the maintenance of cumulative radiation records is given in IACO Circular 126 — Guidance Material on SST Aircraft Operations.*

4.2.12 Passengers

4.2.12.1 An operator shall ensure that passengers are made familiar by means of an oral briefing or by other means, with the location and use of the following items, if appropriate:

a) seat belts.

b) emergency exits.

c) life jackets if the carriage of life jackets is prescribed.

d) oxygen dispensing equipment, if the provision of oxygen for the use of passengers is prescribed; and

e) other emergency equipment provided for individual use, including passenger emergency briefing cards.

4.2.12.2 An operator shall ensure that all passengers on are aware of the location and general manner of use of the principal emergency equipment carried for collective use.

4.2.12.3 An operator shall ensure that in an emergency during flight, passengers are instructed in such emergency action as may be appropriate to the circumstances.

4.2.12.4 An operator shall ensure that, during take-off and landing and whenever considered necessary by reason of turbulence or any emergency occurring during flight, all passengers on board an aeroplane shall be secured in their seats by means of the seat belts or harnesses provided.

4.3 FLIGHT PREPARATION

4.3.1 No person shall issue a flight release until flight preparation have been completed certifying that the pilot-in- command is satisfied that:

a) the aeroplane is airworthy and the appropriate certificates (i.e., airworthiness, registration) are on board the aeroplane.

b) the instruments and equipment prescribed in Chapter 6, for the operation to be undertaken, are installed and are sufficient for the flight.

c) a maintenance release as prescribed in 8.8 has been issued in respect of the aeroplane.

d) the mass of the aeroplane and center of gravity location are such that the flight can be conducted safely, considering the flight conditions expected.

e) any load carried is properly distributed and safely secured;

f) a check has been completed indicating that the operating limitations of Chapter 5 can be complied with for the flight to be undertaken; and

g) The provisions of 4.3.3 relating to operational flight planning have been complied with

4.3.2 Completed flight preparation forms shall be kept by the operator for a period of three months.

4.3.3 Operational flight planning

4.3.3.1 An operational flight plan shall be completed for every intended flight. The operational flight plan shall be approved and signed by the pilot-in- command and, where applicable, signed by the flight operations officer/flight dispatcher, and a copy shall be filed with the operator or a designated agent, or, if these procedures are not possible, it shall be left with the aerodrome authority or on record in a suitable place at the point of departure.

***Note**. — The duties of a flight operations officer/flight dispatcher are contained in 4.6.*

4.3.3.2 The operations manual must describe the content and use of the operational flight plan.

4.3.4 Alternate aerodromes

4.3.4.1 Take-off alternate aerodrome

4.3.4.1.1 A take-off alternate aerodrome shall be selected and specified in the operational flight plan if either the meteorological conditions at the aerodrome of departure are below the operator ‘s established aerodrome landing minima for that operation or if it would not be possible to return to the aerodrome of departure for other reasons.

4.3.4.1.2 The take-off alternate aerodrome shall be located within the following flight time from the aerodrome of departure:

a) for aeroplanes with two engines, one hour of flight time at a one- engine inoperative cruising speed, determined from the aircraft operating manual, calculated in ISA and still-air conditions using the actual take-off mass; or

b) for aeroplanes with three or more engines, two hours of flight time at an all-engines operating cruising speed, determined from the aircraft operating manual, calculated in ISA and still-air conditions using the actual take-off mass; or

c) for aeroplanes engaged in extended diversion time operations (EDTO) where an alternate aerodrome meeting the distance criteria of a) or b) is not available, the first available alternate aerodrome located within the distance of the operator ‘s specified maximum diversion time considering the actual take-off mass.

4.3.4.1.3 For an aerodrome to be selected as a take-off alternate the available information shall indicate that, at the estimated time of use, the conditions will be at or above the operator’s established aerodrome operating minimum for that operation.

4.3.4.2 En-route alternate aerodromes

En-route alternate aerodromes, required by 4.7 for extended diversion time operations by aeroplanes with two turbine engines, shall be selected and specified in the operational and air traffic services (ATS) flight plans.

4.3.4.3 Destination alternate aerodromes

4.3.4.3.1 For a flight to be conducted in accordance with the instrument flight rules, at least one destination alternate aerodrome shall be selected and specified in the operational and ATS flight plans, unless:

a) the duration of the flight from the departure aerodrome, or from the point of in-flight re-planning to the destination aerodrome is such that, considering all meteorological conditions and operational information relevant to the flight, at the estimated time of use, a reasonable certainty exists that:

1) the approach and landing may be made under visual meteorological conditions; and

2) separate runways are usable at the estimated time of use of the destination aerodrome with at least one runway having an operational instrument approach procedure: or

b) the aerodrome is isolated. Operations into isolated aerodromes do not require the selection of a destination alternate aerodrome(s) and shall be planned in accordance with 4.3.6.3 d) 4).

1) for each flight into an isolated aerodrome a point of no return shall be determined; and

2) a flight to be conducted to an isolated aerodrome shall not be continued past the point of no return unless a current assessment of meteorological conditions, traffic and other operational conditions indicate that a safe landing can be made at the estimated time of use.

Note 1. — *Separate runways are two or more runways at the same aerodrome configured such that if one runway is closed, operations to the other runway(s) can be conducted.*

Note 2*.—Guidance on planning operations to isolated aerodromes is contained in the Flight Planning and Fuel Management (FPFM) Manual (ICAO Doc 9976).*

4.3.4.3.2 Two destination alternate aerodromes shall be selected and specified in the operational and ATS flight plans when, for the destination aerodrome:

a) Meteorological conditions at the estimated time of use will be below the operator's established aerodrome operating minima for that operation; or

b) Meteorological information is not available.

4.3.4.4 Notwithstanding the provisions in 4.3.4.1, 4.3.4.2 and 4.3.4.3, CAAB may base on the results of a specific safety risk assessment conducted by the operator which demonstrates how an equivalent level of safety will be maintained, approve operational variations to alternate aerodrome selection criteria. The specific safety risk assessment shall include at least the:

a) capabilities of the operator.

b) overall capability of the aeroplane and its systems.

c) available aerodrome technologies, capabilities, and infrastructure.

d) quality and reliability of meteorological information.

e) identified hazards and safety risks associated with each alternate aerodrome variation; and

f) specific mitigation measures.

***Note**. — Guidance on performing a safety risk assessment and on determining variations, including examples of variations, is contained in the Safety Management Manual (SMM).*

4.3.5 Meteorological conditions

4.3.5.1 A flight to be conducted in accordance with VFR shall not be commenced unless current meteorological reports or a combination of current reports and forecasts indicate that the meteorological conditions along the route or that part of the route to be flown under VFR will, at the appropriate time, be such as to enable compliance with these rules.

4.3.5.2 A flight to be conducted in accordance with the instrument flight rules shall not:

a) take off from the departure aerodrome unless the meteorological conditions, at the time of use, are at or above the operator's established aerodrome operating minima for that operation; and

b) take off or continue beyond the point of in-flight re-planning unless at the aerodrome of intended landing or at each alternate aerodrome to be selected in compliance with 4.3.4, current meteorological reports or a combination of current reports and forecasts indicate that the meteorological conditions will be, at the estimated time of use, at or above the operator's established aerodrome operating minima for that operation.

4.3.5.3 To ensure that an adequate margin of safety is observed in determining whether an approach and landing can be safely carried out at each alternate aerodrome, the operator shall specify appropriate incremental values for height of cloud base and visibility, acceptable to the Civil Aviation Authority of Bangladesh (CAAB), to be added to the operator 's established aerodrome operating minima.

Note. — Guidance on the selection of these incremental values is contained in the Flight Planning and Fuel Management (FPFM) Manual (ICAO Doc 9976).

4.3.5.4 The Civil Aviation Authority of Bangladesh (CAAB) requires that a margin of time is established by the operator for the estimated time of use of an aerodrome.

***Note. —** Guidance on establishing an appropriate margin of time for the estimated time of use of an aerodrome is contained in the* Flight Planning and Fuel Management (FPFM) Manual *(ICAO Doc 9976).*

4.3.5.5 A flight to be operated in known or expected icing conditions shall not be commenced unless the aeroplane is certificated and equipped to cope with such conditions.

4.3.5.6 A flight to be planned or expected to operate in suspected or known ground icing conditions shall not take off unless the aeroplane has been inspected for icing and, if necessary, has been given appropriate de- icing/anti-icing treatment. Accumulation of ice or other naturally occurring contaminants shall be removed so that the aeroplane is kept in an airworthy condition prior to take-off.

Note.—*Guidance material is given for Aircraft Ground De- icing /Anti icing Operations in ANO (AOC).*

4.3.6 Fuel requirements

4.3.6.1 An aeroplane shall carry a sufficient amount of fuel to complete the planned flight safely and to allow for deviations from the planned operation.

4.3.6.2 The amount of usable fuel to be carried shall, as a minimum, be based on;

a) the following data:

1) Current aeroplane-specific data derived from a fuel consumption monitoring system, if available; or

2) If current aeroplane-specific data is not available, data provided by the aeroplane manufacturer;

b) and the operating conditions for the planned flight, including:

1) Anticipated aeroplane mass.

2) Notices to Airmen (NOTAMs).

3) Current meteorological reports or a combination of current reports and forecasts.

4) Air Traffic Services (ATS) procedures, restrictions, and anticipated delays.

5) The effects of deferred maintenance items and/or configuration deviations. and

6) Any other conditions that may delay the landing of the aeroplane or increase fuel, oil, and/or oxygen consumption.

4.3.6.3 The pre-flight calculation of usable fuel required shall include:

a) **TAXI FUEL.** Which shall be the amount of fuel expected to be consumed before take-off, taking into account local conditions at the departure aerodrome and APU fuel consumption.

b) **TRIP FUEL**. Which shall be the amount of fuel required to enable the aeroplane to fly from take-off until landing at the destination aerodrome, taking into account the operating conditions in paragraph 4.3.6.2.(b) of this subsection;

c) **CONTINGENCY FUEL**. Which shall be the amount of fuel required to compensate for unforeseen factors. It shall not be less than 5 per cent of the planned trip fuel or of the fuel required from the point of in-flight re-planning based on the consumption rate used to plan the trip fuel but, in any case, shall not be lower than the amount required to fly for 5 minutes at holding speed at 450 m (1500 ft) above the destination aerodrome in standard conditions;

Note. *— Unforeseen factors are those factors that could have an influence on the fuel consumption to the destination aerodrome, such as deviations of an individual aeroplane from the expected fuel consumption data, deviations from forecast meteorological conditions, extended delays, and deviations from planned routings and/or cruising levels.*

d) **DESTINATION ALTERNATE FUEL**. Which shall be:

1) Where a destination alternate aerodrome is required, the amount of fuel required to enable the aeroplane to:

I. Perform a missed approach at the destination aerodrome.

II. Climb to the expected cruising altitude.

III. Fly the expected routing.

IV. Descend to the point where the expected approach is initiated; and

V. Conduct the approach and landing at the destination alternate aerodrome; or

2) Where two destination alternate aerodromes are required, the amount of fuel, as calculated in 4.3.6.3 d) 1), required to enable the aeroplane to proceed to the destination alternate aerodrome which requires the greater amount of alternate fuel; or

3) Where a flight is operated without a destination alternate aerodrome, the amount of fuel required to enable the aeroplane to fly for 15 minutes at holding speed at 450 m (1 500 ft) above destination aerodrome elevation in standard conditions; or

4) Where the aerodrome of intended landing is an isolated aerodrome:

i) For a reciprocating-engine aeroplane, the amount of fuel required to fly for 45 minutes plus 15 per cent of the flight time planned to be spent at cruising level, including final reserve fuel, or 2 hours, whichever is less; or

ii) For a turbine-engine aeroplane, the amount of fuel required to fly for 2 hours at normal cruise consumption above the destination aerodrome, including final reserve fuel;

e) **FINAL RESERVE FUEL.** Which shall be the amount of fuel on arrival at the destination alternate aerodrome, or the destination aerodrome when no destination alternate aerodrome is required:

1) For a reciprocating-engine aeroplane, the amount of fuel required to fly for 45 minutes; or

2) For a turbine-engined aeroplane, the amount of fuel required to fly for 30 minutes at holding speed at 450 m (1 500 ft) above aerodrome elevation in standard conditions.

f) **ADDITIONAL FUEL**, which shall be the supplementary amount of fuel required if the minimum fuel calculated in accordance with 4.3.6.3 b), c), d) and e) is not sufficient to:

1) allow the aeroplane to descend as necessary and proceed to an alternate aerodrome in the event of engine failure or loss of pressurization, whichever requires the greater amount of fuel based on the assumption that such a failure occurs at the most critical point along the route:

i) fly for 15 minutes at holding speed at 450 m (1 500 ft) above aerodrome elevation in standard conditions; and

ii) make an approach and landing.

2) allow an aeroplane engaged in EDTO to comply with the EDTO critical fuel scenario as established by the Civil Aviation Authority of Bangladesh.

3) meet additional requirements not covered above.

***Note 1**. — Fuel planning for a failure that occurs at the most critical point along a route (4.3.6.3 f) 1)) may place the aeroplane in a fuel emergency based on 4.3.7.2.*

***Note 2.**—Guidance on EDTO critical fuel scenarios is contained in the Extended Diversion Time Operations (EDTO) CAAB Manual ANO (OPS) Part-SPA.*

g) **discretionary fuel**, which shall be the extra amount of fuel to be carried at the discretion of the pilot-in- command.

4.3.6.4 **Recommendation.**—*Operators should determine one final reserve fuel value for each aeroplane type and variant in their fleet rounded up to an easily recalled figure.*

4.3.6.5 No person shall operate a flight unless the usable fuel on board meets the requirements in 4.3.6.3 a), b), c), d), e) and f) if required and shall not continue from the point of in-flight re-planning unless the usable fuel on board meets the requirements in 4.3.6.3 b), c), d), e) and f) if required.

4.3.6.6 Notwithstanding the provisions in 4.3.6.3 a), b), c), d) and f), The Civil Aviation Authority of Bangladesh (CAAB) based on the results of a specific safety risk assessment conducted by the operator which demonstrates how an equivalent level of safety will be maintained, may approve variations to the pre-flight fuel calculation of taxi fuel, trip fuel, contingency fuel, destination alternate fuel, and additional fuel. The specific safety risk assessment shall include at least the:

a) flight fuel calculations.

b) capabilities of the operator to include:

I. a data-driven method that includes a fuel consumption monitoring programme; and/or

II. the advanced use of alternate aerodromes; and

c) specific mitigation measures specific.

***Note**. — Guidance on the specific safety risk assessment, fuel consumption monitoring programmes and the advanced use of alternate aerodromes is contained in the Flight Planning and Fuel Management (FPFM) Manual (ICAO Doc 9976).*

4.3.6.7 The use of fuel after flight commencement for purposes other than originally intended during pre-flight planning shall require a re-analysis and, if applicable, adjustment of the planned operation.

Note.*—Guidance on procedures for in-flight fuel management including re-analysis, adjustment and/or re-planning considerations when a flight begins to consume contingency fuel before take-off is contained in the Flight Planning and Fuel Management (FPFM) Manual (ICAO Doc 9976).*

4.3.7 In-flight fuel management

4.3.7.1 An operator shall establish policies and procedures, approved by the Civil Aviation Authority of Bangladesh (CAAB) to ensure that in- flight fuel checks and fuel management are performed.

4.3.7.2 The pilot-in-command shall continually ensure that the amount of usable fuel remaining on board is not less than the fuel required to proceed to an aerodrome where a safe landing can be made with the planned final reserve fuel remaining upon landing.

Note. — *The protection of final reserve fuel is intended to ensure a safe landing at any aerodrome when unforeseen occurrences may not permit safe completion of an operation as originally planned. Guidance on flight planning, including the circumstances that may require re-analysis, adjustment and/or re-planning of the planned operation before take-off or en-route, is contained in the Flight Planning and Fuel Management (FPFM) Manual (ICAO Doc 9976).*

4.3.7.2.1 The pilot-in-command shall request delay information from ATC when unanticipated circumstances may result in landing at the destination aerodrome with less than the final reserve fuel plus any fuel required to proceed to an alternate aerodrome or the fuel required to operate to an isolated aerodrome.

4.3.7.2.2 The pilot-in-command shall advise ATC of a minimum fuel state by declaring **MINIMUM FUEL** when, having committed to land at a specific aerodrome, the pilot calculates that any change to the existing clearance to that aerodrome may result in landing with less than the planned final reserve fuel.

Note 1. — The declaration of MINIMUM FUEL informs ATC that all planned aerodrome options have been reduced to a specific aerodrome of intended landing and any change to the existing clearance may result in landing with less than the planned final reserve fuel. This is not an emergency situation but an indication that an emergency situation is possible should any additional delay occur.

Note 2.— *Guidance on declaring minimum fuel is contained in the Flight Planning and Fuel Management (FPFM) Manual (ICAO Doc 9976).*

4.3.7.2.3 The pilot-in-command shall declare a situation of fuel emergency by broadcasting **MAYDAY MAYDAY MAYDAY FUEL**, when the calculated usable fuel predicted to be available upon landing at the nearest aerodrome where a safe landing can be made is less than the planned final reserve fuel.

Note 1. — *The planned final reserve fuel refers to the value calculated in 4.3.6.3 e) 1) or 2) and is the minimum amount of fuel required upon landing at any aerodrome.*

Note 2. — *The words –MAY DAY FUEL describes the nature of the distress conditions as required in ANO 10, Volume II, 5.3.2.1.1 b) 3.*

Note 3.— *Guidance on procedures for in-flight fuel management is contained in the Flight Planning and Fuel Management (FPFM) Manual (ICAO Doc 9976).*

4.3.8 Refueling with passengers on board.

4.3.8.1 An aeroplane shall not be refueled when passengers are embarking, on board or disembarking unless it is properly attended by qualified personnel ready to initiate and direct an evacuation of the aeroplane by the most practical and expeditious means available.

4.3.8.2 When refueling with passengers embarking, on board or disembarking, two way communication shall be maintained by the aeroplane's inter- communication system or other suitable means between the ground crew supervising the refueling and the qualified personnel on board the aeroplane.

Note 1. — *The provisions of 4.3.8.1 do not necessarily require the deployment of integral aeroplane stairs or the opening of emergency exits as a prerequisite to refueling.*

Note 2. — *Provisions concerning aircraft refueling are contained in ANO 14, Volume I, and guidance on safe refueling practices is contained in the Airport Services Manual (ICAO DOC 9137) Part 1 & 8.*

Note 3.—*Additional precautions are required when refueling with fuels other than aviation kerosene or when refueling results in a mixture of aviation kerosene with other aviation turbine fuels, or when an open line is used.*

4.3.9 Oxygen supply

Note.—*Approximate altitudes in the Standard Atmosphere corresponding to the values of absolute pressure used in the text are as follows:*

Absolute pressure	Meters	Feet
700	3000	10000
620	4000	13000
376	7600	25000

4.3.9.1 A flight to be operated at flight altitudes at which the atmospheric pressure in personnel compartments will be less than 700 hPa shall not be commenced unless sufficient stored breathing oxygen is carried to supply:

a) all crew members and 10 per cent of the passengers for any period in excess of 30 minutes that the pressure in compartments occupied by them will be between 700 hPa and 620 hPa; and

b) the crew and passengers for any period that the atmospheric pressure in compartments occupied by them will be less than 620 hPa.

4.3.9.2 A flight to be operated with a pressurized aeroplane shall not be commenced unless enough stored breathing oxygen is carried to supply all the crew members and passengers, as is appropriate to the circumstances of the flight being undertaken, in the event of loss of pressurization, for any period that the atmospheric pressure in any compartment occupied by them would be less than 700 hPa. In addition, when an aeroplane is operated at flight altitudes at which the atmospheric pressure is less than 376 hPa, or which, if operated at flight altitudes at which the atmospheric pressure is more than 376 hPa and cannot descend safely within four minutes to a flight altitude at which the atmospheric pressure is equal to 620 hPa, there shall be no less than a 10minute supply for the occupants of the passenger compartment.

4.3.10 Time capability of cargo compartment fire suppression system

4.3.10.1 **Recommendation.**—*All flights should be planned so that the diversion time to an aerodrome where a safe landing could be made does not exceed the cargo compartment fire suppression time capability of the aeroplane, when one is identified in the relevant aeroplane documentation, reduced by an operational safety margin specified by CAAB.*

Note 1*.—Cargo compartment fire suppression time capabilities will be identified in the relevant aeroplane documentation when they are to be considered for the operation.*

4.4 IN-FLIGHT PROCEDURES

4.4.1 Aerodrome operating minima

4.4.1.1 A flight shall not be continued towards the aerodrome of intended landing, unless the latest available information indicates that at the expected time of arrival, a landing can be affected at that aerodrome or at least one destination alternate aerodrome, in compliance with the operating minima established in accordance with 4.2.8.1.

4.4.1.2 An instrument approach shall not be continued below 300 m (1000 ft) above the aerodrome elevation or into the final approach segment unless the reported visibility or controlling RVR is at or above the aerodrome operating minima.

Note*. — Criteria for the final approach segment is contained in PANS-OPS (ICAO Doc 8168), Volume II.*

4.4.1.3 If, after entering the final approach segment or after descending below 300 m (1000 ft) above the aerodrome elevation, the reported visibility or controlling RVR falls below the specified minimum, the approach may be continued to DA/H or MDA/H. In any case, an aeroplane shall not continue its approach-to-land at any aerodrome beyond a point at which the limits of the operating minima specified for that aerodrome would be infringed.

Note.*—Controlling RVR means the reported values of one or more RVR reporting locations (touchdown, mid- point and stop-end) used to determine whether operating minima are or are not met. Where RVR is used, the controlling RVR is the touchdown RVR, unless otherwise specified by CAAB.*

4.4.2 Meteorological observations

Note. *— The procedures for making meteorological observations on board aircraft in flight and for recording and reporting them are contained in ANO 3, the PANS-ATM (ICAO Doc 4444) and the appropriate Regional Supplementary Procedures (ICAO Doc 7030).*

4.4.2.1 The pilot-in-command shall report the runway braking action special air- report (AIREP) when the runway braking action encountered is not as good as reported.

Note*. — The procedures for making special air-reports regarding runway braking action are contained in the PANS-ATM (ICAO Doc 4444), Chapter 4 and Appendix 1.*

4.4.3 Hazardous flight conditions

Hazardous flight conditions encountered, other than those associated with meteorological conditions, shall be reported to the appropriate aeronautical station as soon as possible. The reports so rendered shall give such details as may be pertinent to the safety of other aircraft.

4.4.4 Flight crew members at duty stations

4.4.4.1 ***Take-off and landing.*** All flight crew members required to be on flight deck duty shall be at their stations.

4.4.4.2 ***En route.*** All flight crew members required to be on flight deck duty shall remain at their stations except when their absence is necessary for the performance of duties in connection with the operation of the aeroplane or for physiological needs.

4.4.4.3 ***Seat belts***. All flight crew members shall keep their seat belts fastened when at their stations.

4.4.4.4 ***Safety harness.*** Any flight crew member occupying a pilot's seat shall keep the safety harness fastened during the take-off and landing phases; all other flight crew members shall keep their safety harnesses fastened during the take-off and landing phases unless the shoulder straps interfere with the performance of their duties, in which case the shoulder straps may be unfastened but the seat belt must remain fastened.

Note. — *Safety harness includes shoulder straps and a seat belt which may be used independently.*

4.4.5 Use of oxygen

4.4.5.1 All flight crew members, when engaged in performing duties essential to the safe operation of an aeroplane in flight, shall use breathing oxygen continuously whenever the circumstances prevail for which its supply has been required in 4.3.9.1 or 4.3.9.2.

4.4.5.2 All flight crew members of pressurized aeroplanes operating above an altitude where the atmospheric pressure is less than 376 hPa shall have available at the flight duty station a quick-donning type of oxygen mask which will readily supply oxygen upon demand.

4.4.6 Safeguarding of cabin crew and passengers in pressurized aeroplanes in the event of loss of pressurization

Recommendation.—*Cabin crew should be safeguarded so as to ensure reasonable probability of their retaining consciousness during any emergency descent which may be necessary in the event of loss of pressurization and, in addition, they should have such means of protection as will enable them to administer first aid to passengers during stabilized flight following the emergency. Passengers should be safeguarded by such devices or operational procedures as will ensure reasonable probability of their surviving the effects of hypoxia in the event of loss of pressurization.*

Note*. — It is not envisaged that cabin crew will always be able to provide assistance to passengers during emergency descent procedures which may be required in the event of loss of pressurization.*

4.4.7 In-flight operational instructions

Operational Instructions involving a change in the ATS flight plan shall, when practicable, be coordinated with the appropriate ATS unit before transmission to the aeroplane.

Note. *— When the above coordination has not been possible, operational instructions do not relieve a pilot of the responsibility for obtaining an appropriate clearance from an ATS unit, if applicable, before making a change in flight plan.*

4.4.8 Instrument flight procedures

4.4.8.1 One or more instrument approach procedures designed to support instrument approach operations shall be approved and promulgated by the state in which the aerodrome is located to serve each instrument runway or aerodrome utilized for instrument flight operations.

4.4.8.2 All aircraft operated in accordance with instrument flight procedures shall comply with IFR and the aerodrome IAPs approved by the State where the operation will take place.

Note 1.*—See 4.2.8.3 for instrument approach operation classifications.*

Note 2*.— Information for pilots on flight procedure parameters and operational procedures is contained in PANS-OPS (ICAO Doc 8168), Volume I. Criteria for the construction of instrument flight procedures for the guidance of procedure specialists are provided in PANS- OPS (ICAO Doc 8168), Volume II. Obstacle clearance criteria and procedures used in certain States may differ from PANS-OPS, and knowledge of these differences is important for safety reasons (see Chapter 3, 3.1.1).*

4.4.9 Aeroplane operating procedures for noise abatement

4.4.9.1 **Recommendation. —** *Aeroplane operating procedures for noise abatement should comply with the provisions of PANS-OPS (Doc 8168), Volume I.*

4.4.9.2 **Recommendation**. — *Noise abatement procedures specified by the operator for any one aeroplane type should be the same for all aerodromes*.

***Note**. — A single procedure may not satisfy the requirements at some aerodromes.*

4.4.10 Aeroplane operating procedures for rates of climb and descent

Recommendation.— *Unless otherwise specified in an air traffic control instruction, to avoid unnecessary airborne collision avoidance system (ACAS II) resolution advisories in aircraft at or approaching adjacent altitudes or flight levels, operators should specify procedures by which an aeroplane climbing or descending to an assigned altitude or flight level, especially with an autopilot engaged, may do so at a rate less than 8 m/sec or 1 500 ft/min (depending on the instrumentation available) throughout the last 300 m (1 000 ft) of climb or descent to the assigned level when the pilot is made aware of another aircraft at or approaching an adjacent altitude or flight level.*

***Note**. — Material concerning the development of these procedures is contained in the PANS-OPS (Doc 8168) Volume I, Part III, Section 3, Chapter 3.*

4.4.11 Aeroplane Operating Procedure for landing purpose

4.4.11.1 No pilot shall continue an approach below 300 m (1000 ft.) above the aerodrome elevation or beginning of the final approach segment (FAS) unless:

a) A source approved by the CAAB issues a weather report for that aerodrome.

b) The latest weather report for that aerodrome reports the visibility or controlling RVR to be equal to or more than the minimums prescribed for that procedure; and

c) The given available runway surface condition information and the aeroplane performance information indicate that a safe landing can be made.

4.4.11.2 If a pilot begins the FAS of an IAP and subsequently receives a weather report indicating below-minimum conditions, the pilot may continue the approach to DH or MDA.

***Note 1**.— The procedures used by aerodromes to assess and report runway surface conditions are contained in the PANS-Aerodromes (Doc 9981) and those for using runway surface condition information on board aircraft are in the Aeroplane Performance Manual (ICAO Doc 10064).*

***Note 2**.— Guidance on development of aeroplane performance information is contained in the Aeroplane Performance Manual (ICAO Doc 10064).*

4.5 DUTIES OF PILOT-IN COMMAND (PIC)

4.5.1 The pilot-in-command (PIC) shall be responsible for the safety of all crew members, passengers, and cargo on board when the doors are closed. The pilot- in-command shall also be responsible for the operations and safety of the aeroplane from the moment the aeroplane is ready to move for the purpose of taking off until the moment it finally comes to rest at the end of the flight and the engine(s) used as primary propulsion units are shut down.

4.5.2 The pilot-in-command shall ensure that the checklists specified in 4.2.6 are complied with in detail.

4.5.3 The pilot-in-command shall be responsible for notifying the nearest appropriate authority by the quickest available means of any accident involving the aeroplane, resulting in serious injury or death of any person or substantial damage to the aeroplane or property.

***Note.** — A definition of the term "serious injury" is contained in ANO 13.*

4.5.4 The pilot-in-command shall be responsible for reporting all known or suspected defects in the aeroplane, to the operator, at the termination of the flight.

4.5.5 The pilot-in-command shall be responsible for the journey log book or the general declaration containing the information listed in 11.4.1.

4.5.6 The PIC of an aircraft shall, whether manipulating the controls or not, be responsible for the operation of the aircraft in accordance with the rules of the air, except that the PIC may depart from these rules in emergency circumstances that render such departure necessary in the interests of safety.

4.5.7 The PIC of an aircraft shall have final authority as to the operation of the aircraft while he or she is in command.

4.6 DUTIES OF FLIGHT OPERATIONS OFFICER/FLIGHT DISPATCHER

4.6.1. For safe conduct of flight, a flight operations officer/flight dispatcher in conjunction with a method of control and supervision of flight operations in accordance with 4.2.1.3 shall:

a) Assist the PIC in-flight preparation and provide the relevant information required.

b) Assist the PIC in preparing the operational and ATC flight plans, sign the dispatch copy of the flight release.

c) Furnish the PIC while in-flight, by appropriate means, with information which may be necessary for the safe conduct of the flight; and

d) Notify the appropriate ATS unit when the position of the aeroplane cannot be determined by an aircraft tracking capability and attempts to establish communication are unsuccessful.

e) The duties of the flight operations officer/flight dispatcher mentioned above shall be included in the approved operation manual of the operator.

4.6.2 In the event of an emergency, a flight operations officer/flight dispatcher shall:

a) initiate such procedures as outlined in the operations manual while avoiding taking any action that would conflict with ATC procedures; and

b) convey safety-related information to the pilot-in-command that may be necessary for the safe conduct of the flight, including information related to any amendments to the flight plan that become necessary in the course of the flight.

Note. *— It is equally important that the pilot-in-command also convey similar information to the flight operations officer/ flight dispatcher during the flight, particularly in the context of emergency situations.*

4.7 ADDITIONAL REQUIREMENTS FOR OPERATIONS BY AEROPLANES WITH TURBINE ENGINES BEYOND 60 MINUTES TO AN EN-ROUTE ALTERNATE AERODROME INCLUDING EXTENDED DIVERSION TIME OPERATIONS (EDTO)

Refer to ANO (OPS) Part SPA Sub part F.

4.8 CARRY-ON BAGGAGE

4.8.1 No person may allow the boarding of carry-on baggage unless it can be adequately and securely stowed in accordance with the AOC holder's approved OM procedures.

4.8.2 No person may allow aircraft passenger entry doors to be closed in preparation for taxi or pushback unless at least one required crew member has verified that each article of baggage has been properly stowed in overhead racks with approved restraining devices or doors, or in approved locations.

4.8.3 No person may allow carry-on baggage to be stowed in a location that would cause that location to be loaded beyond its maximum placard mass limitation.

4.8.4 Operator shall not carry any baggage under seat stowage unless the seat is equipped with a restraint bar and the baggage is of such size that it may adequately be restrained by the equipment.

4.8.5 Operator shall ensure that items are not be stowed in the toilet or against bulkheads that are incapable of restraining against movement forwards, sideways or upwards and unless the bulkheads carry a placard specifying the greatest mass that may be placed there.

4.8.6 Operator shall ensure that no baggage or cargo shall be placed in lockers which prevent latched doors from being closed securely.

4.8.7 Operator shall ensure that baggage and cargo are not placed which are likely to impede access to emergency equipment

4.8.8 Operator shall ensure that Checks must be made before take-off , landing and whenever the fasten seat belts sign are illuminated or it is otherwise so ordered to ensure that baggage is stowed where it cannot impede evacuation from the aircraft or cause injury by falling or other movement, as may be appropriate to the phase of flight.

4.8.9 Operator shall ensure that No animal, bird or reptile shall be taken aboard or carried on any aircraft to, from and within Bangladesh, except under, and in accordance with, a general or special permit in writing issued by Chairman in this behalf, and subject to such conditions, if any, as may be specified therein.

4.8.10 Operator shall ensure that a mix of the passengers and live animals should not be permitted except Pets (weighing not more than 8 kg) and guide dog for blind persons only.

Note. *— The stowage locations shall be capable of restraining the articles in crash impacts severe enough to induce the ultimate inertia forces specified in the emergency landing conditions under which the aircraft was type certificated.*

4.9 ADDITIONAL REQUIREMENTS FOR SINGLE PILOT OPERATIONS UNDER THE INSTRUMENT FLIGHT RULES (IFR) OR AT NIGHT

4.9.1 An aeroplane shall not be operated under IFR or at night by a single pilot unless approved by the CAAB.

4.9.2 An aeroplane shall not be operated under IFR or at night by a single pilot unless:

a) The Aircraft Flight Manual does not require a flight crew of more than one.

b) The aeroplane is propeller driven;

c) The maximum approved passenger seating configuration is not more than nine.

d) The maximum certificated take-off mass does not exceed 5700 kg.

e) The aeroplane is equipped as described in paragraphs 6.23; and

f) The PIC has satisfied the requirements of experience, training, checking, and recency described in 9.4.5.

4.10 FATIGUE MANAGEMENT

Note*.—Guidance on the development and implementation of fatigue management regulations is contained in the* Manual for the Oversight of Fatigue Management Approaches *(ICAO Doc 9966).*

4.10.1 For the purpose of managing fatigue these regulations are based upon scientific principles, knowledge and operational experience with the aim of ensuring that flight and cabin crew members are performing at an adequate level of alertness. Accordingly, the following requirement has been established by CAAB:

a) prescriptive regulations for flight time, flight duty period, duty period limitations and rest period requirements; and

b) where authorizing the operator to use a Fatigue Risk Management System (FRMS) to manage fatigue, FRMS regulations.

4.10.2 Managing Fatigue-Related Safety Risks

For managing fatigue-related safety risks, an Operator/AOC holder in compliance with 4.10.1 and for the purposes of managing its fatigue related safety risk, establish either:

a) Flight time, flight duty period, duty period limitations and rest period requirements that are within the prescriptive fatigue management regulations as described in Appendix 11 of this ANO; or

b) An FRMS in compliance with 4.10.6 for all operations; or

c) A FRMS in compliance with 4.10.6 for part of its operations and the requirements of 4.10.2 a) for the remainder of its operations

Note.—*Complying with the prescriptive fatigue management regulations does not relieve the operator of the responsibility to manage its risks, including fatigue- related risks, using its safety management system (SMS) in accordance with the provisions of ANO 19.*

4.10.3 Where the operator adopts prescriptive fatigue management regulations for part or all its operations, the CAAB may approve, in exceptional circumstances, variations to these regulations on the basis of a risk assessment provided by the operator. Approved variations shall provide a level of safety equivalent to, or better than that achieved through the prescriptive fatigue management regulations.

4.10.4 The CAAB shall approve an operator's FRMS before it take the place of any or all the prescriptive fatigue management regulations. An approved FRMS shall provide a level of safety equivalent to, or better than, the prescriptive fatigue management regulations.

4.10.5 An Operator using an FRMS shall adhere to the following provisions of the FRMS approval process:

a) establish maximum values for flight times and/or flight duty period(s) and duty period(s), and minimum values for rest periods that shall be based upon scientific principles and knowledge, subject to safety assurance processes;

b) mandate a decrease in maximum values and an increase in minimum values if be operator's data indicates these values are too high or too low, respectively; and

c) approve any increase in maximum values or decrease in minimum values only after evaluating the operator's justification for such changes, based on accumulated FRMS experiences and fatigue-related data.

Note. — Safety assurance processes are described in Appendix 7.

4.10.6 An operator implementing an FRMS to manage fatigue-related safety risks shall, as a minimum.

a) Incorporate scientific principles and knowledge within the FRMS.

b) Identify fatigue-related safety hazards and the resulting risks on an ongoing basis.

c) Ensure that the remedial actions necessary to effectively mitigate the risks associated with the hazards, are implemented promptly.

d) Provide for continuous monitoring and regular assessment of the mitigation of fatigue risks achieved by such actions; and

e) Provide for continuous improvement to the overall performance of the FRMS.

Note 1*. — Detailed requirements for an FRMS are in Appendix 7 of this manual.*

Note 2*.—Provisions on the protection of safety data, safety information and related sources are contained in ANO 19, Appendix 2.*

4.10.7 **Recommendation**. — *CAAB requires that, where the operator has an FRMS, it is integrated with the operator's SMS.*

Note*. — The integration of FRMS and SMS is described in the Manual for the Oversight of Fatigue Management Approaches (ICAO Doc 9966).*

4.10.8 The operator is required to maintain records for all its flight and cabin crew members of flight time, flight duty periods, duty periods, and rest periods for a period three years.

CHAPTER-5. AEROPLANE PERFORMANCE OPERATING LIMITATIONS

5.1 GENERAL

5.1.1 Aeroplanes shall be operated in accordance with a comprehensive and detailed code of performance established by the CAAB in compliance with the applicable provisions of this chapter.

5.1.2 Except as provided in 5.4, single-engine aeroplanes shall only be operated in conditions of weather and light, and over such routes and diversions therefrom, that permit a safe forced landing to be executed in the event of engine failure.

5.1.3 **Recommendation**. — *For aeroplanes for which Parts IIIA and IIIB of Annex 8 are not applicable because of the exemption provided for in Article 41 of the Convention, the State of Registry should ensure that the level of performance specified in 5.2 should be met as far as practicable.*

5.2 APPLICABLE TO AEROPLANES CERTIFICATE IN ACCORDANCE WITH ANO (AW) PART 21

5.2.1 The provisions contained in 5.2.2 to 5.2.11 inclusive are applicable to the large aeroplanes to which ANO (AW) PART 21 are applicable.

Note.—*The following provisions do not include quantitative specifications comparable to those found in national airworthiness codes. In accordance with 5.1.1, they are to be supplemented by national requirements prepared by the Civil Aviation Authority of Bangladesh (CAAB).*

5.2.2 The level of performance defined by the appropriate parts of the comprehensive and detailed national code referred to in 5.1.1 for the aeroplanes designated in 5.2.1 shall be at least substantially equivalent to the overall level embodied in the provisions of this chapter.

5.2.3 An aeroplane shall be operated in compliance with the terms of its certificate of airworthiness and within the approved operating limitations contained in its flight manual.

5.2.4 The Civil Aviation Authority of Bangladesh (CAAB) requires that such precautions as are reasonably possible to ensure that the general level of safety contemplated by these provisions is maintained under all expected operating conditions, including those not covered specifically by the provisions of this chapter.

5.2.5 No person shall operate a flight unless the performance information provided in the flight manual, supplemented as necessary with other data acceptable to the Civil Aviation Authority of Bangladesh (CAAB) indicates that the provisions of 5.2.6 to 5.2.11 can be complied with for the flight to be undertaken.

5.2.6 In applying the provisions of this chapter, account shall be taken of all factors that significantly affect the performance of the aeroplane, including but not limited to the mass of the aeroplane, the operating procedures, the pressure-altitude appropriate to the elevation of the aerodrome, the runway slope, the ambient temperature, the wind, and surface conditions of the runway at the expected time of use, i.e. presence of snow, slush, water, and/or ice for landplanes, water surface condition for seaplanes. Such factors shall be taken into account directly as operational parameters or indirectly by means of allowances or margins, which may be provided in the scheduling of performance data or in the comprehensive and detailed code of performance in accordance with which the aeroplane is being operated.

Note. *— Guidelines for using runway surface condition information on board aircraft in accordance with 4.4.11 are contained in the Aeroplane Performance Manual (ICAO Doc 10064).*

5.2.7 Mass limitations

a) The mass of the aeroplane at the start of take-off shall not exceed the mass at which 5.2.8 is complied with, or the mass at which 5.2.9, 5.2.10 and 5.2.11 are complied with, allowing for expected reductions in mass as the flight proceeds, and for such fuel jettisoning as is envisaged in applying 5.2.9 and 5.2.10 and, in respect of alternate aerodromes, 5.2.7 c) and 5.2.11.

b) In no case shall the mass at the start of take-off exceed the maximum take-off mass specified in the flight manual for the pressure-altitude appropriate to the elevation of the aerodrome, and, if used as a parameter to determine the maximum take-off mass, any other local atmospheric condition.

c) In no case shall the estimated mass for the expected time of landing at the aerodrome of intended landing and at any destination alternate aerodrome, exceed the maximum landing mass specified in the flight manual for the pressure-altitude appropriate to the elevation of those aerodromes, and if used as a parameter to determine the maximum landing mass, any other local atmospheric condition.

d) In no case shall the mass at the start of take-off, or at the expected time of landing at the aerodrome of intended landing and at any destination alternate aerodrome, exceed the relevant maximum masses at which compliance has been demonstrated with the applicable noise certification Standards in ANO 16, Volume I, unless otherwise authorized in exceptional circumstances for a certain aerodrome or a runway where there is no noise disturbance problem, by the competent authority of the State in which the aerodrome is situated.

5.2.8 Take-off: The aeroplane shall be able, in the event of a critical engine failing, or for other reasons, at any point in the take-off, either to discontinue the take-off and stop within the accelerate-stop distance available, or to continue the take-off and clear all obstacles along the flight path by an adequate vertical or horizontal distance until the aeroplane is in a position to comply with 5.2.9. When determining the resulting take-off obstacle accountability area, the operating conditions, such as the crosswind component and navigation accuracy, must be considered.

5.2.8.1 In determining the length of the runway available, account shall be taken of the loss, if any, of runway length due to alignment of the aeroplane prior to take-off.

5.2.9 *En route — one-engine-inoperative*. The aeroplane shall be able, in the event of the critical engine becoming inoperative at any point along the route or planned diversions therefrom, to continue the flight to an aerodrome at which the Standard of 5.2.11 can be met, without flying below the minimum flight altitude at any point.

5.2.10 En *route — two engines inoperative.* In the case of aeroplanes having three or more engines, on any part of a route where the location of en-route alternate aerodromes and the total duration of the flight are such that the probability of a second engine becoming inoperative must be allowed for if the general level of safety implied by the Standards of this chapter is to be maintained, the aeroplane shall be able, in the event of any two engines becoming inoperative, to continue the flight to an en-route alternate aerodrome and land.

5.2.11 Landing. The aeroplane shall, at the aerodrome of intended landing and at any alternate aerodrome, after clearing all obstacles in the approach path by a safe margin, be able to land, with assurance that it can come to a stop or, for a seaplane, to a satisfactorily low speed, within the landing distance available. Allowance shall be made for expected variations in the approach and landing techniques, if such allowance has not been made in the scheduling of performance data.

Note.*—Guidelines on appropriate margins for the "at time of landing" distance assessment is contained in the Aeroplane Performance Manual (ICAO Doc 10064).*

5.3 OBSTACLE DATA

5.3.1 Obstacle data shall be provided to enable the operator to develop procedures to comply with 5.2.9.

Note. — *See ANO 4 and ANO 15, Chapter 5 and Appendix 1 and the Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM), Chapter 5 for methods of presentation of certain obstacle data.*

5.3.2 The operator shall take account of charting accuracy when assessing compliance with 5.2.8.

5.4 ADDITIONAL REQUIREMENTS FOR OPERATIONS OF SINGLE-ENGINE TURBINE-POWERED AEROPLANES AT NIGHT AND/ OR IN INSTRUMENT METEOROLOGICAL CONDITIONS (IMC)

5.4.1 In approving operations by single-engine turbine-powered aeroplanes at night and/or in IMC, The operator shall ensure that the airworthiness certification of the aeroplane is appropriate and that the overall level of safety intended by the provisions of ANO 6-1, ANO 6-2, ANO 6-3 and ANO (AW) PART 21 is provided by:

a) the reliability of the turbine engine.

b) the operator 's maintenance procedures, operating practices, flight dispatch procedures and crew training programmes; and

c) equipment and other requirements provided in accordance with Appendix 3 of this manual.

5.4.2 All single-engine turbine-powered aeroplanes operated at night and/or in IMC shall have an engine trend monitoring system, and those aeroplanes for which the individual certificate of airworthiness is first issued on or after 1 January 2005 shall have an automatic trend monitoring system.

CHAPTER- 6. AEROPLANE INSTRUMENTS, EQUIPMENT AND FLIGHT DOCUMENTS

Note. — Specifications for the provision of aeroplane communication and navigation equipment are contained in Chapter 7.

6.1 GENERAL

6.1.1 In addition to the minimum equipment necessary for the issuance of a certificate of airworthiness, the instruments, equipment, and flight documents prescribed in the following paragraphs shall be installed or carried, as appropriate, in aeroplanes according to the aeroplane used and to the circumstances under which the flight is to be conducted. The prescribed instruments and equipment, including their installation, shall be approved or accepted by the Civil Aviation Authority of Bangladesh (CAAB).

6.1.2 An aeroplane shall carry a certified true copy of the air operator certificate specified in Chapter 4, 4.2.1, and a copy of the operations specifications relevant to the aeroplane, issued in conjunction with the certificate. The certificate and the associated operations specifications issued by the Civil Aviation Authority of Bangladesh (CAAB) shall be in English.

Note. *— Provisions or the content of the air operator certificate and its associated operations specifications are contained in 4.2.1.5 and 4.2.1.6.*

6.1.3 An operator shall include in the operations manual a minimum equipment list (MEL), approved by The Civil Aviation Authority of Bangladesh (CAAB) which will enable the pilot-in-command to determine whether a flight may be commenced or continued from any intermediate stop should any instrument, equipment or systems become inoperative. If the Civil Aviation Authority of Bangladesh (CAAB) is not the State of Registry, then the operator shall ensure that the MEL does not affect the aeroplane ‘s compliance with the airworthiness requirements applicable in the State of Registry.

Note*.—Attachment C contains guidance on the minimum equipment list.*

6.1.4 An operator shall provide operations staff and flight crew with an aircraft operating manual, for each aircraft type operated, containing the normal, abnormal and emergency procedures relating to the operation of the aircraft. The manual shall include details of the aircraft systems and of the checklists to be used. The design of the manual shall observe Human Factors principles.

Note*. — Guidance material on the application of Human Factors principles can be found in the Human Factors Training Manual (ICAO Doc 9683).*

6.1.5 Aeroplane operated under an Article 83 bis agreement

Note. *— Guidance concerning the transfer of responsibilities by the State of Registry to the State of the Operator in accordance with Article 83 bis is contained in ANO (AOC).*

6.1.5.1 An aeroplane, when operating under an Article 83 bis agreement entered into between the State of Registry and the CAAB, shall carry a certified true copy of the agreement summary, in either an electronic or hard copy format.

Note. *— Guidance regarding the agreement summary is contained in the Manual on the Implementation of Article 83 bis of the Convention on International Civil Aviation (ICAO Doc 10059).*

6.1.5.2 The agreement summary of an Article 83 bis agreement shall be accessible to a civil aviation safety inspector to determine which functions and duties are transferred under the agreement by the State of Registry to CAAB, when conducting surveillance activities such as ramp checks.

Note. *— Guidance for the civil aviation safety inspector conducting an inspection of an aeroplane operated under an article 83 bis agreement is contained in the CAAB Manual ANO(AOC).*

6.1.5.3 The agreement summary shall be transmitted to ICAO together with the Article 83 bis Agreement for registration with the ICAO Council by the State of Registry or the State of the Operator.

Note. *— The agreement summary transmitted with the Article 83 bis agreement registered with the ICAO Council contains the list of all aircraft affected by the agreement. However, the certified true copy to be carried on board as per 6.1.5.1 will need to list only the specific aircraft carrying the copy.*

6.1.5.4 **Recommendation. —** *The agreement summary shall contain the information in Appendix 10 for the specific aircraft and shall follow the layout of Appendix 10, paragraph 2.*

6.2 ALL AEROPLANES ON ALL FLIGHTS

6.2.1 All aircraft shall be equipped with flight instruments that enable the flight crew to:

a) Control the flight path of the aircraft.

b) Carry out any required procedural maneuvers; and

c) Observe the operating limitations of the aircraft in the expected operating conditions.

d) For all aircraft when a means is provided for transferring an instrument from its primary operating system to an alternative system, the means shall include a positive positioning control and shall be marked to indicate clearly which system is being used.

e) For all aircraft the instruments that are used by any one pilot shall be so arranged as to permit the pilot to see the indications readily from his or her station, with the minimum practicable deviation from the position and line of vision that he or she normally assumes when looking forward along the flight path.

6.2.2 An aeroplane shall be equipped with:

a) accessible and adequate medical supplies.

Recommendation. -*The medical supplies shall comprise:*

1) one or more first-aid kits for the use of cabin crew in managing incidents of ill health; and

2) for aeroplanes required to carry cabin crew as part of the operating crew, one universal precaution kit (two for aeroplanes authorized to carry more than 250 passengers) for the use of cabin crew members in managing incidents of ill health associated with a case of suspected communicable disease, or in the case of illness involving contact with body fluids; and

3) for aeroplanes authorized to carry more than 100 passengers, on a sector length of more than two hours, a medical kit, for the use of medical doctors or other qualified persons in treating in-flight medical emergencies.

Note.*— Guidance on the types, number, location and contents of the medical supplies is given in Attachment A.*

b) portable fire extinguishers of a type which, when discharged, will not cause dangerous contamination of the air within the aeroplane. At least one shall be located in:

1) the pilot‘s compartment; and

2) each passenger compartment that is separate from the pilot‘s compartment and that is not readily accessible to the flight crew;

Note 1*. — Any portable fire extinguisher fitted in accordance with the certificate of airworthiness of the aeroplane may count as one prescribed.*

Note 2. *— Refer to 6.2.2.1 for fire extinguishing agents*.

c) 1) a seat or berth for each person over an age to be determined by the Civil Aviation Authority of Bangladesh;

2) a seat belt for each seat and restraining belts for each berth; and

3) a safety harness for each flight crew seat. The safety harness for each pilot seat shall incorporate a device which will automatically the occupant‘s torso in the event of rapid deceleration;

Recommendation. —*The safety harness for each pilot seat should incorporate a device to prevent a suddenly incapacitated pilot from interfering with the flight controls*.

Note. — Safety *harness includes shoulder straps and a seat belt which may be used independently*.

d) means of ensuring that the following information and instructions are conveyed to :

1) when seat belts are to be fastened.

2) when and how oxygen equipment is to be used if the carriage of oxygen is required;

3) restrictions on smoking.

4) location and use of life jackets or equivalent individual flotation devices where their carriage is required; and

5) location and method of opening emergency exits; and

e) spare electrical fuses of appropriate ratings for replacement of those accessible in flight.

6.2.2.1 Any agent used in a built-in fire extinguisher for each lavatory disposal receptacle for towels, paper or waste in an aeroplane for which the individual certificate of airworthiness is first issued on or after 31 December 2011 and any extinguishing agent used in a portable fire extinguisher in an aeroplane for which the individual certificate of airworthiness is first issued on or after 31 December 2018 shall:

a) meet the applicable minimum performance requirements of the Civil Aviation Authority of Bangladesh (CAAB); and

b) not be of a type listed in the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer as it appears in the Eighth Edition of the Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer.

Note.*—Information concerning extinguishing agents is contained in the UNEP Halons Technical Options Committee Technical Note No. 1 –New Technology Halon Alternatives and FAA Report No. DOT/ FAA/AR-99-63, Options to the Use of Halons for Aircraft Fire Suppression Systems.*

6.2.3 An aeroplane shall carry:

a) the operations manual prescribed in Chapter 4, 4.2.3, or those parts of it that pertain to flight operations;

c) the flight manual for the aeroplane, or other documents containing performance data required for the application of Chapter 5 and any other information necessary for the operation of the aeroplane within the terms of its certificate of airworthiness, unless these data are available in the operations manual; and

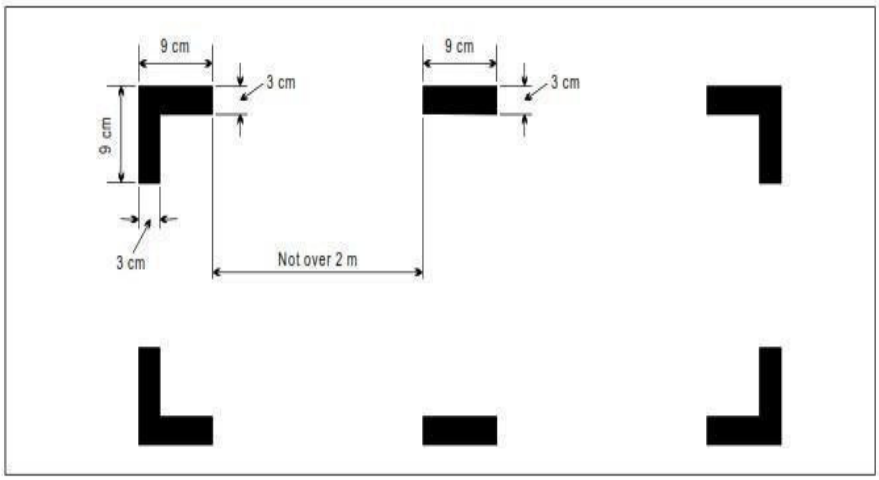
d) current and suitable charts to cover the route of the proposed flight and any route along which it is reasonable to expect that the flight may be diverted.

6.2.4 Marking of break-in points

6.2.4.1 If areas of the fuselage suitable for break-in by rescue crews in an emergency are marked on an aeroplane, such areas shall be marked as shown below (see figure following). The colour of the markings shall be red or yellow, and if necessary, they shall be outlined in white to contrast with the background.

6.2.4.2 If the corner markings are more than 2 m apart, intermediate lines 9 cm × 3 cm shall be inserted so that there is no more than 2 m between adjacent markings.

Note. — *This provision does not require any aeroplane to have break-in areas*.



MARKING OF BREAK-IN POINTS (see-6.2.4)

6.3 FLIGHT RECORDERS

Note 1. — Crash-protected flight recorders comprise one or more of the following:

— a flight data recorder (FDR),

— a cockpit voice recorder (CVR),

— an airborne image recorder (AIR),

— a data link recorder (DLR).

As per Appendix 8, image and data link information may be recorded on either the CVR or the FDR.

Note 2.—Lightweight flight recorders comprise one or more of the following:

— an aircraft data recording system (ADRS),

— a cockpit audio recording system (CARS),

— an airborne image recording system (AIRS),

— a data link recording system (DLRS).

As per Appendix 8, image and data link information may be recorded on either the CARS or the ADRS.

Note 3*. — Detailed requirements on flight recorders are contained in Appendix 8.*

Note 4.— *For aeroplanes for which the application for type certification is submitted to a Contracting State before1 January 2016, specifications applicable to crash- protected flight recorders may be found in EUROCAE ED-112, ED-56A, ED-55, Minimum Operational Performance Specifications (MOPS), or earlier equivalent documents.*

Note 5.— *For aeroplanes for which the application for type certification is submitted to a Contracting State on or after 1 January 2016, specifications applicable to crash- protected flight recorders may be found in EUROCAE ED-112A, Minimum Operational Performance Specification (MOPS), or equivalent documents.*

Note 6. — *Specifications applicable to lightweight flight recorders may be found in EUROCAE ED-155, Minimum Operational Performance Specification (MOPS), or equivalent documents.*

Note 7*. — Chapter 3 contains requirements for Civil Aviation Authority of Bangladesh regarding the use of voice, image and/or data recordings and transcripts.*

6.3.1 Flight data recorders and aircraft data recording systems

Note. *— Parameters to be recorded are listed in Tables A8-1 and A8-3 of Appendix 8 of this manual.*

6.3.1.1 Applicability

6.3.1.1.1 All turbine- engine aeroplanes of a maximum certificated take-off mass of 5 700 kg or less for which the application for type certification is submitted to CAAB on or after 1 January 2016 shall be equipped with:

a) an FDR which shall record at least the first 16 parameters listed in Table A8-1 of Appendix 8 of this manual; or

b) a Class C AIR or AIRS which shall record at least the flight path and speed parameters displayed to the pilot(s), as defined in 2.2.3 of Appendix 8 of this manual; or

c) an ADRS which shall record at least the first 7 parameters listed in Table A8-3 of Appendix 8 of this manual.

Note 1*.—The application for type certification is submitted to CAAB refers to the date of application of the original —Type Certificate for theairplane type, not the date of certification of particular aeroplane variants or derivative models.*

Note 2. *— AIR or AIRS classification is defined in 6.2 of Appendix 8 of this manual*.

6.3.1.1.2 **Recommendation.—***All turbine-engined aeroplanes of a maximum certificated take-off mass of 5700 kg or less for which the individual certificate of airworthiness is first issued on or after 1 January 2016 should be equipped with:*

a) an FDR which should record at least the first 16 parameters listed in Table A8-1 of Appendix 8; or

b) a Class C AIR or AIRS which should record at least the flight path and speed parameters displayed to the pilot(s), as defined in 2.2.3 of Appendix 8; or

c) an ADRS which should record at least the first 7 parameters listed in Table A8-3 of Appendix 8.

6.3.1.1.3 All aeroplanes of a maximum certificated take-off mass of over 27000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 1989 shall be equipped with an FDR which shall record at least the first 32 parameters listed in Table A 8-1 of Appendix- 8 of this manual.

6.3.1.1.4 All aeroplanes of a maximum certificated take-off mass of over 5700 kg, up to and including 27 000 kg, for which the individual certificate of airworthiness is first issued on or after 1 January 1989, shall be equipped with an FDR which shall record at least the first 16 parameters listed in Table A8-1 of Appendix 8 of this manual.

6.3.1.1.5 **Recommendation.**—*All multi-engined turbine-engined aeroplanes of a maximum certificated take-off mass of 5700 kg or less for which the individual certificate of airworthiness is first issued on or after 1 January 1990 should be equipped with an FDR which should record at least the first 16 parameters listed in Table A8-1 of Appendix 8.*

6.3.1.1.6 All turbine-engine aeroplanes, for which the individual certificate of airworthiness was First issued before 1 January 1989, with a maximum certificated take-off mass of over 5700 kg, except those in 6.3.1.1.8, shall be equipped with an FDR which shall record at least the first 5 parameters listed in Table A8-1 of Appendix 8 of this manual.

6.3.1.1.7 **Recommendation.**— *All turbine-engined aeroplanes, for which the individual certificate of airworthiness was first issued on or after 1 January 1987 but before 1 January 1989, with a maximum certificated take-off mass of over 5700 kg, except those in 6.3.1.1.8, should be equipped with an FDR which should record at least the first 9 parameters listed in Table A8-1 of Appendix 8.*

6.3.1.1.8 All turbine-engine aeroplanes, for which the individual certificate of airworthiness was first issued on or after 1 January 1987 but before 1 January 1989, with a maximum certificated take- off mass of over 27000 kg that are of types of which the prototype was certificated by the appropriate national authority after 30 September 1969 shall be equipped with an FDR which shall record at least the first 16 parameters listed in Table A8-1 of Appendix 8 of this manual.

6.3.1.1.9 **Recommendation.**—*All turbine-engined aeroplanes, for which the individual certificate of airworthiness was first issued before 1 January 1987, with a maximum certificated take-off mass of over 27 000 kg that are of types of which the prototype was certificated by the appropriate national authority after 30 September 1969 should be equipped with an FDR which should record, in addition to the first 5 parameters listed in Table A8-1of Appendix 8, such additional parameters as are necessary to meet the objectives of determining:*

a) the attitude of the aeroplane in achieving its flight path; and

b) *the basic forces acting upon the aeroplane resulting in the achieved flight path and the origin of such basic forces.*

6.3.1.1.10 All aeroplanes of a maximum certificated take-off mass of over 5700 kg for which the individual certificate of airworthiness is first issued after 1 January 2005 shall be equipped with an FDR which shall record at least the first 78 parameters listed in Table A8-1 of Appendix 8 of this manual.

6.3.1.1.11 All aeroplanes of a maximum certificated take-off mass of over 5700 kg for which the application for type certification is submitted to Civil Aviation Authority of Bangladesh (CAAB) on or after 1 January 2023 shall be equipped with an FDR capable of recording at least the 82 parameters listed in Table A8-1 of Appendix 8 of this manual.

6.3.1.1.12 **Recommendation.**—*All aeroplanes of a maximum certificated take-off mass of over 5700 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2023 shall be equipped with an FDR capable of recording at least the 82 parameters listed in Table A8-1 of Appendix 8.*

6.3.1.2 Recording technology

6.3.1.2.1 FDRs or ADRS shall not use engraving metal foil, frequency modulation. (FM), photographic film or magnetic tape.

6.3.1.3 Duration

6.3.1.3.1 All FDRs shall retain the information recorded during at least the last 25 hours of their operation, with the exception of those installed on aeroplanes referenced in 6.3.1.1.5 for which the FDR shall retain the information recorded during at least the last 30 minutes of its operation, and, in addition, sufficient information from the preceding take-off for calibration purposes.

6.3.2 Cockpit voice recorders and cockpit audio recording systems

6.3.2.1 Applicability

6.3.2.1.1 All turbine-engine aeroplanes of a maximum certificated take-off mass of over 2250 kg, up to and including 5700 kg, for which the application for type certification is submitted to CAAB on or after 1 January 2016 and required to be operated by more than one pilot shall be equipped with either a CVR or a CARS.

6.3.2.1.2 **Recommendation**.—*All turbine-engined aeroplanes of a maximum certificated take-off mass of 5700 kg or less for which the individual certificate of airworthiness is first issued on or after 1 January 2016 and required to be operated by more than one pilot should be equipped with either a CVR or a CARS.*

6.3.2.1.3 All aeroplanes of a maximum certificated take-off mass of over 5700 kg for which the individual certificate of airworthiness is first issued on or after 1 January 1987 shall be equipped with a CVR.

6.3.2.1.4 All turbine-engine aeroplanes, for which the individual certificate of airworthiness was first issued before 1 January 1987, with a maximum certificated take-off mass of over 27000 kg that are of types of which the prototype was certificated by the appropriate national authority CAAB after 30 September 1969 shall be equipped with a CVR.

6.3.2.1.5 **Recommendation**.- *All turbine-engined aeroplanes, for which the individual certificate of airworthiness was first issued before 1 January 1987, with a maximum certificated take-off mass of over 5700 kg up to and including 27 000 kg that are of types of which the prototype was certificated by the appropriate national authority after 30 September 1969 should be equipped with a CVR.*

6.3.2.2 Recording technology CVRs and CARS shall not use magnetic tape or wire.

6.3.2.3 Duration

6.3.2.3.1 All CVRs shall retain the information recorded during at least the last 2 hours of their operation.

6.3.2.3.2 All aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2022 shall be equipped with a CVR which shall retain the information recorded during at least the last 25 hours of its operation.

6.3.2.3.3 All aeroplanes that are required to be equipped with CARS, and for which the individual certificate of airworthiness is first issued on or after 1 January 2025 shall be equipped with a CARS which shall retain the information recorded during at least the last two hours of their operation.

6.3.2.4 Cockpit voice recorder alternate power source

6.3.2.4.1 An alternate power source shall automatically engage and provide 10 minutes, plus or minus one minute, of operation whenever aeroplane power to the recorder ceases, either by normal shutdown or by any other loss of power. The alternate power source shall power the CVR and its associated cockpit area microphone components. The CVR shall be located as close as practicable to the alternate power source.

Note 1. *— Alternate means separate from the power source that normally provides power to the CVR. The use of aeroplane batteries or other power sources is acceptable provided that the requirements above are met and electrical power to essential and critical loads is not compromised.*

Note 2*. — When the CVR function is combined with other recording functions within the same unit, powering the other functions is allowed.*

6.3.2.4.2 All aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the application for type certification is submitted to CAAB or after 1 January 2018 shall be provided with an alternate power source, as defined in 6.3.2.4.1, that powers the forward CVR in the case of combination recorders.

6.3.2.4.3 **Recommendation.**—*All aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2018 should be provided with an alternate power source, as defined in 6.3.2.4.1, that powers at least one CVR.*

6.3.3 **Data link recorders**

6.3.3.1 Applicability

6.3.3.1.1 No person may operate an aeroplane for which the individual certificate of airworthiness is first issued on or after 1 January 2016, and which utilize any of the data link communications applications listed in 5.1.2 of Appendix 8 of this manual and are required to carry a CVR, unless the aircraft records on a crash-protected flight recorder the data link communications messages.

6.3.3.1.2 No person may operate an aeroplane for which the individual certificate of airworthiness was first issued before 1 January 2016, that are required to carry a CVR and are modified on or after 1 January 2016 to use any of the data link communications applications referred to in 5.1.2 of Appendix 8 , shall record the data link communications messages on a crash-protected flight recorder unless the installed data link communications equipment is compliant with a type certificate issued or aircraft modification first approved prior to 1 January 2016.

Note 1.— *Refer to Table I-5 in Attachment I for examples of data link communication recording requirements.*

Note 2. — *A Class B AIR could be a means for recording data link communications applications messages to and from the aeroplanes where it is not practical or is prohibitively expensive to record those data link communications applications messages on FDR or CVR.*

Note 3.—*The "aircraft modifications" refer to modifications to install the data link communications equipment on the aircraft (e.g. structural, wiring).*

6.3.3.1.3 **Recommendation.—** *All aeroplanes for which the individual certificate of airworthiness was first issued before 1 January 2016, that are required to carry a CVR and are modified on or after 1 January 2016 to use any of the data link communications applications referred to in 5.1.2 of Appendix 8 should record the data link communications messages on a crash-protected flight recorder.*

6.3.3.2 Duration The minimum recording duration shall be equal to the duration of the CVR.

6.3.3.3 Correlation Data link recording shall be able to be correlated to the recorded cockpit audio.

6.3.4 Flight crew-machine interface recordings

6.3.4.1 Applicability

6.3.4.1.1 All aeroplanes of a maximum take-off mass of over 27000 kg for which the application for type certification is submitted to Civil Aviation Authority of Bangladesh (CAAB) or after 1 January 2023 shall be equipped with a crash-protected flight recorder which shall record the information displayed to the flight crew from electronic displays, as well as the operation of switches and selectors by the flight crew as defined in Appendix 8 of this manual.

6.3.4.1.2 **Recommendation.**— *All aeroplanes of a maximum take-off mass of over 5700 kg, up to and including 27000 kg, for which the application for type certification is submitted to a Contracting State on or after 1 January 2023 should be equipped with a crash-protected flight recorder which should record the information displayed to the flight crew from electronic displays, as well as the operation of switches and selectors by the flight crew, as defined in Appendix 8.*

6.3.4.2 Duration

The minimum flight crew-machine interface recording duration shall be at least for the last two hours.

6.3.4.3 Correlation

Flight crew-machine interface recordings shall be able to be correlated to the recorded cockpit audio.

6.3.5 Flight recorders — general

6.3.5.1 Construction and installation

Flight recorders shall be constructed, located and installed so as to provide maximum practical protection for the recordings in order that the recorded information may be preserved, recovered and transcribed. Flight recorders shall meet the prescribed crashworthiness and fire protection specifications.

6.3.5.2 Operation

6.3.5.2.1 Flight recorders shall not be switched off during flight time.

6.3.5.2.2 To preserve flight recorder records, flight recorders shall be deactivated upon completion of flight time following an accident or incident. The flight recorders shall not be reactivated before their disposition as determined in accordance with ANO 13.

***Note 1**. — The need for removal of the flight recorder records from the aircraft will be determined by the investigation authority in Bangladesh conducting the investigation with due regard to the seriousness of an occurrence and the circumstances, including the impact on the operation.*

***Note 2**.—The operator's responsibilities regarding the retention of flight recorder records are contained in 11.6.*

6.3.5.3 Continued serviceability

Operational checks and evaluations of recordings from the flight recorder systems shall be conducted to ensure the continued serviceability of the recorders.

Note.—Procedures for the inspections of the flight recorder systems are given in Appendix 8 of this manual.

6.3.5.4 Flight recorder electronic documentation

Recommendation. — *The documentation requirement concerning FDR and ADRS parameters provided by operators to accident investigation authorities should be in electronic format and take account of industry specifications.*

***Note.**— Industry specification for documentation concerning flight recorder parameters may be found in the ARINC 647A, Flight Recorder Electronic Documentation, or equivalent document.*

6.3.5.5 Combination recorders

6.3.5.5.1 **Recommendation.—***All aeroplanes of a maximum certificated take-off mass of over 5700 kg for which the application for type certification is submitted to a Contracting State on or after 1 January 2016, and which are required to be equipped with both a CVR and an FDR, should be equipped with two combination recorders (FDR/CVR).*

6.3.5.5.2 All aeroplanes of a maximum certificated take-off mass of over 15 000 kg for which the application for type certification is submitted to Civil Aviation Authority of Bangladesh (CAAB) on or after 1 January 2016, and which are required to be equipped with both a CVR and an FDR, shall be equipped with two combination recorders (FDR/CVR). One recorder shall be located as close to the cockpit as practicable and the other recorder located as far aft as practicable.

6.3.5.5.3 **Recommendation.—***All aeroplanes of a maximum certificated take-off mass over 5700 kg, required to be equipped with an FDR and a CVR, may alternatively be equipped with two combination recorders (FDR/CVR).*

Note.—The requirement of 6.3.4.5 may be satisfied by equipping the aeroplanes with two combination recorders (one forward and one aft) or separate devices.

6.3.5.5.4 **Recommendation**.—*All multi-engined turbine-powered aeroplanes of a maximum certificated take-off mass of 5700 kg or less, required to be equipped with an FDR and/or a CVR, may alternatively be equipped with one combination recorder (FDR/CVR).*

6.3.6 Flight recorder data recovery

6.3.6.1 All aeroplanes of a maximum certificated take-off mass of over 27 000 kg and authorized to carry more than nineteen passengers for which the application for type certification is submitted to Civil Aviation Authority of Bangladesh (CAAB) on or after1 January 2021, shall be equipped with a means approved by Civil Aviation Authority of Bangladesh (CAAB), to recover flight recorder data and make it available in a timely manner.

6.3.6.2 In approving the means to make flight recorder data available in a timely manner the following requirements are to be met:

a) the capabilities of the operator;

b) overall capability of the aeroplane and its systems as certified by the State of Design;

c) the reliability of the means to recover the appropriate CVR channels and appropriate FDR data; and

d) specific mitigation measures.

Note. *— Guidance on approving the means to make flight recorder data available in a timely manner is contained in the Manual on Location of Aircraft in Distress and Flight Recorder Data Recovery (ICAO Doc 10054).*

6.4 ALL AEROPLANES OPERATED AS VFR FLIGHTS

6.4.1 No person shall operate a VFR flight unless equipped with:

a) a magnetic compass.

b) an accurate timepiece indicating the time in hours, minutes and seconds.

c) a sensitive pressure altimeter.

d) an airspeed indicator; and

e) such additional instruments or equipment as may be prescribed by the Civil Aviation Authority of (CAAB);

6.4.2 VFR flights which are operated as controlled flights shall be equipped in accordance with 6.9.

6.5 ALL AEROPLANES ON FLIGHTS OVER WATER

6.5.1 Seaplanes

No person shall operate a seaplane unless equipped with:

a) one life jacket, or equivalent individual flotation device, for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided.

b) equipment for making the sound signals prescribed in the International Regulations for Preventing Collisions at Sea, where applicable; and

c) one sea anchor (drogue).

***Note**. — Seaplanes includes amphibians operated as seaplanes*.

6.5.2 Landplanes

6.5.2.1 Landplanes shall carry the equipment prescribed in 6.5.2.2:

a) when flying over water and at more than 93 km (50 NM) away from the shore, in the case of landplanes operated in accordance with 5.2.9 or 5.2.10.

b) when flying en route over water beyond gliding distance from the shore, in the case of all other landplanes; and

c) when taking off or landing at an aerodrome where, in the opinion of the Civil Aviation Authority of Bangladesh (CAAB), the take-off or approach path is so disposed over water that in the event of a mishap there would be a likelihood of a ditching.

6.5.2.2 The equipment referred to in 6.5.2.1 shall comprise one life jacket or equivalent individual flotation device for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided.

Note 1.—*"Landplanes" includes amphibians operated as landplanes.*

***Note 2. —** Life jackets accessible from seats or berths located in crew rest compartments are required only if the seats or berths concerned are certified to be occupied during take-off and landing.*

***Note 3**.—Information regarding the acceptable means of compliance with this Standard, particularly in the case of infants, can be found in the Guidance on the Preparation of an Operations Manual (Doc 10153), Chapter11, Attachment D.*

6.5.3 All aeroplanes on long-range over-water flights

6.5.3.1 In addition to the equipment prescribed in 6.5.1 or 6.5.2 whichever is applicable, the following equipment shall be installed in all aeroplanes when used over routes on which the aeroplane may be over water and at more than a distance corresponding to 120 minutes at cruising speed or 740 km (400 NM), whichever is the lesser, away from land suitable for making an emergency landing in the case of aircraft operated in accordance with 5.2.9 or 5.2.10, and 30 minutes or 185 km (100 NM), whichever is the lesser, for all other aeroplanes:

a) life-saving rafts in sufficient numbers to carry all persons on board, stowed to facilitate their ready use in emergency, provided with such life-saving equipment including means of sustaining life as is appropriate to the flight to be undertaken.

b) equipment for making the pyrotechnical distress signals described in ANO 2; and

c) at the earliest practicable date, but not later than 1 January 2018, on all aeroplanes of a maximum certificated take- off mass of over 27 000 kg, a securely attached underwater locating device operating at a frequency of 8.8 kHz. This automatically activated underwater locating device shall operate for a minimum of 30 days and shall not be installed in wings or empennage.

Note. *— Underwater locator beacon (ULB) performance requirements are as contained in the SAE AS6254, Minimum Performance Standard for Low Frequency Underwater Locating Devices (Acoustic) (Self-Powered), or equivalent documents.*

6.5.3.2 Each life jacket and equivalent individual flotation device, when carried in accordance with 6.5.1 a), 6.5.2.1 and 6.5.2.2, shall be equipped with a means of electric illumination for the purpose of facilitating the location of persons, except where the requirement of 6.5.2.1 c) is met by the provision of individual flotation devices other than life jackets.

6.6 ALL AEROPLANES ON FLIGHTS OVER DESIGNATED LAND AREAS

Aeroplanes, when operated across land areas which have been designated by the State concerned as areas in which search and rescue would be especially difficult, shall be equipped with such signaling devices and life-saving equipment (including means of sustaining life) as may be appropriate to the area overflown.

6.7 ALL AEROPLANES ON HIGH ALTITUDE FLIGHTS

Note.— *Approximate altitude in the Standard Atmosphere corresponding to the value of absolute pressure used in this text is as follows:*

Absolute pressure	Meters	Feet
700 hPa	3000	10000
620 hPa	4000	13000
376 hPa	7600	25000

6.7.1 An aeroplane intended to be operated at flight altitudes at which the atmospheric pressure is less than 700 hPa in personnel compartments shall be equipped with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required in 4.3.9.1.

6.7.2 An aeroplane intended to be operated at flight altitudes at which the atmospheric pressure is less than 700 hPa but which is provided with means of maintaining pressures greater than 700 hPa in personnel compartments shall be provided with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required in 4.3.9.2.

6.7.3 Pressurized aeroplanes newly introduced into service on or after 1 July 1962 and intended to be operated at flight altitudes at which the atmospheric pressure is less than 376 hPa shall be equipped with a device to provide positive warning to the flight crew of any dangerous loss of pressurization.

6.7.4 **Recommendation**. — *Pressurized aeroplanes introduced into service before 1 July 1962 and intended to be operated at flight altitudes at which the atmospheric pressure is less than 376 hPa should be equipped with a device to provide positive warning to the flight crew of any dangerous loss of pressurization.*

6.7.5 An aeroplane intended to be operated at flight altitudes at which the atmospheric pressure is less than 376 hPa, or which, if operated at flight altitudes at which the atmospheric pressure is more than 376 hPa, cannot descend safely within four minutes to a flight altitude at which the atmospheric pressure is equal to 620 hPa and for which the individual certificate of airworthiness is first issued on or after 9 November 1998 shall be provided with automatically deployable oxygen equipment to satisfy the requirements of 4.3.9.2. The total number of oxygens dispensing units shall exceed the number of passenger and cabin crew seats by at least 10 per cent.

6.7.6 **Recommendation.**— *An aeroplane intended to be operated at flight altitudes at which the atmospheric pressure is less than 376 hPa, or which, if operated at flight altitudes at which the atmospheric pressure is more than 376 hPa cannot descend safely within four minutes to a flight altitude at which the atmospheric pressure is equal to 620 hPa, and for which the individual certificate of airworthiness was first issued before 9 November 1998, should be provided with automatically deployable oxygen equipment to satisfy the requirements of 4.3.9.2. The total number of oxygen dispensing units should exceed the number of passenger and cabin crew seats by at least 10 per cent.*

6.8 ALL AEROPLANES IN ICING CONDITIONS

6.8.1 No person may take off an aircraft or continue to operate an aircraft en route when icing conditions are expected or encountered, without ensuring that the aircraft is certified for icing operations and has sufficient operational de-icing or anti-icing equipment.

6.8.2 No person may take off an aircraft when frost, ice, or snow is adhering to the wings, control surfaces, propellers, engine inlets, or other critical surfaces of the aircraft that might adversely affect the performance or controllability of the aircraft.

6.8.3 For commercial air transport operations, no person may take off an aircraft when conditions are such that frost, ice, or snow may reasonably be expected to adhere to the aircraft, unless the aircraft has been inspected for icing and the procedures approved for the AOC holder by the CAAB are followed to ensure ground de-icing and anti-icing is accomplished.

6.9 ALL AEROPLANES OPERATED IN ACCORDANCE WITH INSTRUMENT FLIGHT RULES

6.9.1 No person shall operate a flight in instrument flight rules, or when the aeroplane cannot be maintained in a desired attitude without reference to one or more flight instruments, unless equipped with:

a) a magnetic compass.

b) an accurate timepiece indicating the time in hours, minutes and seconds.

c) two sensitive pressure altimeters with counter drum-pointer or equivalent presentation.

Note. *— neither three-pointer nor drum-pointer altimeters satisfy the requirement in 6.9.1 c).*

d) an airspeed indicating system with means of preventing malfunctioning due to either condensation or icing.

e) a turn and slip indicator.

f) an attitude indicator (artificial horizon).

g) a heading indicator (directional gyroscope).

***Note**. — The requirements of 6.9.1 e), f) and g) may be met by combinations of instruments or by integrated flight director systems provided that the safeguards against total failure, inherent in the three separate instruments, are retained.*

h) a means of indicating whether the power supply to the gyroscopic instrument is adequate.

i) a means of indicating in the flight crew compartment the outside air temperature;

j) a rate-of-climb and descent indicator; and

k) such additional instruments or equipment as may be prescribed by the Civil Aviation Authority of Bangladesh (CAAB);

6.9.2 All aeroplanes over 5700 kg—Emergency power supply for electrically operated attitude indicating instruments

6.9.2.1 All aeroplanes of a maximum certificated take-off mass of over 5700 kg newly introduced into service after1 January 1975 shall be fitted with an emergency power supply, independent of the main electrical generating system, for the purpose of operating and illuminating, for a minimum period of 30 minutes, an attitude indicating instrument (artificial horizon), clearly visible to the pilot-in- command. The emergency power supply shall be automatically operative after the total failure of the main electrical generating system and clear indication shall be given on the instrument panel that the attitude indicator(s) is being operated by emergency power.

6.9.2.2 Those instruments that are used by any one pilot shall be so arranged as to permit the pilot to see their indications readily from his or her station, with the minimum practicable deviation from the position and line of vision normally assumed when looking forward along the flight path.

6.10 ALL AEROPLANES WHEN OPERATED AT NIGHT

6.10.1 All aeroplanes when operated at night shall be equipped with:

a) all equipment specified in 6.9.

b) the lights required by ANO 2 for aircraft in flight or operating on the movement area of an aerodrome.

Note. *- Specifications for lights meeting the requirements of ANO 2 for navigation lights are contained in Appendix-1. The general characteristics of lights are specified in ANO (AW) Part M*

c) two landing lights.

Note*. — Aeroplanes not certificated in accordance with* ANO(AW) Part M *which are equipped with a single landing light having two separately energized filaments will be considered to have complied with 6.10 c).*

d) illumination for all instruments and equipment that are essential for the safe operation of the aeroplane that are used by the flight crew;

e) lights in all passenger compartments; and

f) an independent portable light for each crew member station.

6.11 PRESSURIZED AEROPLANES WHEN CARRYING PASSENGERS - WEATHER RADAR

Recommendation.— *Pressurized aeroplanes when carrying passengers should be equipped with operative weather radar whenever such aeroplanes are being operated in areas where thunderstorms or other potentially hazardous weather conditions, regarded as detectable with airborne weather radar, may be expected to exist along the route either at night or under instrument meteorological conditions.*

6.12 ALL AEROPLANES OPERATED ABOVE 15000 M (49000 FT) - RADIATION INDICATOR

All aeroplanes intended to be operated above 15000 m (49000 ft) shall carry equipment to measure and indicate continuously the dose rate of total cosmic radiation being received (i.e. the total of ionizing and neutron radiation of galactic and solar origin) and the cumulative dose on each flight. The display unit of the equipment shall be readily visible to a flight crew member.

Note. - The *equipment is calibrated based on assumptions acceptable to the CAAB.*

6.13 ALL AEROPLANES COMPLYING WITH THE NOISE CERTIFICATION STANDARDS IN ANO 16, VOLUME I

No person shall operate a flight without carrying a document attesting noise certification. When the document, or a suitable statement attesting noise certification as contained in another document approved by the State of Registry, is issued in a language other than English, it shall include an English translation.

Note. *— The attestation may be contained in any document, carried on board, approved by The State of Registry.*

6.14 MACH NUMBER INDICATOR

All aeroplanes with speed limitations expressed in terms of Mach number shall be equipped with a Mach number indicator.

***Note**. —This does not preclude the use of the airspeed indicator to derive Mach number for ATS purposes.*

6.15 AEROPLANES REQUIRED TO BE EQUIPPED WITH GROUND PROXIMITY WARNING SYSTEMS (GPWS)

6.15.1 No operator shall operate a turbine-engine aeroplane, of a maximum certificated take-off mass of over 5 700 kg or authorized to carry more than nine passengers, unless the aeroplane is equipped with a GPWS that has a forward-looking terrain avoidance function.

6.15.2 An operator shall implement database management procedures that ensure the timely distribution and update of current terrain and obstacle data to the ground proximity warning system.

6.15.3 **Recommendation.** — *All turbine-engined aeroplanes of a maximum certificated take-off mass of 5 700 kg or less and authorized to carry more than five but not more than nine passengers should be equipped with a ground proximity warning system which provides the warnings of 6.15.7 a) and c), warning of unsafe terrain clearance and a forward looking terrain avoidance function.*

6.15.4 All turbine-engine aeroplane of a maximum certificated take-off mass in excess of 5700 kg or authorized to carry more than nine passengers shall be equipped with a ground proximity warning system which provides the warnings in 6.15.7 a) and c), warning of unsafe terrain clearance and a forward-looking terrain avoidance function.

6.15.5 All piston engine aeroplanes of a maximum certificated take-off mass in excess of 5700 kg or authorized to carry more than nine passengers shall be equipped with GPWS which provides the warning in 6.15.7 a) and c) warning of unsafe terrain clearance and a forward-looking terrain avoidance function.

6.15.6 A ground proximity warning system shall provide automatically a timely and distinctive warning to the flight crew when the aeroplane is in potentially hazardous proximity to the earth‘s surface.

6.15.7 Each GPWS shall automatically provide, by means of aural signals that may be supplemented by visual signals, timely and distinctive warning to the flight crew of the following circumstances:

a) excessive descent rate;

b) excessive terrain closure rate;

c) excessive altitude loss after take-off or go-around;

d) unsafe terrain clearance while not in landing configuration:

1) gear not locked down;

2) flaps not in a landing position; and

e) excessive descent below the instrument glide path.

6.16 AEROPLANES CARRYING PASSENGERS—CABIN CREW SEATS

6.16.1 Aeroplanes for which the individual certificate of airworthiness is first issued on or after 1 January **1981**

All aeroplanes shall be equipped with a forward or rearward facing (within 15 degrees of the longitudinal axis of the aeroplane) seat, fitted with a safety harness for the use of each cabin crew member required to satisfy the intent of 12.1 in respect of emergency evacuation.

6.16.2 Aeroplanes for which the individual certificate of airworthiness was first issued before 1 January 1981

Recommendation. — *All aeroplanes should be equipped with a forward or rearward facing (within 15 degrees of the longitudinal axis of the aeroplane) seat, fitted with a safety harness for the use of each cabin crew member required to satisfy the intent of 12.1 in respect of emergency evacuation.*

Note. *— Safety harness includes shoulder straps and a seat belt which may be used independently.*

6.16.3 Cabin crew seats provided in accordance with 6.16.1 and 6.16.2 shall be located near floor level and other emergency exits as required by the State of Registry for emergency evacuation.

6.17 EMERGENCY LOCATOR TRANSMITTER (ELT)

6.17.1 **Recommendation.**—*All aeroplanes should carry an automatic ELT.*

6.17.2 All aeroplanes authorized to carry more than 19 passengers shall be equipped with at least 1 automatic ELT or 2 ELTs of any type.

6.17.3 All aeroplanes authorized to carry more than 19 passengers, for which the individual certificate of airworthiness is first issued after 1 July 2008, shall be equipped with:

a) At least two ELTs, one of which shall be automatic; or

b) At least one ELT and a capability that meets the requirements of 6.18 unless some other means of compliance of aircraft distress tracking has been used.

***Note**. — In the case where the requirements for 6.18 are met by another system no automatic ELT is required.*

6.17.4 Except as provided for in 6.17.5, all aeroplanes authorized to carry 19 passengers or less shall be equipped with at least 1 ELT at any time.

6.17.5 All aeroplanes authorized to carry 19 passengers or less for which the individual's certificate for airworthiness is first issued after 1 July 2008 shall be equipped with at least 1 automatic ELT.

6.17.6 ELT equipment carried to satisfy the requirements of 6.17.2, 6.17.3, 6.17.4 and 6.17.5 shall operate in accordance with the relevant provisions of ANO 10 volume III.

6.17.7 At least one survival type ELT shall be located with each life raft carried.

***Note**. — The judicious choice of numbers of ELTs, their type and placement on aircraft and associated floatable life support systems will ensure the greatest chance of ELT activation in the event of an accident for aircraft operating over water or land, including areas especially difficult for search and rescue. Placement of transmitter units is a vital factor in ensuring optimal crash and fire protection. The placement of the control and switching devices (activation monitors) of automatic fixed ELTs and their associated operational procedures will also take into consideration the need for rapid detection of inadvertent activation and convenient manual switching by crew members.*

6.18 LOCATION OF AN AEROPLANE IN DISTRESS

6.18.1 All aeroplanes of a maximum certificated take-off mass of over 27000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2023 shall autonomously transmit information from which a position can be determined by the operator at least once every minute, when in distress, in accordance with Appendix 9.

6.18.2 **Recommendation**. — *All aeroplanes of a maximum certificated take-off mass of over 5 700 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2023, should autonomously transmit information from which a position can be determined at least once every minute, when in distress, in accordance with Appendix 9.*

6.18.3 All operator shall make position information of a flight in distress available to the appropriate organizations, as established by the Civil Aviation Authority of Bangladesh.

Note 1. — *Refer to 4.2.1.3.1 for operator responsibilities when using third parties.*

Note 2.— *Operational procedures for monitoring and making position information of a flight in distress available to the appropriate organizations in a timely manner are contained in PANS-OPS, Volume III*, Section 10.

6.19 AEROPLANES REQUIRED TO BE EQUIPPED WITH AN AIRBORNE COLLISION AVOIDANCE SYSTEM (ACAS II)

6.19.1 No person shall operate a turbine-engine aeroplane with a maximum certificated take-off mass of over 5700 kg, or authorized to carry more than 19 passengers, unless the aeroplane is equipped with an ACAS II.

6.19.2 **Recommendation**. — *All aeroplanes should be equipped with an airborne collision avoidance system (ACAS II).*

6.19.3 An ACAS shall operate in accordance with the relevant provisions of CAAB manual ANO10, Volume IV.

6.20 REQUIREMENTS FOR PRESSURE-ALTITUDE REPORTING TRANSPONDERS

6.20.1 No person shall operate an aeroplane unless the aeroplane is equipped with an operative pressure-altitude reporting transponder that operates in accordance with the requirements of CAAB's ATS and the relevant provisions of ANO 10, Volume IV.

6.20.1.1 No person shall operate an aircraft in airspace that requires a pressure-altitude reporting transponder unless that equipment is operative.

6.20.2 All aeroplanes for which the individuals certificate of airworthiness is first issued after 1 January 2009 shall be equipped with a data source that provides pressure- altitude information with a resolution of 7.62 m (25 ft), or better.

6.20.3 All aeroplane shall be equipped with a data source that provides pressure-altitude information with a resolution of 7.62 m (25 ft) or better.

6.20.4 **Recommendation**.—*The Mode S transponder should be provided with the airborne/on-the-ground status if the aeroplane is equipped with an automatic means of detecting such status.*

Note 1.—*These provisions will improve the effectiveness of airborne collision avoidance systems as well as air traffic services that employ Mode S radar. In particular, tracking processes are significantly enhanced with a resolution of 7.62 m (25 ft), or better.*

Note 2.— *Mode C replies of transponders always report pressure altitude in 30.50 m (100 ft) increments irrespective of the resolution of the data source.*

6.21 MICROPHONES

All flight crew members required to be on flight deck duty shall communicate through boom or throat microphones under the following operations or conditions:

a) Aeroplane during IFR operations.

b) Aeroplane below the transition level/altitude.

6.22 TURBO-JET AEROPLANES-FORWARD-LOOKING WIND SHEAR WARNING SYSTEMS

6.22.1 **Recommendation.** — *All turbo-jet aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than nine passengers should be equipped with a forward-looking wind shear warning system.*

6.22.2 **Recommendation**. — *A forward- looking wind shear warning system should be capable of providing the pilot with a timely aural and visual warning of wind shear ahead of the aircraft, and the information required to permit the pilot to safely commence and continue a missed approach or go-around or to execute an escape manoeuvre if necessary. The system should also provide an indication to the pilot when the limits specified for the certification of automatic landing equipment are being approached, when such equipment is in use.*

6.23 ALL AEROPLANES OPERATED BY A SINGLE PILOT UNDER THE INSTRUMENT FLIGHT RULES (IFR) OR AT NIGHT

For approval in accordance with 4.9.1, all aeroplanes operated by a single pilot under the IFR or at night shall be equipped with:

a) a serviceable autopilot that has at least altitude hold and heading select modes;

b) a headset with a boom microphone or equivalent; and

c) means of displaying charts that enables them to be readable in all ambient light conditions.

6.24 AEROPLANES EQUIPPED WITH AUTOMATIC LANDING SYSTEMS, A HEAD- UP DISPLAY (HUD) OR EQUIVALENT DISPLAYS, ENHANCED VISION SYSTEMS (EVS), SYNTHETIC VISION SYSTEM S (SVS) AND/OR COMBINED VISION SYSTEMS (CVS)

6.24.1 Notwithstanding chapter 4, 4.2.8.1.1 to 4.2.8.1.3,where aeroplanes are equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS, or any combination of those systems into a hybrid system, the use of such systems for the safe operation of an aeroplane shall be approved by the Civil Aviation Authority of Bangladesh (CAAB).

6.24.2 For approving the operational use of automatic landing systems, a HUD, or equivalent displays, EVS, SVS or CVS, Civil Aviation Authority of Bangladesh (CAAB) requires that:

a) the equipment meets the appropriate airworthiness certification requirements.

b) the operator has carried out a safety risk assessment of the operations supported by the automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS;

c) the operator has established and documented the procedures for the use of, and training requirements for, automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS

Note 1*.— Guidance on safety risk assessments is contained in the Safety Management Manual (SMM).*

Note 2*. — Guidance on operational approval is contained in ANO Part I.*

6.25 ELECTRONIC FLIGHT BAGS (EFBs)

***Note**. Guidance on EFB equipment, functions and specific approval is contained in the Manual on Electronic Flight Bags (EFBs) (ICAO Doc 10020).*

6.25.1 EFB equipment

a) Assess the EFB equipment and its associated installation hardware, including interaction with aircraft systems if applicable, to meet the appropriate airworthiness certification requirements.

b) Assess the risks associated with the operations supported by the EFB function(s);

c) Establish requirements for redundancy of the information (if appropriate) contained in and displayed by the EFB function(s);

d) Establish and document procedures for the management of the EFB function(s), including any databases it may use; and

e) Establish and document the procedures for the use of, and the training requirements for, the EFB function(s).

6.25.2 EFB Function

6.25.2.1 No person shall operate an EFB on board an aircraft unless the PIC and/or operator/owner has ensured that the EFB does not affect the performance of the aircraft systems or equipment or the ability to operate the aircraft and has:

a) Assessed the safety risk(s) associated with each EFB function.

b) Established and documented the procedures for the use of, and the training requirements for, the device and each EFB function; and

c) Ensured that, in the event of an EFB failure, sufficient information is readily available to the flight crew for the flight to be conducted safely.

***Note 1.**—Guidance on EFB equipment, functions, and establishing criteria for their operational use is contained in Appendix 15 of this manual.*

***Note 2**. — Guidance on safety risk assessments is contained in Safety Management Manual (SMM).*

6.25.2.2 An operator shall need specific approval from CAAB for the operational use of EFB function to be used for safe operation of aeroplane.

6.25.3 EFB specific approval

6.25.3.1 While issuing a specific approval by CAAB for the use of EFB following conditions are to be ensured that:

a) the EFB equipment and its associated installation hardware, including interaction with aeroplane systems if applicable, meet the appropriate airworthiness certification requirements.

b) the operator has assessed the safety risks associated with the operations supported by the EFB function(s);

c) the operator has established requirements for redundancy of the information (if appropriate) contained in and displayed by the EFB function(s).

d) the operator has established and documented procedures for the management of the EFB function(s) including any database it may use; and

e) the operator has established and documented the procedures for the use of, and training requirements for, the EFB and the EFB function(s).

Note1. *— Guidance on safety risk assessments is contained in the* Safety Management Manual.

Note 2*. — Guidance for EFB approval is contained in Appendix 14 of this ANO.*

6.26 TURBINE AEROPLANE - RUNWAY OVERRUN AWARENESS AND ALERTING SYSTEM (ROAAS)

6.26.1 All turbine-engine aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg, for which the individual certificate of airworthiness is first issued on or after 1 January 2026, shall be equipped with a runway overrun awareness and alerting system (ROAAS).

Note. *— Guidance material for ROAAS design is contained in EUROCAE ED-250, Minimum Operational Performance Specification (MOPS) for Runway Overrun Awareness and Alerting Systems (ROAAS), or equivalent documents.*

CHAPTER-7. AEROPLANE COMMUNICATION, NAVIGATION AND SURVEILLANCE EQUIPMENT

7.1 COMMUNICATION EQUIPMENT

No person shall operate an aircraft unless the aircraft is equipped with radio communication equipment required for the type of operation being conducted. All aircraft operated in VFR as a controlled flight, in IFR, at night, as an extended flight over water, or over land designated by the Authority as especially difficult for search and rescue shall be equipped with radio communication equipment.

7.1.1 An aeroplane shall be provided with radio communication equipment capable of:

a) Conducting two-way communication for aerodrome control purposes;

b) Receiving meteorological information at any time during the flight; and

c) Conducting two communications at any time during flight with at least one aeronautical station and with such other aeronautical stations and on such frequencies as may be prescribed by the appropriate authority.

Note.—*The requirements in paragraphs 7.1.1 are considered fulfilled if the ability to conduct the communications specified therein is established during radio propagation conditions that are normal for the route.*

7.1.2 The radio communication equipment required in accordance with 7.1.1 shall provide for communications on the aeronautical emergency frequency 121.5 MHz.

7.1.3 For operations where communication equipment is required to meet Required communication performance (RCP) specification for Performance based communication (PBC), an aeroplane shall, in addition to the requirements in paragraphs 7.1.1:

a) be provided with communication equipment that will enable it to operate in accordance with the prescribed RCP specification(s);

b) have information relevant to the aircraft RCP specification capabilities listed in the flight manual or other aircraft documentation approved by the State of Design or State of Registry; and

c) have information relevant to the airoplane RCP specification capabilities included in the MEL.

Note. *— Information on the Performance-based Communication and Surveillance (PBCS) concept and guidance material on its implementation are contained in CAAB Manual CAAB AOG 6-9*.

7.1.4 No person shall operate an aircraft without meeting the established criteria where an RCP specification for PBC has been prescribed by the CAAB. For operations where an RCP specification for PBC has been prescribed, the operator shall ensure established and documented:

a) normal and abnormal procedures, including contingency procedures.

b) flight crew qualification and proficiency requirements, in accordance with appropriate RCP specifications.

c) a training programme for relevant personnel consistent with the intended operations; and

d) appropriate maintenance procedures to ensure continuing airworthiness, in accordance with appropriate RCP specifications.

7.1.5 The operator is required to provide CAAB that, in respect of those aeroplanes mentioned in 7.1,3, adequate provisions exist for:

a) reports of observed communication performance issued by monitoring programmes established in accordance with CAAB ANO 11, Chapter 3,3.3.5.2; and

b) taking immediate corrective action for individual aircraft, aircraft types, or operators identified in such reports as not complying with the RCP specification(s).

7.2 NAVIGATION EQUIPMENT

7.2.1 No person can operate an aircraft unless the aircraft is equipped with navigation equipment that will enable it to proceed in accordance with:

a) Its operational flight plan; and

b) The requirements of ATS;

Except when, if not so precluded by the CAAB, navigation for flights under VFR is accomplished by visual reference to landmark.

7.2.2 No person can operate an aircraft in defined portions of airspace, including MNPS, RVSM, or any other routes where a navigation specification for PBN has been prescribed in 7.2.1, unless:

a) The aircraft is equipped with navigation equipment to enable it to operate in accordance with the prescribed navigation specification(s).

b) Information relevant to the aircraft navigation specification capabilities is listed in the AFM or other aircraft documentation approved by the State of Design.

c) Where the aircraft is operated in accordance with a MEL, information relevant to the aircraft navigation specification capabilities is included in the MEL.

d) The aircraft is equipped with navigation equipment that continuously provides information to the flight crew of adherence to or departure from track with respect to the required degree of accuracy at any point along that track; and

7.2.3 No person shall operate an aircraft in PBN operations unless such operations have been approved by the Civil Aviation Authority of Bangladesh (CAAB). When and where a navigation specification for PBN has been prescribed by CAAB, the operator shall ensure that it has established and documented the following:

a) Normal and abnormal procedures, including contingency procedures.

b) Flight crew qualification and proficiency requirements, in accordance with the appropriate navigation specifications.

c) A training programme for relevant personnel, consistent with the intended operations; and

d) Appropriate maintenance procedures to ensure continuing airworthiness, in accordance with the appropriate navigation specifications.

***Note 1**.—Guidance on safety risks and mitigations for PBN operations, in accordance with ANO 19, are contained in Performance-based Navigation (PBN) Operational Approval Manual (CAAB IHB 6- 1-1).*

***Note 2**.—Electronic navigation data management is an integral part of normal and abnormal procedures.*

7.2.4 No person shall operate a flight based on PBN authorization required (AR) navigation specification without obtaining special authorization from CAAB.

***Note.** — Guidance on specific approvals for PBN authorization required (AR) navigation specifications is contained in the CAAB ANO (AOC) Part SPA.*

7.2.5 For flights in defined portions of airspace where, based on Regional Air Navigation Agreement, minimum navigation performance specifications (MNPS) are prescribed, an aeroplane shall be provided with navigation equipment which:

a) continuously provides indications to the flight crew of adherence to or departure from track to the required degree of accuracy at any point along that track; and

b) has been authorized by the Civil Aviation Authority of Bangladesh (CAAB) for the MNPS operations concerned.

Note.*—The prescribed minimum navigation performance specifications (MNPS) and the procedures governing their application are published in the CAAB ANO (OPS) Part-SPA.*

7.2.6 An aeroplane, for flights in defined portions of airspace where, based on a Regional Air Navigation Agreement, a reduced vertical separation minimum (RVSM) of 300 m (1000 ft) is applied between FL 290 and FL 410 inclusive:

a) shall be provided with equipment which is capable of:

1) indicating to the flight crew the flight level being flown ;

2) automatically maintaining a selected flight level ;

3) providing an alert to the flight crew when a deviation occurs from the selected flight level; the threshold for the alert shall not exceed ± 90 m (300 ft); and

4) automatically reporting pressure altitude; and

b) shall obtain specific approval for RVSM operations from CAAB.

7.2.7 Prior to granting the RVSM approval required by paragraph 7.2.6(b), the CAAB is required to be satisfied that:

a) The vertical navigation performance capability of the aeroplane satisfies the requirements specified in Appendix 4;

b) The operator has instituted appropriate procedures with respect to continuing airworthiness (maintenance and repair) practices and programmes; and

c) The operator has instituted appropriate flight crew procedures for operations in RVSM airspace.

Note. — *An RVSM approval is valid globally on the understanding that any operating procedures specific to a given region will be stated in the OM or appropriate crew guidance.*

7.2.8 CAAB in consultation with the State of Registry, if appropriate, shall ensure that, with respect to those aeroplanes mentioned in paragraph 7.2.6 adequate provisions exist for:

a) receiving the reports of height-keeping performance issued by the monitoring agencies established in accordance with CAAB ANO 11, 3.3.5.1; and

b) taking immediate corrective action for individual aircraft, or aircraft type groups, identified in such reports as not complying with the height-keeping requirements for operations in airspace where RVSM is applied.

7.2.9 An operator with RVSM approval shall ensure that a minimum of two aeroplanes of each aircraft type grouping of the operator have their height-keeping performance monitored at least once every 2 years or within intervals of 1 000 flight hours per aeroplane, whichever period is longer. If the operator aircraft type grouping consists of a single aeroplane, monitoring of that aeroplane shall be accomplished within the specified period.

***Note**. —Monitoring data from any regional monitoring programme established in accordance with CAAB ANO (OPS) Part-SPA Subpart-D may be used to satisfy the requirement.*

7.2.10

a) No person shall operate an aircraft in airspace where a Regional Air Navigation Agreement, MNPS, or RVSM airspace has been prescribed, except in accordance with:

(1) The conditions of the procedures and restrictions required for this airspace; and

(2) A written authorization issued by the CAAB;

b). Provisions and procedures has been developed in ANO(OPS) Part - SPA which ensures that appropriate action will be taken in respect of aircraft and operators found to be operating in Regional Air Navigation Agreement, MNPS, or RVSM airspace without a valid specific approval.

***Note 1**. — These provisions and procedures need to address both the situation where the aircraft in question is operating without a specific approval in the airspace of the State, and the situation where the operator for which the State has regulatory oversight responsibility is found to be operating without the required specific approval in the airspace of another State.*

Note 2. *— Guidance material relating to the specific approval for operation in RVSM airspace is contained in the Manual on a 300 m (1000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive in CAAB ANO (SPA) Part SPA.*

7.2.11 The aeroplane shall be sufficiently provided with navigation equipment to ensure that, in the event of the failure of one item of equipment at any stage of the flight, the remaining equipment will enable the aeroplane to navigate in accordance with 7.2.1 and, where applicable, 7.2.2, 7.2.5 and 7.2.6.

Note. *— Guidance material relating to aircraft equipment necessary for flight in airspace where RVSM is applied is contained in the Manual on a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive in CAAB ANO(OPS) Part SPA.*

7.2.12 On flights in which it is intended to land in instrument meteorological conditions, an aeroplane shall be provided with radio equipment capable of receiving signals providing guidance to a point from which a visual landing can be affected. This equipment shall be capable of providing such guidance for each aerodrome at which it is intended to land in instrument meteorological conditions and for any designated alternate aerodromes.

7.3 SURVEILLANCE EQUIPMENT

7.3.1 No person shall operate an aircraft unless it is provided with surveillance equipment that will enable it to operate in accordance with the requirements of ATS.

7.3.2 For operations where surveillance equipment is required to meet an RSP specification for PBS, an aircraft shall, in addition to the requirements specified in paragraph 7.3.1:

a) Be provided with surveillance equipment that will enable it to operate in accordance with the prescribed RSP specification(s);

b) Have information relevant to the aircraft RSP specification capabilities listed in the AFM or other aircraft documentation approved by CAAB or State of Design; and

c) Have information relevant to the aircraft RSP specification capabilities included in the MEL.

Note 1.— *Information on surveillance equipment is contained in the Aeronautical Surveillance Manual (Doc 9924).*

Note 2.— *Information on RSP specifications for performance-based surveillance is contained in the Performance-based Communication and Surveillance (PBCS) Manual (ICAO Doc 9869).*

7.3.3 When and where an RSP specification for PBS has been prescribed by CAAB, the operator shall establish and document the following before using the PBS procedure:

a) Normal and abnormal procedures, including contingency procedures.

b) Flight crew qualification and proficiency requirements, in accordance with appropriate RSP specifications.

c) A training programme for relevant personnel, consistent with the intended operations; and

d) Appropriate maintenance procedures to ensure continuing airworthiness, in accordance with appropriate RSP specifications.

7.3.4 The operator shall satisfy CAAB that, in respect of those aeroplanes mentioned in 7.3.2, adequate provisions exist for:

a) receiving the reports of observed surveillance performance issued by monitoring programmes established in accordance with ANO 11 chapter 3, 3.3.5.2; and

b) Taking immediate corrective action for individual aircraft or aircraft types, identified in such reports as not complying with the RSP specification(s).

7.4 INSTALLATION

The equipment installation shall be such that the failure of any single unit required for communication, navigation or surveillance purposes or any combination thereof will not result in the failure of another unit required for communication, navigation, or surveillance purposes.

7.5 ELECTRONIC NAVIGATION DATA MANAGEMENT

7.5.1 No person shall employ electronic navigation data products that have been processed for application in the air and on the ground unless the CAAB has approved:

a) The operator's procedures for ensuring that the process applied, and the products delivered have met acceptable standards of integrity and that the products are compatible with the intended function of the equipment that will use them;

b) The operator's programmer for continual monitoring of both the process and products; and

Note. *— Guidance relating to the processes that data suppliers may follow is contained in RTCA DO-200A/EUROCAE ED-76 and RTCA DO-201A/EUROCAE ED-77.*

7.5.2 The operator shall implement procedures that ensure the timely distribution and insertion of current and unaltered electronic navigation data to all necessary aircraft.

CHAPTER- 8. AEROPLANE CONTINUING AIRWOTHINESS

The requirements of this Chapter related to Aeroplane Continuing Airworthiness are described in ANO (AW) Part M.

CHAPTER- 9. AEROPLANE FLIGHT CREW

9.1 COMPOSITION OF THE FLIGHT CREW

9.1.1 The number and composition of the flight crew shall not be less than that specified in the flight manual or other documents associated with the certificate of airworthiness, when necessitated by considerations related to the type of aeroplane used, the type of operations involved and the duration of flight between points where flight crew are changed.

9.1.2 **Radio operator**

The flight crew shall include at least one number who holds a valid licence issued or renewed valid by the Civil Aviation Authority of Bangladesh (CAAB) authorizing operation of the type of radio transmitting equipment to be used;

9.1.3 **Flight Engineer**

When a separate Flight Engineer's (FE) station is incorporated in the design of an aeroplane and the Flight Crew shall include at least one flight engineer assigned to that station, unless the duties associated with that station can be satisfactorily performed by another flight crew member, holding a flight engineer license, without interference with regular duties.

9.1.4 **Flight navigator**

The flight crew shall include at least one member who holds a flight navigator licence in all operations where, as determined by Civil Aviation Authority of Bangladesh (CAAB), navigation necessary for the safe conduct of the flight cannot be adequately accomplished by the pilots from the pilot station.

9.2 FLIGHT CREW MEMBER EMERGENCY DUTIES

The operator shall, for each type of aeroplane, assign to all flight crew members the necessary functions they are to perform in an emergency or in a situation requiring emergency evacuation. Annual training in accomplishing these functions shall be contained in the operator's training programme and shall include instruction in the use of all emergency and life-saving equipment required to be carried, and drills in the emergency evacuation of the aeroplane.

9.3 FLIGHT CREW MEMBER TRAINING PROGRAMMES

9.3.1 The operator shall establish and maintain a ground and flight training programme, approved by the Civil Aviation Authority of Bangladesh (CAAB) which ensures that all flight crew members are adequately trained to perform their assigned duties. The training programme shall:

a) include ground and flight training facilities and properly qualified instructors as determined by the Civil Aviation Authority of Bangladesh (CAAB).

b) consist of ground and flight training in the type(s) of aeroplane on which the flight crew member serves.

c) include proper flight crew coordination and training in all types of emergency and abnormal situations or procedures caused by engine, airframe or systems malfunctions, fire or other abnormalities.

d) include upset prevention and recovery training.

e) include training in knowledge and skills related to visual and instrument flight procedures for the intended area of operation, charting, human performance including threat and error management and in the transport of dangerous goods.

f) ensure that all flight crew members know the functions for which they are responsible and the relation of these functions to the functions of other crew members, particularly in regard to abnormal or emergency procedures; and

g) be given on a recurrent basis, as determined by the Civil Aviation Authority of Bangladesh (CAAB) and shall include an assessment of competence.

Note 1. *— Paragraph 4.2.5 prohibits the in-flight simulation of emergency or abnormal situations when passengers or cargo are being carried.*

Note 2*. — Flight training may, to the extent deemed appropriate by the Civil Aviation Authority of Bangladesh (CAAB) be given in flight simulation training devices approved by the Civil Aviation Authority of Bangladesh (CAAB).*

Note 3. *— The scope of the recurrent training required by 9.2 and 9.3 may be varied and need not be as extensive as the initial training given in a particular type of aeroplane.*

Note 4*.—The use of correspondence courses and written examinations as well as other means may, to the extent deemed feasible by the Civil Aviation Authority of Bangladesh (CAAB) be utilized in meeting the requirements for periodic ground training.*

Note 5. *— For more information on dangerous goods operational requirements, see Chapter 14.*

Note 6. *— Guidance material to design training programmes to develop knowledge and skills in human performance can be found in the Human Factors Training Manual of CAAB.*

Note 7*.— Information for pilots and flight operations personnel on flight procedure parameters and operational procedures is contained in PANS-OPS (Doc 8168), Volume I. Criteria for the construction of visual and instrument flight procedures are contained in PANS -OPS (Doc 8168), Volume II. Obstacle clearance criteria and procedures used in certain States may differ from PANS-OPS, and knowledge of these differences is important for safety reasons.*

Note 8*.— Guidance material to design flight crew training programmes can be found in the Manual of Evidence-based Training (CAAB).*

Note 9*.— Guidance material on the different means used to assess competence can be found in the Attachment to Chapter 2 of the Procedures for Air Navigation Services — Training (CAAB).*

Note 10.*— Procedures for upset prevention and recovery training in a flight simulation training device are contained in the Procedures for Air Navigation Services — Training (CAAB).*

Note 11*.— Guidance on upset prevention and recovery training in a flight simulation training device is contained in the Manual on Aeroplane Upset Prevention and Recovery Training (CAAB).*

9.3.2 The requirement for recurrent flight training in a particular type of aeroplane shall be considered fulfilled by:

a) the use, to the extent deemed feasible by the Civil Aviation Authority of Bangladesh (CAAB), of flight simulation training devices approved by the Civil Aviation Authority of Bangladesh (CAAB) for that purpose; or

b) the completion within the appropriate period of the proficiency check required by 9.4.4 in that type of aeroplane.

9.4 QUALIFICATIONS

Note.*—See the Manual of Procedures for Establishment and Management of a State's Personnel Licensing System (Doc 9379) for guidance of a general nature on cross-crew qualification, mixed-fleet flying and cross-credit.*

9.4.1 Recent experience - pilot-in-command and co-pilot

9.4.1.1 The operator shall not assign a pilot-in-command or a co-pilot to operate at the flight controls of a type or variant of a type of aeroplane during take-off and landing unless that pilot has operated the flight controls during at least three take-offs and landings within the preceding 90 days on the same type of aeroplane or in a flight simulator approved for the purpose.

9.4.1.2 When a pilot-in-command or a co-pilot is flying several variants of the same type of aeroplane or different types of aeroplanes with similar characteristics in terms of operating procedures, systems and handling, shall also meet the provision of 9.4.1.1 for each variant or each type of aeroplane.

9.4.2 Recent experience — cruise relief pilot

9.4.2.1 No person may act as a cruise relief pilot in commercial air transport unless, within the preceding 90 days, that person has either:

a) Operated as PIC, CP, or cruise relief pilot on the same type of aircraft; or

b) Carried out flying skill refresher training including normal, abnormal, and emergency procedures specific to cruise flight on the same type of aeroplane or in a Flight Simulator approved for the purpose, and has practiced approach and landing procedures, where the approach and landing procedure practice may be performed as the pilot who is not flying the aeroplane.

9.4.2.2 When a cruise relief pilot is flying several variants of the same type of aeroplane or different types of aeroplanes with similar characteristics in terms of operating procedures, systems and handling, the Civil Aviation Authority of Bangladesh shall decide under which conditions the requirements of 9.4.2.1 for each variant or each type of aeroplane can be combined.

9.4.3 Pilot-in command area, route, and aerodrome qualification

9.4.3.1 No person shall serve, nor shall any AOC holder use a person as a pilot unless, within the preceding 12 calendar months, that person has passed a line check in which he or she satisfactorily performed his or her assigned duties in one of the types of aircraft he or she is to fly.

9.4.3.2 Each PIC shall demonstrate operational competency by navigation over the route and area to be flown and the aerodromes to be used as PIC under the supervision of a check person and, on a continuing basis, by flights performing PIC duties. This, at a minimum, shall include a PIC demonstration of knowledge in the following:

a) The terrain and minimum safe altitudes;

b) The seasonal meteorological conditions;

c) The search and rescue procedures;

d) The navigational facilities and procedures, including any LORAN procedures, associated with the route along which the flight is to take place; and

e) Procedures applicable to:

1) Flight paths over heavily populated areas or high air traffic density;

2) Obstructions.

3) Physical layout.

4) Lighting, approach aids.

5) Arrival, departure, holding and IAPs; and

6) Applicable operating minima.

Note. *— That portion of the demonstration relating to arrival, departure, holding and instrument approach procedures may be accomplished in an appropriate training device which is adequate for this purpose.*

9.4.3.3 A pilot-in-command shall have made an actual approach into each aerodrome of landing on the route, accompanied by a pilot who is qualified for the aerodrome, as a member of the flight crew or as an observer on the flight deck, unless:

a) the approach to the aerodrome is not over difficult terrain and the instrument approach procedures and aids available are similar to those with which the pilot is familiar, and a margin to be approved by the Civil Aviation Authority of Bangladesh (CAAB) is added to the normal operating minima, or there is reasonable certainty that approach, and landing can be made in visual meteorological conditions; or

b) the descent from the initial approach altitude can be made by day in visual meteorological conditions; or

c) the operator qualifies the pilot-in-command to land at the aerodrome concerned by means of an adequate pictorial presentation; or

d) the aerodrome concerned is adjacent to another aerodrome at which the pilot-in command is currently qualified to land.

9.4.3.4 The operator shall maintain a record, sufficient to satisfy the Civil Aviation Authority of Bangladesh (CAAB) of the qualification of the pilot and of the manner in which such qualification as been achieved.

9.4.3.5 The operator shall not continue to utilize a pilot as a pilot-in-command on a route or within an area specified by the operator and approved by the Civil Aviation Authority of Bangladesh (CAAB) unless within the preceding 12 months, that pilot has made at least one trip as a pilot member of the flight crew, or as a check pilot, or as an observer in the flight crew compartment:

a) Within that specified area; and

b) if appropriate, on any route where procedures associated with that route or with any aerodromes intended to be used for take-off or landing require the application of special skills or knowledge.

9.4.3.6 In the event that more than 12 months elapse in which a pilot-in-command has not made such a trip on a route in close proximity and over similar terrain, within such a specified area, route or aerodrome, and has not practiced such procedures in a training device which is adequate for this purpose, prior to again serving as a pilot-in- command within that area or on that route, that pilot must requalify in accordance with 9.4.3.2 and 9.4.3.3.

9.4.4 Pilot proficiency checks (PPC)

9.4.4.1 No person shall act as a pilot of an aircraft unless that person has, within the preceding 12 months, successfully passed two proficiency checks conducted by an authorized representative of the CAAB. The proficiency check requirement:

a) Shall ensure that piloting technique and the ability to execute emergency procedures is checked in such a way as to demonstrate the pilot's competence on each type or variant of a type of aircraft, including where the operations may be conducted under IFR.

b) Shall not be satisfied by the conduct of two checks that are similar and such checks shall be performed twice within any period of one year. Any two such checks which are similar and which occur within a period of four consecutive months shall not alone satisfy this requirement.

Note 1. *— Flight simulation training devices approved by the Civil Aviation Authority of Bangladesh (CAAB) may be used for those parts of the checks for which they are specifically approved.*

Note 2. — *See the Manual of Criteria for the Qualification of Flight Simulation Training Devices (CAAB).*

Note 3. —

(i). If the next PPC is performed within 4 months from the first PPC then the yearly cycle shall start anew.

(ii). If the next PPC is performed within the same yearly cycle but after expiry of the validity of first PPC then the PPC shall be valid for maximum 4 months;

(iii). If the next PPC is performed in the succeeding yearly cycle, then the yearly cycle shall start anew.

(iv). A flight crew member completing a PPC shall be entitled for full validity from the date of expiry including the last day of the month.

Note 4. — *After completion of PPC for a type of endorsement, a trainee will complete the Route Training requirements as per operator's OM part D. Thereafter, the trainee will undergo an oral examination followed by an initial Route Check (02 sectors) to be conducted by a Route Check Instructor and monitored by a CAAB nominated inspector.*

Note 5. — *IRC is not required if a trainee's oral and skill test is conducted by an approved SFE in a FSTD and monitored by a type rated FOI.*

9.4.4.2 PPC requirements may be combined for several variants of the same type of aircraft or different types of aircraft with similar characteristics in terms of operating procedures, systems, and handling, if approved by the CAAB.

9.4.4.3 The qualification, training, and proficiency checking requirements for flight crew members engaged in commercial air transport are prescribed in 9.3 of this ANOS. Additionally, the requirements in paragraphs 9.4.4.1 of this subsection shall be met, as applicable.

9.4.5 Single pilot operations under the instrument flight rules (IFR) or at night

9.4.5.1 Single pilot operations intended to be carried out under the IFR or at night shall meet the prescribed requirements of experience, recency, and training applicable to single pilot operations of CAAB.

9.4.5.2 **Recommendation**.— *The pilot-in-command should:*

a) for operations under the IFR or at night, have accumulated at least 50 hours flight time on the class of aeroplane, of which at least 10 hours shall be as pilot-in-command;

b) for operations under the IFR, have accumulated at least 25 hours flight time under the IFR on the class of aeroplane, which may form part of the 50 hours flight time in sub-paragraph a);

c) for operations at night, have accumulated at least 15 hours flight time at night, which may form part of the 50 hours flight time in sub-paragraph a);

d) for operations under the IFR, have acquired recent experience as a pilot engaged in a single pilot operation under the IFR of:

1) at least five IFR flights, including three instrument approaches carried out during the preceding 90 days on the class of aeroplane in the single pilot role; or

2) an IFR instrument approach check carried out on such an aeroplane during the preceding 90 days;

e) for operations at night, have made at least three take-offs and landings at night on the class of aeroplane in the single pilot role in the preceding 90 days; and

f) have successfully completed training programmes that include, in addition to the requirements of 9.3, passenger briefing with respect to emergency evacuation, autopilot management, and the use of simplified in-flight documentation.

9.4.5.3 The initial and recurrent flight training and proficiency checks indicated in 9.3.1 and 9.4.4 shall be performed by the pilot-in-command in the single pilot role on the class of aeroplane in an environment representative of operation.

9.5 FLIGHT CREW EQUIPMENT

A flight crew member assessed as fit to exercise the privileges of a licence subject to the use of suitable correcting lenses , shall have a spare set of the correcting lenses readily available when exercising those privileges.

CHAPTER- 10. FLIGHT OPERATIONS OFFICER/FLIGHT DISPATCHER

10.1 The Civil Aviation Authority of Bangladesh (CAAB) requires that a flight operations officer/flight dispatcher, when employed in conjunction with an approved method of control and supervision of flight operations, be licensed, that flight operations officer/flight dispatcher shall be licensed in accordance with the provisions of ANO 1.

10.2 In accepting proof of qualifications other than the option of holding of a flight operations officer/flight dispatcher licence, the Civil Aviation Authority of Bangladesh (CAAB) in accordance with the approved method of control and supervision of flight operations, shall require that, as a minimum, such persons meet the requirements specified in ANO 1 for the flight operations officer/flight dispatcher licence.

10.3 A flight operations officer/flight dispatcher shall not be assigned to duty unless that person has:

a) satisfactorily completed the operator-specific training course that addresses all the specific components of its approved method of control and supervision of flight operations specified in 4.2.1.3;

Note.— *Guidance on the composition of such training syllabi is provided in the Training Manual (ICAO Doc 7192), Part D-3 — Flight Operations Officers/Flight Dispatchers*.

b) made, within the preceding 12 months, at least a one-way qualification flight in the flight crew compartment of an aeroplane over any area for which that individual is authorized to exercise flight supervision. The flight should include landings at as many aerodromes as practicable.

Note.—*For the purpose of the qualification flight, the flight operations officer/flight dispatcher must be able to monitor the flight crew intercommunication system and radio communications and be able to observe the actions of the flight crew.*

c) demonstrated to the operator a knowledge of:

1) the contents of the operations manual described in Appendix-2;

2) the radio equipment in the aeroplanes used; and

3) the navigation equipment in the aeroplanes used.

d) demonstrated to the operator a knowledge of the following details concerning operations for which the officer is responsible and areas in which that individual is authorized to exercise flight supervision:

1) the seasonal meteorological conditions and the sources of meteorological information.

2) the effects of meteorological conditions on radio reception in the aeroplanes used.

3) the peculiarities and limitations of each navigation system which is used by the operation; and

4) the aeroplane loading instructions;

e) demonstrated to the operator knowledge and skills related to human performance relevant to dispatch duties; and

f) demonstrated to the operator the ability to perform the duties specified in 4.6.

10.4 **Recommendation.**—*A flight operations officer/flight dispatcher assigned to duty should maintain complete familiarization with all features of the operation which are pertinent to such duties, including knowledge and skills related to human performance.*

Note.— *Guidance material to design training programmes to develop knowledge and skills in human performance can be found in the* Human Factors Training Manual *(ICAO Doc 9683)*.

10.5 **Recommendation.** — *A flight operations officer/flight dispatcher should not be assigned to duty after 12 consecutive months of absence from such duty, unless the provisions of 10.3 are met.*

CHAPTER- 11. MANUALS, LOGS AND RECORDS

Note. *— The following additional manuals, logs and records are associated with this ANO but are not included in this chapter:*

Fuel and oil records — ***see 4.2.10.***

Maintenance records — ***see ANO(AW) PART M.***

Flight time records — ***sees 4.10.8***

Flight preparation forms — ***sees 4.3.***

Operational flight plan — ***see 4.3.3.1***

Pilot-in-command route and airport qualification records — ***see 9.4.3.4.***

11.1 FLIGHT MANUAL

Note. *— The flight manual contains the information specified in ANO (AW) Part 21.*

The flight manual shall be updated by implementing changes made mandatory by the

State of Registry.

11.2 OPERATOR'S MAINTENANCE CONTROL MANUAL

The provisions related to the operator's maintenance control manual are described in ANO(AW) Part M

11.3 MAINTENANCE PROGRAMME

The provisions related to the operator's maintenance programme are described in ANO(AW) Part M

11.4 JOURNEY LOG BOOK

11.4.1 The aeroplane journey logbook shall contain the following items and the corresponding roman numerals:

I - Aeroplane nationality and registration.

II - Date.

III - Names of crew members.

IV - Duty assignments of crew members.

V - Place of departure.

VI - Place of arrival.

VII - Time of departure.

VIII - Time of arrival.

IX - Hours of flight.

X - Nature of flight (private, aerial work, scheduled or non-scheduled).

XI - Incidents, observations, if any.

XII - Signature of person in charge.

11.4.2 **Recommendation**. — *Entries in the journey logbook should be made currently and in ink or indelible pencil.*

11.4.3 **Recommendation**.—*Completed journey log book should be retained to provide a continuous record of the last six months' operations.*

11.5 RECORDS OF EMERGENCY AND SURVIVAL EQUIPMENT CARRIED

Operators shall always have available for immediate communication to rescue coordination centres, lists containing information on the emergency and survival equipment carried on board any of their aeroplanes engaged in international air navigation. The information shall include, as applicable, the number, colour and type of life rafts and pyrotechnics, details of emergency medical supplies, water supplies and the type and frequencies of the emergency portable radio equipment.

11.6 FLIGHT RECORDER RECORDS

The operator shall ensure, to the extent possible, in the event the aeroplane becomes involved in an accident or incident, the preservation of all related flight recorder records and, if necessary, the associated flight recorders, and their retention in safe custody pending their disposition as determined in accordance with ANO 13.

CHAPTER- 12. CABIN CREW

12.1 ASSIGNMENT OF EMERGENCY DUTIES

The operator shall establish, to the satisfaction of the Civil Aviation Authority of Bangladesh (CAAB), the minimum number of cabin crew required for each type of aeroplane, based on seating capacity or the number of passengers carried, to affect a safe and expeditious evacuation of the aeroplane, and the necessary functions to be performed in an emergency or a situation requiring emergency evacuation. The operator shall assign these functions for each type of aeroplane.

12.2 CABIN CREW AT EMERGENCY EVACUATION STATIONS

Each cabin crew member assigned to emergency evacuation duties shall occupy a seat provided in accordance with 6.16 during take-off and landing and whenever the pilot-in command so directs.

12.3 PROTECTION OF CABIN CREW DURING FLIGHT

Each cabin crew member shall be seated with seat belt or, when provided, safety harness fastened during take-off and landing and whenever the pilot-in-command so directs.

Note. *— The foregoing does not preclude the pilot-in-command from directing the fastening of the seat belt only, at times other than during take-off and landing.*

12.4 TRAINING

The operator shall establish and maintain a training programme, approved by the Civil Aviation Authority of Bangladesh (CAAB) to be completed by all persons before being assigned as a cabin crew member. Cabin crew members shall complete a recurrent training programme annually. These training programmes shall ensure that each person is:

a) competent to execute those safety duties and functions which the cabin crew member is assigned to perform in the event of an emergency or in a situation requiring emergency evacuation;

b) drilled and capable in the use of emergency and life-saving equipment required to be carried, such as life jackets, life rafts, evacuation slides, emergency exits, portable fire extinguishers, oxygen equipment, first-aid and universal precaution kits, and automated external defibrillators;

c) when serving on aeroplanes operated above 3 000m (10 000 ft), knowledgeable as regards the effect of lack of oxygen and, in the case of pressurized aeroplanes, as regards physiological phenomena accompanying a loss of pressurization.

d) aware of other crew members‘ assignments and functions in the event of an emergency so far as is necessary for the fulfilment of the cabin crew member‘s own duties;

e) aware of the types of dangerous goods which may, and may not, be carried in a passenger cabin; and

f) knowledgeable about human performance as related to passenger cabin safety duties including flight crew- cabin crew coordination.

Note 1.— *Requirements for the training of cabin crew members in the transport of dangerous goods are included in the Dangerous Goods Training Programme contained in ANO 18* — The Safe Transport of Dangerous Goods by Air *and the* Technical Instructions for the Safe Transport of Dangerous Goods by Air *(ICAO Doc 9284).*

Note 2*. — For more information on dangerous goods operational requirements, see Chapter 14.*

Note 3*.— Guidance material to design training programmes to develop knowledge and skills in human performance can be found in the* Cabin Crew Safety Training Manual *(ICAO Doc 10002).*

Note 4. — See Appendix 12 of this annual *for more information on Cabin Crew.*

CHAPTER- 13. SECURITY

13.1 DOMESTIC COMMERCIAL OPERATIONS

Recommendation.—*International Standards and Recommended Practices set forth in this chapter should be applied by all Contracting States also in case of domestic commercial operations (air services).*

13.2 SECURITY OF THE FLIGHT CREW COMPARTMENT

13.2.1 In all aeroplanes which are equipped with a flight crew compartment door, this door shall be capable of being locked, and means shall be provided by which cabin crew can discreetly notify the flight crew in the event of suspicious activity or security breaches in the cabin.

13.2.2 All passenger-carrying aeroplanes:

a) of a maximum certificated take-off mass more than 54,500 kg; or

b) of a maximum certificated take-off mass in excess of 45 500 kg with a passenger seating capacity greater than 19; or

c) with a passenger seating capacity greater than 60 shall be equipped with an approved flight crew compartment door that is designed to resist penetration by small arms fire and grenade shrapnel, and to resist forcible intrusions by unauthorized persons. This door shall be capable of being locked and unlocked from either pilot ‘s station.

13.2.3 In all aeroplanes which are equipped with a flight crew compartment door in accordance with 13.2.2:

a) this door shall be closed and locked from the time all external doors are closed following embarkation until any such door is opened for disembarkation, except when necessary to permit access and egress by authorized persons; and

b) means shall be provided for monitoring from either pilot‘s station the entire door area outside the flight crew compartment to identify persons requesting entry and to detect suspicious behavior or potential threat.

13.2.4 **Recommendation.** — *All passenger-carrying aeroplanes should be equipped with an approved flight crew compartment door, where practicable, that is designed to resist penetration by small arms fire and grenade shrapnel, and to resist forcible intrusions by unauthorized persons. This door should be capable of being locked and unlocked from either pilot’s station.*

13.2.5 **Recommendation**.—*In all aeroplanes which are equipped with a flight crew compartment door in accordance with 13.2.4:*

a) the door should be closed and locked from the time all external doors are closed following embarkation until any such door is opened for disembarkation, except when necessary to permit access and egress by authorized persons; and

b) means should be provided for monitoring from either pilot's station the entire door area outside the flight crew compartment to identify persons requesting entry and to detect suspicious behaviour or potential threat.

13.3 AEROPLANE SEARCH PROCEDURE CHECKLIST

The operator shall ensure that there is on board a checklist of the procedures to be followed in searching for a bomb in case of suspected sabotage and for inspecting aeroplanes for concealed weapons, explosives, or other dangerous devices when a well- founded suspicion exists that the aeroplane may be the object of an act of unlawful interference. The checklist shall be supported by guidance on the appropriate course of action to be taken should a bomb or suspicious object be found and information n on the least-risk bomb location specific to the aeroplane.

13.4 TRAINING PROGRAMMES

13.4.1 The operator shall establish and maintain a CAAB approved security training programme which ensures crew members act in the most appropriate manner to minimize the consequences of acts of unlawful interference. As a minimum, this programme shall include the following elements:

a) determination of the seriousness of any occurrence.

b) crew communication and coordination.

c) appropriate self-defense responses;

d) use of non-lethal protective devices assigned to crew members whose use is authorized by the Civil Aviation Authority of Bangladesh (CAAB);

e) understanding of behaviors of terrorists so as to facilitate the ability of crew members to cope with hijacker behaviors and passenger responses.

f) live situational training exercises regarding various threat conditions.

g) flight crew compartment procedures to protect the aeroplane; and

h) aeroplane search procedures and guidance on least-risk bomb locations where practicable.

13.4.2 The operator shall also establish and maintain a CAAB approved training programme to acquaint appropriate employees with preventive measures and techniques in relation to passengers, baggage, cargo, mail, equipment, stores and supplies intended for carriage on an aeroplane so that they contribute to the prevention of acts of sabotage or other forms of unlawful interference.

13.5 REPORTING ACTS OF UNLAWFUL INTERFERENCE

Following an act of unlawful interference, the pilot-in-command shall submit, without delay, a report of such an act to the designated local authority.

13.6 MISCELLANEOUS

13.6.1 **Recommendation.**—*Specialized means of attenuating and directing the blast should be provided for use at the least-risk bomb location.*

13.6.2 **Recommendation**. — *Where the operator accepts the carriage of weapons removed from passengers, the aeroplane should have provision for stowing such weapons in a place so that they are inaccessible to any person during flight time.*

CHAPTER- 14. DANGEROUS GOODS

14.1 CAAB RESPONSIBILITIES

Note 1.—*ANO 18, Chapter 11, contains requirements for each Contracting State to establish oversight procedures for all entities (including packers, shippers, ground handling agents and operators) performing dangerous goods functions.*

Note 2.—*Operator responsibilities for the transport of dangerous goods are contained in Chapters 8, 9 and 10 of ANO 18. Part 7 of the Technical Instructions for the Safe Transport of Dangerous Goods by Air (ANO 18) (Technical Instructions) contains the operator's responsibilities and requirements for incident and accident reporting.*

Note 3. — *The requirements pertaining to crew members or passengers carrying dangerous goods on aircraft are set forth in Part 8, Chapter 1, of the Technical Instructions.*

14.2 OPERATORS WITH NO SPECIFIC APPROVAL FOR THE TRANSPORT OF DANGEROUS GOODS AS CARGO

All operators with no specific approval to transport dangerous goods, shall have to:

a) establish a dangerous goods training programme that meets the requirements of ANO 18, the applicable requirements of the Technical Instructions, Part 1, Chapter 4, and the requirements of the Civil Aviation Authority of Bangladesh (CAAB) regulations, as appropriate. Details of the dangerous goods training programme shall be included in the operator 's operations manuals;

b) establish dangerous goods policies and procedures in its operations manual to meet, at a minimum, the requirements of ANO 18, the Technical Instructions and CAAB's regulations to allow operator personnel to:

   1) identify and reject undeclared dangerous goods, including COMAT classified as dangerous goods; and

   2) report to the appropriate authorities of the Civil Aviation Authority of Bangladesh (CAAB) and the State in which it occurred any:

      i) occasions when undeclared dangerous goods are discovered in cargo or mail; and

      ii) dangerous goods accidents and incidents.

14.3 OPERATORS WITH A SPECIFIC APPROVAL FOR THE TRANSPORTOF DANGEROUS GOODS AS CARGO

All operators with specific approval to transport dangerous goods, shall have to:

a) establish a dangerous goods training programme that meets the requirements in the Technical Instructions, Part 1, Chapter 4, Table 1-4, and the requirements of the CAAB regulations, as appropriate. Details of the dangerous goods training programme shall be included in the operator ‘s operations manuals;

b) establish dangerous goods policies and procedures in its operations manual to meet, at a minimum, the requirements of ANO 18, the Technical Instructions and the CAAB ‘s regulations to enable operator personnel to:

1) identify and reject undeclared or mis declared dangerous goods, including COMAT is classified as dangerous goods.

2) report to the appropriate authorities of the Civil Aviation Authority of Bangladesh (CAAB) and the State in which it occurred any:

i) occasions when undeclared or mis declared dangerous goods are discovered in cargo or mail; and

ii) dangerous goods accidents and incidents;

3) report to the appropriate authorities of The Civil Aviation Authority of Bangladesh (CAAB) and the State of Origin any occasions when dangerous goods are discovered to have been carried.

i) when not loaded, segregated, separated or secured in accordance with theTechnical Instructions, Part 7, Chapter 2; and

ii) without information having been provided to the pilot-in-command.

4) accept, handle, store, transport, load and unload dangerous goods, including COMAT classified as dangerous goods as cargo on board an aircraft; and

5) provide the pilot-in-command with accurate and legible written or printed information concerning dangerous goods that are to be carried as cargo.

***Note**.— Article 35 of the Convention refers to certain classes of cargo restrictions.*

14.4 PROVISION OF INFORMATION

The operator shall ensure that all personnel, including third-party personnel, involved in the acceptance, handling, loading, and unloading of cargo are informed of the operator's specific approval and limitations with regard to the transport of dangerous goods.

14.5 DOMESTIC COMMERCIAL AIR TRANSPORT OPERATIONS

Recommendation. — *The International Standards and Recommended Practices set forth in this chapter should be applied by all Contracting States also in the case of domestic commercial air transport operations.*

***Note. —** ANO 18 contains a similar provision in this regard.*

CHAPTER- 15. CARGO COMPARTMENT SAFETY

Note. — *Guidance on the hazards associated with the transport of items in the cargo compartment, the conduct of a specific safety risk assessment in accordance with the Safety Management Manual (ICAO Doc 9859), and the responsibilities for the transport of dangerous goods, is contained in the Guidance for Safe Operations Involving Cargo Compartments (CAAB).*

15.1 Transport of items in the cargo compartment

15.1.1 All operators shall establish policy and procedures for the transport of items in the cargo compartment, which include the conduct of a specific safety risk assessment. The risk assessment shall include at least the:

a) hazards associated with the properties of the items to be transported.

b) capabilities of the operator.

c) operational considerations (e.g. area of operations, diversion time);

d) capabilities of the aeroplane and its systems (e.g. cargo compartment fire suppression capabilities);

e) containment characteristics of unit load devices.

f) packing and packaging.

g) safety of the supply chain for items to be transported; and

h) quantity and distribution of dangerous goods items to be transported.

Note. *— Additional operational requirements for the transport of dangerous goods are contained in Chapter 14.*

15.2 Fire protection

15.2.1 The elements of the cargo compartment(s) fire protection system as approved by the State of Design or State of Registry, and a summary of the demonstrated cargo compartment fire protection certification standards, shall be provided in the aeroplane flight manual or other documentation supporting the operation of the aeroplane.

***Note**.—Guidance on the elements of cargo compartment fire protection and associated demonstrated standards are provided in the* Guidance for Safe Operations Involving Cargo Compartments *(ICAO Doc 10102).*

15.2.2 The Operator shall establish policy and procedures that address the items to be transported in the cargo compartment. These shall ensure to a reasonable certainty that in the event of a fire involving those items; it can be detected and sufficiently suppressed or contained by the elements of the aeroplane design associated with cargo compartment fire protection, until the aeroplane makes a safe landing.

***Note**. — Guidance on policies and procedures that address the items to be transported in the cargo compartment are provided in the* Guidance for Safe Operations Involving Cargo Compartments *(ICAO Doc 10102).*

CHAPTER-16. REPEAL AND SAVINGS

16.1 Despite such repeal under para 16.1,

a. As soon as may be after the commencement of this ANO, ANO (OPS) A-8, ANO (OPS) A-9, ANO (OPS) B3, ANO (OPS) B7, ANO (OPS) B8, ANO (OPS) C1, ANO (OPS) A10, ANO (OPS) E6, ANO (OPS) E7, ANO (OPS) H-1, ANO (OPS) H-2, (CAD-PEL-OPS)13/2020, (CAD-OPS)17/2021 and (CAC-OPS) 03/2020 shall be repealed after the transition period of twelve months.

b. any act done, measures taken, any order, ANO, circular, or notice issued, certificate, licence or permit given or any agreement entered into or document signed under the said order, ANO, circular shall be deemed to have done, taken, entered, issued, given, made or signed under this ANO;

c. any proceeding, going on or pending, shall, in so far as possible, be disposed of under this ANO; and

d. any suit and other legal proceedings instituted before any court shall, if pending, be disposed of in such a way as if the said order, ANO, circular had not been repealed.

APPENDIX 1. LIGHTS TO BE DISPLAYED BY AEROPLANES

(Chapter 6, 6.10, refers)

1. TERMINOLOGY

When the following terms are used this Appendix, they have the following meanings:

Angles of coverage.

a) Angle of coverage A is formed by two intersecting vertical planes making angles of 70 degrees to the right and 70 degrees to the left respectively, looking aft along the longitudinal axis to a vertical plane passing through the longitudinal axis.

b) Angle of coverage F is formed by two intersecting vertical planes making angles of 110 degrees to the right and 110 degrees to the left respectively, looking forward along the longitudinal axis to a vertical plane passing through the longitudinal axis.

c) Angle of coverage L is formed by two intersecting vertical planes, one parallel to the longitudinal axis of the aeroplane, and the other 110 degrees to the left of the first, when looking forward along the longitudinal axis.

d) Angle of coverage R is formed by two intersecting vertical planes, one parallel to the longitudinal axis of the aeroplane, and the other 110 degrees to the right of the first, when looking forward along the longitudinal axis.

Horizontal plane means the plane contains the longitudinal axis and perpendicular to the plane of symmetry of the aeroplane.

Longitudinal axis of the aeroplane means a selected axis parallel to the direction of flight at a normal cruising speed, and passing through the centre of gravity of the aeroplane.

Making way means an aeroplane on the surface of the water is ―making way when it is under way and has a velocity relative to the water.

Under command means an aeroplane on the surface of the water is ―under command when it is able to execute manoeuvres as required by the International Regulations for Preventing Collisions at Sea for the purpose of avoiding other vessels.

Under way means an aeroplane on the surface of the water is ―under way‖ when it is not aground or moored to the ground or to any fixed object on the land or in the water.

Vertical planes means planes perpendicular to the horizontal plane.

Visible means visible on a dark night with a clear atmosphere.

2. NAVIGATION LIGHTS TO BE DISPLAYED IN THE AIR

Note.—*The lights specified herein are intended to meet the requirements of ANO 2 for navigation lights.*

As illustrated in Figure 1, the following unobstructed navigation lights shall be displayed:

a) a red light projected above and below the horizontal plane through angle of coverage L;

b) a green light projected above and below the horizontal plane through angle of coverage R;

c) a white light projected above and below the horizontal plane rearward through angle of coverage A.

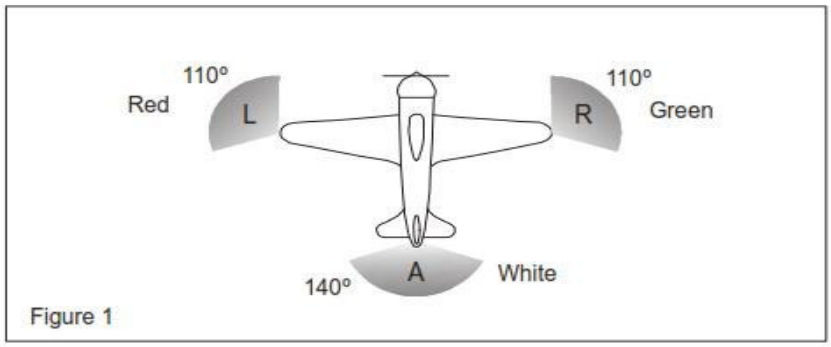


Figure 1

3. LIGHTS TO BE DISPLAYED ON THE WATER

3.1 General

Note.—*The lights specified herein are intended to meet the requirements of ANO 2 for lights to be displayed by aeroplanes on the water.*

The International Regulations for Preventing Collisions at Sea require different lights to be displayed in each of the following circumstances:

a) when under way;

b) when towing another vessel or aeroplane.

c) when being towed.

d) when not under command and not making way.

e) when making way but not under command.

f) when at anchor;

g) when aground.

The lights required by aeroplanes in each case are described below.

3.2 When under way

As illustrated in Figure 2, the following appearing as steady unobstructed lights:

a) a red light projected above and below the horizontal through angle of coverage L;

b) a green light projected above and below the horizontal through angle of coverage R;

c) a white light projected above and below the horizontal through angle of coverage A; and

d) a white light projected through angle of coverage F.

The lights described in 3.2 a), b) and c) should be visible at a distance of at least 3.7 km (2 NM). The light described in 3.2 d) should be visible at a distance of 9.3 km (5 NM) when fitted to an aeroplane of 20 m or more in length or visible at a distance of 5.6 km (3 NM) when fitted to an aeroplane of less than 20 m in length.

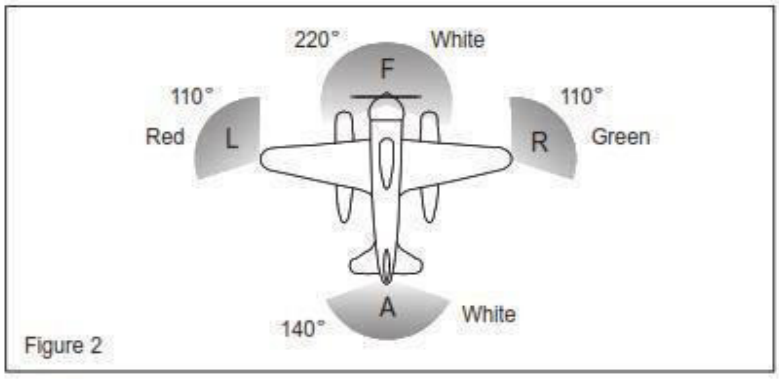


Figure 2

3.3 When towing another vessel or aeroplane

As illustrated in Figure 3, the following appearing as steady, unobstructed lights:

a) the lights described in 3.2.

b) a second light having the same characteristics as the light described in 3.2 d) and mounted in a vertical line at least 2 m above or below it; and

c) a yellow light having otherwise the same characteristics as the light described in 3.2 c) and mounted in a v

d) ertical line at least 2 m above it.

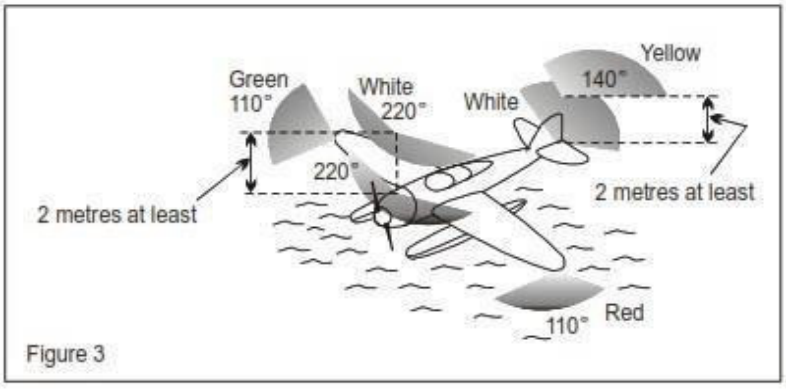


Figure 3

3.4 When being towed

The lights described in 3.2 a), b) and c) appearing as steady, unobstructed lights.

3.5 When not under command and not making way

As illustrated in Figure 4, two steady red lights placed where they can best be seen, one vertically over the other and not less than 1 m apart, and of such a character as to be visible all around the horizon at a distance of at least 3.7 km (2 NM).

3.6 When making way but not under command

As illustrated in Figure 5, the lights described in 3.5 plus the lights described in 3.2 a), b) and c).

Note. *— The display of lights prescribed in 3.5 and 3.6 is to be taken by other aircraft as signals that the aeroplane showing them is not under command and cannot therefore get out of the way. They are not signals of aeroplanes in distress and requiring assistance.*

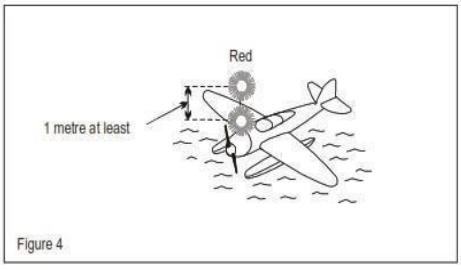


Figure 4

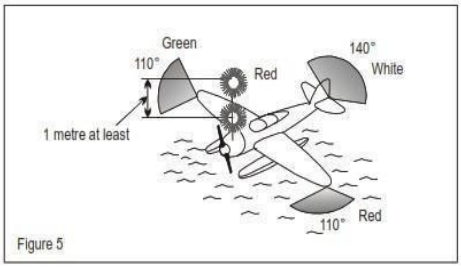


Figure 5

3.7 When at anchor

a) If less than 50 m in length, where it can best be seen, a steady white light (Figure 6), visible all around the horizon at a distance of at least 3.7 km (2 NM).

b) If 50 m or more in length, where they can best be seen, a steady white forward light and a steady white rear light (Figure 7) both visible all around the horizon at a distance of at least 5.6 km (3 NM).

c) If 50 m or more in span a steady white light on each side (Figures 8 and 9) to indicate the maximum span and visible, so far as practicable, all around the horizon at a distance of at least 1.9 km (1 NM).

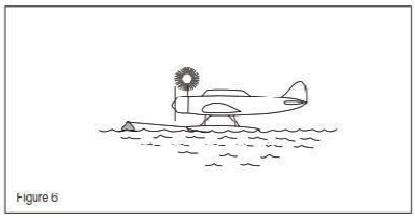


Figure 6

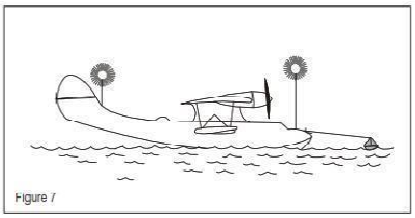
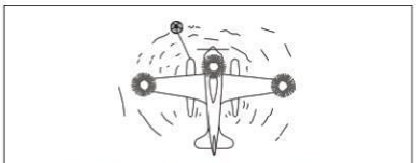
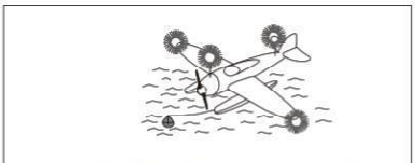


Figure 7


Less than 50 metres in length; 50 metres or more in span
Figure 8


50 metres or more in length; 50 metres or more in span
Figure 9

3.8 When aground

The lights prescribed in 3.7 and in addition two steady red lights in vertical line, at least 1 m apart so placed as to be visible all around the horizon

APPENDIX- 2. ORGANIZATION AND CONTENTS OF AN OPERATION MANUAL

(Chapter 4, 4.2.3.1, refers)

1. ORGANIZATION

An operation manual, which may be issued in separate parts corresponding to specific aspects of operations, provided in accordance with Chapter 4, 4.2.3.1, shall be organized with the following structure:

a) General;

b) Aircraft operating information.

c) Areas, routes and aerodromes; and

d) Training.

2. CONTENTS

The operations manual referred to in 1 shall contain at the least the following:

2.1 General

2.1.1 Instructions outlining the responsibilities of operations personnel pertaining to the conduct of flight operations.

2.1.2 Information and policy relating to fatigue management including:

a) policy pertaining to flight time, flight duty period, duty period limitations and rest requirements for flight and cabin crew members in accordance with Chapter 4, 4.10.2 a) & Appendix 13 of this manual; and

b) policy and documentation pertaining to the operator‘s FRMS in accordance with Appendix 7.

2.1.3 A list of the navigational equipment to be carried including any requirements relating to operations where performance-based navigation is prescribed.

2.1.4 Where relevant to the operations, the long-range navigation procedures, engine failure procedure for EDTO and the nomination and utilization of diversion aerodromes.

2.1.5 The circumstances in which a radio listening watch is to be maintained.

2.1.6 The method for determining minimum flight altitudes.

2.1.7 The methods for determining aerodrome operating minima.

2.1.8 Safety precautions during refueling with passengers on board.

2.1.9 Ground handling arrangements and procedures.

2.1.10 Procedures, as prescribed in ANO 12, for pilots-in-command observing an accident.

2.1.11 The flight crew for each type of operation including the designation of the succession of command.

2.1.12 Specific instructions for the computation of the quantities of fuel and oil to be carried, taking into account all circumstances of the operation including the possibility of loss of pressurization and the failure of one or more engines while en route.

2.1.13 The conditions under which oxygen shall be used and the amount of oxygen determined in accordance with Chapter 4, 4.3.9.2.

2.1.14 Instructions for mass and balance control.

2.1.15 Instructions for the conduct and control of ground de-icing/anti-icing operations.

2.1.16 The specifications for the operational flight plan.

2.1.17 Standard operating procedures (SOPs) for each phase of flight.

2.1.18 Instructions on the use of normal checklists and the timing of their use.

2.1.19 Departure contingency procedures.

2.1.20 Instructions on the maintenance of altitude awareness and the use of automated or flight crew altitude call- out.

2.1.21 Instructions on the use of autopilots and auto-throttles in IMC.

Note.—*Instructions on the use of autopilots and auto-throttles, together with 2.1.26 and 2.1.30, are essential for avoidance of approach and landing accidents and controlled flight into terrain accidents.*

2.1.22 Instructions on the clarification and acceptance of ATC clearances, particularly where terrain clearance is involved.

2.1.23 Departure and approach briefings.

2.1.24 Procedures for familiarization with areas, routes and aerodromes.

2.1.25 Stabilized approach procedure.

2.1.26 Limitation on high rates of descent near the surface.

2.1.27 Conditions required to commence or to continue an instrument approach.

2.1.28 Instructions for the conduct of precision and non-precision instrument approach procedures.

2.1.29 Allocation of flight crew duties and procedures for the management of crew workload during night and IMC instrument approach operations.

2.1.30 Instructions and training requirements for the avoidance of controlled flight into terrain and policy for the use of the ground proximity warning system (GPWS).

2.1.31 Policy, instructions, procedures and training requirements for the avoidance of collisions and the use of the airborne collision avoidance system (ACAS).

Note.— *Procedures for the operation of ACAS are contained in PANS-OPS (Doc 8168), Volume I, and in PANS-ATM (Doc 4444), Chapters 12 and 15.*

2.1.32 Information and instructions relating to the interception of civil aircraft including:

a) procedures, as prescribed in ANO 2, for pilots-in-command of intercepted aircraft; and

b) visual signals for use by intercepting and intercepted aircraft, as contained in ANO 2.

2.1.33 For aeroplanes intended to be operated above 15 000 m (49 000 ft):

a) information which will enable the pilot to determine the best course of action to take in the event of exposure to solar cosmic radiation; and

b) procedures in the event that a decision to descend is taken, overing:

1) the necessity of giving the appropriate ATS unit prior warning of the situation and of obtaining a provisional descent clearance; and

2) the action to be taken if communication with the ATS unit cannot be established or is interrupted.

Note.—*Guidance material on the information to be provided is contained in ICAO Circular 126* — Guidance Material on SST Aircraft Operations.

2.1.34 Details of the safety management system (SMS) provided in accordance with Chapters 3 and 4 of ANO 19.

2.1.35 Information and instructions on the carriage of dangerous goods, in accordance with Chapter 14, including action to be taken in the event of an emergency.

Note.—*Guidance material on the development of policies and procedures for dealing with dangerous goods incidents on board aircraft is contained in* Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods *(ICAO Doc 9481)*.

2.1.36 Security instructions and guidance

2.1.37 The search procedure checklist provided in accordance with Chapter 13, 13.3.

2.1.38 Instructions and training requirements for the use of automatic landing systems, a HUD or equivalent displays and EVS, SVS or CVS equipment as applicable.

2.1.39 Instructions and training requirements for the use of the EFB, as applicable.

2.2 Aircraft operating information

2.2.1 Certification limitations and operating limitations.

2.2.2 The normal, abnormal and emergency procedures to be used by the flight crew and the checklists relating thereto as required by Chapter 6, 6.1.4.

2.2.3 Operating instructions and information on climb performance with all engines operating, if provided in accordance with Chapter 4, 4.2.4.3.

2.2.4 Flight planning data for pre-flight and in-flight planning with different thrust/power and speed settings.

2.2.5 The maximum crosswind and tailwind components for each aeroplane type operated and the reductions to be applied to these values having regard to gusts, low visibility, runway surface conditions, crew experience, use of autopilot, abnormal or emergency circumstances, or any other relevant operational factors.

2.2.6 Instructions and data for mass and balance calculations.

2.2.7 Instructions for aircraft loading and securing of load.

2.2.8 Aircraft systems, associated controls, and instructions for their use, as required by Chapter 6, 6.1.4.

2.2.9 The minimum equipment list and configuration deviation list for the aeroplane types operated and specific operations authorized, including any requirements relating to operations where performance-based navigation is prescribed.

2.2.10 Checklist of emergency and safety equipment and instructions for its use.

2.2.11 Emergency evacuation procedures, including type-specific procedures, crew coordination, assignment of crew‘s emergency positions and the emergency duties assigned to each crew member.

2.2.12 The normal, abnormal and emergency procedures to be used by the cabin crew, the checklists relating thereto and aircraft systems information as required, including a statement related to the necessary procedures for the coordination between flight and cabin crew.

2.2.13 Survival and emergency equipment for different routes and the necessary procedures to verify its normal functioning before take-off, including procedures to determine the required amount of oxygen and the quantity available.

2.2.14 The ground-air visual signal code for use by survivors, as contained in ANO 12.

2.3 Routes and aerodromes

2.3.1 A route guide to ensure that the flight crew will have, for each flight, information relating to communication facilities, navigation aids, aerodromes, instrument approaches, instrument arrivals and instrument departures as applicable for the operation, and such other information as the operator may deem necessary for the proper conduct of flight operations.

2.3.2 The minimum flight altitudes for each route to be flown.

2.3.3 Aerodrome operating minima for each of the aerodromes that are likely to be used as aerodromes of intended landing or as alternate aerodromes.

2.3.4 The increase of aerodrome operating minima in case of degradation of approach or aerodrome facilities.

2.3.5 Instructions for determining aerodrome operating minima for instrument approaches using eligible equipment for operational credit.

2.3.6 The necessary information for compliance with all flight profiles required by regulations, including but not limited to, the determination of:

a) take-off runway length requirements for dry, wet and contaminated conditions, including those dictated by system failures which affect the take-off distance.

b) take-off climb limitations.

c) en-route climb limitations.

d) approach climb limitations and landing climb limitations.

e) landing runway length requirements for dry, wet and contaminated conditions, including systems failures which affect the landing distance; and

f) supplementary information, such as tire speed limitations.

2.4 Training

2.4.1 Details of the flight crew training programme, as required by Chapter 9, 9.3.

2.4.2 Details of the cabin crew duties training programme as required by Chapter 12, 12.4.

2.4.3 Details of the flight operations officer/flight dispatcher training programme when employed in conjunction with a method of flight supervision in accordance with Chapter 4, 4.2.1.

Note. *— Details of the flight operations officer/flight dispatcher training programme are contained in Chapter 10, 10.2.*

APPENDIX 3. ADDITIONAL REQUIREMENTS FOR APPROVED OPERATIONS BY SINGLE- ENGINE TURBINE-POWERED AEROPLANES AT NIGHT AND/OR IN INSTRUMENT METEOROLOGICAL CONDITIONS (IMC)

(Chapter 5, 5.4.1, refers)

Airworthiness and operational requirements provided in accordance with Chapter 5, 5.4.1, shall satisfy the following:

1. TURBINE ENGINE RELIABILITY

1.1 Turbine engine reliability shall be shown to have a power loss rate of less than 1 per 100000 engine hours.

Note. *— Power loss in this context is defined as any loss of power, the cause of which may be traced to faulty engine or engine component design or installation, including design or installation of the fuel ancillary or engine control systems. (See Attachment E.)*

1.2 The operator shall be responsible for engine trend monitoring.

1.3 To minimize the probability of in-flight engine failure, the engine shall be equipped with:

a) an ignition system that activates automatically, or is capable of being operated manually, for take-off and landing, and during flight, in visible moisture;

b) a magnetic particle detection or equivalent system that monitors the engine, accessories gearbox, and reduction gearbox, and which includes a flight deck caution indication; and

c) an emergency engine power control device that permits continuing operation of the engine through a sufficient power range to safely complete the flight in the event of any reasonably probable failure of the fuel control unit.

2. SYSTEMS AND EQUIPMENT

Single-engine turbine-powered aeroplanes approved to operate at night and/or in IMC shall be equipped with the following systems and equipment intended to ensure continued safe flight and to assist in achieving a safe forced landing after an engine failure, under all allowable operating conditions:

a) two separate electrical generating systems, each one capable of supplying all probable combinations of continuous in-flight electrical loads for instruments, equipment and systems required at night and/or in IMC;

b) a radio altimeter;

c) an emergency electrical supply system of sufficient capacity and endurance, following loss of all generated power, to as a minimum:

1) maintain the operation of all essential flight instruments, communication and navigation systems during a descent from the maxi mu m certificated altitude in a glide configuration to the completion of a landing.

2) lower the flaps and landing gear, if applicable.

3) provide power to one pilot heater, which must serve an air speed indicator clearly visible to the pilot.

4) provide for operation of the landing light specified in 2 (j).

5) provide for one engine restart, if applicable; and

6) provide for the operation of the radio altimeter.

d) two attitude indicators, powered from independent sources.

e) a means to provide for at least one attempt at engine re-start.

f) airborne weather radar.

g) a certified area navigation system capable of being programmed with the positions of aerodromes and safe forced landing areas and providing instantly available track and distance information to those locations.

h) for passenger operations, passenger seats and mounts which meet dynamically- tested performance standards and which are fitted with a shoulder harness or a safety belt with a diagonal shoulder strap for each passenger seat.

i) in pressurized aeroplanes, sufficient supplemental oxygen for all occupants for descent following engine failure at the maximum glide performance from the maximum certificated altitude to an altitude at which supplemental oxygen is no longer required.

j) a landing light that is independent of the landing gear and is capable of adequately illuminating the touchdown area in a night forced landing; and

k) an engine fire warning system.

3. MINIMUM EQUIPMENT LIST

The Civil Aviation Authority of Bangladesh (CAAB) requires the minimum equipment list of the operator approved in accordance with Chapter 5,5.4 to specify the operating equipment required for night and/or IMC operations, and for day/VMC operations.

4. FLIGHT MANUAL INFORMATION

The flight manual shall include limitations, procedures, approval status and other information relevant to operations by single-engine turbine-powered aeroplanes at night and/or in IMC.

5. EVENT REPORTING

5.1 The operator approved for operations by single-engine turbine-powered aeroplanes at night and/or in IMC shall report all significant failures, malfunctions or defects to the Civil Aviation Authority of Bangladesh (CAAB) who in turn will notify the State of Design.

5.2 To achieve the intended safety level, the safety data and monitoring of the reliability information to be able to take any actions necessary, it must be reviewed by the Civil Aviation Authority of Bangladesh (CAAB). Who may notify major events or trends of particular concern to the appropriate Type Certificate Holder and the State of Design.

6. OPERATOR PLANNING

6.1 Operator route planning shall take account of all relevant information in the assessment of intended routes or areas of operations, including the following:

a) the nature of the terrain to be overflown, including the potential for carrying out a safe forced landing in the event of an engine failure or major malfunction.

b) weather information, including seasonal and other adverse meteorological influences that may affect the flight; and

c) other criteria and limitations as specified by the CAAB.

6.2 The operator shall identify aerodromes or safe forced landing areas available for use in the event of engine failure, and the position of these shall be programmed into the area navigation system.

Note 1. — *A safe forced landing in this context means a landing in an area at which it can reasonably be expected that it will not lead to serious injury or loss of life, even though the aeroplane may incur extensive damage.*

Note 2. *— Operation over routes and in weather conditions that permit a safe forced landing in the event of an engine failure, as specified in Chapter 5, 5.1.2, is not required by Appendix 3, 6.1 and 6.2 for aeroplanes approved in accordance with Chapter 5, 5.4. The availability of forced landing areas at all points along a route is not specified for these aeroplanes because of the very high engine reliability, additional systems and operational equipment, procedures and training requirements specified in this Appendix.*

7. FLIGHT CREW EXPERIENCE, TRAINING AND CHECKING

7.1 The minimum flight crew experience required for night/IMC operations by single-engine turbine- powered aeroplanes has to be prescribed by CAAB.

7.2 The operator ‘s flight crew training and checking shall be appropriate to night and/or IMC operations by single- engine turbine-powered aeroplanes, covering normal, abnormal and emergency procedures and, in particular, engine failure, including descent to a forced landing in night and/or in IMC conditions.

8. ROUTE LIMITATIONS OVER WATER

The route limitation criteria for single-engine turbine-powered aeroplanes operating at night and/or in IMC on over water operations if beyond gliding distance from an area suitable for a safe forced landing/ditching having regard to the characteristics of the aeroplane, seasonal weather influences, including likely sea state and temperature, and the availability of search and rescue services should be approved by CAAB.

9. OPERATOR CERTIFICATION OR VALIDATION

The operator shall demonstrate the ability to conduct operations by single-engine turbine powered aeroplanes at night and/or in IMC through a certification and approval process specified by the Civil Aviation Authority of Bangladesh (CAAB).

Note. *— Guidance on the airworthiness and operational requirements is contained in Attachment E.*

APPENDIX 4. ALTIMETRY SYSTEM PERFORMANCE REQUIREMENTS FOR OPERATIONS IN RVSM AIRSPACE

(Chapter 7, 7.2.7, refers)

1. In respect of groups of aeroplanes that are nominally of identical design and build with respect to all details that could influence the accuracy of height-keeping performance, the height-keeping performance capability shall be such that the total vertical error (TVE) for the group of aeroplanes shall have a mean no greater than 25 m (80 ft) in magnitude and shall have a standard deviation no greater than $28 - 0.013z^2$ for $0 \leq z \leq 25$ when z is the magnitude of the mean TVE in metres, or $92 - 0.004z^2$ for $0 \leq z \leq 80$ where z is in feet. In addition, the components of TVE shall have the following characteristics:

   a) the mean altimetry system error (ASE) of the group shall not exceed 25 m (80 ft) in magnitude.

   b) the sum of the absolute value of the mean ASE and of three standard deviations of ASE shall not exceed 75 m (245 ft); and

   c) the differences between cleared flight level and the indicated pressure altitude actually flown shall be symmetric about a mean of 0 m, with a standard deviation no greater than 13.3 m (43.7 ft), and in addition, the decrease in the frequency of differences with increasing difference magnitude shall be at least exponential.

2. In respect of aeroplanes for which the characteristics of the airframe and altimetry system fit are unique and so cannot be classified as belonging to a group of aeroplanes encompassed by paragraph 1, the height- keeping performance capability shall be such that the components of the TVE of the aeroplane have the following characteristics:

   a) the ASE of the aeroplane shall not exceed 60 m (200 ft) in magnitude under all flight conditions; and

   b) the differences between the cleared flight level and the indicated pressure altitude actually flown shall be symmetric about a mean of 0 m, with a standard deviation no greater than 13.3 m (43.7 ft), and in addition, the decrease in the frequency of differences with increasing difference magnitude shall be at least exponential.

APPENDIX 5. SAFETY OVERSIGHT OF AIR OPERATORS

(Chapter 4, 4.2.1.8, refers)

Note 1. — "Chapter 3" *to ANO 19 contains the general provisions for a CAAB 's safety oversight system.*

Note 2. *— This Appendix provides additional provisions for the safety oversight of international commercial air transport operators*.

1. PRIMARY AVIATION LEGISLATION

Bangladesh has promulgated the Civil Aviation Act 2017 to enact and implement laws that enable Bangladesh to regulate the certification and continued supervision of air operators and the resolution of safety issues identified by the authority and to ensure that compliance will result in an acceptable level of safety performance for the operations undertaken.

Note 1. *— The term authority as used in this Appendix refers to the Civil Aviation Authority of Bangladesh as well as equivalent organizations, including inspectors and staff.*

Note 2*.— Guidance on the inspection, certification and continued surveillance of operations is contained in the ANO (AOC) and CPD 6-7 of Ops and CPD 8 for Airworthiness.*

2. SPECIFIC OPERATING REGULATIONS

The Civil Aviation Authority of Bangladesh (CAAB) promulgated Air Navigation Order (ANO) to adopt regulations that provide for the certification and continued surveillance of aircraft operations and the maintenance of aircraft in conformity with the Annexes to the Convention on International Civil Aviation.

3. STATE SAFETY OVERSIGHT SYSTEM AND FUNCTIONS

3.1 The Civil Aviation Act 2017 ensures that the authority is responsible for the safety oversight of air operators.

3.2 The Civil Aviation Authority of Bangladesh (CAAB) has established a methodology to determine its inspector staffing requirements according to the size and complexity of civil air operations in Bangladesh.

3.3 **Recommendation**. — *The methodology in 3.2 should be documented.*

3.4 The Civil Aviation Authority of Bangladesh (CAAB) ensures that inspectors have adequate support, credentials and transportation to accomplish, independently, their certification and continued surveillance tasks.

4. QUALIFIED TECHNICAL PERSONNEL

The Civil Aviation Authority of Bangladesh (CAAB) ensures that the initial and recurrent training of the It's inspectors include aircraft- specific subjects.

***Note**. — Guidance on experience and training for inspectors is contained in the* Manual of Procedures for Operations Inspection, Certification and Continued Surveillance *(ICAO Doc 8335 & CA procedure doc CPD 6-1).*

5. TECHNICAL GUIDANCE, TOOLS AND PROVISION OF SAFETY-CRITICAL INFORMATION

5.1 The Civil Aviation Authority of Bangladesh (CAAB) ensures that it's inspectors are provided with technical guidance manuals containing the policies, procedures and standards to be used in the certification and continued surveillance of air operators.

5.2 The Civil Aviation Authority of Bangladesh (CAAB) ensures that it's inspectors are provided with technical guidance manuals containing the policies, procedures and standards to be used in the resolution of safety issues, including enforcement.

5.3 The Civil Aviation Authority of Bangladesh (CAAB) ensures that authority inspectors are provided with technical guidance manuals that address ethics, personal conduct and the avoidance of actual or perceived conflicts of interest in the performance of official duties.

6. CERTIFICATION OBLIGATIONS

The Civil Aviation Authority of Bangladesh (CAAB) requires, prior to commencement of new commercial air transport operations, air operators to demonstrate that they can safely conduct the proposed operations.

***Note. —** Attachment B contains further information in this regard.*

7. CONTINUED SURVEILLANCE OBLIGATIONS

The Civil Aviation Authority of Bangladesh (CAAB) ensures an ongoing surveillance plan to confirm that operators continue to meet the relevant requirements for initial certification and that each air operator is functioning satisfactorily.

8. RESOLUTION OF SAFETY ISSUES

***Note.** — Provisions for the resolution of safety issues are contained in* "Chapter 3" *to ANO 19 and CPD 31.*

APPENDIX 6. AIR OPERATOR CERTIFICATE (AOC)

(Chapter 4, 4.2.1.5 and 4.2.1.6, refer)

The requirements of this Appendix to Air Operator's Certificate are described in ANO (AOC) Section 1.1.11, 1.1.12, 1.1.13, 1.1.14 & IS 1.1.6.

APPENDIX 7. FATIGUE RISK MANAGEMENT SYSTEM REQUIREMENTS

***Note**.—Guidance on the development and implementation of FRMS regulations is contained in the Manual for the Oversight of Fatigue Management Approaches (ICAO Doc 9966).*

A Fatigue Risk Management System (FRMS) established in accordance with Chapter 4, 4.10.6, shall contain, at a minimum:

1. FRMS POLICY AND DOCUMENTATION

1.1 FRMS policy

1.1.1 The operator shall define its FRMS policy, with all elements of the FRMS clearly identified.

1.1.2 The policy shall require that the scope of FRMS operations be clearly defined in the operations manual.

1.1.3 The policy shall:

a) reflect the shared responsibility of management, flight and cabin crews, and other involved personnel.

b) clearly state the safety objectives of the FRMS.

c) be signed by the accountable executive of the organization.

d) be communicated, with visible endorsement, to all the relevant areas and levels of the organization;

e) declare management commitment to effective safety reporting.

f) declare management commitment to the provision of adequate resources for the FRMS.

g) declare management commitment to continuous improvement of the FRMS.

h) require that clear lines of accountability for management, flight and cabin crews, and all other involved personnel are identified; and

i) require periodic reviews to ensure it remains relevant and appropriate.

Note.—Effective safety reporting is described in the Safety Management Manual (ICAO Doc 9859).

1.2 FRMS documentation

The operator shall develop and keep current FRMS documentation that describes and records:

a) FRMS policy and objectives.

b) FRMS processes and procedures.

c) accountabilities, responsibilities and authorities for these processes and procedures.

d) mechanisms for ongoing involvement of management, flight and cabin crew members, and all other involved personnel;

e) FRMS training programmes, training requirements and attendance records.

f) scheduled and actual flight times, duty periods and rest periods with significant deviations and reasons for deviations Noted; and

***Note**. — Significant deviations are described in the* Manual for the Oversight of Fatigue Management Approaches *(ICAO Doc 9966).*

g) FRMS outputs including findings from collected data, recommendations, and actions taken.

2. FATIGUE RISK MANAGEMENT PROCESSES

2.1 Identification of hazards

***Note.** — As of 7 November 2019, provisions on the protection of safety data, safety information and related sources are contained in Appendix 2 to ANO 19.*

The operator shall develop and maintain three fundamental and documented processes for fatigue hazard identification:

2.1.1 Predictive

The predictive process shall identify fatigue hazards by examining crew scheduling and considering factors known to affect sleep and fatigue and their effects on performance. Methods of examination may include but are not limited to:

a) operator or industry operational experience and data collected on similar types of operations.

b) evidence-based scheduling practices; and

c) bio-mathematical models.

2.1.2 Proactive

The proactive process shall identify fatigue hazards within current flight operations. Methods of examination may include but are not limited to:

a) self-reporting of fatigue risks.

b) crew fatigue surveys.

c) relevant flight and cabin crew performance data.

d) available safety databases and scientific studies; and

e) analysis of planned versus actual time worked.

2.1.3 Reactive

The reactive process shall identify the contribution of fatigue hazards to reports and events associated with potential negative safety consequences in order to determine how the impact of fatigue could have been minimized. At a minimum, the process may be triggered by any of the following:

a) fatigue reports.

b) confidential reports.

c) audit reports

d) incidents; and

e) flight data analysis events.

2.2 Risk assessment

2.2.1 The operator shall develop and implement risk assessment procedures that determine the probability and potential severity of fatigue-related events and identify when the associated risks require mitigation.

2.2.2 The risk assessment procedures shall review identified hazards and link them to:

a) operational processes;

b) their probability.

c) possible consequences; and

d) the effectiveness of existing safety barriers and controls.

2.3 Risk mitigation

The operator shall develop and implement risk mitigation procedures that:

a) select the appropriate mitigation strategies.

b) implement the mitigation strategies; and

c) monitor the strategies' implementation and effectiveness.

3. FRMS SAFETY ASSURANCE PROCESSES

The operator shall develop and maintain FRMS safety assurance processes to:

a) provide for continuous FRMS performance monitoring, analysis of trends, and measurement to validate the effectiveness of the fatigue safety risk controls. The sources of data may include, but are not limited to:

1) hazard reporting and investigations.

2) audits and surveys; and

3) reviews and fatigue studies.

b) provide a formal process for the management of change which shall include but is not limited to:

1) identification of changes in the operational environment that may affect FRMS.

2) identification of changes within the organization that may affect FRMS; and

3) consideration of available tools which could be used to maintain or improve FRMS performance prior to implementing changes; and

c) provide for the continuous improvement of the FRMS. This shall include but is not limited to:

1) the elimination and/or modification of risk controls that have had unintended consequences or that are no longer needed due to changes in the operational or organizational environment.

2) routine evaluations of facilities, equipment, documentation and procedures; and

1) the determination of the need to introduce new processes and procedures to mitigate emerging fatigue-related risks.

4. FRMS PROMOTION PROCESSES

FRMS promotion processes support the ongoing development of the FRMS, the continuous improvement of its overall performance, and attainment of optimum safety levels. The following shall be established and implemented by the operator as part of its FRMS:

a) training programmes to ensure competency commensurate with the roles and responsibilities of management, flight and cabin crew, and all other involved personnel under the planned FRMS; and

b) an effective FRMS communication plan that:

1) explains FRMS policies, procedures and responsibilities to all relevant stakeholders; and

2) describes communication channels used to gather and disseminate FRMS- related information.

APPENDIX 8. FLIGHT RECORDERS

(Chapter 6, 6.3, 6.18, refers)

The material in this Appendix concerns flight recorders intended for installation in aeroplanes engaged in international air navigation. Crash-protected flight recorders comprise one or more of the following systems:

— a flight data recorder (FDR),

— a cockpit voice recorder (CVR),

— an airborne image recorder (AIR),

— a data link recorder (DLR).

When image or data link information is required to be recorded on a crash-protected flight recorder, it is permissible to record it on either the CVR or the FDR.

Lightweight flight recorders comprise one or more of the following systems:

— *an aircraft data recording system (ADRS),*

— *a cockpit audio recording system (CARS),*

— *an airborne image recording system (AIRS),*

— *a data link recording system (DLRS).*

When image or data link information is required to be recorded on a lightweight flight recorder, it is permissible to record it on either the CARS or the ADRS.

1. GENERAL REQUIREMENTS

1.1 Non-deployable flight recorder containers shall be painted a distinctive orange colour.

1.2 Non-deployable crash-protected flight recorder containers shall:

a) carry reflective material to facilitate their location; and

b) have securely attached an automatically activated underwater locating device operating at a frequency of 37.5 kHz. At the earliest practicable date, but not later than 1 January 2018, this device shall operate for a minimum of 90 days.

1.3 Automatic deployable flight recorder containers shall:

a) be painted a distinctive orange colour, however the surface visible from outside the aircraft may be of another colour.

b) carry reflective material to facilitate their location; and

c) have an integrated automatically activated ELT.

1.4 The flight recorder systems shall be installed so that:

a) the probability of damage to the recordings is minimized.

b) there is an aural or visual means for pre-flight checking that the flight recorder systems are operating properly; and

c) if the flight recorder systems have an erasure device, the installation shall be designed to prevent operation of the device during flight time or crash impact; and

d) For aeroplanes for which the individual certificate of airworthiness is first issued on or after 1 January 2023, a flight crew-operated erase function shall be provided on the flight deck which, when activated, modifies the recording of a CVR and AIR so that it cannot be retrieved using normal replay or copying techniques. The installation shall be designed to prevent activation during flight. In addition, the probability of an inadvertent activation of an erase function during an accident shall also be minimized.

Note. *— The erase function is intended to prevent access to CVR and AIR recordings by normal replay or copying means, but would not prevent accident investigation authorities access to such recordings by specialized replay or copying techniques.*

1.5 The crash-protected flight recorders shall be installed so that they receive electrical power from a bus that provides the maximum reliability for operation of the flight recorders without jeopardizing service to essential or emergency loads.

1.6 The lightweight flight recorders shall be connected to a power source having the characteristics which ensure proper and reliable recording in the operational environment.

1.7 The flight recorder systems, when tested by methods approved by the appropriate certificating authority, shall be demonstrated to be suitable for the environmental extremes over which they are designed to operate.

1.8 Means shall be provided for an accurate time correlation between the flight recorder system's recordings.

1.9 The manufacturer shall provide the appropriate certificating authority with the following information in respect of the flight recorder systems:

a) manufacturer's operating instructions, equipment limitations and installation procedures.

b) parameter origin or source and equations which relate counts to units of measurement.

c) manufacturer's test reports; and

d) detail information to ensure the continued serviceability of the flight recorder system.

1.10 The holder of the airworthiness approval for the installation design of the flight recorder system shall make available the relevant continuing airworthiness information to the operator of the aeroplane to be incorporated in the continuing airworthiness maintenance programme. This continuing airworthiness information shall cover in detail all the tasks required to ensure the continued serviceability of the flight recorder system.

Note 1. *— The flight recorder system is composed of the flight recorder as well as any dedicated sensors, hardware and software that provide information required per this Appendix.*

Note 2.— *Conditions related to the continued serviceability of a flight recorder system are defined in section 7 of this appendix. The Manual on Flight Recorder System Maintenance (FRSM) (ICAO Doc 10104) provides guidance on maintenance tasks associated with flight recorder systems.*

2. FLIGHT DATA RECORDER (FDR) AND AIRCRAFT DATA RECORDING SYSTEMS (ADRS)

2.1 Start and stop logic

The FDR or ADRS shall start to record prior to the aeroplane moving under its own power and record continuously until the termination of the flight when the aeroplane is no longer capable of moving under its own power.

2.2 Parameters to be recorded

Note. *— In previous editions of ANO 6, Part I, types of recorders were defined to capture the first evolutions of FDRs.*

2.2.1 The parameters that satisfy the requirements for FDRs are listed in Table A8-1. The number of parameters to be recorded shall depend on aeroplane complexity. The parameters without an asterisk (*) are mandatory parameters. Which shall be recorded regardless of aeroplane complexity. In addition, the parameters designated by an asterisk (*) shall be recorded if an information data source for the parameter is used by aeroplane systems or the flight crew to operate the aeroplane. However, other parameters may be substituted with due,regard to the aeroplane type and the characteristics of the recording equipment.

2.2.2 If further FDR recording capacity is available, recording of the following additional information shall be considered:

a) operational information from electronic display systems, such as electronic flight instrument systems (EFIS), electronic centralized aircraft monitor (ECAM) and engine indication and crew alerting system (EICAS). Use the following order of priority:

1) parameters selected by the flight crew relating to the desired flight path, e.g. barometric pressure setting, selected altitude, selected airspeed, decision height, and auto flight system engagement and mode indications if not recorded from another source;

2) display system selection/status, e.g. SECTOR, PLAN, ROSE, NAV, WXR, COMPOSITE, COPY, ETC.

3) warnings and alerts; and

4) the identity of displayed pages for emergency procedures and checklists, and

b) retardation information including brake application for use in the investigation of landing overruns and rejected take-offs.

2.2.3 The parameters that satisfy the requirements for flight path and speed as displayed to the pilot(s) are listed below. The parameters without an (*) are mandatory parameters which shall be recorded. In addition, the parameters designated by an (*) shall be recorded if an information source for the parameter is displayed to the pilot and is practicable to record:

— *Pressure altitude.*

— *Indicated airspeed or calibrated airspeed.*

— *Heading (primary flight crew reference).*

— Pitch attitude.

— *Roll attitude.*

— *Engine thrust/power*.

— *Landing-gear status*.*

— *Total or outside air temperature*.*

— *Time*.*

—Navigation data: drift angle, wind speed, wind direction, latitude/ longitude*.

— *Radio altitude*.*

2.2.4 The parameters that satisfy the requirements for ADRS are the first 7 parameters listed in Table A8-3.

2.2.5 If further ADRS recording capacity is available, the recording of any parameters from 8 onwards defined in Table A8-3 shall be considered.

2.3 Additional information

2.3.1 The measurement range, recording interval and accuracy of parameters on installed equipment shall be verified by methods approved by the appropriate certificating authority.

2.3.2 Documentation concerning parameter allocation, conversion equations, periodic calibration and other serviceability/ maintenance information shall be maintained by the operator. The documentation needs to be sufficient to ensure that accident investigation authorities have the necessary information to read out the data in engineering units.

3. COCKPIT VOICE RECORDER (CVR) AND COCKPIT AUDIO RECORDING SYSTEM (CARS)

3.1 Start and stop logic

The CVR or CARS shall start to record prior to the aeroplane moving under its own power and record continuously until the termination of the flight when the aeroplane is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the CVR or CARS shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

3.2 Signals to be recorded

3.2.1 The CVR shall record simultaneously on four separate channels, or more, at least the following:

a) voice communication transmitted from or received in the aeroplane by radio.

b) aural environment on the flight deck.

c) voice communication of flight crew members on the flight deck using the aeroplane ‘s interphone system, if installed;

d) voice or audio signals identifying navigation or approach aids introduced in the headset or speaker; and

e) voice communication of flight crew members using the passenger address system, if installed.

3.2.2 The preferred CVR audio allocation should be as follows:

a) pilot-in-command audio panel.

b) co-pilot audio panel.

c) additional flight crew positions and time reference; and

d) cockpit area microphone.

3.2.3 The CARS shall record simultaneously on two separate channels, or more, at least the following:

a) voice communication transmitted from or received in the aeroplane by radio.

b) aural environment on the flight deck; and

c) voice communication of flight crew members on the flight deck using the aeroplane 's interphone system, if installed.

3.2.4 The preferred CARS audio allocation should be as follows:

a) voice communication; and

b) aural environment on the flight deck.

4. AUTOMATIC DEPLOYABLE FLIGHT RECORDER (ADFR)

4.1 Operation

The following requirements shall apply to an ADFR:

a) deployment shall take place when the aeroplane structure has been significantly deformed.

b) deployment shall take place when an aeroplane sinks in water.

c) ADFR shall not be capable of manual deployment.

d) the ADFR shall be able to float on water.

e) the ADFR deployment shall not compromise the safe continuation of the flight;

f) the ADFR deployment shall not significantly reduce the chance of survival of the recorder and of successful transmission by its ELT.

g) the ADFR deployment shall not release more than one piece.

h) an alert shall be made to the flight crew when the ADFR is no longer captive to the aircraft.

i) the flight crew shall have no means to disable ADFR deployment when the aircraft is airborne.

j) the ADFR shall contain an integrated ELT, which shall activate automatically during the deployment sequence. Such ELT may be of a type that is activated in- flight and provides information from which a position can be determined; and

k) the integrated ELT of an ADFR shall satisfy the same requirements as an ELT required to be installed on an aeroplane. The integrated ELT shall at least have the same performance as the fixed ELT to maximize detection of the transmitted signal.

Note 1.— *Refer to the* Manual on Location of Aircraft in Distress and Flight Recorder Data Recovery *(Doc 10054) for more information on ADFR.*

Note . *— If an integrated ELT of a type that is activated in flight is used within an ADFR, it could be a means to comply with the requirements of Chapter 6, 6.18.*

5. DATA LINK RECORDER (DLR)

5.1 Applications to be recorded

5.1.1 Where the aircraft flight path is authorized or controlled through the use of data link messages, all data link messages, both uplinks (to the aircraft) and downlinks (from the aircraft), shall be recorded on the aircraft. As far as practicable, the time the messages were displayed to the flight crew and the time of the responses shall be recorded.

Note. — *Sufficient information to derive the content of the data link communications message and the time the messages were displayed to the flight crew is needed to determine an accurate sequence of events on board the aircraft.*

5.1.2 Messages applying to the applications listed in Table A8-2 shall be recorded. Applications without the asterisk (*) are mandatory applications which shall be recorded regardless of the system complexity. Applications with an (*) shall be recorded only as far as is practicable given the architecture of the system.

6. FLIGHT CREW-MACHINE INTERFACE RECORDINGS

6.1 Start and stop logic

The AIR or AIRS shall start to record prior to the aeroplane moving under its own power and record continuously until the termination of the flight when the aeroplane is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the AIR or AIRS shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

6.2 Classes

6.2.1 A Class A AIR or AIRS captures the general cockpit area in order to provide data supplemental to conventional flight recorders.

Note 1. *— To respect crew privacy, the cockpit area view may be designed as far as practical to exclude the head and shoulders of crew members whilst seated in their normal operating position.*

Note 2. *—There are no provisions for Class A AIR or AIRS in this document.*

6.2.2 A Class B AIR or AIRS captures data link message displays.

6.2.3 A Class C AIR or AIRS captures instruments and control panels.

Note*. — A Class C AIR or AIRS may be considered as a means for recording flight data where it is not practical or is prohibitively expensive to record on an FDR or an ADRS, or where an FDR is not required*.

6.3 Applications to be recorded

6.3.1 The operation of switches and selectors and the information displayed to the flight crew from electronic displays shall be captured by sensors or other electronic means.

6.3.2 The recording of operation of switches and selectors by the flight crew shall include the following:

a) any switch or selector that will affect the operation and the navigation of the aircraft; and

b) selection of normal and alternate systems.

6.3.3 The recording of the information displayed to the flight crew from electronic displays shall include the following:

a) primary flight and navigation displays;

b) aircraft system monitoring displays;

c) engine indication displays;

d) traffic, terrain, and weather displays;

e) crew alerting systems displays;

f) stand-by instruments; and

g) installed EFB to the extent it is practical.

6.3.4 If image sensors are used, the recording of such images shall not capture the head and shoulders of the flight crew members while seated in their normal operating position.

7. INSPECTIONS OF FLIGHT RECORDER SYSTEMS

7.1 Prior to the first flight of the day, the built-in test features for the flight recorders and flight data acquisition unit (FDAU), when installed, shall be monitored by manual and/or automatic checks.

7.2 FDR systems or ADRS, CVR systems or CARS, and AIR systems or AIRS shall have recording inspection intervals of one year; subject to the approval from the appropriate regulatory authority, this period may be extended to two years provided these systems have demonstrated a high integrity of serviceability and self- monitoring. DLR systems or DLRS shall have recording inspection intervals of two years; subject to the approval from the appropriate regulatory authority, this period may be extended to four years provided these systems have demonstrated high integrity of serviceability and self- monitoring.

7.3 Recording inspections shall be carried out as follows:

a) an analysis of the recorded data from the flight recorders shall ensure that the recorder operates correctly for the nominal duration of the recording;

b) the FDR or ADRS recording from a complete flight shall be examined in engineering units to evaluate the validity of all recorded parameters. Particular attention shall be given to parameters from sensors dedicated to the FDR or ADRS. Parameters taken from the aircraft‘s electrical bus system need not be checked if their serviceability can be detected by other aircraft systems.

c) the readout facility shall have the necessary software to accurately convert the recorded values to engineering units and to determine the status of discrete signals;

d) an examination of the recorded signal on the CVR or CARS shall be carried out by replay of the CVR or CARS recording. While installed in the aircraft, the CVR or CARS shall record test signals from each aircraft source and from relevant external sources to ensure that all required signals meet intelligibility standards;

e) where practicable, during the examination, a sample of in-flight recordings of the CVR or CARS shall be examined to evidence that the intelligibility of the signal is acceptable.

f) an examination of the recorded images on the AIR or AIRS shall be carried out by replay of the AIR or AIRS recording. While installed in the aircraft, the AIR or AIRS shall record test images from each aircraft source and from relevant external sources to ensure that all required images meet recording quality standards; and

g) An examination of the recorded messages on the DLR or DLRS shall be carried out by replay of the DLR or DLRS recording.

7.4 A flight recorder system shall be considered unserviceable if there is a significant period of poor-quality data, unintelligible signals, or if one or more of the mandatory parameters is not recorded correctly.

7.5 A report of the recording inspection shall be made available on request to Civil Aviation Authority of Bangladesh (CAAB).

7.6 Calibration of the FDR system:

a) for those parameters which have sensors dedicated only to the FDR and are not checked by other means, recalibration shall be carried out at least every five years or in accordance with the recommendations of the sensor manufacturer to determine any discrepancies in the engineering conversion routines for the mandatory parameters and to ensure that parameters are being recorded within the calibration tolerances; and

b) when the parameters of altitude and airspeed are provided by sensors that are dedicated to the FDR system, there shall be a recalibration performed as recommended by the sensor manufacturer, or at least every two years.

Table A 8-1. Parameter characteristics for flight data recorders

Serial number	Parameter	Applicability	Measurement	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
1	Time (UTC when available, otherwise relative time count or GNSS time sync)		24 hours	4	±0.125%/h	1 s
2	Pressure- altitude		–300 m (–1000 ft) to maximum certificated altitude of aircraft +1 500 m (+5 000 ft)	1	±30 m to ±200 m (±100 ft to ±700 ft)	1.5 m (5 ft)
3	Indicated airspeed or calibrated airspeed		95 km/h (50 VSo (Note 1) VSo to 1.2 VD (Note 2)	1	±5% ±3%	1 kt (0.5 kt recommended)
4	Heading (primary flight crew reference)		360°	1	±2	0.5°
5	Normal acceleration (Note 8)	Application for type certification is submitted to CAAB before 1 January 2016 Application for type certification is submitted to CAAB on or after 1 January 2016	–3 g to +6 g –3 g to +6 g	0.125 0.0625	±1% of maximum range excluding datum error of ±5% ±1% of maximum range excluding datum error of ±5%	0.004 g 0.004 g

Serial number	Parameter	Applicability	Measurement	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
5	Normal acceleration (Note 8)	Application for typ certification is submitted to CAAB before 1 January 2016 Application for type certification is submitted. to CAAB on or after 1 January 2016	–3 g to +6 g –3 g to +6 g	0.125 0.0625	±1% of maximum range excluding datum error of ±5% ±1% of maximum range excluding datum error of ±5%	0.004 g 0.004 g
6	Pitch attitude		±75° or usable range whichever is greater	0.25	±2°	0.5°
7	Roll attitude		±180°	0.25	±2°	0.5°
8	Radio transmission keying		On-off (one discrete)	1		
9	Power on each engine (Note 3)		Full range	1 (per engine)	±2%	0.2% of full range or the resolution required to operate the aircraft
10*	Trailing edge flap and cockpit control selection		Full range or each discrete position	2	±5% or as pilot's indicator	0.5% of full range or the resolution required to operate the aircraft
11*	Leading edge flap and cockpit control selection		Full range or each discrete position	2	±5% or as pilot's indicator	0.5% of full range or the resolution required to operate the aircraft

Serial number	Parameter	Applicability	Measurement	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
12*	Thrust reverser position		Stowed, in transit, and reverse	1 (per engine)		
13*	Ground spoiler/speed brake selection (selection and position)		Full range or each discrete position	1	±2% unless higher accuracy uniquely required	0.2% of full range
14	Outside air		Sensor range	2	±2°C	0.3°C
15*	Autopilot/auto throttle/AFCS mode and engagement status		A suitable combination of discretes	1		
16	Longitudinal acceleration (Note 8)	Application for type certification submitted to a Contracting State before 1 January 2016	±1 g	0.25	±0.015 g excluding a datum error of ±0.05 g	0.004 g
		Application for type certification submitted to a Contracting State on or after 1 January 2016	±1 g	0.0625	±0.015 g excluding a datum error of ±0.05 g	0.004 g
17	Lateral acceleration (Note 8)	Application for type certification submitted to a Contracting State before 1 January 2016	±1 g	0.25	±0.015 g excluding a datum error of ±0.05 g	0.004 g
		Application for type certification submitted to a Contracting State on or after 1 January 2016	±1 g	0.0625	±0.015 g excluding a datum error of ±0.05 g	0.004 g

Serial number	Parameter	Applicability	Measurement	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
18	Pilot input and/or control surface position- primary controls (pitch, roll, yaw) (Notes 4 and 8)	Application for type certification submitted to a Contracting State before 1 January 2016 Application for type certification submitted to a Contracting State on or after 1 January 2016	Full range Full range	0.25 0.125	±2° unless higher accuracy uniquely required ±2° unless higher accuracy uniquely required	0.2% of full range or as installed 0.2% of full range or as installed
19	Pitch trim position		Full range	1	±3% unless higher accuracy uniquely required	0.3% of full range or as installed
20*	Radio altitude		–6 m to 750 m (–20 ft to 2500 ft)	1	±0.6 m (±2 ft) or ±3% whichever is greater below 150 m (500 ft) and ±5% above 150 m (500 ft)	0.3 m (1 ft) below 150 m (500 ft) 0.3 m (1 ft) + 0.5% of full range above 150 m (500 ft)
21*	Vertical beam deviation (ILS/GNSS/GLS glide path, MLS elevation, IRNAV/IAN vertical deviation)		Signal range	1	±3%	0.3% of full range
22*	Horizontal beam deviation (ILS/GNSS/GLS localizer, MLS azimuth, IRNAV/IAN lateral deviation)		Signal range	1	±3%	0.3% of full range
23	Marker beacon		Discrete	1		
24	Master warning		Discrete	1		

Serial number	Parameter	Applicability	Measurement	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
25	Each NAV receiver frequency selection (Note 5)		Full range	4	As installed	
26*	DME 1 and 2 distance (includes Distance to runway threshold (GLS) and Distance to missed approach point (IRNAV/IAN)) (Notes 5 and 6)		0 – 370 km (0– 200 NM)	4	As installe d	1 852 m (1NM)
27	Air/ground status		Discrete	1		
28*	GPWS/TAWS/GCAS status (selection of terrain display mode including pop-up display status) and (terrain alerts, both cautions and warnings, and advisories) and (on/off switch		Discrete	1		
29*	Angle of attack		Full range	0.5	As installe	0.3 % of full range
30*	Hydraulics, each system (low pressure)		Discrete	2		0.5% of full range
31*	Navigation data (latitude/longitude, ground speed and drift angle) (Note 7)		As installed	1	As installe d	
32*	Landing gear and gear selector position		Discrete	4	As installe d	
33*	Groundspeed		As installed	1	Data should be obtained from the most	1 kt
34	Brakes (left and right brake pressure, left and right brake pedal position)		Maximum metered brake range, discretes or full range)	1	±5%	2% of full range

Serial number	Parameter	Applicability	Measurement	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
35*	Additional engine parameters (EPR, N1, indicated vibration level, N2, EGT, fuel flow, fuel cut- off lever position, N3, engine fuel metering valve position)	Engine fuel metering valve position: Application for type certification is submitted to a Contracting State on or after 1 January 2023	As installed	Each engine each second	As installed	2% of full range
36*	TCAS/ACAS (traffic alert and collision avoidance system)		Discretes	1	As installed	
37*	Wind shear warning		Discrete	1	As installed	
38*	Selected barometric setting (pilot, co-pilot)		As installed	64	As installed	0.1 mb (0.01 in-Hg)
39*	Selected altitude (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection
40*	Selected speed (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection
41*	Selected Mach (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection
42*	Selected vertical speed (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection
43*	Selected heading (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection

Serial number	Parameter	Applicability	Measurement	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
44*	Selected flight path (all pilot selectable modes of operation) (course/DSTRK, path angle, final approach path			1	As installed	
45*	Selected decision height		As installed	64	As installed	Sufficient to determine crew selection
46*	EFIS display format (pilot, co-pilot)		Discrete(s)	4	As installed	
47*	Multi-function/ engine/ alerts display format		Discrete(s)	4	As installed	
48*	AC electrical bus status		Discrete(s)	4	As installed	
49*	DC electrical bus status		Discrete(s)	4	As installed	
50*	Engine bleed valve		Discrete(s)	4	As installed	
51*	APU bleed valve		Discrete(s)	4	As installed	
52*	Computer failure		Discrete(s)	4	As installed	
53*	Engine thrust command		As installed	2	As installed	
54*	Engine thrust target		As installed	4	As installed	2% of full range
55*	Computed centre of gravity		As installed	64	As installed	1% of full range
56*	Fuel quantity in CG trim tank		As installed	64	As installed	1% of full range
57*	Head up display in use		As installed	4	As installed	
58*	Para visual display on/off		As installed	1	As installed	

Serial number	Parameter	Applicability	Measurement	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
59*	Operational stall protection, stick shaker and pusher activation		As installed	1	As installed	
60*	Primary navigation system reference (GNSS, INS, VOR/ DME, MLS, Loran C, localizer glideslope)		As installed	4	As installed	
61*	Ice detection		As installed	4	As installed	
62*	Engine warning each		As installed	1	As installed	
63*	Engine warning each engine over		As installed	1	As installed	
64*	Engine warning each engine oil		As installed	1	As installed	
65*	Engine warning each		As installed	1	As installed	
66*	Yaw trim surface position		As installed	2	±3% unless higher accuracy uniquely required	0.3% of full range
67*	Roll trim surface position		Full range	2	±3% unless higher accuracy uniquely required	0.3% of full range
68*	Yaw or sideslip angle		Full range	1	±5%	0.5
69*	De-icing and/or anti-icing system selection		Discrete(s)	4		
70*	Hydraulic pressure (each system)		Full range	2	±5%	100 psi
71*	Loss of		Discrete	1		
72*	Cockpit trim control input position, Pitch		Full range	1	±5%	0.2% of full range or as installed
73*	Cockpit trim control input		Full range	1	±5%	0.2% of full range or as

Serial number	Parameter	Applicability	Measurement	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
74*	Cockpit trim control input position,		Full range	1	±5%	0.2% of full range or as
75*	All cockpit flight control input forces (control wheel, control column, rudder pedal)		Full range (±311 N (±70 lbf), ± 378 N (±85 lbf), ±734 N (±165 lbf))	1	±5%	0.2% of full range or as installed
76*	Event marker		Discrete	1		
77*	Date		365 days	64		
78*	ANP or EPE or EPU		As installed	4	As installed	
79*	Cabin pressure altitude	Application for type certification submitted to a Contracting State on or after 1 January 2023	As installed (0 ft to 40 000 ft recommended)	1	As installed	100 ft
80*	Aeroplane computed weight	Application for type certification submitted to a Contracting State on or after 1 January 2023	As installed	64	As installed	1% of full range
81*	Flight director command	Application for type certification submitted to a Contracting State on or after 1 January 2023	Full range	1	±2°	0.5°
82*	Vertical speed	Application for type certification submitted to a Contracting State on or after 1 January 2023	As installed	0.25	As installed (32 ft/min recommended)	16 ft/min

Notes. —

1) *VSO stalling speed or minimum steady flight speed in the landing configuration is in Section "Abbreviations and Symbols".*

2) *VD design diving speed.*

3) *Record sufficient inputs to determine power.*

4) *For aeroplanes with control systems in which movement of a control surface will back drive the pilot's control, ''or'' applies. For aeroplanes with control systems in which movement of a control surface will not back drive the pilot's control, ''and'' applies. In aeroplanes with split surfaces, a suitable combination of inputs is acceptable in lieu of recording each surface separately. In aeroplanes with independent pilot input on primary controls, each pilot input on primary controls needs to be recorded separately.*

5) *If signal available in digital form.*

6) *Recording of latitude and longitude from INS or other navigation system is a preferred alternative.*

7) *If signals readily available.*

8) *It is not intended that aeroplanes issued with an individual certificate of airworthiness before 1 January 2016 be modified to meet the measurement range, maximum sampling and recording interval, accuracy limits or recording resolution description detailed in this Appendix.*

Table A8-2. Description of Applications for Data Link Recorders

Item No.	Application type	Application description	Recording content
1.	Data link initiation	This includes any applications used to log on to or initiate data link service. In FANS-1/A and ATN, these are ATS facilities notification (AFN) and context management (CM) respectively	C
2.	Controller/pilot communication	This includes any application used to exchange requests, clearances, instructions and reports between the flight crew and controllers on the ground. In FANS-1/A and ATN, this includes the CPDLC application. It also includes applications used for the exchange of oceanic (OCL) and departure clearances (DCL) as well as data link delivery of taxi clearances.	C
3.	Addressed surveillance	This includes any surveillance application in which the ground sets up contracts for delivery of surveillance data. In FANS-1/A and ATN, this includes the automatic dependent surveillance — contract (ADS-C) application. Where parametric data are reported within the message they shall be recorded unless data from the same source are recorded on the FDR.	C
4.	Flight information	This includes any service used for delivery of flight information to specific aircraft. This includes, for example, data link aviation weather report service (D- METAR), data link-automatic terminal service (D- ATIS), digital Notice to Airmen (D-NOTAM) and other textual data link services.	C
5.	Aircraft broadcast surveillance	This includes elementary and enhanced surveillance systems, as well as automatic dependent surveillance. -broadcast (ADS-B) output data. where parametric data sent by the aeroplane are reported within the message they shall be recorded unless data from the same sources are recorded on the FDR.	M*
6.	Aeronautical operational control data	This includes any application transmitting or receiving data used for aeronautical operational control purposes (per the CAAB definition of operational control).	M*

Key:

C : Complete contents recorded.

M : Information that enables correlation to any associated records stored separately from the aeroplane.

* Applications to be recorded only as far as is practicable given the architecture of the system.

Table A8-3. Parameter Characteristics for Aircraft Data Recording Systems

No.	*Parameter name*	*Minimum recording range*	*Maximum recording interval in seconds*	*Minimum recording accuracy*	*Minimum recording resolution*	*Remarks*
1	Heading					
	a) Heading (Magnetic or True)	±180º	1	±2°	0.5°	Heading is preferred, if not available, yaw rate shall be recorded
	b) Yaw rate	±300º/s	0.25	±1% + drift of 360°/h	2°/s	
2	Pitch					
	a) Pitch attitude	±90º	0.25	±2º	0.5°	Pitch attitude is preferred, if not available, pitch rate shall be recorded
	b) Pitch rate	±300º/s	0.25	±1% + drift of 360°/h	2°/s	
3	Roll					
	a) Roll attitude	±180º	0.25	±2º	0.5°	Roll attitude is preferred, if not available, roll rate shall be recorded
	b) Roll rate	±300º/s	0.25	±1% + drift of 360°/h	2°/s	
4	Positioning system:					
	a) Time	24 hours	1	±0.5 s	0.1 s	UTC time preferred where available.
	b) Latitude/ longitude	Latitude:±90° Longitude:±180°	2 (1 if available)	As installed (0.00015° recommended)	0.00005°	
	c) Altitude	–300 m (–1000 ft) to maximum certificated altitude of aeroplane+1 500 m (5000 ft)	2 (1 if available)	As installed (±15 m (±50 ft) recommended)	1.5 m (5 ft)	
	d) Ground speed	0–1 000 kt	2 (1 if available)	As installed (±5 kt recommended)	1 kt	
	e) Track	0–360º	2 (1 if available)	As installed (± 2º recommended)	0.5°	
	f) Estimated error	Available range	2 (1 if available)	As installed	As installed	Shall be recorded if readily available

No.	*Parameter name*	*Minimum recording range*	*Maximum recording interval in seconds*	*Minimum recording accuracy*	*Minimum recording resolution*	*Remarks*
5	Normal acceleration	–3 g to + 6 g (*)	0.25 (0.125 if available)	As installed (± 0.09 g excluding a datum error of ±0.45 g recommended)	0.004 g	
6	Longitudinal acceleration	±1 g (*)	0.25 (0.125 if available)	As installed (±0.015 g excluding a datum error of ±0.05 g recommended)	0.004 g	
7	Lateral acceleration	±1 g (*)	0.25 (0.125 if available)	As installed (±0.015 g excluding a datum error of ±0.05 g recommended)	0.004 g	
8	External static pressure (or pressure altitude)	34.4 mb (3.44 in-Hg) to 310.2 mb (31.02 in-Hg) or available sensor range	1	As installed (±1 mb (0.1 in-Hg) or ±30 m (±100 ft) to ±210 m (±700 ft) recommended)	0.1 mb (0.01 in-Hg) or 1.5 m (5 ft)	
9	Outside air temperature (or total air temperature)	–50° to +90°C or available sensor range	2	As installed (±2°C recommended)	1°C	
10	Indicated air speed	As the installed pilot display measuring system or available sensor range	1	As installed (±3 % recommended)	1 kt (0.5 kt recommended)	
11	Engine RPM	Full range including overspeed condition	Each engine each second	As installed	0.2% of full range	
12	Engine oil pressure	Full range	Each engine each second	As installed (5% of full range recommended)	2% of full range	
13	Engine oil temperature	Full range	Each engine each second	As installed (5% of full range recommended)	2% of full range	
14	Fuel flow or pressure	Full range	Each engine each second	As installed	2% of full range	
15	Manifold pressure	Full range	Each engine each second	As installed	0.2% of full range	

No.	*Parameter name*	*Minimum recording range*	*Maximum recording interval in seconds*	*Minimum recording accuracy*	*Minimum recording resolution*	*Remarks*
16	Engine thrust/ power/ torque parameters required to determine propulsive thrust/power*	Full range	Each engine each second	As installed	0.1% of full range	*Sufficient parameters e.g. EPR/ N1 or torque/ Np as appropriate to the particular engine shall be recorded to determine power in both normal and reverse thrust. A margin for possible overspeed should be provided.
17	Engine gas generator speed (Ng)	0-150%	Each engine each second	As installed	0.2% of full range	
18	Free power turbine speed (Nf)	0-150%	Each engine each second	As installed	0.2% of full range	
19	Coolant temperature	Full range	1	As installed (±5°C recommended)	1° C	
20	Main voltage	Full range	Each engine each second	As installed	1 Volt	
21	Cylinder head temperature	Full range	Each cylinder each second	As installed	2% of full range	
23	Primary flight control surface position	Full range	0.25	As installed	0.2 % of full range	
24	Fuel quantity	Full range	4	As installed	1% of full range	
25	Exhaust gas temperature	Full range	Each engine each second	As installed	2% of full range	
26	Emergency voltage	Full range	Each engine each second	As installed	1 Volt	
27	Trim surface position	Full range or each discrete position	1	As installed	0.3% of full range	
28	Landing gear position	Each discrete position*	Each gear every two seconds	As installed		* Where available, record up-and-locked and down-and-locked position
29	Novel/unique aircraft features	As required	As required	As required	As required	

Table A8-3. Parameter Characteristics for Aircraft Data Recording Systems

No.	*Parameter name*	*Minimum recording range*	*Maximum recording interval in seconds*	*Minimum recording accuracy*	*Minimum recording resolution*	*Remarks*
1	Heading					
	a) Heading (Magnetic or True)	±180º	1	±2°	0.5°	Heading is preferred, if not available, yaw rate shall be recorded
	b) Yaw rate	±300º/s	0.25	±1% + drift of 360°/h	2°/s	
2	Pitch					
	a) Pitch attitude	±90º	0.25	±2º	0.5°	Pitch attitude is preferred, if not available, pitch rate shall be recorded
	b) Pitch rate	±300º/s	0.25	±1% + drift of 360°/h	2°/s	
3	Roll					
	a) Roll attitude	±180º	0.25	±2º	0.5°	Roll attitude is preferred, if not available, roll rate shall be recorded
	b) Roll rate	±300º/s	0.25	±1% + drift of 360°/h	2°/s	
4	Positioning system:					
	a) Time	24 hours	1	±0.5 s	0.1 s	UTC time preferred where available.
	b) Latitude / longitude	Latitude:±90° Longitude:±180°	2 (1 if available)	As installed (0.00015° recommended)	0.00005°	
	c) Altitude	–300 m (–1000 ft) to maximum certificated altitude of aeroplane+1500 m (5 000 ft)	2 (1 if available)	As installed (±15 m (±50 ft) recommended)	1.5 m (5 ft)	
	d) Ground speed	0–1 000 kt	2 (1 if available)	As installed (±5 kt recommended)	1 kt	
	e) Track	0–360º	2 (1 if available)	As installed (± 2º recommended)	0.5°	
	f) Estimated error	Available range	2 (1 if available)	As installed	As installed	Shall be recorded if readily available
5	Normal acceleration	–3 g to + 6 g (*)	0.25 (0.125 if available)	As installed (± 0.09 g excluding a datum error of ±0.45 g recommended)	0.004 g	
6	Longitudinal acceleration	±1 g (*)	0.25 (0.125 if available)	As installed (±0.015 g excluding a datum error of ±0.05 g recommended)	0.004 g	

APPENDIX 9. LOCATION OF AN AEROPLANE IN DISTRESS

(Chapter 6, 6.18, refers)

1. PURPOSE AND SCOPE

Location of an aeroplane in distress aims at establishing, to a reasonable extent, the location of an accident site within a 6 NM radius.

2. OPERATION

2.1 An aero plane in distress shall automatically activate the transmission of information from which its position can be determined by the operator and the position information shall contain a time stamp. It shall also be possible for this transmission to be activated manually. The system used for the autonomous transmission of position information shall be capable of transmitting that information in the event of aircraft electrical power loss, at least for the expected duration of the entire flight.

Note 3. — *Guidance on the location of an aeroplane in distress is provided in Attachment H.*

2.2 An aircraft is in a distress condition when it is in a state that, if the aircraft behaviour event is left uncorrected, can result in an accident. Autonomous transmission of position information shall be active when an aircraft is in a distress condition. This will provide a high probability of locating an accident site to within a 6 NM radius. The operator shall be alerted when an aircraft is in a distress condition with an acceptable low rate of false alerts. In case of a triggered transmission system, initial transmission of position information shall commence immediately or no later than five seconds after the detection of the activation event.

Note 1*. — Aircraft behaviour events can include, but are not limited to, unusual attitudes, unusual speed conditions, collision with terrain and total loss of thrust/propulsion on all engines and ground proximity warnings.*

Note 2. *— A distress alert can be triggered using criteria that may vary as a result of aircraft position and phase of flight. Further guidance regarding in-flight event detection and triggering criteria may be found in the EUROCAE ED-237, Minimum Aviation System Performance Specification (MASPS) for Criteria to Detect In-Flight Aircraft Distress Events to Trigger Transmission of Flight Information.*

2.3 When an aircraft operator or an air traffic service unit (ATSU) has reason to believe that an aircraft is in distress, coordination shall be established between the ATSU and the aircraft operator.

2.4 The Civil Aviation Authority of Bangladesh shall identify the organizations that will require the position information of an aircraft in an emergency phase. These shall include, as a minimum:

a) air traffic service unit(s) (ATSU); and

b) SAR rescue coordination centre (s) (RCC) and sub-centres.

Note 1. *— Refer to ANO11 for emergency phase criteria.*

Note 2. *— Refer to ANO 12 for required notifications in the event of an emergency phase.*

2.5 When autonomous transmission of position information has been activated, it shall only be able to be deactivated using the same mechanism that activated it.

2.6 The accuracy of position information shall, as a minimum, meet the position accuracy requirements established for ELTs.

APPENDIX- 10. ARTICLE 83 bis AGREEMENT SUMMARY

(Chapter 6, 6.1.5.4 refers)

Purpose and scope

Article 83 bis AGREEMENT SUMMARY			
Title of the Agreement:			
State of Registry:			Focal point:
State of the Operator:			Focal point:
Date of signature:	By State of Registry1:		
	By State of the Operator1:		
Duration:	Start Date1:		**End Date (if applicable)2:**
Languages of the Agreement:			
ICAO Registration No.:			
Umbrella Agreement (if any) with ICAO Registration number:			
Chicago Convention	**ICAO Annexes affected by the transfer of responsibility in respect of certain functions and duties to the State of the Operator**		
Article 12: Rules of the Air	ANO 2, all chapters	Yes	
		No	
Article 30 a): Aircraft radio equipment	Radio Station Licence	Yes	
		No	
Articles 30 b) and 32 a): Personnel Licensing	ANO 1, Chapters 1, 2, 3 and 6 and ANO 6 Part I, Radio Operator or Part III, section II, Composition of the flight crew (radio operator) and/ or Part II, Qualifications and/or Flight crew member licensing or Part III, Section III, Qualifications	Yes	ANO 6: [Specify Part and paragraph][3]
		No	
Article 31: Certificates of Airworthiness	ANO 6 Part I or Part III, Section II	Yes	[Specify Part and chapters][3]
		No	
	ANO 6 Part II or Part III, Section III	Yes	[Specify Part and chapters][3]
		No	
	ANO 8 Part II, Chapters 3 and 4	Yes	3
		No	

Recommendation.—*The Article 83 bis agreement summary should contain the information in the template at paragraph 2, in a standardized format.*

1. Article 83 bis agreement summary

Aircraft affected by the transfer of responsibilities to the State of the Operator					
Aircraft make, model, series	Nationality and Registration marks	Serial No	AOC# (Commercial air transport)	Dates of transfer of responsibilities	
				From1	To (if applicable)2

Specify chapters]

Notes. —

1. *dd/mm/yyyy.*
2. *dd/mm/yyyy or N/A if not applicable.*
3. *Square brackets indicate information that needs to be provided.*

APPENDIX- 11. FLIGHT AND DUTY TIME LIMITATIONS AND REST REQUIREMENTS (FTL) SECTI0N 1
(Refer to Chapter 4, 4.10.2 a)

General

1.1 Scope

This Appendix establishes the requirements to be met by an operator and its crew member about flight and duty time limitations and rest requirements for Flight and Cabin crew members.

1.2 Definitions

For the purpose of this Directive the following definitions shall apply:

(1) "acclimatized" means a state in which a crew member's circadian biological clock is synchronized to the time zone where the crew member is. A crew member is acclimatized to a 2-hour wide time zone surrounding the local time at the point of departure. When the local time at the place where a duty commences differs by more than 2 hours from the local time at the place where the next duty starts, the crew member, for the calculation of the maximum daily flight duty period, is considered to be acclimatized in accordance with the values in the Table 1.

Table 1

Time difference(h) between reference time and local time where the crew	Time elapsed since reporting at reference time				
	< 48	48-71:59	72-95.59	96-119:59	≥ 120
< 4	B	D	D	D	D
≤ 6	B	X	D	D	D
≤ 9	B	X	X	D	D
≤ 12	B	X	X	X	D

Note:

'B' *means acclimatized to the local time of the departure time zone;*

'D' *means acclimatized to the local time where the crew member starts his/her next duty; and*

'X' *means that a crew member is in an unknown state of acclimatization.*

(2) **"reference time"** means the local time at the reporting point situated in a 2-hour wide time zone band around the local time where a crew member is acclimatized.

(3) **"accommodation"** means, for the purpose of standby and split duty, a quiet and comfortable place not open to the public with the ability to control equipped with adequate furniture that provides a crew member with the possibility to sleep, with enough capacity to accommodate all crew members present at the same time and with access to food and drink;

(4) **"suitable accommodation**" means for the purpose of standby, split duty and rest, a separate room for each crew member located in a quiet environment and equipped with a bed, which is sufficiently ventilated, has a device for regulating temperature and light intensity, and access to food and drink;

(5) **"acceptable means of compliance (AMC)"** means non-binding standards adopted by the operators to illustrate means to establish compliance with Regulations and it's implementing rules;

(6) **"alternate means of compliance (ALMOC)" means** those means that propose an alternative to an existing acceptable means of compliance or those new means to establish compliance with CAA Act 2017 and CA Act 2017 ant it's implementing Rules for which no associate AMC have been adopted by the CAAB;

(7) **"augmented flight crew"** means a flight crew which comprises more than the minimum number required to operate the aircraft, allowing each flight crew member to leave the assigned post, for the purpose of in-flight rest, and to be replaced by another appropriately qualified flight crew member;

(8) **"break"** means a period of time within a flight duty period, shorter than a rest period, counting as duty and during which is free of all tasks;

(9) **"delayed reporting"** means the postponement of a scheduled FDP by the operator before a crew member has left the place of rest;

(10) **"disruptive schedule"** means a crew member's roster which disrupts the sleep opportunity during the optimal sleep time window by comprising an FDP or a combination of FDPs which encroach, start or finish during any portion of the day or of the night where a crew member is acclimatized. A schedule may be disruptive due to early starts, late finishes, or night duties.

(a) **"early type"** of disruptive schedule means:

(i) for 'early start' a duty period starting in the period between 05:00 and 05:59 in the time zone to which a crew member is acclimatized;

(ii) for 'late finish' a duty period finishing in the period between 23:00 and 1 :59 in the time zone to which a crew member is acclimatized;

(b) **"late type"** of disruptive schedule means:

(i) for 'early start' a duty period starting in the period between 05:00 and 06:59 in the time zone to which a crew member is acclimatized;

(ii) for 'late finish' a duty period finishing in the period between 00:00 and 01 :59 in the time zone to which a crew member is acclimatized;

(11) **"night duty"** means a duty period encroaching any portion of the period between 02:00 and 04:59 in the time zone to which the crew is acclimatized;

(12) **"Duty"** means any task that a crew member performs for the operator, including flight duty, administrative work, giving or receiving training and checking, positioning, and some elements ofstandby;

(13) **"duty period"** means a period which starts when a crew member is required by a n operator to report for or to commence a duty and ends when that person is free of all duties, including post- flight duty;

(14) **"flight duty period (FDP)"** means a period that commences when a crew member is required to report for duty, which includes a sector or a series of sectors, and finishes when the aircraft finally comes to rest and the engines are shut down, at the end of the last sector on which the crew member acts as an operating crew member;

(15) **"flight time"** means, for aeroplanes and touring motor gliders, the time between an aircraft first moving from its parking place for the purpose of taking off until it comes to rest on the designated parking position and all engines or propellers are shut down;

(16) **"GM"** means Guidance Material;

(17) **"home base"** means the location, assigned by the operator to the crew member, from where the crew member normally starts and ends a duty period or a series of duty periods and where, under normal circumstances, the operator is not responsible for the accommodation of the crew member concerned;

(18) **"local day"** means a 24-hour period commencing at 00:00;

(19) **"local night"** means a period of 8 hours falling between 22:00 and 08:00 local time;

(20) **"operating crew member"** means a crew member carrying out duties in an aircraft during a sector

(21) **"Positioning"** means the transferring of a non-operating crew member from one place to another, at the behest of the operator, excluding the time of travel from a private place of rest to the designated reporting place at home base and vice versa, anthe time for local transfer from a place of rest to the commencement of duty and vice versa;

(22) **"rest facility"** means a bunk or seat with leg and foot support suitable for crew members' sleeping on board an aircraft;

(23) **"reserve"** means a period of time during which a crew member is required by the operator to be available to receive an assignment for an FDP, positioning or other duty notified at least 10 hours in advance;

(24) **"rest period"** means a continuous, uninterrupted and defined period of time, following duty or prior to duty, during which a crew member is free of all duties, standby and reserve;

(25) **"rotation"** means a duty or a series of duties, including at least one flight duty, and rest periods out of home base, starting at home base and ending when returning to home base for rest period where the operator is no longer responsible for the accommodation of the crew member;

(26) **"single day free of duty"** means a time free of all duties and standby consisting of one day and two local nights, which is notified in advance. A rest period may be included as part of the single day free of duty;

(27) **"Sector"** means the segment of an FDP between an aircraft first moving for the purpose of taking off until it comes to rest after landing on the designated parking position;

(28) **"Standby"** means a pre-notified and defined period of time during which a crew member is required by the operator to be available to receive an assignment for a flight, positioning or other duty without an intervening rest period;

(29) **"airport standby duty** means a pre-notified and defined period of time during which a crew member is required by the operator to be at the airport immediately available to receive an assignment for a flight, positioning or other duty;

(30) **"other standby"** means a standby either at home or in a suitable accommodation;

(31) **"window of circadian low"** means the period between 02.00 and 05.59 hours in the time zone to which a crew member is acclimatized.

GM1 1.2 (1) Definitions

ACCLAMETISED

d) A crew member remains acclametised to the local time of his or her reference time during 47 hours 59 minutes after reporting no matter how many time zones he/ she has crossed**.**

e) The maximum daily FDP for acclametised crew members is determined by using table 2 in section-2 with the reference time of the point of departure. As soon as 48 hours have elapsed, the state of acclametisation is derived from the time elapsed since reporting at reference time and the number of time zones crossed.

f) A crew member is considered to be in an unknown state of acclametisation after the first 58 hours of the rotation have elapsed unless he or she remains in the first arrival destination time zone (either for rest or any duties) in accordance with table-1 in section-1, 1.2.

g) Should a crew member's rotation include additional duties that end in a different time zone than his or her first arrival destination's time zone while he or she is considered to be in an unknown state of acclimatization, then the crew member remains in an unknown state of acclimatization until he or she:

1. has taken the rest period required by para 2.8 of section-3 at home base;

2. has taken the rest period required by para 2.8 at the new location; or

3. has been undertaking duties starting at and returning to the time zone of the new location until he or she becomes acclimatized in accordance with the value inthe table-1 section-1, 1.2. To determine the state of acclimatization, the two following criteria should be applied**.**

I. the greater of the time difference between the time zone where he or she was last acclametised or the local time of his or her last departure point and the new location; and

II. the time elapsed since reporting at home base or the first time during the rotation.

GM2 1.2 (1) Definitions

ACCLAMETIZED 'POINT OF DEPARTURE'

The point of departure refers to the reporting point for a flight duty period or positioning duty after a rest period.

GM3 1.2 (1) Definitions

ACCLIMATIZED 'TIME ELAPSED SINCE REPORTING AT REFERENCE TIME'

The time elapsed since reporting at reference time for operations applying Section 3. 7 (b)(3)(ii) at home base refers to the time elapsed since reporting for the first time at home base for a rotation.

GM1 1.2 (2) Definitions

REFERENCE TIME

(a) Reference time refers to reporting points in a 2-hour wide time zone band around the local time where a crew member is acclimatized;

(b) Example: A crew member is acclimatized to the local time in Dhaka and reports for duty in Dubai. The reference time is the local time in Dubai.

GM1 1.2(3) Definitions

ADEQUATE FURNITURE FOR ACCOMMODATION

Adequate furniture for crew member accommodation should include a seat that reclines at least 45° back angle to the vertical, has a seat width of at least 20 inches (50cm) and provides leg and foot support.

GM1 1.2(10) Definitions

DETERMINATION OF DISRUPTIVE SCHEDULES

If a crew member is acclimatized to the local time at his/her home base, the local time at the home base should be used to consider an FDP as 'disruptive schedule'. This applies to operations within the 2-hour wide time zone surrounding the local time at the home base, if a crew member is acclimatized to the local time at his/her home base.

GM1 1.2 (28) Definitions

ELEMENTS OF STANDBY FOR DUTY

Section 2.6(c) and (d) and Section 3.5(b)(2) determine which elements of standby count as duty.

GM1 1.2 (20) Definitions

OPERATING CREW MEMBER

A person on board an aircraft is either a crew member or a passenger. If a crew member is not a passenger on board an aircraft, he/she should be considered as 'carrying out duties. The crew member remains an operating crew member during in-flight rest. In- flight rest counts in full as FDP, and for the purpose of Section-2, 2.3.

1.3 **Operator responsibilities**

An operator shall:

(a) publish duty rosters sufficiently in advance to provide the opportunity for crew members to plan adequate rest;

(b) ensure that flight duty periods are planned in a way that enables crew members to remain sufficiently free from fatigue so that they can operate to a satisfactory level of safety under all circumstances;

(c) specify reporting times that allow sufficient time for ground duties;

(d) take into account the relationship between the frequency and pattern of flight duty periods and rest periods and give consideration to the cumulative effects of undertaking long duty hours combined with minimum rest periods;

(e) allocate duty patterns which avoid practices that cause a serious disruption of an established sleep/work pattern, such as alternating day/night duties;

(f) comply with the provisions concerning disruptive schedules in accordance with Section 1.2 (10);

(g) provide rest periods of sufficient time to enable crew members to overcome the effects of the previous duties and to be rested by the start of the following flight duty period;

(h) plan recurrent extended recovery rest periods and notify crew members sufficiently in advance;

(i) plan flight duties in order to be completed within the allowable flight duty period taking into account the time necessary for pre-flight duties, the sector and turnaround times;

(j) change a schedule and/or crew arrangements if the actual operation exceeds the maximum flight duty period on more than 33% of the flight duties in that schedule during a scheduled seasonal period.

AMC1 1.3 Operator responsibilities SCHEDULING

(a) Scheduling has an important impact on a crew member's ability to sleep and to maintain a proper level of alertness. When developing a workable roster, the operator should strike a fair balance between the commercial needs and the capacity of individual crew members to work effectively. Rosters should be developed in such a way that they distribute the amount of work evenly among those that are involved;

(b) Schedules should allow for flights to be completed within the maximum permitted flight duty period and flight rosters should take into account the time needed for pre-flight duties, taxiing, the flight and turnaround times. Other factors to be considered when planning duty periods should include:

(1) the allocation of work patterns which avoid undesirable practices such as alternating day/night duties, alternating eastward-westward or westward- eastward time zone transitions, positioning of crew members so that a serious disruption of established sleep/work patterns occurs;

(2) scheduling sufficient rest periods especially after long flights crossing many time zones; and

(3) preparation of duty rosters sufficiently in advance with planning of recurrent extended recovery rest periods and notification of the crew members well in advance to plan adequate pre-duty rest.

AMC1 1.3(a) Operator responsibilities PUBLICATION OF ROSTERS

Monthly/fortnightly rosters should be published at least 07 days in advance;

AMC1 1.3 (j) Operator responsibilities

OPERATIONAL ROBUSTNESS OF ROSTERS

The operator should establish and monitor performance indicators for operational robustness of rosters.

GM1 1.3 (j) Operator responsibilities

OPERATIONAL ROBUSTNESS OF ROSTERS

Performance indicators for operational robustness of rosters should support the operator in the assessment of the stability of its rostering system. Performance indicators for operational robustness of rosters should at least measure how often a rostered crew pairing for a duty period is achieved within the planned duration of that duty period. Crew pairing means rostered positioning and flights for crew members in one duty period.

1.4 **Crew member responsibilities**

Crew members shall:

(a) comply with responsibilities of crew members and other personnel involved in operations of motor-powered aircraft (MPA); and

(b) make optimum use of the opportunities and facilities for rest provided and plan and use their rest periods properly.

1.5 **Flight time specification scheme**

(a) Operators shall establish, implement and maintain flight time specification schemes that are appropriate for the type(s) of operation performed and that comply with this Directive and other applicable national legislation.

(b) Before being implemented, flight time specification schemes, including any related FRM where required, shall be approved by the CAAB.

SECTION 2

Commercial Air Transport Operators

2.1 Home base

An operator shall assign a home base to each crew member.

2.2 Flight duty period (FDP)

a) The operator shall:

(1) define reporting times appropriate to each individual operation taking into account 1.3(c);

(2) establish procedures specifying how the Pilot in Command shall, in case of special circumstances which could lead to severe fatigue, and after consultation with the crew members concerned, reduce the actual FDP and/or increase the rest period in order to eliminate any detrimental effect on flight safety;

b) Basic maximum daily FDP.

(1) The maximum daily FDP without the use of extensions for acclimatized crew members shall be in accordance with the following table:

Table 2

Maximum daily FDP- Acclimatized crew members

Starting time of FDP	**1-2 sectors (in hours)**	**3 sectors (in hours)**	**4 sectors (in hours)**	**5 sectors (in hours)**
0600-0614	Not allowed	Not allowed	Not allowed	Not allowed
0615-0629	13:15	12:45	12:15	11:45
0630-0644	13:30	13:00	12:30	12:00
0645-0659	13:45	13:15	12:45	12:15
0700-1329	14:00	13:30	13:00	12:30
1330-1359	13:45	13:15	12:45	Not allowed
1400-1429	13:30	13:00	12:30	Not allowed

Starting time of FDP	**1-2 sectors (in hours)**	**3 sectors (in hours)**	**4 sectors (in hours)**	**5 sectors (in hours)**
1430-1459	13:15	12:45	12:15	Not allowed
1500-1529	13:00	12:30	12:00	Not allowed
1530-1559	12:45	Not allowed	Not allowed	Not allowed
1600-1629	12:30	Not allowed	Not allowed	Not allowed
1630-1659	12:15	Not allowed	Not allowed	Not allowed
1700-1729	12:00	Not allowed	Not allowed	Not allowed
1730-1759	11:45	Not allowed	Not allowed	Not allowed
1800-1829	11 :30	Not allowed	Not allowed	Not allowed
1830-1859	11 :15	Not allowed	Not allowed	Not allowed
1900-0359	Not allowed	Not allowed	Not allowed	Not allowed
0400-0414	Not allowed	Not allowed	Not allowed	Not allowed
0415-0429	Not allowed	Not allowed	Not allowed	Not allowed
0430-0444	Not allowed	Not allowed	Not allowed	Not allowed
0445-0459	Not allowed	Not allowed	Not allowed	Not allowed
0500-0514	Not allowed	Not allowed	Not allowed	Not allowed
0515-0529	Not allowed	Not allowed	Not allowed	Not allowed
0530-0544	Not allowed	Not allowed	Not allowed	Not allowed
0545-0559	Not allowed	Not allowed	Not allowed	Not allowed

(2) The maximum daily FDP when crew members are in an unknown state of acclimatization shall be in accordance with the following table:

Table 3

Crew members in an unknown state of acclimatization

Maximum daily FDP according to sectors						
1-2	3	4	5	6	7	8
11:00	10:30	10:00	09:30	09:00	09:00	09:00

(3) The maximum daily FDP when crew members are in an unknown state of acclimatization and the operator has implemented a FRM, shall be in accordance with the following table:

Maximum daily FDP according to sectors						
1-2	3	4	5	6	7	8
12:00	11:30	11:00	10:30	10:00	09:30	09:00

(c) FDP with different reporting time for flight crew and cabin crew:

Whenever cabin crew requires more time than the flight crew for their pre-flight briefing for the same sector or series of sectors, the FDP of the cabin crew may be extended by the difference in reporting time between the cabin crew and the flight crew. The difference shall not exceed 1 hour. The maximum daily FDP for cabin crew shall be based on the time at which the flight crew report for their FDP, but the FDP shall start at the reporting time of the cabin crew.

(d) Maximum daily FDP for acclimatized crew members with the use of extensions without in-flight rest:

(1) The maximum daily FDP may be extended by up to 1 hour not more than twice in any 7 consecutive days. In that case:

I. the minimum pre-flight and post-flight rest periods shall be increased by 2 hours or

II. the post-flight rest period shall be increased by 4 hours;

(2) When extensions are used for consecutive FDPs, the additional pre and post flight rest between the two extended FDPs required under subparagraph 1 shall be provided consecutively.

(3) The use of the extension shall be planned in advance, and shall be limited to a maximum of:

I. 5 sectors when the WOCL is not encroached; or

II. 4 sectors, when the WOCL is encroached by 2 hours or less; or

III. 2 sectors, when the WOCL is encroached by more than 2 hours.

(4) Extension of the maximum basic daily FDP without in-flight rest shall not be combined with extensions due to in-flight rest or split duty in the same duty period.

(5) Flight time specification schemes shall specify the limits for extensions of the maximum basic daily FDP in accordance with the certification specifications applicable to the type of operation, taking into account:

(i) the number of sectors flown; and

(ii) WOCL encroachment.

(e) Maximum daily FDP with the use of extensions due to in-flight rest Flight time specification schemes shall ecify the conditions for extensions of the maximum basic daily FDP with in-flight rest in accordance with the certification specifications applicable to the type of operation, taking into account:

(i) the number of sectors flown;

(ii) the minimum in-flight rest allocated to each crew member;

(iii) the type of in-flight rest facilities; and

(iv) the augmentation of the basic flight crew.

(f) Unforeseen circumstances in flight operations- Pilot in Command's (PIC) Discretion

1. The conditions to modify the limits on flight duty, duty and rest periods by the PIC in case of unforeseen circumstances in flight operations, which start at or after the reporting time shall comply with the following:

i. the maximum daily FDP which results after applying points (b) and (e) of section 2.2 or section 2.5 may not be increased by more than 2 hours unless the flight crew has been augmented, in which case the maximum flight duty period may be increased by not more than 3 hours;

ii. if on the final sector within an FDP the allowed increase is exceeded because of unforeseen circumstances after take-off, the flight may continue to the planned destination or alternate aerodrome; and

iii. the rest period following the FDP may be reduced but can never be less than 10 hours;

2. In case of unforeseen circumstances which could lead to severe fatigue, the Pilot in Command shall reduce the actual flight duty period and /or increase the rest period in order to eliminate any detrimental effect on flight safety;

3. The Pilot in Command shall consult all crew members on their alertness before deciding the modifications under subparagraphs 1 and 2;

4. The Pilot in Command shall submit a report to the operator when an FDP is increased or a rest period is reduced at his or her discretion;

5. Where the increase of an FDP or reduction of a rest period exceeds 1 hour, a copy of the report, to which the operator shall add its comments, shall be sent by the operator to CAAB not later than 28 days after the event;

6. The operator shall implement a non-punitive process for the use of the discretion described under this provision and shall describe it in the operations manual

(g) Unforeseen Circumstances in Flight Operations - Delayed Reporting:

The operator shall establish procedures, in the operations manual, for delayed reporting in the event of unforeseen circumstances, in accordance with the certification specifications applicable to the type of operation.

GM1 2.2 (a) (1) Flight Duty Period (FDP) REPORTING TIMES

a) The operator should specify in Operation Manual about the reporting times taking into account the type of operation, the size and type of aircraft and the reporting airport conditions.

b) **GM1 2.2(b)(1) Flight duty period (FDP) REFERENCE TIME**

The start time of the FDP in the table refers to the 'reference time'. That means, to the local time of the point of departure, if this point of departure is within a 2-hour wide time zone band around the local time where a crew member is acclimatized.

AMC1 2.2 (f) Flight Duty Period (FDP)

UNFORESEEN CIRCUMSTANCES IN ACTUAL FLIGHT OPERATION-PILOT IN COMMAND'S DISCRETION

c) As general guidance when developing a Pilot in Command's discretion policy, the operator should take into consideration the shared responsibility of management, flight and cabin crew in the case of unforeseen circumstances. The exercise of Pilot in Command's discretion should be considered exceptional and should be avoided at home base and/or company hubs where standby or reserve crew members should be available. Operators should asses on a regular basis the series of pairings where Pilot in Command's discretion has been exercised in order to be aware of possible e inconsistencies in their rostering.

d) The operator's policy on Pilot in Command's discretion should state the safety objectives, especially in the case of an extended FDP or reduced rest and should take due consideration of additional factors that might decrease a crew member's alertness levels, such as:

a) WOCL encroachment;

b) weather conditions;

c) complexity of the operation and/or airport environment;

d) aeroplane malfunctions or specifications;

e) flight with training or supervisory duties;

f) increased number of sectors;

g) circadian disruption; and

h) individual conditions of affected crew members (time since awake, Sleep-related factor, workload, etc.).

GM1 2.2(f)(1)(i) Flight Duty Period (FDP)

PILOT IN COMMAND'S DISCRETION

The maximum basic daily FDP that results after applying 2.2(b) should be used to calculate the limits of Pilot in Command's discretion, if Pilot in Command's discretion is applied to an FDP which has been extended under the provisions of 2.2(d).

2.3 Flight times and duty periods

(a) The total duty periods to which a crew member may be assigned shall not exceed:

(1) 60 duty hours in any 7 consecutive days;

(2) 110 duty hours in any 14 consecutive days; and

(3) 190 duty hours in any 28 consecutive days, spread as evenly as practicable throughout that period

(b) The total flight time of the sectors on which an individual crew member is assigned as an operating crew member shall not exceed:

(1) 120 hours flight time for flight crew and 125 hours flight time for cabin crew in any 28 consecutive days;

(2) 1000 hours flight time for flight crew and 1100 hours flight time for cabin crew in any 12 consecutive calendar months.

(c) Post-flight duty shall count as duty period. The operator shall specify in its operations manual the minimum time period for post-flight duties.

AMC1 2.3 (c) Flight times and duty periods POST-FLIGHT DUTIES

The operator should count a minimum of 30 minutes a s post-flight duty times taking into account the type of operation, the size and type of aircraft and the airport conditions.

2.4 Positioning

If an operator positions a crew member, the following shall apply:

- positioning after reporting but prior to operating shall be counted as FDP but shall not count as a sector;
- all time spent on positioning shall count as duty period.

2.5 Split duty

The conditions for extending the basic maximum daily FDP due to a break on the ground shall be in accordance with the following:

(a) flight time specification schemes shall specify the following elements for split duty in accordance with the certification specifications applicable to the type of operation:

(i) the minimum duration of a break on the ground; and

(ii) the possibility to extend the FDP prescribed under point 2.5(b) taking into account the duration of the break on the ground, the facilities provided to the crew member to rest and other relevant factors;

(b) the break on the ground shall count in full as FDP;

(c) split duty shall not follow a reduced rest.

2.6 Standby and duties at the airport

If an operator assigns crew members to standby or to any duty at the airport, the following shall apply in accordance with the certification specifications applicable to the type of operation:

(a) standby and any duty at the airport shall be in the roster and the start and end time of standby shall be defined and notified in advance to the crew members concerned to provide them with the opportunity to plan adequate rest;

(b) a crew member is considered on airport standby from reporting at the reporting point until the end of the notified airport standby period;

(c) airport standby shall count in full as duty period for the purpose of FDP in Section 2.3 and in section 2.8;

(d) any duty at the airport shall count in full as duty period and the FDP shall count in full from the airport duty reporting time;

(e) the operator shall provide accommodation to the crew member on airport standby;

(f) flight time specification schemes shall specify the following elements:

(1) the maximum duration of any standby;

(2) the impact of the time spent on standby on the maximum FDP that may be assigned, considering facilities provided to the crew member to rest, and other relevant factors such as:

a. the need for immediate readiness of the crew member;

b. the interference of standby with sleep; and

c. sufficient notification to protect a sleep opportunity between the call for duty and the assigned FDP;

(3) the minimum rest period following standby which does not lead to assignment of an FDP;

(4) how time spent on standby other than airport standby shall be counted for the purpose of cumulative duty periods.

2.7 Reserve

If an operator assigns crew members to reserve, the following requirements shall apply in accordance with the certification specifications applicable to the type of operation.

- reserve shall be in the roster;
- Flight time specification schemes shall specify the following elements: the maximum duration of any single reserve period;
- the number of consecutive reserve days that may be assigned to a crew member.

GM 12.7 (a) Reserve ROSTERING OF RESERVE

Including reserve in a roster, also referred to as 'rostering', implies that a reserve period that does not result in a duty period may not retrospectively be considered as part of a recurrent extended recovery rest period.

2.8 Rest Periods

a) Minimum rest period at home base.

(1) The minimum rest period provided before undertaking an FDP starting at home base shall be at least as long as the preceding duty period, or 12 hours, whichever is greater.

(2) By way of derogation from point (1), the minimum rest provided under point (b) applies if the operator provides suitable accommodation to the crew member at home base.

b) Minimum rest period away from home base.

The minimum rest period provided before undertaking an FDP starting away from home base shall be at least as long as the preceding duty period, or 10 hours, whichever is greater. This period shall include an 8- hour sleep opportunity in addition to the time for travelling and physiological needs.

(c) Reduced rest

By derogation from points (a) and (b), flight time specification schemes may reduce the minimum rest periods in accordance with the certification specifications applicable to the type of operation and taking into account the following elements:

(1) the minimum reduced rest period;

(2) the increase of the subsequent rest period; and

(3) the reduction of the FDP following the reduced rest.

(d) Recurrent extended recovery rest periods

Flight time specification schemes shall specify recurrent extended recovery rest periods to compensate for cumulative fatigue. The minimum recurrent extended recovery rest period shall be 36 hours, including 2 local nights, and in any case the time between the end of one recurrent extended recovery rest period and the start of the next extended recovery rest period shall not be more than 168 hours. The recurrent extended recovery rest period shall be increased to 2 local days twice every month.

(e) Flight time specification schemes shall specify additional rest periods in accordance with the applicable certification specifications to compensate for:

(1) the effects of time zone differences and extensions of the FDP;

(2) additional cumulative fatigue due to disruptive schedules; and

(3) a change of home base.

GM1 2.B (a) (2) Rest periods

MINIMUM REST PERIOD AT HOME BASE IF SUITABLE ACCOMMODATION IS PROVIDED

An operator may apply the minimum rest period away from home base during a rotation which includes a rest period at a crew member's home base. This applies only if the crew member does not rest at his/her residence, or temporary accommodation, because the operator provides suitable accommodation. This type of roster is known as "back-to- back operation".

AMC1 2.B (b) Rest periods

MINIMUM REST PERIOD AWAY FROM HOME BASE

The time allowed for physiological needs should be 1 hour. Consequently, if the travelling time to the suitable accommodation is more than 30 minutes, the operator should increase the rest period by twice the amount of difference of travelling time above 30minutes.

2.9 Nutrition

(a) During the FDP there shall be the opportunity for a meal and drink in order to avoid any detriment to a crew member's performance, especially when the FDP exceeds 6 hours.

(b) An operator shall specify in its operations manual how the crew member's nutrition during FDP is ensured.

AMC1 2.9 Nutrition

MEAL OPPORTUNITY

(a) The operations manual should specify the minimum duration of the meal opportunity, when a meal opportunity is provided, in particular when the FDP encompasses the regular meal windows (e.g. if the FDP starts at 11 :DO hours and ends at 22:00 hours meal opportunities for two meals should be given).

(b) It should define the time frames in which a regular meal should be consumed in order not to alter the human needs for nutrition without affecting the crew member's body rhythms.

2.10 Records of Home base flight times, duty and rest periods

(a) An operator shall maintain, for a period of 24 months:

(1) individual records for each crew member including:

(i) flight times;

(ii) start, duration and end of each duty period and FDP;

(iii) rest periods and days free of all duties; and

(iv) assigned home base;

(2) reports on extended flight duty periods and reduced rest periods.

(b) Upon request, the operator shall provide copies of individual records of flight times, duty periods and rest periods to:

(i) the crew member concerned; and

(ii) to another operator, in relation to a crew member who is or becomes a crew ember of the operator concerned.

2.1 Fatigue management training

2.11 Fatigue management training

(a) The operator shall provide initial and recurrent fatigue management training to crew members, personnel responsible fo preparation and maintenance of crew roasters and management personnel concerned.

(b) This training shall follow a training programme stablished by the operator and described in the operations manual. The training syllabus shall cover the possible causes and effects of fatigue and fatigue counter measures.

AMC1 2.11 fatigue management training

TRAINING SYLLABUS FATIGUE MANAGEMENT TRAINING

The training syllabus should contain the following:

(a) applicable regulatory requirements for flights, duty and rest;

(b) the basics of fatigue including sleep fundamentals and the effects of disturbing the circadian rhythms;

(c) the causes of fatigue, including medical conditions that may lead to fatigue;

(d) the effect of fatigue on performance;

(e) fatigue counter measures;

(f) the influence of life style, including nutrition, exercise, and family life, on fatigue;

(g) familiarity with sleep disorder and their possible treatments;

(h) where applicable, the effects of long-range operations and heavy short range schedules on individuals;

(i) the effect of operating through and within multiple time zones; and

(j) the crew member responsibility for ensuring adequate rest and fitness for flight duty.

SECTION 3

CERTIFICATION SPECIFICATIONS AND GUIDANCE MATERIAL FOR COMMERCIAL AIR TRANSPORT BY AEROPLANE-SCHEDULED AND CHARTER OPERATIONS

3.1 Applicability

These Certification Specifications are applicable to commercial air transport by aeroplanes for scheduled and charter operations, excluding emergency medical service (EMS), air taxi and single pilot operations.

3.2 Home base

(a) The home base is a single airport location assigned with a high degree of permanence.

(b) In the case of a change of home base, the first recurrent extended recovery rest period prior to starting duty at the new home base is increased to 72 hours, including 3 local nights. Travelling time between the former home base and the new home base is positioning.

3.3 Flight duty period (FDP)

(a) Night duties under the provisions of basic maximum daily FDP [2.2(b)] and maximum daily FDP for acclimatized crew members with use of extension without in flight rest [2.2(d)] comply with the following:

(1) when establishing the maximum FDP for consecutive night duties, the number of sectors is limited to 4 sectors per duty.

(b) Extension of FDP without in-flight rest:

The extension of FDP without in-flight rest under the provisions of 2.2(d) (5) is limited to the values specified in the table below:

Starting time of FDP	**1-2 sectors (in hours)**	**3 sectors (in hours)**	**4 sectors (in hours)**	**5 sectors (in hours)**
0600-0614	Not allowed	Not allowed	Not allowed	Not allowed
0615-0629	13:15	12:45	12:15	11:45
0630-0644	13:30	13:00	12:30	12:00
0645-0659	13:45	13:15	12:45	12:15
0700-1329	14:00	13:30	13:00	12:30
1330-1359	13:45	13:15	12:45	Not allowed
1400-1429	13:30	13:00	12:30	Not allowed

Starting time of FDP	**1-2 sectors (in hours)**	**3 sectors (in hours)**	**4 sectors (in hours)**	**5 sectors (in hours)**
1430-1459	13:15	12:45	12:15	Not allowed
1500-1529	13:00	12:30	12:00	Not allowed
1530-1559	12:45	Not allowed	Not allowed	Not allowed
1600-1629	12:30	Not allowed	Not allowed	Not allowed
1630-1659	12:15	Not allowed	Not allowed	Not allowed
1700-1729	12:00	Not allowed	Not allowed	Not allowed
1730-1759	11:45	Not allowed	Not allowed	Not allowed
1800-1829	11 :30	Not allowed	Not allowed	Not allowed
1830-1859	11 :15	Not allowed	Not allowed	Not allowed
1900-0359	Not allowed	Not allowed	Not allowed	Not allowed
0400-0414	Not allowed	Not allowed	Not allowed	Not allowed
0415-0429	Not allowed	Not allowed	Not allowed	Not allowed
0430-0444	Not allowed	Not allowed	Not allowed	Not allowed
0445-0459	Not allowed	Not allowed	Not allowed	Not allowed
0500-0514	Not allowed	Not allowed	Not allowed	Not allowed
0515-0529	Not allowed	Not allowed	Not allowed	Not allowed
0530-0544	Not allowed	Not allowed	Not allowed	Not allowed
0545-0559	Not allowed	Not allowed	Not allowed	Not allowed

(c) Extension of FDP due to in-flight rest:

In-flight rest facilities in accordance with 2.2(e)(iii) fulfill the following minimum standards:

'Class 1 rest facility' means a bunk or other surface that allows for a flat or near flat sleeping position. It reclines to at least 80' back angle to the vertical and is located separately from both the flight crew compartment and the passenger cabin in an area that allows the crew member to control light, and provides isolation from noise and disturbance;

'Class 2 rest facility' means a seat in an aircraft cabin that reclines at least 45'back angle to the vertical, has at least a pitch of 55 inches (137,5 cm), a seat width of at least 20 inches (50 cm) and provides leg and foot support. It is separated from passengers by at least a curtain to provide darkness and some sound mitigation, and is reasonably free from disturbance by passengers or crew members;

'Class 3 rest facility' means a seat in an aircraft cabin or flight crew compartment that reclines at least 40' from the vertical, provides leg and foot support and is separated from passengers by at least a curtain to provide darkness and some sound mitigation, and is not adjacent to any seat occupied by passengers.

(1) the extension of FDP with in-flight rest under the provisions of 2.2(e) complies with the following:

(i) the FDP is limited to 3 sectors; and

(ii) the minimum in-flight rest period is a consecutive 90-minute period for each crew member and 2 consecutive hours for the flight crew members at control during landing.

(2) the maximu daily FDP under the provisions of 2.2(e) may be extended due to in flight rest for flight crew:

(i) with one additional flight crew member:

(A) Up to 14 hours with class 3 rest facilities;

(B) Up to 15 hours with class 2 rest facilities; or

(C) Up to 16 hours with class 1 rest facilities;

a. with two additional flight crew members:

(A) up to 15 hours with class 3 rest facilities;

(B) up to 16 hours with class 2 rest facilities; or

(C) Up to 17 hours with class 1 rest facilities.

(3) the minimum in-flight rest for each cabin crew member is:

Maximum extended FDP	Minimum in-flight rest (In hours)		
	Class1	Class 2	Class 3
up to 14:30 hrs	1:30	1:30	1:30
14:31 - 15:00 hrs	1:45	2:00	2:20
15:01 - 15:30 hrs	2:00	2:20	2:40
15:31 - 16:00 hrs	2:15	2:40	3:00
16:01 - 16:30 hrs	0:35	3:00	Not allowed
16:31 - 17:00 hrs	3:002	3:25	Not allowed
17:01 - 17:30 hrs	3:25	Not allowed	Not allowed
17:31 - 18:00 hrs	3:50	Not allowed	Not allowed

1. the limits specified in (2) may be increased by 1 hour for FDPs that include 1 sector of more than 9 hours of continuous flight time and a maximum of 2 sectors.

2. all time spent in the rest facility is counted as FDP.

3. the minimum rest at destination is at least as long as the preceding duty period, or 14 hours, whichever is greater.

4. a crew member does not start a positioning sector to become part of this operating crew on the same flight.

ii. Unforeseen circumstances in flight operations-delayed reporting:

1. The operator may delay the reporting time in the event of unforeseen circumstances, if procedures for delayed reporting are established in the operations manual. The operator keeps records of delayed reporting. Delayed reporting procedures establish a notification time allowing a crew member to remain in his/her suitable accommodation when the delayed reporting procedure is activated. In such a case, if the crew member is informed of the delayed reporting time, the FDP is calculated as follows:

a. one notification of a delay leads to the calculation of the maximum FDP according to (iii) or (iv);

b. if the reporting time is further amended, the FDP starts counting 1 hour after the second notification or at the original delayed reporting time if this is earlier;

c. when the delay is less than 4 hours, the maxi calculated based on the original reporting time and counting at the delayed reporting time;

d. when the delay is 4 hours or more, the maximum FDP is calculated based on the more limiting of the original or the delayed reporting time and the FDP starts counting at the delayed reporting time;

e. as an exception to (i) and (ii), when the operator informs the crew member of a delay of 1 O hours or more in reporting time and the crew member is not further disturbed by the operator, such delay of 10 hours or more counts as a rest period.

GM1 3.3 (c) (1)(ii) Flight Duty Period

(FDP) IN-FLIGHT REST

In-flight rest should be taken during the cruise phase of the flight.

GM2 3.3 (c) (1)(ii) **Flight Duty Period**

(FDP) IN-FLIGHT REST

In-flight rest periods should be allocated in order to optimize the alertness of those flight crew members at control during landing.

GM2 3.3 **(d) Flight Duty Period**

(FDP) DELAYED REPORTING

Operator procedures for delayed reporting should:

(a) specify a contacting mode;

(b) establish minimum and maximum notification times; and

(c) avoid interference with sleeping patterns when possible

b. Split duty

The increase of limits on flight duty, under the provisions of Section 2.5, complies with the following:

i. the break on the ground within the FDP has a minimum duration of 3 consecutive hours.

ii. the break excludes the time allowed for post and pre-flight duties and travelling. The minimum total time for post and pre-flight duties and travelling is 30 minutes. The operator specifies the actual times in its operations manual.

iii. the maximum FDP specified in Section 2.2 (b) may be increased by up to 50 % of the break.

iv. suitable accommodation is provided either for a break of 6 hours or more or for a break that encroaches the window of circadian low (WOCL).

v. in all other cases:

1. accommodation is provided; and

2. any time of the actual break exceeding 6 hours or any time of the break that encroaches the WOCL does not count for the extension of the FDP.

vi. split duty cannot be combined with inflight rest.

GM1 3.4 (b) Split duty

POST, PRE-FLIGHT DUTY AND TRAVELLING TIMES

The operator should specify post and pre-flight duty and travelling times taking into account aircraft type, type of operation and airport conditions.

c. Stand by

The modification of limits on flight duty, duty and rest periods under the provisions of Section 2.6 complies with the following:

i. Airport standby:

1. If not leading to the assignment of an FDP, airport standby is followed by a rest period as specified in Section 2.8;

2. If an assigned FDP starts during airport standby, the following applies:

   a. the FDP counts from the start of the FDP. The maximum FDP is reduced by any time spent on standby in excess of 4 hours;

   b. the maximum combined duration of airport standby and assigned FDP as specified in Section 2.2(b) and (d) is 16 hours.

ii. Standby other than airport standby:

1. the maximum duration of standby other than airport standby is 16 hours;

2. the operator's standby procedures are designed to ensure that the combination of standby and FDP do not lead to more than 18 hours awake time;

3. 25 % of time spent on standby other than airport standby counts as duty time for the purpose of Section 2.3;

4. standby is followed by a rest period in accordance with Section 2.8;

5. standby ceases when the crew member reports at the designated reporting point;

6. if standby ceases within the first 6 hours, the maximum FDP counts from reporting;

7. if standby ceases after the first 6 hours, the maximum FDP is reduced by the amount of standby time exceeding 6 hours;

8. if the FDP is extended due to in-flight rest according to Section 3.3(c), or to split duty according to Section 3.4, the 6 hours of paragraph (5) and (6) are extended to 8 hours;

9. if standby starts between 23:00 and 07:00, the time between 23:00 and 07:00 does not count towards the reduction of the FDP under (6), and (7) until the crew member is contacted by the operator;

10. the response time between call and reporting time established by the operator allows the crew member to arrive from his/her place of rest to the designated reporting point within a reasonable time; and

11. stand by ceases if a crew member is contacted for duty but not utilized.

GM1 3.5 Standby

MINIMUM REST AND STANDBY

(a) If airport or other standby initially assigned is reduced by the operator during standby that does not lead to an assignment to a flight duty period, the minimum rest requirements specified in Section 2.8 should apply.

(b) If a minimum rest period as specified in Section 2.8 is provided before reporting for the duty assigned during the standby, this time period should not count as standby duty.

(c) Standby other than airport standby counts (partly) as duty for the purpose of Section 2.3 only. If a crew member receives an assignment during standby other than airport standby, the actual reporting time at the designated reporting point should be used for the purpose of Section 2.8.

GM1 3.5(b) STANDBY

STANDBY OTHER THAN AIRPORT STANDBY NOTIFICATION

Operator procedures for the notification of assigned duties during standby other than airport standby should avoid interference with sleeping patterns if possible.

GM1 3.5(b)(2) Standby

AWAKE TIME

Scientific research shows that continuous awake in excess of 18 hours can reduce the alertness and should be avoided.

d. Reserve

The operator assigns duties to a crew member on reserve under the provisions of Section 2. 7 complying with the following:

i. An assigned FDP counts from the reporting time;

ii. Reserve times do not count as duty period for the purpose of Section 2.3 and 2.8;

iii. The operator defines the maximum number of consecutive reserve days within the limits of Section 2.8(d);

iv. To protect an 8-hour sleep opportunity, the operator rosters a period of 8-hours, taking into account fatigue management principal, for each reserve day during which a crew member on reserve is not contacted by the operator.

GM1 3.6 Reserve

RESERVE NOTIFICATION

Operator procedures for the notification of assigned duties during reserve should avoid interference with sleeping patterns if possible.

GM2 3.6 Reserve

NOTIFICATION IN ADVANCE

The minimum 'at least 10 hours' between the notification of an assignment for any duty and reporting for that duty during reserve may include the period of 8 hours during which a crew member on reserve is not contacted by the operator.

GM3 3.6(c) Reserve

RECURRENT EXTENDED RECOVERY REST

Section 2.8(d) applies to a crew member on reserve.

e. Rest Periods

i. Disruptive schedules

1. If a transition from a late finish/night duty to an early start is planned at home base, the rest period between the 2 (two) FDPs includes 1 (one) local night.

2. If a crew member performs 4 or more-night duties, early starts or late finishes between 2 extended recovery rest periods as defined in Section 2.8(d), the second extended recovery rest period is extended to 60 hours.

ii. Time zone differences

1. For the purpose of Section 2.8(e)(1),'rotation' is a series of duties, including at least one flight duty, and rest period out of home base, starting at home base and ending when returning to home base for a rest period where the operator is no longer responsible for the accommodation of the crew member.

2. The operator monitors rotations and combinations of rotations in terms of their effect on crew member fatigue, and adapts the rosters as necessary.

3. Time zone differences are compensated by additional rest, as follows:

a. at home base, if a rotation involves a 4-hour time difference or more, the minimum rest is as specified in the following table.

Minimum local nights of rest at home base to compensate for time zone difference

Maximum time difference (h) between reference time and local time where a crew member rests during a rotation	**Time elapsed (h) since reporting for the first FDP in a rotation involving at least 4-hour time difference to the reference time**			
	<48	48-71:59	72-95:59	≥96
≤6	2	2	3	3
≤9	2	3	3	4
≤12	2	3	4	5

b. Away from home base, if an FDP involves a 4-hour time difference or more, the minimum rest following that FDP is at least as long as the preceding duty period, or 14 hours, whichever is greater. By way of derogation from point (b)(3)(i) and only once between 2 recurrent extended recovery rest periods as specified in Section 2.8(d), the minimum rest provided under this point (b)(3)(ii) may also apply to home base if the operator provides suitable accommodation to the crew member.

4. In case of an Eastward-Westward or Westward-Eastward transition, at least 3 local nights of rest at home base are provided between alternating rotations.

5. The monitoring of combinations of rotations is conducted under the operator's management system provisions.

iii. Reduced rest

1. The minimum reduced rest periods under reduced rest arrangements are 12 hours at home base and 10 hours out of base.

2. The rest period following the reduced rest is extended by the difference between the minimum rest period specified in Section 2.8 (a) or(b) and the reduced rest.

3. The FDP following the reduced rest is reduced by the difference between the minimum rest period specified in Section 2.B(a) or (b) as applicable and the reduced rest.

4. There is a maximum of 2 reduced rest periods between 2 recurrent extended recovery rest periods specified in accordance with Section 2.B(d).

GM1 3.7(b) (3) Rest periods

TIME ELAPSED SINCE REPORTING

The time elapsed since reporting for a rotation involving at least a 4-hour time difference to the reference time stops counting when the crew member returns to his/her home base for a rest period during which the operator is no longer responsible for the accommodation of the crew member.

GM2 3.7(b)(3) Additional rest to compensate for time zone differences

REST AFTER ROTATIONS WITH THREE OR MORE FLIGHT DUTY PERIODS

For a rotation with three or more FDPs, the greatest time zone difference from the original reference time should be used to determine the minimum number of local nights of rest to compensate for time zone differences. If such a rotation includes time zones crossings in both directions, the calculation is based on the highest number of time zones crossed in any one FDP during the rotation.

SECTION 4

Guidance Material on Ultra long-range operations (ULR)

1. **Purpose**

This Civil Aviation Advisory Circular provides policy and guidance material for the operation of Bangladesh registered aircraft operating worldwide on regular Ultra Long Range (ULR) operations as described in Paragraph 2 — Applicability below.

This circular will provide methods acceptable to the CAAB for showing equivalent means of compliance and equivalent safety. The requirements and characteristics of a fatigue likely to be accumulated in ULR flight operations are also addressed.

2. **Applicability**

This guidance material applies to all Bangladeshi operators when operating on ULR Operations as defined in paragraph 4.2;

3. **Introduction**

3.1 **General**

The previous approach to long haul operations has been an informal increment of historical rules and requirements. This has long been recognized by the aviation industry and in 2000 a group of concerned manufacturers, operators, regulators and crew organizations created a working group in cooperation with the Flight Safety Foundation.

The objective was to create a methodology for Ultra Long-Range operations (ULR) based on experience from all groups. After the final meeting in Kuala Lumpur in March, 2003 the working group recommended a general acceptance of an initial operational concept based on scientifically based modeling of city pairs (Departure and Arrival airports). Included in the recommendations were guidelines to provide for an acceptable means for determining what sufficient in-flight rest/sleep is required so that crewmembers would be alert enough to perform duties in a safe manner, followed by another meeting that took place in Montréal, Canada in November 2009 and was organized by ICAO to introduce a new standard of ANO 6 in relation to the Fatigue Risk Management System (FRMS).The guidance material and policy contained in this CAAB circular reflects the above. It was also recognized that the present ANO 6-1 Appendix 11 and the ULR concept, do not adequately address augmented crew operations where more than three pilots are carried. These Circular addresses this deficiency. Operators should refer to the definitions of ULR below.

3.2 **Definitions**

3.2.1 Ultra Long-Range Operation (ULR)

An operation involving any sector between a specific City Pairing (Point A- Point B-Point A) where the scheduled flight time could exceed 17 hours at any time during a calendar year taking into account the mean and seasonal wind changes.

The maximum permitted, duty period (including ground time) is 22 hours on both a scheduled/planned and actual basis and scheduled/planned flight time shall not exceed 20 hours.

Note: *A ULR operation applies to both sectors of a city pair.*

3.2.2 FRMS

"A scientifically based data-driven flexible alternative to prescriptive flight and duty time limitations that forms part of an operator's Safety Management System and involves a continuous process of monitoring and managing fatigue risk".

Note*: Unless otherwise stipulated in the paragraph, the term crew means flight and cabin crewmember throughout this manual.*

4. **Crew Avoidance of Excessive Fatigue Operational Requirements**

ANO (OPS) 6-1 Appendix 11 which specifies the limitations applicable to flight time and flight duty periods for crew members is for operations of all flight. The following, however, are additional requirements for ULR operation.

4.1 **Crew Rest Facilities**

Designated crew rest facilities shall be provided on board aircraft and should be certified to an industry standard. These rest facilities comprise not less than two independent rest areas with horizontal bunks and shall provide an environment that is conducive to rest/sleep. Each rest area shall be equipped with a sleeping surface (bunk or equivalent), adequate lighting, air conditioning, independent temperature controls and have noise levels which afford rest and are less than 75 dBA. Humidity enhancement shall be provided, Operators may refer to the FAA Advisory Circular AC 121-31 on crew rest facilities, the Crew Rest Facilities shall be subject to the prior approval of the CAAB or be part of the certification exercise.

4.2 **Operations Manual**

ULR shall not be conducted unless approved by the CAAB and in accordance with the provisions of the approved Operations Manual. The Operations Manual shall contain specific instructions to ensure that the ULR flight meets the following requirements:

(a) ULR Pre-flight and In-flight Rest Planning

A scheme shall be established to provide guidance to the crew on the expected preflight preparations and in-flight rest to be taken. Flight crew are to be appropriately rested for the ULR flight.

(b) ULR pre-flight Rostering Requirements:

Prior to operating a ULR flight or a ULR Standby departing Bangladesh, all crew members shall be scheduled for 02 days off including 03 local nights of rest in base.

(c) ULR Flight Rest Period Away from Base

In the ULR Rostered Duty Assignment, the scheduled period free of flying duties away from base shall be at least 48 hours.

(d) Post ULR Rostered Duty Assignment Rest At Base Before embarking on the Next Flight:

All crewmembers shall be scheduled for a minimum of 2 days off including 03 local nights of rest in base upon completion of a ULR pairing followed by any other duty or a ULR pairing.

(e) No crew member shall be rostered more than 02 ULR Pairings in a consecutive 30 days period.

(f) Travelling Time

Travelling time, other than time spent on positioning, shall not be countered in the computation of the FDP. Where the usual travelling time from the crew member's home to the normal departure aerodrome is in excess of 90 minutes, the crew member concerned shall make rest arrangements nearer the departure aerodrome, so as to ensure that he or she has the minimum rest period as specified in paragraph (b) above.

(g) Cabin crew shall be provided with a minimum in flight rest period of 3h 50m for any ULR flight.

4.3 **Flight Disruptions**

(a) At base:

Delayed flights will require a replacement of Crew if the projected FDP would exceed total of 22:00 hours.

(b) Standby Crew

(i) At base, the standby crew for a ULR Duty shall be roistered such that the standby flight crew meets the requirements of paragraph 4.2 above.

(ii) At outstation, the ULR flight crew may be called to operate an ULR FDP after achieving a rest period of at least 24 hours including one local night provided the Commander and one other crew have met the rest requirement of paragraph 4.2 (c) above. The flight crew if has been called out for the ULR FDP will be deemed to have completed a ULR pairing and shall be given the rest provided in paragraph 4.2 (d) above.

4.4 Crew compliment and composition

4.4.1 Flight Crew compliment and composition

(a) Each ULR flight is to be operated by no less than four (4) pilots of whom two (2) must be pilot-in-command qualified.

(b) The duty flight crew shall comprise at least two pilots of which one crew member is pilot - in-command qualified.

4.4.2 Cabin Crew Complement and Composition

Each ULR flight is to be operated by the following Cabin Crew complement which will be in accordance with following table:

Aircraft Type	Crew Composition
B787/900	14
B777/300	16

*** The provisions for cabin crew compliments for B777/300 ER has been kept as the aircraft has the capability for ultra-long-range flights. However, the provisions will be implemented as and when the aircraft is ready with class 1 rest facilities for the cabin crew.

The required crew complement shall include at least two Chief Pursers for each ULR sector with at least one Chief Purser on duty at all times.

5. **Application and Approval Process**

5.1 General

In order to obtain approval to conduct ULR operations, an operator must satisfy the CAAB that the proposed operation can be conducted safely. The application and approval process sequentially are as follows:

(a) Submission of an operational plan by the operator including the fatigue management;

(b) Authorization to commence trial by the CAAB;

(c) Validation by the operator,

(d) Validation results and final approval by the CAAB, and

(e) Ongoing safety oversight/audit;

(f) Deviations from this circular requirement are not permitted unless the operator based on the CAAB FRMS requirements has established the FRMS.

Areas to be considered by the Operator:

The following areas are to be considered by the Operator before the submission of an ULR Operational Plan:

(a) Aircraft entry into service and/or proposed route schedule;

(b) Rostering and scheduling procedures, including rostering computer software programmes;

(c) Training and education requirements;

(d) The regulatory process;

5.2 Approval Process

The approval process will require at least the following:

(a) Evaluation phase

(i) Submission of the proposed operational plan;

(ii) Consideration of the proposed operational plan by the CAAB. This should be an interactive process between the CAAB and the operator;

(iii) Submission of a draft Operations Manual amendment reflecting proposed operational plan;

(iv) Initial approval by the CAAB as a Letter of Approval for a limited time period.

(b) Final approval

(i) Submission of the validation results based on the validation programme;

(ii) Consideration of the validation results by the CAAB. There may be requirements for modification of the regulatory basis and further validation required;

(iii) Final approval as an amendment to the operator's Operations Manual.

6. **Operational Plan**

6.1 General

The operational plan must be developed using a scientifically-based approach, or equivalent, to achieve an acceptable level of safety. The objective is to determine the best strategies for preflight, in-flight and recuperative rest, scheduling and rostering.

6.2 Equivalent Approach

An equivalent approach to achieve an acceptable level of safety may be based on operational experience. It may include the applicant's previous experience in operations to long haul flights, as defined by the CAAB in ANO 6-1 Appendix 1 1 or another operator's modelling information or validation programme between similar flights. However, it must be considered that another operator's schedule to the same or similar flights may not be appropriate due to their individual work practices, departure time windows, crew complement and rest facilities etc.

6.3 Content of Operational Plan

6.3.1 General:

The operational plan, and associated modelling, must be predicated on specific schedules and rest strategies based on those schedules. The operational plan is therefore only valid for t hose schedules and strategies.

6.3.2 Schedules:

Scheduling is normally a commercial function of an operation. However, the operational management must ensure that the commercial department is fully aware of these requirements so that the schedule is realistic and generally not changed.

6.3.3 Flight Crew Complement:

For initial operations on a ultra-long range flight, the number of crew required would need to be assessed by acceptable scientific means and industry operational experience available at the time. Following this assessment, if there is a discrepancy between the two recommendations, best practice would advocate adopting the higher crew complement. Initially, the CAAB shall require a minimum of 4 pilots for ULR operations.

6.3.4 Crew Qualifications:

Crews should have adequate operational experience including previous long- h a u I flights where augmented crew and time zone change rest strategies have been utilized. For ULR flights, the crew complement must include at least two pilots, who hold Pilot -in-Command qualifications and at least two, but preferably all, should be qualified for the take-off and landing phases of flight. A Pilot-in-Command qualified crewmember must be at the controls at all times excluding operator authorized breaks.

6.3.5 Cabin Crew Complement:

The cabin crew complement shall be at least the minimum required by the CAAB. Sufficient augmented cabin crew shall be carried to enable adequate rest on board for all cabin crew members. The operator shall have a policy to address last minute cabin crew "no - shows" to ensure the complement is met and the proposed rest strategy is not compromised. The operator must develop the cabin crew requirements and include it in the Operations Manual.

6.3.6 Standby System

There shall be a robust standby crew system in place. The operator shall demonstrate to the CAAB that their standby system will ensure that a crewmember assigned to a ULR or specific long-range operation duty from standby can fulfil the pre-flight rest requirements. Where a standby crew system is utilized, crewmembers shall be aware of the planned assignment to address delays beyond the departure window.

6.3.7 Departure Time Windows

Departure time windows from base and outstation should be clearly defined in the operational plan and should be derived by scientific or equivalent means.

6.3.8 Rest Strategy

There shall be a rest strategy for flight and cabin crew. Guidance on rest must be provided to the operating flight and cabin crew as well as standby crew members. It is required that for the operation, rest requirements should take into account both preparatory and recuperative rest that meets the modelled assumptions, or equivalent, covering the strategies for:

(a) Pre-flight rest

(b) In-flight rest

(c) Post-flight rest

6.3.9 Contingencies:

The operational plan must also include strategies for dealing with operational considerations such as:

(a) Standby activation;

(b) Exceptional circumstances/commander's discretion;

(c) MEL limitations on crew rest facility;

(d) Plans to cope with delays and disruptions, including diversions;

7. Documentation

The Operations Manual shall address all of the above, in the appropriate operational, cabin crew and training sections, as well as any additional MEL items associated with a crew rest facility.

An operator will need to revise existing sections of an approved Flight and Duty Time scheme to address these long-range operations as the ANO 6-1 Appendix I I basis of a scheme may no longer apply. For example, standby provisions, duty flight crew, crew augmentation, crew rest facilities and the use of dedicated standby crew.

8. Validation Programme

8.1 Responsibility

Validation is the operator's responsibility and is required from the commencement of operations.

8.2 Objective

The objective is to validate the agreed assumptions on which the operational approval is based.

For example, the particular flight, aircraft type(s), departure windows, routing pre-flight and recuperative rest, crew complement, in flight rest strategy, adequacy of facilities etc.

8.3 Process

The operator must constitute a committee to supervise the validation process; Validation may consist of both objective and subjective measures and must be shown to be statistically significant with due consideration to sampling size and sampling interval. It should be conducted in two phases:

(i) Initial Validation:

The initial validation should be sufficiently rigorous to ensure operational safety is equivalent to, or better than, current long-haul operations. As a result of initial validation, the operational plan, including any model, may then be adjusted as required and ongoing monitoring will take place.

(ii) On-going Monitoring:

This is the operator's responsibility and should be part of the duties of the operator's selected committee for validation;

8.4 Validation Re-assessment

An assessment should be conducted to determine if re-validation is required whenever there is any change to;

(a) The operational model;

(b) City pair/cluster;

(c) Departure window;

(d) Major route changes;

(e) Aircraft type; and

(f) Periodically, as an on-going monitoring process which should also assess human and social factors, such as:

(i) Crew demographic change (age distribution, gender distribution, etc);

(ii) Crew basing;

(iii) Medical input

(g) It may use software validated for reliability and integrity;

(h) Includes a crew reporting mechanism with associated feedback.

8.5 CAAB'S Recommendations to the operators:

(a) Ensure that the operator's FTL ULR policy identify management commitment to open and positive fatigue-related reporting mechanisms and describe the conditions under which disciplinary action would be applicable. This is to be carried out in an ongoing consultation with the designated line flight and cabin crew representatives in order to establish a mutually agreeable reporting system for identifying fatigue risks. A clear statement about the mechanisms and disciplinary policy is particularly important to build the trust required to assure the reliable reporting that is fundamental to FTL policy;

(b) Operators shall define the FTL for ULR policy through management in consultation with other stakeholders, including flight and cabin crew representatives, in the spirit of shared responsibility for the FTL and they shall enable the FTL to achieve its objective;

(c) Reports or data including notifiable events that suggests negative safety issues should be provided timely to the CAAB and the operators should propose satisfactory processes to mitigate any safety issues;

(d) Operators should develop a mechanism for providing open and continuous feedback to the stakeholders including flight and cabin crew and should periodically assess whether the communication channels are effective;

(e) Operators should develop and use a methodology that will continually assess the effectiveness of fatigue management systems implemented by operators through FTL, including their ability to improve sleep and alertness, mitigate performance errors, and prevent incidents and accidents;

(f) Operators have to develop fatigue management training guidance material which is route specific to include rest strategies, Duty/rest provisions to cover the entire ULR operation from pre-duty, in-flight, layover, and return-to-base rest for both flight crew and cabin crew and follow up on the crew responsibility to implement those strategies;

(g) Operators have to publish in advance the flight/cabin crew on-board rest cycle to plan their rest before reporting for duty;

(h) Operators have to establish and implement process for adapting best practices for assessment & evaluation of fatigue management programs;

(i) Operators have to ensure flight and cabin crew fatigue data is motored from actual operating environments.

9. Training

Operators shall provide appropriate training, and where appropriate educational awareness, to ground and flying staff associated with these operations. This should include, but is not limited to, operational and commercial management, flight and cabin crew, scheduling and rostering staff, operational control staff and airline medical service providers. Training and educational awareness should be tailored to the job description, as appropriate. The curricula should include, but is not limited to, the following:

(a) Consequences of fatigue on aviation safety;

(b) Physiology of sleep;

(c) Circadian rhythms and consequences;

(d) Sleep and alertness strategies;

(e) Diet and hydration;

(f) Prescription and non-prescription medication;

(g) In-Flight environment;

(h) Work scheduling;

(i) Consequence of delays, flight disruptions and diversions.

APPENDIX- 12, CABIN SAFETY

(Chapter 12, 12.4 Note-4, refers)

1. APPROVAL PROCEDURE FOR CABIN CREW INSTRUCTOR/ EXAMINER

1.1 Selection Criteria:

The selected cabin crew shall have:

a) At least 3 years' experience as a cabin crew for Turbo-Prop aircraft or at least 5 years' experience as a cabin crew for Jet aircraft.

b) Qualified in CAAB approved I.T (Instructional Techniques) course.

c) Satisfactorily conducted training classes for a minimum of 4 hours each of 4 cabin crew course subjects under supervision of CAAB approved equivalent subject Instructor /Examiner;

d) Conducted line checks in two domestic sectors and two international sectors under supervision of a CAAB approved company examiner.

e) English language proficiency i,e the desired spoken and written capability.

1.2 Approval Criteria:

The selected candidate shall have to pass line checks in four sectors (02 domestic & 02 international) under the monitoring of a Cabin Safety Inspector (CSI).

1.3 Validity of approval:

a) The validity for initial approval will be for one year.

b) After successful completion of initial one year, the validity shall be renewed for a maximum period of five years subject to satisfactory acceptance of the performance by CAAB.

2. COMPETENCY CARD:

Until licenses are issued by CAAB to each to cabin crew, an operator shall develop a competency card which includes completion of the following training:

a. Initial;

b. Recurrent;

c. CRM;

d. AVSEC

e. DGR

f. First Aid Training

g. Evacuation

h. Fire and ditching drill

3. CABIN TRAINING DEVICES

3.1 Cabin training devices (CTDs) that are capable of recreating realistic situations shall be used to provide effective training on safety and abnormal/emergency procedures. When applicable, a mock-up or simulator may be used to enable realistic simulation of cabin crew's duties.

3.2 If CTDs are not available the training shall be covered through other means such as using of real aircraft.

4. CABIN CREW LIFE VEST

Crew life vest shall be different color than the yellow passenger life vest, which could be Red or flamed orange

APPENDIX- 13, (NAT HLA)

(Chapter 07, 7.2.2,7.2.5, refers)

1. Glossary

ADS	Automatic Dependent Surveillance
ADS-B	Automatic Dependent Surveillance — Broadcast
ADS-C	Automatic Dependent Surveillance — Contract
ATA	Actual Time of Arrival
ATC	Air Traffic Control
CPDLC	Controller Pilot Data Link Communications
ETA	Estimated Time of Arrival
FAA	Federal Aviation Administration
FIDE	Fault Detection and Exclusion
FL	Flight Level
FMC	Flight Management Computer
FMS	Flight Management System
GLONASS	Global Orbiting Navigation Satellite System
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
INS	Inertial Navigation System
IRS	Inertial Reference System
LRNS	Long Range Navigation System
MASPS	Minimum Aircraft System Performance Specifications
MEL	Minimum Equipment List
MNPS	Minimum Navigation Performance Specifications
NAT	North Atlantic
NAT VILA	North Atlantic High-Level Airspace
OTS	Organized Track System
PBCS	Performance Based Communication and Surveillance
PBN	Performance Based Navigation
RAIM	Receiver Autonomous Integrity Monitoring
RNAV	Area Navigation
RNP	Required Navigation Performance
RVSM	Reduced Vertical Separation Minimum
RLatSM	Reduced Lateral Separation Minimum
SSR	Secondary Surveillance Radar
TC	Type Certificate
UTC	Coordinated Universal Time

2. INTRODUCTION

2.1 ANO 6-1 Ch 7, 7.25 and ANO(OPS) Part SPA Sub Part C stipulates that Navigation Equipment for flights in defined portions of airspace where, based on Regional Air Navigation Agreement, minimum navigation performance specification (MNPS) are prescribed, an aero plane shall be provided with navigation equipment which:

i) Continuously provides indications to the flight crew of adherence to or departure from track to the required degree of accuracy at any point along the track; and

ii) Has been authorized by the Chairman for MNPS operations concerned.

2.2 In accordance with the NAT HLA to PBN transition Plan for the North Atlantic Region, with effect from 04 February 2016 that airspace formerly known as the "North Atlantic Minimum Navigational Specifications Airspace" (MNPSA), but excluding the BOTA (Brest Oceanic Transition Area) and SOTA (Shannon Oceanic Transition Area) areas and with the addition of the BOD (Oceanic FIR (FL285- 420 inclusive), is re-designated as the "North Atlantic High Level Airspace"(NAT HLA). However, recognizing that CAAB ANO 6-1 allows for a "minimum navigation performance specification" to be regionally specified in Regional Supplementary Procedures. it has been determined to maintain reference to a "MNPS" in the NAT Region within NAT and in the guidance material (North Atlantic Operations and, Airspace Manual) within contexts. Thus, approvals initially issued to operate in the NAT MNPSA are referred to as "NAT MNPS" approvals and approvals issued to operate in the NAT HLA are referred to as "NAT HLA MNPS" approvals. Otherwise, except in respect of historical references and subsequently, previous references to "Minimum Navigation Performance Specifications" and "MNPS" are replaced by "North Atlantic High Level Airspace Specifications" and "NAT HLA".

2.3 This Circular (CAC-OPS) lays down the requirements concerning operations and airworthiness approval of navigation equipment in NAT HLA Airspace. The requirements stipulated in this Circular must be complied with by operators intending to operate their airplanes in NAT HLA airspace.

3. NAT HLA AIRSPACE

3.1 A large portion of the airspace of the North Atlantic Region, through which the majority of these North Atlantic crossings route between FL285 and 420 inclusive, is designated as the NAT High Level Airspace (NAT LILA). W thin this airspace a formal Approval Process by the State of Registry of the aircraft or the State of the Operator ensures that aircraft meet defined NAT HLA Standards and that appropriate crew procedures and training have been adopted. The lateral dimensions of the NAT IILA airspace include the following Control Areas (CTAs): REYKJAVIK, SHANWICK (excluding SOTA & BOTA), and GANDER, SANTA MARIA OCEANIC, BODO OCEANIC and the portion of NEW YORK OCEANIC EAST which is north of 27^0 N.

3.2 The main reference document for operations in NAT HLA is NAT Doc007 - Guidance concerning Air Navigation in and above the NAT HLA which is required to be plied by al operators in this airspace.

4. GENERAL REQUIREMENTS

4.1 No person or operator shall operate Bangladesh registered aircraft in air space designated as NAT HLA unless:

(a) The operator is authorized by CAAB to perform such operations;

(b) The aircraft has approved navigation performance capability to maintain within the requirements laid down for NAT HLA in NAT Doc 007 - Guidance concerning Air Navigation in and above the NAT HLA (V .2020.1 or current edition as applicable);

(c) The crew have been trained for NAT HLA and RVSM operations.

4.2 Presently NAT HLA requirements are applicable in the North Atlantic Airspace (NAT). However, NAT HLA requirements may be imposed in any other airspace by the ATS providers. Specifications may not be exactly similar to that of NAT HLA. To meet, the accuracy requirements for navigation in the particular NAT HLA Airspace, appropriate equipment shall be installed for such operations. Individual approval is required for each aircraft and the operator to operate in each NAT HLA airspace as and when such areas are notified and operator wishes to operate in such airspace.

4.3 Special arrangements for the penetration of NAT HLA airspace by non-NAT HLA approved aircraft in accordance with NAT Doc 007 (V.2020.1) or current edition as applicable).

4.4 Special arrangements for the penetration of NAT HLA airspace by non-RVSM approved aircraft in accordance with NAT Doc 007 (V.2020.1) or current edition as applicable).

5. HORIZONTAL NAVIGATION REQUIREMENTS FOR UNRESTRICTED MNPS AIRSPACE OPERATIONS.

5.1 **Longitudinal Navigation**

Longitudinal separation between subsequent aircraft following the same track(in-trail) and between aircraft on intersecting tracks in the NAT HLA are assessed in terms of differences in ATAs/ETAs at common waypoints. The longitudinal separation minima currently used in the NAT HLA are thus expressed in clock minutes. The pre-flight procedures for any NAT HLA operation must include a UTC time check and resynchronization of the Master Clock (typically the FMS). List of acceptable time sources for this purpose have been promulgated by NAT ATS provider states.

5.2 **Lateral Navigation**

5.2.1 For approvals, the navigation system accuracy requirements for NAT MNPSA/HLA operation should only be based on the PBN specifications, RNP 10 (PBN application of RNAV 10) or RNP 4.

5.2.2 Additionally, in order for the 50 NM's lateral separation minimum to be utilized in the New York Oceanic East the following navigation performance criteria must also be met by aircraft with RNAV 10 (RNP 10) Approvals:

(a) the proportion of the total flight time spent by aircraft 46 km (25 NM) or more off the cleared track shall be less than 9.11x 10-5; and

(b) The proportion of the total flight time spent by aircraft between 74 and 111 km (40 and 60 NM) off the cleared track shall be less than 1.68 x 10-5. And similarly the additional criteria which must be met by aircraft approved as RNP 4 are as follows.

(c) the proportion of the total flight time spent by aircraft 28 km (15NM) or more off the cleared track shall be less than 5.44 x 10-5; and

(d) The proportion of the total flight time spent by aircraft between 44 and 67 km (24 and 36 NM) off the cleared track shall be less than 1.01 x 1()-5.

***Note**: In December 2015 the first phase of North Atlantic trials of reducing the lateral separation minimum to 25 NM was commenced. In this "RLatSM" Phase I (reduced lateral separation minima),25 NM lateral separation is implemented by establishing 1/2 degree spacing between two specified core OTS tracks and a central track, within the vertical limits applicable to the airspace associated with the NAT Region Data Link Mandate. Only aircraft with the appropriate Required Navigation Performance (RNP4) approval and operating Automatic Dependent Surveillance-Contract (ADS-C) and Controller Pilot Data Link Communications (CPDLC),are permitted to operate on these h degree spaced tracks. Special procedures in respect of planning and o p er a tin g on these tracks have been developed and promulgated via the AIS of the participating States I.e. Canada, Iceland and the United Kingdom. Operators intending to participate in these trials will need to ensure that advanced appropriate pilot and dispatcher training is undertaken.*

5.2.3 Furthermore, when granting approval for operations in NAT HLA airspace on the basis of PBN navigational standards, States of Registry should also ensure that in-flight operating drills are approved which include mandatory navigation cross-checking procedures aimed at identifying navigation errors in sufficient time to prevent the aircraft inadvertently deviating from the ATC-cleared route.

Note: *In Summary: From Febntary 2016 the NAT MNPSA is re-designated as NAT HLA. Previously granted MNPS Approvals are valid for NAT HLA operations. Milestone 2 of the MNPS to P B N NAT transition plan was achieved in January 2015. From that date all new North Atlantic MNPS Operational Approvals should have been based upon RNAV 10 (RNP 10) or RNP 4 navigation specifications. Previously issued 6.3 NM based MNPS Approvals will continue to be valid for NAT HLA operations but it is important to note that their longevity will be limited. Since subsequently, from January 202(), Milestone 4 of the MNPS to PBN NAT Transition Plan will take effect and the NAT HIDA airspace will be re-designated for "PBN Based Operations" and thus from then Aircraft Approvals based on the earlier 6.3NM MNPS standard will no longer be valid.*

6. AIRCRAFT SYSTEM/EQUIPMENT REQUIREMENTS

To consider each aircraft for unrestricted operation in the NAT HLA CAAB approval may presently be granted to an aircraft equipped as follows:

(a) with at least two fully serviceable Long Range Navigation Systems (LRNSs). A LRNS may be one of the following: one Inertial Navigation System (INS); one Global Navigation Satellite System (GNSS); or one navigation system using the inputs from one or more Inertial Reference System (IRS) or any other sensor system complying with the NAT IILA requirement.

Note 1*: Currently the only GNSS system fully operational and for which approval material is available, is GPS.*

Note 2*: A GPS installation must be approved as follows:*

If the two required LRNSs are both GPS, they must be approved in accordance with the current version of FAA Advisory Circular AC-20-138D Appendix 1. AC- 20-138 requires that GPS systems used in Oceanic airspace must have a Fault Detection and Exclusion (FDE) function. States other than the USA may see their own standards for operational approval of GPS to provide Primary Means of Navigation in Oceanic and remote areas but in all cases these approvals will include the requirement to carry out Pre- Departure Satellite Navigation Prediction Programs. If, however, GPS serves as only one of the two required LRNSs, then it must be approved in accordance with FAA TSO- €129 or later standard as Class Al, A2, Bl, B2, Cl or C2, or with equivalent European Aviation Safety Programme (EASA) documentation ETSO-C129

(b) In this instance CAAB insists upon the need for the conduct of pre-departure satellite navigation prediction programs (viz. FDE/RAIM).

(c) Each LRNS must be capable of providing to the flight crew a continuous indication of the aircraft position relative to desired track;

() It is also highly desirable that the navigation system employed for the provision of steering guidance is capable of being coupled to the autopilot;

***Note**: Some aircraft may carry two independent LRNS but only one FMCS. Such an arrangement may meet track keeping parameters but does not provide the required redundancy (in terms of continuous indication of position relative to track or of automatic steering guidance) should the FMCS fail; therefore, in order to obtain NAT IILA certification, dual FMCS is required to be carried. For example: a single INS is considered to be one LRNS; and an FMCS with inputs from one or more IRS/INS is also considered to be a single LRNS.*

(d) Since MNPS Airspace is now designated as RVSM airspace at all levels (i.e. FL 290-410 inclusive) specific State RVSM Approval i s also required to operate within NATHLA . RVSM approvals prescribe both airworthiness requirements to ensure aircraft height-keeping performance in accordance with the RVSM Minimum Aircraft System Performance Specification (MASPS), and also crew operating procedures;

(e) Aircraft operating in RVSM Airspace are required to be compliant with the altimetry MASPS and hold an issued approval. RVSM operations are required to be conducted in MNPS airspace and the following additional equipment shall also be installed:

(i) Two fully serviceable independent primary altitude measurement systems;

(ii) One automatic altitude-control system;

(iii) One altitude-alerting device;

(iv) A functioning Mode-C SSR Transponder

(v) ADS-C and CPDLC .

(f) Carriage of standby navigation equipment shall be governed by CAAB ANO 6 Part I and Part Il — Chapter 7; and

(g) Any other equipment which meet MNPSA accuracy criteria and is acceptable to Chairman CAA may be installed.

7. OPERATIONAL REQUIREMENT

7.1 Each operator shall develop NAT H LA operational procedures in accordance with NAT Doc 007 - Guidance concerning Air Navigation in and above the NAT HLA (V .2020.1 or current edition as applicable).

7.2 Each operator shall have a system of evaluation and recording Inertial Navigation System radial errors and ensure that such defects when reported are duly rectified.

8. TRAINING REQUIREMENTS

8.1 ***Introduction***

8.1.1 T h e operating crew shall be adequately trained and kept proficient for operation of aircraft in NAT HLA and shall be fully aware of the procedures to be followed. During operations in NAT HLA if there is any failure, the pilot shall inform the concerned ATC immediately and comply with their instructions. Operators shall ensure that appropriate guidance is provided to all flight dispatchers in accordance with NAT Doc 007 (V .2020.1 or current edition as applicable).

8.1.2 All initial NAT I-ILA training courses must be approved by the MFSR, CAAB prior to use and the syllabus incorporated in the Operations Manual. Recurrent training is required on an annual basis. The following items detailed below should be standardized and incorporated into training programmes and operating practices and procedures.

8.2 ***Flight Crew Training***

The following items should be included in flight crew training (initial and recurrent) programmes:

(a) Knowledge understanding and compliance of standard ATC phraseology and track messages used in each area of operations;

(b) MNPS procedures for NAT (and other areas when applicable);

(c) Changes to charting and documents to reflect MNPS;

(d) Navigation equipment required to be operational for flight in designated MNPS airspace, limitations associated with the RNAV equipment;

(e) Flight planning requirements;

(f) Entry, in-flight and exit requirements and procedures;

(g) Contingency procedures for system failures or navigation inaccuracies.

(h) Position error log and notification requirements;

(i) Operations Manual information and procedures.

9. MAINTENANCE REQUIREMENTS:

9.1 All equipment/systems pertaining to NATHI A shall be maintained in accordance with the CAAB Approved Maintenance Program (AMP). Operator shall ensure that the AMP is approved taking into consideration the aspect of MNPS operations, relevant recommendations of TC holders and the relevant requirements of CAAB are reflected into the AMP.

9.2 Operator shall ensure that the relevant procedure(s) in regard to control and perform the required maintenance action (s) is/are incorporated into the Maintenance Control Manual (MCM) or Continuing Airworthiness Maintenance Exposition (CAME) and/or Maintenance Organization Exposition (MOE) as required (if any by TC holder and/or CAAB for the MNSP operation.

10. MINIMUM EQUIPMENT LIST (MEL)

Each operator shall reflect requirements of minimum navigation systems for NAT HLA in their MEL.

11. VALIDATION FLIGHT(S)

The contents of the NAT HLA application and programmes may be sufficient to validate the aircraft. However, the final step of the approval process may require a validation flight through NAT HLA by a CAAB Flight Operations Inspector to verify that all relevant procedures are applied effectively. If the performance is satisfactory, operational approval for NAT HLA may be granted.

12. APPROVAL

Approval to operate in NAT HLA will be granted as by inclusion in the AOC issued by the CAAB for commercial operators and a Letter of Authorization for General Aviation operators. Each aircraft for which the operator is granted authority will be listed.

APPENDIX 14. ESTABLISHMENT OF FLIGHT DATA ANALYSIS PROGRAM

(Chapter 3, 3.3.3 referes)

***Note** : Flight Data Analysis (FDA) may also refer to Flight Data Monitoring (FDM).*

1.0 All Operators operating with aircraft (including wet lease or damp lease) of a maximum certificated take off mass in excess of 27,000 kgs shall establish and maintain a flight data analysis program(FDAP) as a part of its safety management system. The flight data analysis (FDA) program shall require a systematic download and analysis of electronically recorded flight data from applicable aircraft in its fleet.

2.0 A flight data analysis programme (FDAP) shall be confidential, non-punitive and contain adequate safeguards to protect the source(s) of the data.

3.0 Operator's Flight Data Analysis program shall be integrated to the management system including safety management system.

4.0 The operator applicable for establishing FDA program shall document, communicate and demonstrate FDA policy which includes following as a minimum, but not limited to:

i) The main objective of FDA program is to identify potential and actual hazards within the flight operation in order to prevent accident, not apportion of blame;

ii) It is a non punitive program. Confidentially will be maintained;

iii) Explicitly addressing the use of FDM data for identifying, monitoring and mitigating safety risks. Also mention that non-punitive use of FDM data is made at the FDM programme level;

iv) Statement on the general condition of use and protection of the FD data;

v) Clear statement on access and security of data;

vi) Inclusion of the FDM programme into the Management System processes;

vii) Allocation of required resources to maintain and operate FDA program effectively.

5.0 All Operators shall establish, maintain and comply with Flight Data Analysis Program that must correspond to the provisions of this appendix 14.

6.0 If the Operator has an FDA program in accordance with the above provision (1.0), the Operator shall ensure that such program has processes for:

(i) Interpretation and analysis of flight and aircraft technical data;

(ii) Flight crew liaison, including permission and responsibility for confidential discussions with flight crew members involved in events highlighted by FDA;

(iii) Data collection that comprises data that are representative of all aircraft operations for each applicable fleet type;

(iv) Dissemination of de-identified information to relevant operational personnel;

(v) Training and qualification of personnel as appropriate to perform assigned program functions.

If the Operator has an FDA program in accordance with the above provision (1.0), the Operator shall have standards for the management and protection of FDAP data and information that define:

(i) Methods for ensuring the integrity and validity of downloaded flight data;

(ii) Policies and procedures for data de-identification and confidentiality;

(iii) Methods for maintaining and presenting event and exceedance information for trend analysis;

(iv) Policies and procedures for data retention, retrieval and archiving;

(v) Processes for assessing and improving data management policies, methods and procedures.

8.0 **The operator's FDA Program shall be described in a controlled manual which shall be approved by CAAB.**

9.0 **Appointment of key safety personnel, organization structure and competency of FDM personnel**

9.1 The operator shall appoint or designate (depending on size and complexity of the operation) a properly trained and experienced person as FDAP Manager for the development and maintenance of an effective FDA program. The FDAP Manager shall be approved by CAAB.

9.2 The FDAP Manager shall have direct reporting line to the Accountable Manager. He/She shall be independent from operational areas and not be subservient. The appointed person shall have direct access to the Accountable Manager, Senior Mmanagement personnel of flight operations, aircraft airworthiness and maintenance and other relevant areas. The Post of FDAP Manager shall not hold other positions that may conflict or impair his/her role.

9.3 The operator shall have an appropriate organization structure for managing FDA program. The FDA Office shall be allocated with the supported manpower depending on the size and complexity of the organization.

9.4 The operator shall have allocated sufficient ccompetent personnel able to perform FDA program effectively.

Note. -*The number, type, skills, composition and appointment of key safety personnel will differ greatly depending on the size, nature and complexity of the operation. A large company shall have a dedicated FDA department, led by a full time FDAP Manager, supported by a team of analysts.*

9.5 The operator shall develop and maintain a training program for the personnel involved in maintenance and operation of FDAP. This training program shall includes initial, recurrent training, OJT, cockpit observation etc.

10.0 Should an operator contracts the operation of a Flight Data Analysis Programme to another party, the party involved in the processing and analysing of FDA shall act as a service provider only while the overall responsibility for the FDAP shall remain with the operator.

Note*. - An Operator may act as a sub- contractor providing FDA/FDM services. However, the overall responsibility for the FDA/FDM program and integrating it into their mmanagement ssystem lies with the operator who has opted to outsource this function. Agreement with the FDM service provider for the protection of FDM data should be clearly defined and executed.*

11.0 **Preservation of FDM data in the case of a safety investigation**

11.1 The operator having FDAP shall have a process to preserve FDA data of the flight involved into incident, serious incident or accident for the purpose of investigation until the investigation is completed and taking consent from the Investigation In-charge.

11.2 In the event of an incident and accident investigation, the investigator of AAIC-BD or CAAB is authorized to have access to all data that are relevant for that investigation.

12.0 **The operator shall maintain and retain FDM records for 5 years.**

12.1 If the Operator uses an electronic system for the management and control of records of FDA program, the Operator shall ensure that the system provides for a scheduled generation of backup record.

APPENDIX – 15

ELECTRONIC FLIGHT BAG (EFB)

(Chapter 6, 6.25 refers)

1. Introduction:

(a) An Electronic Flight Bag or EFB is defined by ICAO as "An electronic information system, comprised of equipment and applications for flight crew, which allows for storing, updating, displaying and processing of EFB functions to support flight operations or duties. EFB is an information management and display system by electronic means, intended primarily for flight crew or cabin crew functions that were traditionally accomplished using paper references (e.g. navigation charts, operating manuals, performance calculations).

(b) The EFB may also support other functions that have no paper equivalent, e.g. a video surveillance display or flight dispatch function such as flight performance calculations based on data provided to the airline's flight crew. The EFB may also be used to host other secondary functions on the same display system.

(c) An EFB system has essentially two components, viz. a host platform or hardware to run the software programmes and software programmes or applications to provide the required functionality.

(d) An EFB may be portable or installed either as an independent system or as part of an integrated onboard information system.

(e) It is the sole the responsibility of the operator to ensure the accuracy and integrity of the information used and all data derived from are from verifiable sources.

2. DEFINITIONS:

AID (Aircraft Interface Device) means a device or function that provides an interface between the EFBs and other aircraft systems which protects the aircraft systems and related functions from the undesired effects from non-certified equipment and related functions.

AMM (Airport Moving Map) means a software application displaying airport maps and using a navigation source to depict the aircraft current position on this map while on ground.

COTS means commercial off the shelf that refers non-developmental items (NDI) sold in commercial marketplace and used or obtained through government contracts. A COTS product is usually a computer hardware or software product tailored for specific uses and made available to the general public.

Critical phases of flight means all ground operations involving taxi, takeoff and landing; all other flight operations conducted below 10,000 feet; and when handling abnormal situations.

Data connectivity for EFB systems means either uni-or bi-directional data communication between the EFB and other aircraft systems (e.g. avionics). Direct interconnectivity between EFBs or direct connectivity between EFBs and ground systems are not covered by this definition.

EMI/EMC means Electromagnetic Interference/Electromagnetic Compatibility.

EFB administrator means a person appointed by the operator, held responsible for the administration of the EFB system within the company. The EFB administrator is the primary link between the operator and the EFB system and software suppliers.

EFB host platform means the equipment (i.e. hardware) in which the computing capabilities and basic software (e.g. operating system, input/output software) reside.

EFB risk assessment and mitigation means a process that considers an EFB system, its software applications, and its integration inside a specific aircraft, to identify the potential malfunctions and failure scenarios; analyze their operational repercussions; and, if necessary, propose mitigation means.

EFB software application means Software installed on an EFB system that allows specific operational functionality.

EFB system means the hardware (including any battery, connectivity p r o v i s i o n, I/O devices) and software (including databases) needed to support the intended EFB function(s).

EFB system supplier means the company responsible for developing, or for having developed, the EFB system or part of it. The EFB system supplier is not necessarily a host platform or aircraft manufacturer.

EMI means electromagnetic interference.

Mounting device means an aircraft certified part which secures portable or installed EFB, and/or its system components.

HMI means Human Machine Interface.

Installed resources means Hardware/software installed in accordance with airworthiness requirements.

Independent EFB platforms means multiple EFBs that are designed in such a way that no single failure makes all of them unavailable.

OEM means an original equipment manufacturer is generally perceived as a company that produces parts and equipment that may be marketed by another company.

Portable Electronic Device (PED) means a typically consumer electronic devices, which have functional capability for communications, entertainment, data processing, and/or utility. There are two basic categories of PEDs–those with and those without intentional transmitting capability.

Viewable Stowage means a device that is secured either on the flight crew (e.g. kneeboard) or in/to an existing aircraft part (e.g. suction cups) with the intent to hold a portable EFB (e.g. a tablet) viewable to the pilot at her/his duty station. The device is not necessarily part of the certified aircraft configuration.

3. HARDWARE OR HOST PLATFORMS

3.1 Class 1 EFB systems

3.1.1 Considered as controlled personal electronic devices (PEDs), Class 1 EFBs are essentially commercially-off-the-shelf (COTS) portable computer system for use on an aircraft. It is not attached to any aircraft mounting device and must be secured during critical phases of flight.

3.1.2 Aircraft power may be connected to the EFB through a certified power source only. Except under specified conditions, EFB to aircraft data connectivity is not authorized.

3.1.3 A portable EFB provides a portable host platform, although when used on the flight deck, it is not part of the certified aircraft configuration. Portable EFBs can be used either as hand-held equipment or secured in a mounting device / viewable stowage solution.

3.1.4 Class 1 EFBs do not normally require airworthiness approval for the system.

3.2 Class 2 EFB systems

3.2.1 Though still considered as controlled PEDs, Class 2 EFBs are generally COTS-based computer systems connected to aircraft mounting devices during normal operations.

3.2.2 Aircraft power connection to Class 2 EFBs is through a certified power source and connectivity to aircraft avionics is possible.

3.2.3 A Class 2 EFB requires an airworthiness approval.

3.3 Class 3 EFB Systems

3.3.1 Class 3 EFB systems are installed equipment requiring an airworthiness approval. This approval covers the integrity of the EFB hardware installation (e.g. server, display, keyboard, power, switching) and include hardware and software qualifications. Such aspects as the human machine interface should also be addressed.

4. SOFTWARE PROGRAMMES OR APPLICATIONS

4.1 Type A Programmes

4.1.1 Type A programmes typically comprise applications including pre composed, fixed data which may be hosted by any of the 3 EFB hardware classes. Though requiring processing for operational approval by the CAAB, there is no necessity to obtain an airworthiness approval for these programmes.

4.2 Type B Programmes

4.2.1 Type B programmes are applications which are capable of dynamic and interactive activities that can manipulate data and presentation. The data may be hosted by any of the 3 EFB hardware classes. Type B programmes do not require airworthiness approval but are subject to operational approval process by the Authority.

5. AIRWORTHINESS CONSIDERATIONS

5.1 Hardware or Host Platform

5.1.1 Class 1 EFBs:

(a) A Class 1 EFB does not require airworthiness approval for use during critical phases of a flight.

(b) The following items shall be assessed in relation to the physical use of the device in the flight deck, its safe stowage, crashworthiness, security and the use of it under normal environmental conditions including turbulence:

(1) **EMI Emission:** If the EFB is to be used during critical phases of flight such as take- off and landing, the EFBs shall be tested for compliance RTCA/DO-160(F)/EUROCAE ED-4(F)- Environmental conditions and test procedure for airborne equipment is a standard for environmental testing of avionics hardware.

(2) **Lithium Batteries:** As a minimum, lithium batteries shall be tested to UL1642 standards for risk of leakage, hazards of overheating and short circuiting.

(3) **Power Source:** The design of the power source shall be such that it's easy for the crew to deactivate, remove or un-plug from the EFB, failing which a clearly labeled and conspicuous means such as an on/off switch be provided.

(4) **Data Connectivity:** Data connectivity to other aircraft systems is not authorized except if the EFB system is connected to a system which is completely isolated from the avionics/aircraft systems (e.g., EFB system connected to a transmission medium that receives and transmits data for Aircraft Administrative Communications (AAC) purposes on the ground only). Any other type of data connectivity requires an airworthiness approval.

5.1.2 Class 2 EFBs:

(a) A Class 2 EFB requires an airworthiness approval for the mounting device, crashworthiness, data connectivity and EFB power connection.

(b) Evaluation of the EFB mounting device and flight deck location shall be conducted as follows:

(1) Design and placement of Mounting Device: The mounting device shall not obstruct visual or physical access to aircraft controls and/or displays, flight crew ingress or egress, or external vision. It shall allow easy access to the EFB controls and afford a clear view of the EFB display while in use. The following are considerations for the design of an EFB mounting device:

(i) Impedance to flight crew performing the task of operating the aircraft or aircraft system;

(ii) Location of mount to afford optimum visual scope and physical accessibility of the EFB to the flight crew in his normal seated position;

(iii) The mount shall be easily locked in place and secured out of the way when not in use;

(iv) The OEM data shall be used when dealing with issues pertaining to mechanical interference adversely affecting control column forces or aircraft handling qualities;

(v) Cable to mate aircraft systems or other EFBs should be of optimal length and can easily and safely be secured to avoid becoming operational or safety hazard.

(2) EMI emission, Lithium Batteries and Power Source: In respect of EMI emission, Lithium batteries and Power source guidelines provided for Class 1 EFB in paragraphs 5.1.1(b)(1) and 5.1.1(b)(2) are also valid for Class 2 EFB.

(3) Data Connectivity: EFB data connectivity should be validated and verified to ensure non-interference and isolation from aircraft systems during transmission and reception.

5.1.3 Class 3 EFBs:

(a) A Class 3 EFB is considered installed equipment and is subject to assessment of compliance with airworthiness requirements as well as approval. The airworthiness requirements are typically concerned with:

(1) The intended function and safety (e,g. Security and integrity) of interfaces between EFB and avionics data sources including failure modes under normal and fault conditions. Software applications do not require airworthiness approval but are subject to operational approval process.

(2) Hardware and software qualification should be conducted in accordance with an agreed Design Assurance Level (DAL) for the system and its interfaces. The DAL may take into consideration provisions for future needs.

(b) Human factor assessment relating to display, keyboard, switches, annunciators, etc., shall be conducted in accordance with criteria of the aircraft type design or basis of aircraft certification if it is a modification.

5.2 EFB Software Applications (Type A and Type B):

5.2.1 Type A and Type B EFB software applications do not require airworthiness approval, but shall be approved through the operational approval process.

5.2.2 EFB software applications not classified Type A or Type B under EASA or classified Type C under FAA AC 120-76D shall undergo full airworthiness approval.

5.3 Specific Considerations for Performance and Electronic Checklist Applications:

5.3.1 The operator shall ensure that all EFB derived performance calculations are consistent with those derived from the approved Airplane Flight Manual (AFM).

5.3.2 The operator shall consult the CAAB on any changes to the electronic checklist which differs from the approved procedures contained in the AFM.

6. OPERATIONAL APPROVAL

6.1 The Civil Aviation Authority of Bangladesh (CAAB) grants EFB operational approval on a case-by-case basis taking into consideration the robustness of the EFB system and the reliability and integrity of information the EFB provides to the crew. A quality assurance system must also be established to approve the integrity of the software data prior to installation on the EFB.

7. MODES OF EFB OPERATIONS

7.1 The operator may opt for EFB operations with no paper back-up in which case the operator will have to demonstrate to the CAAB a full Operational Risk Assessment with suitable means of mitigation against failure or malfunction conditions.

7.2 Alternatively the operator may opt for EFB operations with paper back-up for cross- checking and mitigation against system failure or malfunction in which case the CAAB may accept a safety review consistent with the operator's Safety Management System.

7.3 The third option is a combination of paragraphs 7.1 and 7.2 with limited paper back-up for which the operator has to satisfy the CAAB of its merits and comply with specific conditions stipulated by the CAAB. Approval of this mode of EFB operation is at the absolute discretion of the CAAB.

8. OPERATIONAL RISK ANALYSIS

8.1 The Civil Aviation Authority of Bangladesh (CAAB) must be satisfied that the operator has taken into consideration for the analysis failure of the complete EFB system as well as individual applications including corruption or loss of data and erroneously displayed information.

8.2 The scope of analysis is operator-specific but shall include:

(a) How to minimize undetected erroneous application output;

(b) Effective detection of erroneous outputs from software applications by

(i) Description of corruption scenario;

(ii) Description of mitigation means (crew monitoring).

(c) Upstream development quality process;

(i) Root data reliability (qualified/verified input data) (ii) Software partitioning predicated on safety effect.

(d) Mitigation means to the above.

9. HUMAN MACHINE INTERFACE ASSESSMENT FOR TYPE A AND B SOFTWARE APPLICATION

9.1 Assessment of Human Machine interface and Cockpit of Resource Management (CRM) to include at least the review of:

(a) Human/machine interface;

(b) Legibility of text;

(c) Approach/departure and navigation chart display;

(d) Responsiveness of application;

(e) Off-screen text and content;

(f) Active regions;

(g) Managing multiple open applications and documents;

(h) Messages and the use of colours;

(i) System error messages;

(j) Data entry screening and error messages;

10. FLIGHT CREW OPERATING PROCEDURES

10.1 The procedures for using EFB systems with other Flight Deck System shall be designed such as to ensure the flight crew are able to:

(a) Determine the correct use of the appropriate system for a given purpose;

(b) Determine the appropriate course of action to deal with any information mismatch;

(c) Distinguish primary from backup information and decide upon the appropriate use of the backup information.

10.2 As far as possible the EFB/user interfaces should be consistent with the flight deck design philosophy.

10.3 A procedure should be in place to enable flight crew to determine at pre-flight the validity of the database, its version, revision number and the effective date. The verification should cover data that could adversely affect flight operations and the procedure should specify actions to deal with out-of-date application software or databases.

10.4 To mitigate and/or control additional workload arising from the use of EFB system, procedures should be developed to:

1 Preclude both flight crew members become preoccupied with the EFB system at the same time; and

2 Clearly define crew functions so to ease workload and enhance monitoring of operations of EFB and other aircraft systems.

10.5 The procedures shall be strictly applied in flight and should include specific time periods during which the flight crew may not use the EFB system.

10.6 The operator shall develop procedures to define the roles of the flight crew and dispatch office in creating, reviewing, and using performance calculations supported by the EFB systems.

11. QUALITY ASSURANCE

11.1 The operator shall document procedures for the quality control of the EFB system. This details an overall in-charge of the EFB system, i.e. the EFB Administrator who will have authority to authorize and activate amendments to the hardware and software.

11.2 Maintenance procedures shall be established for the EFB system to deal with unserviceability and failures to assure the integrity of the EFB system. The maintenance procedures will include the handling of updated information, the acceptance and timely promulgation to all users and aircraft platforms.

11.3 A fault or failure of the system shall be brought to the immediate attention of the flight crew and the faulty or failed system isolated until rectification action is taken. In addition to back-up procedures to deal with system failures, a reporting system needs to be in place so that necessary actions are to prevent the erroneous information being used by the flight crew.

11.4 The EFB hardware shall be secured physically and protected against unauthorized access by the use of password protected system updates. Such measures shall also include the control of laptop software installations to prevent unauthorized use of data.

12. EFB ADMINISTRATOR

12.1 An Administrator is essential in the running the EFB system. The Administrator needs to be trained in his role and shall have a good working knowledge of the proposed system hardware and operating system.

12.2 The Administrator shall seek guidance from the EFB system supplier to identify clearly which parts of the EFB system that can be accessed and modified by the Administrator and the parts that are only to be accessed by the supplier.

12.3 Certain specified roles of the Administrator involving changes and modifications to the EFB may be procedurally delegated by the Administrator to maintenance and support staff. The Administrator must ensure these procedural guidelines are strictly adhered to and that no unauthorized changes can take place.

12.4 The Administrator shall also be responsible for conducting audits and to ensure compliance with company procedures by all personnel and the audits should include systematic audits/checks against the procedures as well as random checks of reports for followed-up actions.

13. FLIGHT CREW TRAINING

13.1 Specific training shall be given to flight crew on the use of the EFB system and the training should include at least the following:

(a) An overview of the system architecture

(b) Pre-flight checks of the system

(c) Limitations of the system

(d) Specific use of each application and the conditions specifying EFB usability.

(e) Restrictions on system usage including system is non-availability

(f) Procedures for cross-checking data entry and computed information

(g) Phases of flight when the EFB system may and may not be used

(h) CRM and human factor considerations on the use of the EFB

(i) Training for new applications or changes to the hardware configuration

13.2 The EFB system may be used to play a role in the operator's Proficiency Checks as part of recurrent training and checking.

13.3 Operational Evaluation Test (OET): The purpose of the OET is to verify satisfactory compliance with the above elements prior to final approval of the EFB to replace paper documentation.

13.4 Where the operator opts for initial retention of paper back-up, a two-stage operational evaluation will be conducted and the first stage shall:

(a) run in parallel with the equivalent paper format verification of correctness and reliability of the system;

(b) run for 6 month or as determined by the CAAB; and

(c) Include an evaluation and audits of the procedures used as well as checks on the accuracy of any computed data.

13.5 A report of satisfactory completion of the first stage should be submitted to the CAAB for acceptance and issue of approval for the use of the system in place of the paper format.

13.6 The second stage will still involve with carriage of paper documentation as precaution against any event cause by EFB system non-availability or fault.

13.7 The CAAB may ultimately grant approval to allow removal of paper documentation when it is satisfied that the back-up procedures are sufficiently robust.

13.8 Where the operator opts to start operations without paper back-up the OET will comprise of the followings:

(a) A detailed review of the operational risk analysis;

(b) A simulator LOFT session to validate the use of the EFB in normal, abnormal and emergency operating conditions. Such items as a late runway change and diversion to an alternate should also be included. The LOFT should precede any actual line flights, as the LOFT outcome may result in changes to flight crew training and/or administrative procedures.

(c) Observation by the authority of the initial line flights.

13.9 The CAAB must be satisfied that the operator is able to maintain the EFB to the required standard by the EFB Administrator and the quality assurance system.

14. FINAL OPERATIONAL REPORT (OPERATIONAL COMPLIANCE SUMMARY)

14.1 As final operational report to the CAAB, the operator shall submit an Operational Compliance Summary (OCS) summarizing all activities conducted or demonstrated as means of compliance with the requirements for the issue of an operational approval for the EFB system. The report shall include, but not be limited to, the following:

(a) EFB platform/hardware description;

(b) Description of each software application to be included in the approval;

(c) Risk analysis summary for each application and mitigation means put in place;

(d) Human factor assessment for the complete EFB system, human machine interface and all software applications;

(e) Pilot workload in both single-pilot and multi-crew flown aircraft;

(f) Size, resolution, and legibility of symbols and text;

(g) Navigation chart display: access to desired charts, access to information within a chart,

(h) grouping of information, general layout, orientation (e.g. track-up, north-up), depiction of scale information;

(i) Training; and

(j) EFB Administrator qualification.

14.2 An operational approval based on the submission above will depend upon satisfactory evaluation by the Authority that the EFB is suitable for use as replacement or as an alternative to paper based information.

15. WITHDRAWAL OF OPERATIONAL APPROVAL:

15.1 The operator shall develop its maintenance programme for EFB system including conduct of regular evaluation and audit.

15.2 Any s defect or operational anomaly must be investigated and rectified promptly. Failure to comply with the terms of approval may result in the Authority withdrawing the operational approval.

APPENDIX 16. REQUIREMENTS FOR SELECTION OF ROUTE TRAINING INSTRUCTORS (RTI) FOR CAT OPERATIONS – AEROPLANE

(Chapter 9, 9.3, refers)

1. **INTRODUCTION**

1.1 A specific authorization for Route Training Instructor (RTI) may be granted by CAAB to conduct flight instruction required for conducting Route training of a pilot as required in the part D of an operator's manual for Commercial Air Transport Operations (aeroplane).

1.2 The Route Training Instructor (RTI) requirements is to be established by CAAB.

1.3 The checks conducted by the Route Training Instructors are restricted to CAAB and company requirements.

1.4 Operators are required to incorporate the training program in Operations Manual specific to the aeroplane type of operations, taking the provisions of this Appendix, as a minimum.

2. **ROUTE TRAINING INSTRUCTORS (RTI)**

Qualifications and Experience Required for RTI Authorization

The applicant :

2.1 have received theoretical instruction on the fundamentals of Instructional Techniques (IT) as per approved syllabus of CAAB followed by examination at CAAB. Based on military qualifications and experience, the certificate holders of Qualified Flight Instructor from the military organization are also accepted to have completed the theoretical course on Instructional techniques.

2.2 (for aeroplane 7000 kg or less) - to hold ATPL (A) or CPL (A) and be current on the applicable type of aeroplane as 'Captain' for which the instructor authorization is sought;

2.3 (for aeroplane above 7000 kg) - to hold ATPL (A) and be current on the applicable type of aeroplane as 'Captain' for which the instructor authorization is sought;

2.4 to hold Medical Assessment, Class-1;

2.5 have no record of any violation, aircraft accident or serious incident, directly or indirectly attributable to him/her, in last 5 years;

2.6 have no record of any aircraft incident, directly or indirectly attributable to him/her, in last 2 years;

2.7 (experience for turbo prop aeroplane - all up weight 7000 kg or less): have a minimum flying experience of total of 1500 hours of which 250 hours as 'Captain' on the applicable type of aeroplane. The experience as 'Captain' on the applicable type of aeroplane may be reduced to 100 hours for pilots previously qualified and experienced as an instructor on equivalent or heavier aeroplane type(s); or,

2.8 experience for turbo prop aeroplane - all up weight above 7000 kg): have a minimum flying experience of total of 2000 hours of which 500 hours as 'Captain' on the applicable type of aeroplane. The experience as 'Captain' on the applicable type of aeroplane may be reduced to 300 hours for pilots previously qualified and experienced as an instructor on equivalent or heavier aeroplane type(s); or,

2.9 (experience for jet aeroplane): have a minimum flying experience of total of 3000 hours of which 1000 hrs as 'Captain' on the applicable type of aeroplane. The experience as 'Captain' on the applicable type of aeroplane may be reduced to 500 hrs for pilots previously qualified & experienced as an instructor on equivalent or heavier aircraft type(s);

2.10 be proficient in both seats;

2.11 to demonstrate to a CAAB inspector, a thorough knowledge of the Air Operator's Operations Manual, Operations Specifications, Standard Operating Procedures (SOPs), Aeroplane Flight & Operating manuals, relevant legislation, record keeping and documentation required for safe operations on the applicable type of aeroplane;

2.12 have conducted a demonstration class / lecture of 1 hour at CAAB for assessment;

2.13 have completed the Route Training which includes the following minimum requirements:

a. (for heavy aeroplane - all up weight 136000 kg or more): A candidate has to fly a minimum of 04 sectors training with a RTI in the airplane for which the instructor authorization is sought followed by a Route Check with another RTI;

b. (for medium aeroplane-all up weight less than 136000 kg but more than 7000 kg): A candidate has to fly a minimum of 06 sectors training with a RTI in the airplane for which the instructor authorization is sought followed by a Route Check with another RTI;

c. (for light aeroplane - all up weight 7000 kg or less): A candidate has to fly a minimum of 10 sectors training with a RTI in the airplane for which the instructor authorization is sought followed by a Route Check with another RTI or to be monitored by a FOI.

3. **Privileges of RTI**

RTI should have the following privileges:

3.1 to conduct Route Trainings & Company Route Checks;

3.2 to conduct Ground Training on IT Refresher course, Safety Equipment & Emergency Procedure (SEEP) and Type Rating training on the applicable type of aeroplane for Flight Crew;

3.3 to familiarize with flight training for flight crew with the latest operational procedures;

3.4 to conduct Company Standardization Flights.

4. **Validity Period for RTI**

4.1 The RTI authorization is valid for 5 years subject to maintaining valid class 1 medical and type currency.

5. **Currency Requirement for RTI**

5.1 to hold ATPL (A) or CPL (A), Medical Assessment (Class-1) and be current on the applicable type of the aeroplane;

5.2 required to conduct a minimum 12 (twelve) sectors Route Training and/or Company Route Check in every 12 months;

Or

Undergo a route check with another RTI;

5.3 if the currency expires but not exceeding 24 months, then the candidate has to fly two sectors with another RTI followed by a route check (two sectors); Or,

5.4 if the currency expires beyond 24 months but not exceeding 60 months then the candidate has to fly a total of four sectors with a RTI followed by a route check (two sectors) with another RTI; Or,

5.5 if the currency expires beyond 60 months, then the candidate has to undergo initial RTI training program for the issue of RTI authorization;

5.6 To complete IT refresher course every 5 years and pass the ground examination conducted by the operator. The syllabus for IT refresher training shall be prepared by the operator and included in the Operations Manual, Part-D.

APPLICATION FOR ISSUANCE OF ROUTE TRAINING INSTRUCTORS (RTI) (AEROPLANE)

S/N	Annexuere-16	ITEM	OPERATOR's		CAAB USE
			Response	Page No	
1	1.2, a	Name of the applicant			□ Accepted □ Not Accepted
2	2.1.2/ 2.1.3	Application for RTI (Route Training) Aircraft Type:	□ Turbo-Prop □ Jet		□ Accepted □ Not Accepted
3	1.2 /1.3	Name of the Operator			□ Accepted □ Not Accepted
4	2.1.1	Qualified/ Passed in either: (attach evidence)	□ CAAB IT exam □ QFI □ Hold or Held FIR		□ Accepted □ Not Accepted
5	2.1.2	For Aircraft 7000 kg or less : Licence Type & Number (licence valid & current on the type of aircraft as PIC for which the instructor authorization is sought, copy attached)	□ Applicable □ N/A □ ATPL # □ CPL #		□ Accepted □ Not Accepted
6	2.1.3	For Aircraft above 7000 kg: Licence Type & Number (valid & current on the type of aircraft as PIC for which the instructor authorization is sought (copy attached)	□ Applicable □ N/A □ ATPL #		□ Accepted □ Not Accepted
7	2.1.2/ 2.1.3	Competency and Recent experience Requirements as per Annexure-8, 2.1.1 (attach evidence)	Attached: □ Yes □ No		□ Accepted □ Not Accepted
8	2.1.4	Medical Assessment (Class-I)	Attached: □ Yes □ No		□ Accepted □ Not Accepted
9	2.1.5	Not responsible for any violation, aircraft accident or serious incident in last 05 years: (declaration by operator)	Attached: □ Yes □ No		□ Accepted □ Not Accepted
10	2.1.6	Not responsible for any aircraft incident in last 02 years: (declaration by operator)	Attached: □ Yes □ No		□ Accepted □ Not Accepted

S/N	Annexuere-16	ITEM	OPERATOR's		CAAB USE
			Response	Page No	
11	2.1.7	Experience for Turbo Prop aircraft AUW 7000 kg or less): □ Min 1500 hrs □ Min 250 hrs as PIC on Type □ Min 100 hrs reduced as PIC with justification attached	□ Applicable □ N/A □ □ □		□ Accepted □ Not Accepted
12	2.1.8	Experience for Turbo Prop aircraft AUW above 7000 kg □ Min 2000 hrs □ Min 500 hrs as PIC on Type □ Min 300 hrs reduced as PIC with justification attached	□ Applicable □ N/A □ □ □		□ Accepted □ Not Accepted
13	2.1.9	Experience for Jet aircraft □ Min 3000 hrs □ Min 1000 hrs as PIC on Type □ Min 500 hrs reduced as PIC with justification attached	□ Applicable □ N/A □ □ □		□ Accepted □ Not Accepted
14	2.1.10	The applicant is proficient in both seats (attach Skill Test report)	Attached: □ Yes □ No		□ Accepted □ Not Accepted
15	2.1.11	Oral test report by RTI monitored by a CAAB designee.	Attached: □ Yes □ No		□ Accepted □ Not Accepted
16	2.1.12	Assessment of demonstration class / lecture of 1 hour at CAAB	Attached: □ Yes □ No		□ Accepted □ Not Accepted
17	2.1.13	Completed Route Training which includes minimum following requirements			□ Accepted □ Not Accepted
		a. For Heavy Aircraft (AUW 136000 kg or more): □ Min 4 sectors □ Route Check with another RTI	□ Applicable □ N/A □ Sectors □ Yes □ No		□ Accepted □ Not Accepted

S/N	Annexuere-16	ITEM	OPERATOR's		CAAB USE
			Response	Page No	
		b. For medium aircraft (AUW less than 136000 kg but more than 7000 kg): □ Min 6 sectors □ Route Check with another RTI	□ Applicable □ N/A □ Sectors □ Yes □ No		□ Accepted □ Not Accepted
		c. For light aircraft (AUW 7000 kg or less): □ Min 10 sectors □ Route Check with another RTI/FOI	□ Applicable □ N/A □ Sectors □ Yes □ No		□ Accepted □ Not Accepted
18	1.4	Annexure-16 has been incorporated in the Operations Manual	□ Yes □ No		□ Accepted □ Not Accepted
19	2.1.13 a/b/c	i. Flying Log Book (relevant pages) ii. Training records and documents	i. Attached:□ Yes □ No ii. Attached:□Yes □ No		□ Accepted □ Not Accepted
20	2.4.6	IT refresher training syllabus included in the OM-D	□ Yes □ No		□ Accepted □ Not Accepted
21	2.4.6	Completed IT refresher course every 5 years and pass the ground examination conducted by the operator.	Report Attached: □ Yes □ No		□ Accepted □ Not Accepted
22		Request letter	Submitted: □ Yes □No		□ Accepted □ Not Accepted
23		Others (If any)			

N.B: √ (tick) the appropriate box 2. Attach certificates/result/report/evidence. 3. N/A-Not applicable. 4. Add paper, if required.

Applicant's Name,
Signature with date

(for CAAB use)

□ **Recommended** for issue of **RTI o**n aircraft type: for 5 years from the date of approval.
□ **NOT** recommended for issue of **RTI**, reason:

Inspector's Name, Signature & Seal

APPENDIX 17. CONDITIONS & LIMITATIONS OF FLIGHT CREW TO OPERATE WITH OML

1. **INTRODUCTION**

1.1 A flight crew with OML (Operational Multi-Pilot Limitation) is authorized to exercise the privileges relevant to the licence and rating to operate an aircraft meeting the following conditions and limitations.

1.2 When the holder of a CPL or ATPL does not fully meet the requirements for a class 1 medical assessment, the medical assessor is to assess whether the medical assessment may be issued with an OML.

2. **Conditions for issuance of OML**

a. Aircraft are to be fitted with dual controls;

b. Flight crew with OML are not eligible for issuance of new flight instructor rating in General Aviation operations except Synthetic Flight Instructor;

c. Flight crew with OML are not be eligible for issuance of new RTI authorization in Commercial Air Transport Operations except Synthetic Flight Instructor;

d. Hold medical assessment Class 1 with OML;

e. The OML for class 1 medical assessment shall be imposed by the Medical Assessor.

3. **Limitations for Pilots with OML to operate in Commercial Air Transport Operations**

a. The holder of a medical assessment with an OML shall only operate an aircraft in multi-pilot operations when the other pilot is fully qualified on the relevant type of aircraft and shall not be under OML.

4. **Limitations for Route Training Instructors (RTI) with OML**:

b. Shall have at least 500 hours instructional experience;

c. Shall not be allowed to conduct instruction/skill test in more than one category of aircraft;

d. Shall conduct instructional/skill test flight in VFR condition only, except when the student has done sufficient instrument and night flying in General Aviation.

e. Shall conduct instructional flight with a rated pilot on board the aircraft in Commercial Air Transport Operations.

f. The holder of a medical assessment with an OML shall only operate an aircraft in multi-pilot operations when the other pilot is fully qualified on the relevant type of aircraft and shall not be under OML.

5. **Conditions for withdrawal of OML**

The OML may be removed by the medical assessor if the medical condition of the flight crew is assessed to be improved to the required standard.

APPENDIX 18. FLYING MORE THAN ONE TYPE OF AIRCRAFT OR VARIANT

1. **INTRODUCTION**

1.1 Flight Crew, engaged in commercial air transport operations, may exercise the privileges to fly different types of aircraft or several variants of the same type of aircraft with similar characteristics in terms of operating procedures, systems and handling fulfilling the following requirements.

2. **COMMERCIAL AIR TRANSPORT OPERATIONS - AEROPLANE**

1.1 Flight Operations Inspectors (FOIs) may fly maximum two types of aeroplanes or two variants of the same type of aeroplane with similar characteristics in terms of operating procedures, systems and handling.

2.3 Pilot-in-command, engaged in commercial air transport operations-aeroplane, may fly maximum two variants (*) of the same type of aeroplane under one “Common Aircraft Type Rating (**)” or maximum two types of aeroplanes with similar characteristics in terms of operating procedures, systems and handling in compliance with the following conditions.

2.3.1 Prerequisite Experience

Pilot-in-command,

a. be current and qualified on the Base Aircraft (***) with 1500 hours on type of aeroplane and a total of 10,000 flight hours.

b. have previous instructional experience in airline operation.

2.3.2 Training, Checking and Currency Requirements

Pilot-in-command,

a. Completed and qualified in difference training and checking, in accordance with company operations manual.

b. Who are qualified on the common type rating, shall complete proficiency checks alternately in either variant of the same type of aeroplane under one “Common Aircraft Type Rating, provided the applicable differences are covered.

c. Operate at the flight controls of a type or variant of an aeroplane during take-offs and landing unless that flight crew member has operated the flight controls during at least three take-offs and landings within the preceding 90 days on the same type of aeroplane/variant of that aeroplane or in a flight simulator approved for the purpose.

1.3.3 Other Conditions

a. The privileges of operation are restricted to flying maximum one variant of the same type of aeroplane under one "Common Aircraft Type Rating" or maximum one type of aeroplane on the same day.

b. "Common type rating" procedures are be incorporated in the Operations Manual of the air operator.

c. No aircraft accident and incident attributable to the pilot in last 10 years.

***** — *Variant - means an aircraft or a group of aircraft within the same pilot type rating that has differences to the base aircraft requiring difference training or familiarization training.*

****.** — *Common Type Rating - A number of aircraft, approved by the authority, to fly after completion of a (Difference or Familiarization) type rating course e.g. B777/B787, A330/A350, ATR 42/72.*

*****.** — *Base Aircraft - Base aircraft means an aircraft or group of aircraft used as a reference to compare differences with another aircraft.*

ATTACHMENT A. MEDICAL SUPPLIES

Supplementary to Chapter 6, 6.2.2 a)

TYPES, NUMBER, LOCATION AND CONTENTS OF MEDICAL SUPPLIES

1. TYPES

1.1 The different types of medical supplies should be provided as follows: first-aid kit(s) for carriage on all aeroplanes, universal precaution kit(s) for carriage on all aeroplanes that require a cabin crew member, and a medical kit for carriage where the aeroplane is authorized to carry more than 100 passengers on a sector length of more than two hours. However ,operators may elect to carry the recommended medication in the first-aid kit.

1.2 Based on the limited available evidence, only a very small number of passengers are likely to benefit from the carriage of automated external defibrillators (AED) on aeroplanes. However, operators carry them because they offer the only effective treatment for cardiac fibrillation. The likelihood of use, and therefore of potential benefit to a passenger, is greatest in aircraft carrying a large number of passengers, over long duration sector lengths. The carriage of AEDs should be determined by operators based on a risk assessment taking into account the particular needs of the operation.

2. NUMBER OF FIRST-AID AND UNIVERSAL PRECAUTION KITS

2.1 First-aid kits

The number of first-aid kits should be appropriate to the number of passengers which the aeroplane is authorized to carry:

Passenger	*First-aid kits*
0 –100	1
101 – 200	2
201 – 300	3
301 – 400	4
401 – 500	5
More than 500	6

2.2 Universal precaution kits

For routine operations, one or two universal precaution kits should be carried on aircraft that are required to operate with at least one cabin crew member. Additional kit(s) should be made available at times of increased public health risk, such as during an outbreak of a serious communicable disease having pandemic potential. Such kits may be used to clean up any potentially infectious body contents such as blood, urine, vomit and faeces and to protect the cabin crew members who are assisting potentially infectious cases of suspected communicable disease.

3. LOCATION

3.1 First-aid and universal precaution kits should be distributed as evenly as practicable throughout the passenger cabins. They should be readily accessible to cabin crew members.

3.2 The medical kit, when carried, should be stored in an appropriate secure location.

4. CONTENTS

4.1 The following provides guidance on typical contents of first-aid, universal precaution, and medical kits.

4.1.1 *First-aid kit:*

— List of contents
— Antiseptic swabs (10/pack)
— Bandage: adhesive strips
— Bandage: gauze 7.5 cm × 4.5 m
— Bandage: triangular; safety pins
— Dressing: burn 10 cm × 10 cm
— Dressing: compress, sterile 7.5 cm × 12 cm
— Dressing: gauze, sterile 10.4 cm × 10.4 cm
— Tape: adhesive 2.5 cm (roll)
— Steri-strips (or equivalent adhesive strip)
— Hand cleanser or cleansing towelettes
— Pad with shield, or tape, for eye
— Scissors: 10 cm (if allowed by national regulations)
— Tape: Adhesive, surgical 1.2 cm × 4.6 m
— Tweezers: splinter
— Disposable gloves (multiple pairs)

— Thermometers (non-mercury)

— Mouth-to-mouth resuscitation mask with one-way valve

— First-aid manual, current edition

— Incident record form

The following suggested medications can be included in the first-aid kits where permitted by national regulations:

— Mild to moderate analgesic

— Antiemetic

— Nasal decongestant

— Antacid

— Antihistamine

4.1.2 *Universal precaution kit:*

— Dry powder that can convert small liquid spill into a sterile granulated gel

— Germicidal disinfectant for surface cleaning

— Skin wipes

— Face/eye mask (separate or combined)

— Gloves (disposable)— Protective apron

— Large absorbent towel

— Pick-up scoop with scraper

— Bio-hazard disposal waste bag

— Instructions

4.1.3 *Medical kit:*

Equipment

— List of contents

— Stethoscope

— Sphygmomanometer (electronic preferred)

— Airways, oropharyngeal (three sizes)

— Syringes (appropriate range of sizes)

— Needles (appropriate range of sizes)

— Intravenous catheters (appropriate range of sizes)

— Antiseptic wipes

— Gloves (disposable)

— Needle disposal box

— Urinary catheter
— System for delivering intravenous fluids
— Venous tourniquet
— Sponge gauze
— Tape – adhesive
— Surgical mask
— Emergency tracheal catheter (or large gauge intravenous cannula)
— Umbilical cord clamp
— Thermometers (non-mercury)
— Basic life support cards
— Bag-valve mask
— Flashlight and batteries

Medication

— Epinephrine 1:1 000
— Antihistamine – injectable
— Dextrose 50% (or equivalent) – injectable: 50 ml
— Nitroglycerin tablets, or spray
— Major analgesic
— Sedative anticonvulsant – injectable
— Antiemetic – injectable
— Bronchial dilator – inhaler
— Atropine – injectable
— Adrenocortical steroid – injectable
— Diuretic – injectable
— Medication for postpartum bleeding
— Sodium chloride 0.9% (minimum 250 ml)
— Acetyl salicylic acid (aspirin) for oral use
— Oral beta blocker

If a cardiac monitor is available (with or without an AED) add to the above list:

— Epinephrine 1:10 000 (can be a dilution of epinephrine 1:1 000)

Note.— The United Nations Conference for Adoption of a Single Convention on Narcotic Drugs in March 1961 adopted such a Convention, Article 32 of which contains special provisions concerning the carriage of drugs in medical kits of aircraft engaged in international flight.

ATTACHMENT B. AIR OPERATOR CERTIFICATION AND VALIDATION

Supplementary to Chapter 4, 4.2.1

1. PURPOSE AND SCOPE

1.1 Introduction

The purpose of this Attachment is to provide guidance concerning actions required by CAAB in connection with the operator certification requirements in Chapter 4, 4.2.1, particularly the means of accomplishing and recording those actions.

1.2 Prior certification required

In accordance with Standard 4.2.1.3, the issuance of an air operator certificate (AOC) is "dependent upon the operator demonstrating" to the CAAB that its organization, training policy and programmes, flight operations, ground handling and maintenance arrangements are adequate considering the nature and extent of the operations to be conducted. The certification process involves the CAAB's evaluation of each operator and a determination that the operator can conduct safe operations before initial issuance of an AOC or the addition of any subsequent authorizations to an AOC.

1.3 Standard certification practices

Bangladesh is required by provision 4.2.1.8 to establish a certification system to ensure compliance with the required provisions for the type of operation to be conducted. As such it is required that CAAB develops policies and procedures to comply with this certification requirement as industry capabilities evolve.

2. REQUIRED TECHNICAL SAFETY EVALUATIONS

2.1 Specific approval, approval and acceptance actions

2.1.1 The certification and continued surveillance of an air operator includes actions taken by CAAB on matters submitted for its review. The actions can be categorized as specific approvals, approvals or acceptances depending on the nature of the response by the CAAB to the matter submitted for its review.

2.1.2 A specific approval is an approval which is documented in the Operations Specifications for Commercial Air Transport.

2.1.3 An approval is an active response by CAAB to a matter submitted for its review. An approval constitutes a finding or determination of compliance with the applicable provisions. An approval will be evidenced by the signature of the approving official, the issuance of a document or certificate, or some other formal action taken by the State.

2.1.4 An acceptance does not necessarily require an active response by the CAAB to a matter submitted for its review. CAAB may accept a matter submitted to it for review as being in compliance with the applicable provisions if the CAAB does not specifically reject all or a portion of the matter under review, usually after some defined period of time after submission.

2.1.5 The phrase Approved or similar phrases using the word "approval" are frequently used in ANO 6 Part I. Provisions indicating a review and implying approval or at least "acceptance" by the CAAB occur even more frequently in ANO 6 Part I. In addition to these specific phrases, ANO 6 Part I, contains numerous references to requirements which would, as a minimum, create the need for at least a technical review by the CAAB. This Attachment groups and outlines those specific provisions for ease of use by the CAAB.

2.1.6 CAAB should make or arrange for a technical safety evaluation before issuing the specific approval, approval or acceptance. The evaluation should:

a) be accomplished by a person with specific qualifications to make such a technical evaluation;

b) be in accordance with written, standardized methodology; and

c) where necessary to safety, include a practical demonstration of the air operator's actual ability to conduct such an operation.

2.2 Demonstrations before issuance of specific approvals and approvals

2.2.1 Provisions 4.2.1.3 obligates, that CAAB prior to certification of the operator, to require sufficient demonstrations by the operator to enable the CAAB to evaluate the adequacy of the operator's organization, method of control and supervision of flight operations, ground handling and maintenance arrangements. These demonstrations should be in addition to the review or inspections of manuals, records, facilities and equipment. Some of the specific approvals and approvals required by ANO 6, Part I, such as specific approval for low visibility operations, have significant safety implications and should be validated by demonstration before the CAAB authorizes such operations.

2.2.2 While the specific methodology and extent of the required demonstrations and evaluations vary, with other states the certification processes of CAAB whose operators have good safety records are generally consistent. CAAB's technically qualified inspectors should evaluate a representative sample of the actual training, maintenance and operations prior to the issuance of an AOC or additional authorizations to the AOC.

2.3 Recording of certification actions

2.3.1 It is important that the certification, specific approval, approval and acceptance actions of the CAAB are adequately documented. CAAB should issue a written instrument, such as a letter or formal document, as an official record of the action. These written instruments should be retained as long as the operator continues to exercise the authorizations for which the specific approval, approval or acceptance action was issued. These instruments are unambiguous evidence of the authorizations held by the operator and provide proof if the CAAB and the operator disagree on the operations that the operator is authorized to conduct.

2.3.2 CAAB should retain these records in files according to the certification action performed, and revise the file as the specific approvals, approvals or acceptance instruments are updated. Regardless of the method used, these certification records are persuasive evidence that CAAB is complying with its ICAO obligations regarding operator certification.

2.4 Coordination of operations and airworthiness evaluations

Some of the references to specific approval, approval or acceptance in ANO 6, Part I, will require an operations evaluation and an airworthiness evaluation. Specific approvals for operations in low visibility, for example, require coordinated prior evaluation by operations and airworthiness specialists. Flight operations specialists should evaluate the operational procedures, training, and qualifications. Airworthiness specialists should evaluate the aircraft, equipment reliability and maintenance procedures. These evaluations may be accomplished separately but should be coordinated to ensure that all aspects necessary for safety have been addressed before any specific approval, approval or acceptance is issued.

2.5 CAAB's and State of Registry's responsibilities

2.5.1 ANO 6, Part I and ANO AOC , places the responsibility for initial certification, issuance of the AOC, and ongoing surveillance of an air operator and also requires that CAAB considers or act in accordance with various approvals and acceptances by the State of Registry. Under these provisions, the CAAB should ensure that its actions are consistent with the approvals and acceptances of the State of Registry and that the air operator follows State of Registry requirements.

2.5.2 It is essential that the CAAB is with the arrangements by which its air operators use aircraft on the register of another State, particularly for maintenance and crew training. CAAB should review such arrangements in coordination with the State of Registry. Where appropriate, an agreement transferring oversight responsibilities from the State of Registry to CAAB in pursuant to Article 83 *bis* to the Convention on International Civil Aviation should be arranged to preclude any misunderstandings regarding responsibilities for specific oversight responsibilities.

Note.— Guidance concerning the responsibilities of the CAAB and the State of Registry in connection with lease, charter and interchange operations is contained in ANO AOC. Guidance concerning the transfer of State of Registry responsibilities to the CAAB in accordance with Article 83 bis is contained in the ANO AOC.

3. AUTHORIZATIONS

An authorization entitles an operator, owner or pilot-in-command to undertake the authorized operations. Authorizations can take the form of specific approvals, approvals or acceptances.

3.1 Specific approval actions

3.1.1 The term "specific approval" indicates a formal action on the part of CAAB which results in an addition to the operations specification.

3.1.2 The following provisions make explicit reference to the need for a specific approval:

a) operational credits for operations with advanced aircraft when used for low visibility operations [4.2.8.1.1];

b) low visibility operations [4.2.8.4 and 4.2.8.5];

c) extended diversion time operations [4.7.2.2];

d) electronic flight bags [6.25.3];

e) AR navigation specifications for PBN operations [7.2.4];

f) reduced vertical separation minima [7.2.6]; and

g) dangerous goods [14.3].

3.1.3 An example of an Operations Specification template is provided in ANO AOC

3.2 Air operator certificate (AOC)

3.2.1 The AOC required by ANO 6, Part I, Chapter 4, 4.2.1, is a formal instrument. Chapter 4, 4.2.1.5, lists the information to be included in the AOC.

3.2.2 In addition to the items in ANO AOC, operations specifications may include other specific approvals, such as:

a) special aerodrome operations (e.g. short take-off and landing operations or land and hold short operations);

b) special approach procedures (e.g. steep gradient approach, instrument landing system precision runway monitor approach, localizer-type directional aid precision runway monitor approach);

c) single-engine passenger transport at night or in instrument meteorological conditions; and

d) operations in areas with special procedures (e.g. operations in areas using different altimetry units or altimeter setting procedures).

3.3 Approval actions

3.3.1 The term "approval" indicates a more formal action on the part of CAAB with respect to a certification matter than does the term "acceptance". CAAB always issues a formal written instrument for every "approval" action taken. The approval document issued, and the matter addressed by the approval will depend on the delegated authority of the official. CAAB accords authority to sign routine approvals, such as operator minimum equipment lists for specific aircraft, is delegated to technical inspectors. More complex or significant approvals are normally issued by higher-level officials.

3.3.2 Provisions that require an approval

The following provisions require or encourage approval by CAAB. The approval of CAAB is required in all of the certification actions listed below that are not preceded by one or more asterisks. Certification actions listed below that are preceded by one or more asterisks require approval by the State of Registry (single asterisk or "*"), or by the State of Design (double asterisk or "**"). However, the CAAB should take the necessary steps to ensure that operators for which it is responsible comply with any applicable approvals issued by the State of Registry and/or State of Design, in addition to its own requirements.

Note. — Items that require a specific approval are not included here. Refer to 3.1.2 of this attachment for a list of these provisions.

a) **Configuration deviation list (CDL) (Definitions);

b) **Master minimum equipment list (MMEL) (Definitions);

c) The method for establishing minimum flight altitudes (4.2.7.3);

d) The method of determining aerodrome operating minima (4.2.8.1);

e) Additional requirements for single pilot operations under the instrument flight rules (IFR) at night (4.9.1);

f) Fatigue management (4.10);

g) **EDTO configuration, maintenance and procedure (CMP) document for aeroplanes with two turbine engines (4.7.2);

h) Additional requirements for operations of single-engine turbine-powered aeroplanes at night and/or in instrument meteorological conditions (IMC) (5.4.1);

i) Aircraft-specific minimum equipment list (MEL) (6.1.3);

j) Performance-based navigation operations (7.2.2 b));

k) MNPS operations (7.2.5 b));

l) Procedures for electronic navigation data management (7.5.1);

m) *Aircraft-specific maintenance programme (8.3.1);

n) *Approved maintenance organization (Annex 8, Part II, Chapter 6, 6.2);

o) *Maintenance quality assurance methodology (Annex 8, Part II, Chapter 6, 6.4.1);

p) Flight crew training programmes (9.3.1);

q) Training in the transport of dangerous goods (9.3.1, Note 5);

r) Aerodrome additional safety margin (9.4.3.3 a));

s) Pilot-in-command area, route and aerodrome qualifications (9.4.3.5);

t) Use of flight simulation training devices (9.3.1, Note 2 and 9.4.4, Note 1);

u) Method of control and supervision of flight operations (4.2.1.3 and 10.1);

v) **Mandatory maintenance tasks and intervals (11.3.2);

w) Cabin attendant training programmes (12.4).

x) Security training programmes (13.4).

3.4 Provisions that require a technical evaluation

Other provisions in ANO 6, Part I, require the State to have made a technical evaluation. These provisions contain the phrases "acceptable to the State", "satisfactory to the State", "determined by the State", "deemed acceptable by the State", and "prescribed by the State". While not necessarily requiring an approval by the State, these Standards do require the State to at least accept the matter at issue after it conducts a specific review or evaluation. These provisions are:

a) details of the aircraft-specific checklists (Definition: aircraft operating manual and 6.1.4);

b) details of the aircraft-specific systems (Definition: aircraft operating manual and 6.1.4);

c) mandatory material for the operations manual (4.2.3.2/ Appendix 2);

d) engine trend monitoring systems (5.4.2);

e) equipment for aeroplanes operated by a single pilot under the instrument flight rules or at night (6.23);

f) requirements for approval to operate in RVSM airspace (7.2.7);

g) monitoring of height-keeping performance of aeroplanes approved to operate in RVSM airspace (7.2.8);

h) procedures for distribution and insertion of electronic navigation data in aircraft (7.5.2);

i) *operator's aircraft-specific maintenance responsibilities (8.1.1);

j) *method of maintenance and release (8.1.2);

k) *maintenance control manual (8.2.1);

l) *mandatory material for the maintenance control manual (8.2.4);

m) *reporting of maintenance experience information (8.5.1);

n) *implementing necessary maintenance corrective actions (8.5.2);

o) *modification and repair requirements (8.6);

p) *minimum competence level of maintenance personnel (Annex 8, Part II, Chapter 6, 6.6.4);

q) requirement for flight navigator (9.1.4);

r) training facilities (9.3.1);

s) qualifications of instructors (9.3.1);

t) need for recurrent training (9.3.l);

u) use of correspondence courses and written examinations (9.3.1, Note 4);

v) use of flight simulation training devices (9.3.2);

w) flight crew qualification records (9.4.3.4);

x) designated representative of the State of the Operator (9.4.4);

y) pilot experience, recency and training requirements for single pilot operations under the instrument flight rules (IFR) or at night (9.4.5.1 and 9.4.5.2);

z) *flight manual changes (11.1);

aa) minimum number of flight attendants assigned to a specific aircraft (12.1);

bb) altimetry system performance requirements for operations in RVSM airspace (Appendix 4, 1 and 2);

Single-engine operations

cc) turbine engine reliability for approved operations by single-engine turbine-powered aeroplanes at night and/or in instrument meteorological conditions (IMC) (Appendix 3, 1.1);

dd) systems and equipment (Appendix 3, 2); ee) minimum equipment list (Appendix 3, 3); ff) flight manual information (Appendix 3, 4); gg) event reporting (Appendix 3, 5);

hh) operator planning (Appendix 3, 6);

ii) flight crew experience, training and checking (Appendix 3, 7);

jj) route limitations over water (Appendix 3, 8); and kk) operator certification or validation (Appendix 3, 9).

3.5 Acceptance actions

3.5.1 Acceptance

3.5.1.1 The actual extent of the CAAB's technical evaluation of the operator's readiness to conduct certain flight operations should be much broader than just those provisions which require or imply approval. During certification, the ~~State~~ CAAB should ensure that the operator will follow all requirements of ANO 6, Part I, prior to conducting international commercial air transport operations.

3.5.2 Conformance report

CAAB uses a compliance checklist to document the acceptances it makes with regard to a particular operator. This is a document submitted by the operator detailing how, with specific references to operations or maintenance manuals, it will comply with all applicable CAAB regulations. Such a compliance checklist should be actively used during the certification process and revised as necessary to reflect modifications required by the CAAB in the operator's policies and procedures. Then a final conformance report is included in the CAAB's certification records, along with other records of certification. The conformance report is an excellent method of demonstrating that the operator was properly certificated with respect to all applicable regulatory requirements.

3.5.3 Operations and maintenance manuals

3.5.3.1 Operations and maintenance manuals, and any subsequent amendments should be submitted to the CAAB (4.2.3.2, 8.1.1, 8.2.4, 8.3.2, and ANO AW Part 21. The CAAB–also establishes minimum contents for these manuals (11.2, 11.3, 11.4 and Appendix 2). The pertinent portions of the operator's manual for evaluation should be identified in the CAAB's technical guidance, e.g. operations policy manual, operating manual, cabin crew manual, route guide, and training manual. CAAB issues a formal instrument accepting each manual and any subsequent amendments.

3.5.3.2 CAAB's technical evaluation should, in addition to ensuring that all required contents are addressed, consider if the specific policies and procedures would result in the desired outcome. For example, the specifications for the operational flight plan (Appendix 2, 2.1.16) should provide the step-by-step completion guidance necessary for compliance with 4.3 concerning the content and retention of these plans.

3.5.3.3 Proven industry practices, such as an example of an actual completed operational flight plan for reference by the flight crew and dispatchers (although not a Standard), may also be required by CAAB's technical evaluator during certification. This aspect of the technical evaluation should be conducted by inspectors experienced in operator certification. A major consideration with respect to evaluating for proven industry practices that are aircraft-specific, equipment-specific or have limited applications is the employment of evaluators who are currently qualified in the practice to be evaluated.

4. OTHER APPROVAL OR ACCEPTANCE CONSIDERATIONS

CAAB should provide for approval or acceptance of certain critical documents, records or procedures specified in ANO 6, Part I. The following are some examples:

a) flight data analysis programme (3.3.3);

b) method for obtaining aeronautical data (4.1.1);

c) adequacy of the fuel and oil records (4.2.10);

d) adequacy of flight time, flight duty and rest period records (4.10);

e) adequacy of the aircraft maintenance log book (4.3.1 a), b), and c));

f) adequacy of the load manifest (4.3.1 d), e) and f));

g) adequacy of the operational plan (4.3.1 g));

h) method for obtaining weather data (4.3.5.1 and 4.3.5.2);

i) method of compliance with carry-on baggage stowage (4.8);

j) aeroplane performance operating limitations (5.2.4);

k) method of obtaining and applying aerodrome obstacle data (5.3);

l) adequacy of passenger information cards (6.2.2 d));

m) contents of the journey log book (11.4.1); and

n) content of the security training programme (13.4).

5. VALIDATION OF THE STANDARD OF OPERATIONS

Provisions 4.2.1.4 require that the validity of an AOC shall depend upon the operator maintaining the original certification provisions (4.2.1.3) under the supervision of the CAAB. This supervision requires that a system of continued surveillance be established to ensure the required provisions of operations are maintained (4.2.1.8). A good starting point in the development of such a system is to require annual or semi-annual inspections, observations and tests to validate the required certification, specific approval, approval and acceptance actions.

6. AMENDMENT OF AIR OPERATOR CERTIFICATES

The certification of the operator is an ongoing process. Few operators will be satisfied over time with the initial authorizations issued with their AOC. Evolving market opportunities will cause the operator to change aircraft models and seek approval for new operational areas requiring other additional capabilities. Additional technical evaluations should be required by the CAAB before issuing the formal written instruments approving any changes to the original AOC and other authorizations. Where possible, each request should be "bridged", using the original authorization as the foundation to determine the extent of the CAAB's impending evaluation before issuing the formal instrument.

ATTACHMENT C. MINIMUM EQUIPMENT LIST (MEL)

Supplementary to Chapter 6, 6.1.2

1. If deviations from the requirements of CAAB in the certification of aircraft were not permitted an aircraft could not be flown unless all systems and equipment were operable. Experience has proved that some unserviceability can be accepted in the short term when the remaining operative systems and equipment provide for continued safe operations.

2. CAAB should indicate through approval of a minimum equipment list those systems and items of equipment that may be inoperative for certain flight conditions with the intent that no flight can be conducted with inoperative systems and equipment other than those specified.

3. A minimum equipment list, approved by the CAAB , is therefore necessary for each aircraft, based on the master minimum equipment list established for the aircraft type by the organization responsible for the type design in conjunction with the State of Design.

4. CAAB requires that the operator to prepare a minimum equipment list designed to allow the operation of an aircraft with certain systems or equipment inoperative provided an acceptable level of safety is maintained.

5. The minimum equipment list is not intended to provide for operation of the aircraft for an indefinite period with inoperative systems or equipment. The basic purpose of the minimum equipment list is to permit the safe operation of an aircraft with inoperative systems or equipment within the framework of a controlled and sound programme of repairs and parts replacement.

6. Operators are to ensure that no flight is commenced with multiple minimum equipment list items inoperative without determining that any interrelationship between inoperative systems or components will not result in an unacceptable degradation in the level of safety and/or undue increase in the flight crew workload.

7. The exposure to additional failures during continued operation with inoperative systems or equipment must also be considered in determining that an acceptable level of safety is being maintained. The minimum equipment list may not deviate from requirements of the flight manual limitations section, emergency procedures or other airworthiness requirements of the State of Registry or of CAAB unless the appropriate airworthiness authority or the flight manual provides otherwise.

8. Systems or equipment accepted as inoperative for a flight should be placarded where appropriate, and all such items should be noted in the aircraft technical log to inform the flight crew and maintenance personnel of the inoperative system or equipment.

9. For a particular system or item of equipment to be accepted as inoperative, it may be necessary to establish a maintenance procedure, for completion prior to flight, to de-activate or isolate the system or equipment. It may similarly be necessary to prepare an appropriate flight crew operating procedure.

10. The responsibilities of the pilot-in-command in accepting an aeroplane for operation with deficiencies in accordance with a minimum equipment list are specified in Chapter 4, 4.3.1.

ATTACHMENT D. FLIGHT SAFETY DOCUMENTS SYSTEM

Supplementary to Chapter 3, 3.5

1. INTRODUCTION

1.1 The following material provides guidance on the organization and development of the operator's flight safety documents system. It should be understood that the development of a flight safety documents system is a complete process, and changes to each document comprising the system may affect the entire system. Guidelines applicable to the development of operational documents have been produced by government and industry sources and are available to operators. Nevertheless, it may be difficult for operators to make the best use of these guidelines, since they are distributed across a number of publications.

1.2 Furthermore, guidelines applicable to operational documents development tend to focus on a single aspect of documents design, for example, formatting and typography. Guidelines rarely cover the entire process of operational documents development. It is important for operational documents to be consistent with each other, and consistent with regulations, manufacturer requirements and Human Factors principles. It is also necessary to ensure consistency across departments as well as consistency in application. Hence the emphasis on an integrated approach, based on the notion of the operational documents as a complete system.

1.3 The guidelines in this Attachment address the major aspects of the operator's flight safety documents system development process, with the aim of ensuring compliance with Chapter 3, 3.5. The guidelines are based not only upon scientific research, but also upon current best industry practices, with an emphasis on a high degree of operational relevance.

2. ORGANIZATION

2.1 A flight safety documents system should be organized according to criteria which ensure easy access to information required for flight and ground operations contained in the various operational documents comprising the system and which facilitate management of the distribution and revision of operational documents.

2.2 Information contained in a flight safety documents system should be grouped according to the importance and use of the information, as follows:

a) time-critical information, e.g., information that can jeopardize the safety of the operation if not immediately available;

b) time-sensitive information, e.g., information that can affect the level of safety or delay the operation if not available in a short time period;

c) frequently used information;

d) reference information, e.g., information that is required for the operation but does not fall under b) or c) above; and

e) information that can be grouped based on the phase of operation in which it is used.

2.3 Time-critical information should be placed early and prominently in the flight safety documents system.

2.4 Time-critical information, time-sensitive information, and frequently used information should be placed in cards and quick-reference guides.

3. VALIDATION

The flight safety documents system should be validated before deployment, under realistic conditions. Validation should involve the critical aspects of the information use, in order to verify its effectiveness. Interactions among all groups that can occur during operations should also be included in the validation process.

4. DESIGN

4.1 A flight safety documents system should maintain consistency in terminology and in the use of standard terms for common items and actions.

4.2 Operational documents should include a glossary of terms, acronyms and their standard definition, updated on a regular basis to ensure access to the most recent terminology. All significant terms, acronyms and abbreviations included in the flight documents system should be defined.

4.3 A flight safety documents system should ensure standardization across document types, including writing style, terminology, use of graphics and symbols, and formatting across documents. This includes a consistent location of specific types of information, consistent use of units of measurement and consistent use of codes.

4.4 A flight safety documents system should include a master index to locate, in a timely manner, information included in more than one operational document.

Note.— The master index must be placed in the front of each document and consist of no more than three levels of indexing. Pages containing abnormal and emergency information must be tabbed for direct access.

4.5 A flight safety documents system should comply with the requirements of the operator's quality system, if applicable.

5. DEPLOYMENT

Operators should monitor deployment of the flight safety documents system, to ensure appropriate and realistic use of the documents, based on the characteristics of the operational environment and in a way which is both operationally relevant and beneficial to operational personnel. This monitoring should include a formal feedback system for obtaining input from operational personnel.

6. AMENDMENT

6.1 Operators should develop an information gathering, review, distribution and revision control system to process information and data obtained from all sources relevant to the type of operation conducted, including, but not limited to, the State of the Operator, State of design, State of Registry, manufacturers and equipment vendors.

Note.— Manufacturers provide information for the operation of specific aircraft that emphasizes the aircraft systems and procedures under conditions that may not fully match the requirements of operators. Operators should ensure that such information meets their specific needs and those of the CAAB.

6.2 Operators should develop an information gathering, review and distribution system to process information resulting from changes that originate within the operator, including:

a) changes resulting from the installation of new equipment;

b) changes in response to operating experience;

c) changes in the operator's policies and procedures;

d) changes in the operator certificate; and

e) changes for purposes of maintaining cross fleet standardization.

Note.— Operators should ensure that crew coordination philosophy, policies and procedures are specific to their operation.

6.3 A flight safety documents system should be reviewed:

a) on a regular basis (at least once a year);

b) after major events (mergers, acquisitions, rapid growth, downsizing, etc.);

c) after technology changes (introduction of new equipment); and d) after changes in safety regulations.

6.4 Operators should develop methods of communicating new information. The specific methods should be responsive to the degree of communication urgency.

Note.— As frequent changes diminish the importance of new or modified procedures, it is desirable to minimize changes to the flight safety documents system.

6.5 New information should be reviewed and validated considering its effects on the entire flight safety documents system.

6.6 The method of communicating new information should be complemented by a tracking system to ensure currency by operational personnel. The tracking system should include a procedure to verify that operational personnel have the most recent updates.

ATTACHMENT E. ADDITIONAL GUIDANCE FOR APPROVED OPERATIONS BY SINGLE-ENGINE TURBINE-POWERED AEROPLANES AT NIGHT AND/OR IN INSTRUMENT METEOROLOGICAL CONDITIONS (IMC)

Supplementary to Chapter 5, 5.4 and Appendix 3

1. PURPOSE AND SCOPE

The purpose of this attachment is to give additional guidance on the airworthiness and operational requirements described in Chapter 5, 5.4 and Appendix 3, which have been designed to meet the overall level of safety intended for approved operations by single-engine turbine-powered aeroplanes at night and/or in IMC.

2. TURBINE ENGINE RELIABILITY

2.1 The power loss rate required in Chapter 5, 5.4.1 and Appendix 3 should be established as likely to be met based on data from commercial operations supplemented by available data from private operations in similar theatres of operation. A minimum amount of service experience is needed on which to base the judgment, and this should include at least 20 000 hours on the actual aeroplane/engine combination unless additional testing has been carried out or experience on sufficiently similar variants of the engine is available.

2.2 In assessing turbine engine reliability, evidence should be derived from a world fleet database covering as large a sample as possible of operations considered to be representative, compiled by the manufacturers and reviewed with the States of Design and CAAB. Since flight hour reporting is not mandatory for many types of operators, appropriate statistical estimates may be used to develop the engine reliability data. Data for individual operators approved for these operations including trend monitoring and event reports should also be monitored and reviewed by CAAB to ensure that there is no indication that the operator's experience is unsatisfactory.

2.2.1 Engine trend monitoring should include the following:

a) an oil consumption monitoring programme based on manufacturers' recommendations; and

b) an engine condition monitoring programme describing the parameters to be monitored, the method of data collection and the corrective action process; this should be based on the manufacturer's recommendations. The monitoring is intended to detect turbine engine deterioration at an early stage to allow for corrective action before safe operation is affected.

2.2.2 A reliability programme should be established covering the engine and associated systems. The engine programme should include engine hours flown in the period and the in-flight shutdown rate for all causes and the unscheduled engine removal rate, both on a 12-month moving average basis. The event reporting process should cover all items relevant to the ability to operate safely at night and/or in IMC. The data should be available for use by the operator, the Type Certificate Holder and the State so as to establish that the intended reliability levels are being achieved. Any sustained adverse trend should result in an immediate evaluation by the operator in consultation with the CAAB and manufacturer with a view to determining actions to restore the intended safety level. The operator should develop a parts control programme with support from the manufacturer that ensures that the proper parts and configuration are maintained for single-engine turbine-powered aeroplanes approved to conduct these operations. The programme includes verification that parts placed on an approved single-engine turbine-powered aeroplane during parts borrowing or pooling arrangements, as well as those parts used after repair or overhaul, maintain the necessary configuration of that aeroplane for operations approved in accordance with Chapter 5, 5.4.

2.3 Power loss rate should be determined as a moving average over a specified period (e.g. a 12-month moving average if the sample is large). Power loss rate, rather than in-flight shut-down rate, has been used as it is considered to be more appropriate for a single-engine aeroplane. If a failure occurs on a multi-engine aeroplane that causes a major, but not total, loss of power on one engine, it is likely that the engine will be shut down as positive engine-out performance is still available, whereas on a single-engine aeroplane it may well be decided to make use of the residual power to stretch the glide distance.

2.4 The actual period selected should reflect the global utilization and the relevance of the experience included (e.g. early data may not be relevant due to subsequent mandatory modifications which affected the power loss rate). After the introduction of a new engine variant and whilst global utilization is relatively low, the total available experience may have to be used to try to achieve a statistically meaningful average.

3. OPERATIONS MANUAL

The operations manual should include all necessary information relevant to operations by single-engine turbine-powered aeroplanes at night and/or in IMC. This should include all of the additional equipment, procedures and training required for such operations, route and/or area of operation and aerodrome information (including planning and operating minima).

4. OPERATOR CERTIFICATION OR VALIDATION

The certification or validation process specified by the State of the Operator should ensure the adequacy of the operator's procedures for normal, abnormal and emergency operations, including actions following engine, systems or equipment failures. In addition to the normal requirements for operator certification or validation, the following items should be addressed in relation to operations by single-engine turbine-powered aeroplanes:

a) proof of the achieved engine reliability of the aeroplane engine combination (see Appendix 3, paragraph 1);

b) specific and appropriate training and checking procedures including those to cover engine failure/malfunction on the ground, after take-off and en-route and descend to a forced landing from the normal cruising altitude;

c) a maintenance programme which is extended to address the equipment and systems referred to in Appendix 3, paragraph 2;

d) an MEL modified to address the equipment and systems necessary for operations at night and/or in IMC;

e) planning and operating minima appropriate to the operations at night and/or in IMC;

f) departure and arrival procedures and any route limitations;

g) pilot qualifications and experience; and

h) the operations manual, including limitations, emergency procedures, approved routes or areas of operation, the MEL and normal procedures related to the equipment referred to in Appendix 3, paragraph 2.

5. OPERATIONAL AND MAINTENANCE PROGRAMME REQUIREMENTS

5.1 Approval to undertake operations by single-engine turbine-powered aeroplanes at night and/or in IMC specified in an air operator certificate or equivalent document should include the particular airframe/engine combinations, including the current type design standard for such operations, the specific aeroplanes approved, and the areas or routes of such operations.

5.2 The operator's maintenance control manual should include a statement of certification of the additional equipment required, and of the maintenance and reliability programme for such equipment, including the engine.

6. ROUTE LIMITATIONS OVER WATER

6.1 Operators of single-engine turbine-powered aeroplanes carrying out operations at night and/or in IMC should make an assessment of route limitations over water. The distance that the aeroplane may be operated from a land mass suitable for a safe forced landing should be determined. This equates to the glide distance from the cruise altitude to the safe forced landing area following engine failure, assuming still air conditions. CAAB may add to this an additional distance taking into account the likely prevailing conditions and type of operation. This should take into account the likely sea conditions, the survival equipment carried, the achieved engine reliability and the search and rescue services available.

6.2 Any additional distance allowed beyond the glide distance should not exceed a distance equivalent to 15 minutes at the aeroplane's normal cruise speed.

ATTACHMENT F. RESCUE AND FIRE FIGHTING SERVICES (RFFS) LEVELS
Supplementary to Chapter 4, 4.1.4

1. PURPOSE AND SCOPE

1.1 Introduction

The purpose of this Attachment is to provide guidance for assessing the level of RFFS deemed acceptable by aeroplane operators using aerodromes for differing purposes. This guidance does not relieve the operator from the obligation to ensure that an acceptable level of protection is available for the aeroplane intended to be used.

1.2 Basic concepts

1.2.1 For flight planning purposes, an aeroplane operator should utilize an aerodrome whose RFFS category, as required by ANO 14, Volume I, Chapter 9, 9.2, matches or exceeds the aeroplane's RFFS category. Some aerodromes currently used do not, however, meet these requirements. Furthermore, ANO 14, Volume I provisions relate to the level of aerodrome RFFS to be provided for aeroplanes normally using an aerodrome; hence, this level of RFFS protection does not take into account aeroplanes for which the aerodrome is selected as an alternate aerodrome.

1.2.2 If an aerodrome is exposed to a temporary reduction of its RFFS capability, ANO 14, Volume I, 2.11.3, requires that: "Changes in the level of protection normally available at an aerodrome for rescue and fire fighting shall be notified to the appropriate air traffic services units and aeronautical information services units to enable those units to provide the necessary information to arriving and departing aircraft. When such a change has been corrected, the above units shall be advised accordingly."

1.2.3 In order to determine the acceptability of an aerodrome RFFS protection level, the operator should consider:

a) *for a departure or destination aerodrome*, the difference between the aerodrome RFFS category and the aeroplane RFFS category, and the frequency of flights to that aerodrome; and

b) *for an alternate aerodrome*, the difference between the aerodrome RFFS category and the aeroplane RFFS category, and the probability that this alternate aerodrome will be used.

1.2.4 The intention is that the operator will consider the available RFFS as one element of a risk assessment process conducted under their safety management system (SMS), to ensure that the overall safety of the operation can be maximized. This risk assessment would also include considerations of aerodrome facilities, availability, terrain, weather conditions, etc. to ensure that the most appropriate aerodrome is selected.

Note.—ANO 19 includes safety management provisions for air operators. Further guidance is contained in the Safety Management Manual *(Doc 9859).*

1.2.5 The following guidance is intended to assist operators in making the assessment required by Chapter 4, 4.1.4 with due consideration of the basic principles described in 1.2.1 to 1.2.4. It is not intended that this guidance limit or regulate the operation of an aerodrome.

2. GLOSSARY OF TERMS

***Aerodrome RFFS category*.** The RFFS category for a given aerodrome, as published in the appropriate Aeronautical Information Publication (AIP).

***Aeroplane RFFS category*.** The category derived from ANO 14, Volume I, Table 9-1 for a given aeroplane type.

***Temporary downgrade*.** RFFS category as notified, including by NOTAM, and resulting from the downgrade of the level of RFFS protection available at an aerodrome.

3. MINIMUM ACCEPTABLE AERODROME RFFS CATEGORY

3.1 Planning

3.1.1 In principle, the published RFFS category for each of the aerodromes used for a given flight should be equal to or better than the aeroplane's RFFS category. However, if the aeroplane's RFFS category is not available at one or more of the aerodromes required to be specified in the operational flight plan, the operator should ensure that the aerodrome has a level of RFFS category which is deemed acceptable, based on a risk assessment conducted as part of the operator's safety management system (SMS). When establishing acceptable levels of RFFS category for these situations, the operator may use the criteria in Table F-1 and Table F-2. Notwithstanding these criteria, the operator may determine other acceptable levels of RFFS category in accordance with 3.1.3 of this attachment.

3.1.1.1 Intended operations to aerodromes with RFFS categories below the levels specified in ANO 14, Volume I, Chapter 9, 9.2, should be coordinated between the aeroplane operator and the aerodrome operator.

3.1.1.2 For departure and destination aerodromes, during flight planning, the acceptable RFFS protection level should equal or exceed the values specified in Table F-1.

Table F-1. Acceptable aerodrome category for rescue and fire fighting (departure and destination aerodrome)

Aerodromes (Required to be specified in the operational flight plan) ~~(1)~~ *Note.—If an individual aerodrome serves more than one purpose, the highest required category corresponding to that purpose at the time of expected use applies.*	**Acceptable aerodrome RFFS category** (Based on published aerodrome RFFS category, including any modification by NOTAM)
Departure and destination aerodrome	RFFS category for each aerodrome should be equal to or better than the aeroplane RFFS category. Where a suitable risk assessment has been conducted by the operator: **One** category below the aeroplane RFFS category, or **Two** categories below the aeroplane RFFS category, in the case of a temporary downgrade of 72 hours or less but not lower than aerodrome RFFS Category 4 for aeroplanes with maximum certificated take-off mass of over 27 000 kg and not lower than Category 1 for other aeroplanes.

3.1.1.3 So as to comply with the operational regulations applicable to a given flight, the operator selects alternate aerodrome(s) for various uses. During flight planning, the acceptable aerodrome RFFS category at a selected alternate aerodrome may equal or exceed the values specified in Table F-2.

Table F-2. Acceptable aerodrome category for rescue and firefighting (alternate aerodromes)

Aerodromes (Required to be specified in the operational flight plan) *Note.— If an individual aerodrome serves more than one purpose, the highest required category corresponding to that purpose at the time of expected use applies.*	**Acceptable aerodrome RFFS protection level** (Based on published aerodrome RFFS category, including any modification by NOTAM)
Take-off alternate and destination alternate aerodromes	Where a suitable risk assessment has been conducted by the operator: **Two** categories below the aeroplane RFFS category, or **Three** categories below the aeroplane RFFS category in the case of a temporary downgrade of 72 hours or less but not lower than aerodrome RFFS Category 4 for aeroplanes with maximum certificated take-off mass of over 27 000 kg and not lower than Category 1 for other aeroplanes.
En-route alternate aerodromes	If at least 30 minutes notice is given to the aerodrome operator prior to the arrival of the aeroplane, a minimum of RFFS Category 4 for aeroplanes with maximum certificated take-off mass of over 27 000 kg, and RFFS Category 1 for other aeroplanes. If less than 30 minutes notice can be given to the aerodrome operator prior to the arrival of the aeroplane: **Two** categories below the aeroplane RFFS category, or **Three** categories below the aeroplane RFFS category in the case of a temporary downgrade of 72 hours or less but not lower than aerodrome RFFS Category 4 for aeroplanes with maximum certificated take-off mass of over 27 000 kg and not lower than Category 1 for other aeroplanes.

3.1.2 For all-cargo operations, further reductions might be acceptable provided that the RFFS capability is adequate to arrest fire around the flight deck area long enough for the persons on board to safely evacuate the aeroplane.

3.1.3 Variations

3.1.3.1 Notwithstanding the guidance developed in 3.1.1, an aerodrome RFFS category below the protection levels defined in Tables F-1 and F-2 may be acceptable if other considerations prevail, such as weather conditions, runway(s) characteristics, or length of diversion. Such variations should be based on a specific risk assessment conducted by the operator as part of its safety management system (SMS).

3.1.3.2 Variations to the aerodrome RFFS category may concern, among other cases:

a) an occasional flight; or

b) temporary downgrades exceeding 72 hours.

Where applicable, a variation may be used for a group of aerodromes selected for the same purpose, for a given aeroplane type.

3.1.3.3 The aforementioned variations may be based on additional or other criteria relevant to the type of operations. For instance, the 72-hour threshold for RFFS temporary downgrades may not be relevant for a single flight to or from the aerodrome concerned, such as a non-scheduled flight, whereas it is fully relevant for operations carried out on a continuous and daily basis. A variation may be time limited. A variation may also be modified to reflect the changes of the RFFS protection level available at the aerodrome(s) concerned. In accordance with Chapter 4, 4.1.5, the variations and their validity periods should be included in the operations manual.

3.1.3.4 For variations to the acceptable RFFS category at departure and destination aerodromes, the aeroplane operator's specific safety risk assessment for an aerodrome intended to be used as a departure or destination aerodrome may be based on the following elements:

a) the frequency of flights intended by the aeroplane operator in relation to a lowered aerodrome RFFS category;

b) coordination between the aeroplane operator and the aerodrome operator (for instance, reducing intervention time by prepositioning the existing RFFS means along the runway before the intended take-off or landing).

3.1.3.5 For regular flights, the coordination should take into account the principles of ANO 14, Volume I, Chapter 9, 9.2.5 and 9.2.6 which are applicable to the aerodrome operator, as well as the possibilities to modulate the aerodrome RFFS category available on a daily cycle or seasonal cycle.

3.1.3.6 For variations in acceptable RFFS for an alternate aerodrome, the aeroplane operator's specific safety risk assessment for an aerodrome selected as a take-off alternate aerodrome, a destination alternate aerodrome or an en-route alternate aerodrome may be based on the following elements:

a) the probability of effective use of the aerodrome concerned; and

b) the frequency of selection of the aerodrome for the respective purpose of use.

3.2 In flight

3.2.1 The information contained in the operations manual according to Chapter 4, 4.1.5 about the aerodrome RFFS category acceptable at the planning stage (including Tables F-1, F-2 and, where usable, the variations under the specifications in 3.1.3) is applicable at the in-flight re-planning point.

3.2.2 In flight, the pilot-in-command may decide to land at an aerodrome regardless of the RFFS category if, in the pilot's judgement after due consideration of all prevailing circumstances, to do so would be safer than to divert.

ATTACHMENT G. DANGEROUS GOODS

Supplementary to Chapter 14

1. PURPOSE AND SCOPE

The material in this attachment provides guidance regarding the carriage of dangerous goods as cargo. Chapter 14, includes dangerous goods operational requirements that apply to all operators. Operators that have a specific approval to transport dangerous goods as cargo need to meet additional requirements. In addition to the operational requirements contained in ANO 6, there are other requirements in ANO 18 and the Technical Instructions that also need to be complied with.

2. DEFINITIONS

Where the following term is used in this attachment, it has the meaning indicated:

Cargo. Any property carried on an aircraft other than mail and accompanied or mishandled baggage.

Note 1.— This definition differs from the definition of "cargo" given in ANO 9 — Facilitation.

Note 2.— COMAT that meets the classification criteria of dangerous goods and which is transported in accordance with Part 1;2.2.2 or Part 1;2.2.3 or Part 1;2.2.4 of the Technical Instructions are considered as "cargo" (e.g. aircraft parts such as chemical oxygen generators, fuel control units, fire extinguishers, oils, lubricants, cleaning products).

3. STATES

3.1 The CAAB should indicate in the operations specification if the operator has been issued a specific approval to transport dangerous goods as cargo. Any limitations should be included.

3.2 A specific approval may be granted for the transport of specific types of dangerous goods only (e.g. dry ice; biological substance, Category B; and dangerous goods in excepted quantities) or COMAT.

3.3 The Supplement to the Technical Instructions contains guidance on a CAAB's responsibilities with respect to operators. This includes additional information to Part 7 of the Technical Instructions on storage and loading, provision of information, inspections, enforcement and ANO–6 information relevant to the CAAB responsibilities for dangerous goods.

3.4 Carriage of dangerous goods other than as cargo (e.g. medical flights, search and rescue) are addressed in Part 1, Chapter 1, of the Technical Instructions. The exceptions for the carriage of dangerous goods that are either equipment or for use on board the aircraft during flight are detailed in Part 1, 2.2.1, of the Technical Instructions.

4. OPERATOR

4.1 The operator's training programme should cover, as a minimum, the aspects of the transport of dangerous goods listed in the Technical Instructions in Table 1-4 for operators holding a specific approval or Table 1-5 for operators without a specific approval. Recurrent training must be provided within 24 months of previous training, except as otherwise provided by the Technical Instructions.

4.2 Details of the dangerous goods training programme including the policies and procedures regarding third-party personnel involved in the acceptance, handling, loading and unloading of dangerous goods cargo should be included in the operations manual.

4.3 The Technical Instructions require that operators provide information in the operations manual and/or other appropriate manuals that will enable flight crews, other employees and ground handling agents to carry out their responsibilities with regard to the transport of dangerous goods and that initial training be conducted prior to performing a job function involving dangerous goods.

4.4 Operators should meet and maintain requirements established by the States in which operations are conducted in accordance with 4.2.2.3 of this ANO

4.5 Operators may seek a specific approval to transport, as cargo, specific dangerous goods only, such as dry ice, biological substance, Category B, COMAT and dangerous goods in excepted quantities.

4.6 Attachment 1 to Part S-7, Chapter 7, of the Supplement to the Technical Instructions contains additional guidance and information on requirements regarding operators not holding a specific approval to transport dangerous goods as cargo and for operators that have a specific approval to transport dangerous goods as cargo.

4.7 All operators should develop and implement a system that ensures they will remain current with regulatory changes and updates. The Technical Instructions contain detailed instructions necessary for the safe transport of dangerous goods by air. These instructions are issued biennially, becoming effective on 1 January of an odd-numbered year.

ATTACHMENT H. LOCATION OF AN AEROPLANE IN DISTRESS

(Supplementary to Chapter 6, 6.18)

GUIDANCE FOR LOCATION OF AN AEROPLANE IN DISTRESS

1. INTRODUCTION

The following material provides guidance on locating an aeroplane in distress. The Triggered Transmission of Flight Data Working Group (TTFDWG) reviewed forty-two accidents to determine an indication of the distance from a last-known aeroplane position to the location of an accident site. The report concluded that in approximately 95 per cent of the cases, when the aircraft position was known one minute prior to the accident, the accident site location was within a 6 NM radius of that position. (Click here to access the TTFDWG Report under the "publications" tab or go to https://www.bea.aero/en/ .)

1.2 When an aeroplane has an accident into water and becomes submerged, the location of the accident site within a 6 NM radius on the surface becomes more important. Starting the initial search area beyond a 6 NM radius reduces the amount of time available to search for and locate the aeroplane. At current estimated underwater search capabilities of 100 km2/day, an area with a 6 NM radius could be searched in four days. Allowing for naval assets to reach the search area and conduct the search, it is estimated that an area of 2 300 km2, equivalent to a radius of 14 NM, will be able to be searched before the ULD battery degrades. Starting at an area of more than 6 NM radius reduces the probability of a successful location during an initial search, whilst extending the location requirement beyond 6 NM radius reduces the time available to search with no appreciable gain in the probability of recovery.

2. CLARIFICATION OF PURPOSE OF EQUIPMENT

2.1 Information from which a position can be determined: Information from an aircraft system which either is active, or, when automatically or manually activated, can provide position information which includes a time stamp. This is a performance-based requirement which is not system-specific and may also bring operational benefits.

2.2 Emergency locator transmitter (ELT): The current generation of ELTs were designed to provide the position of impact for a survivable accident. The next generation of ELTs may have the capability to activate a transmission in flight when any of the conditions detailed in EUROCAE ED-237, Minimum Aviation System Performance Specification (MASPS) for Criteria to Detect In-Flight Aircraft Distress Events to Trigger Transmission of Flight Information are met. When an ELT sinks below the surface of water, its signal is not detectable.

2.3 Automatic deployable flight recorder (ADFR): The purpose of an ADFR is to have flight recorder data available soon after an accident, in particular for accidents over water. The integrated ELT provides for both locating the accident site for accident investigation and search and rescue purposes. Being floatable, it will assist in locating the accident site by providing an ELT signal when the wreckage sinks below the surface of the water. It also ensures redundancy for one ELT.

2.4 Underwater locator device (ULD): A ULD operating at a frequency of 8.8 kHz is attached to the airframe to locate aeroplane wreckage below the surface of water when an ELT signal is not possible to detect. The ULDs operating at 37.5 kHz are attached to the flight recorders and are used for locating the flight recorders under water.

3. EQUIPAGE COMPLIANCE

The advancement of technology has made it possible to meet the equipage requirements by different means. Table H-1 below provides examples of compliance. In such potential installations, the cost will be minimized and the effectiveness of the current installation improved.

Table H-1. Examples of compliance

Current	**After 1 January 2021**
In-service	**Application for type certification is submitted to a Contracting State**
Two ELTs Two fixed recorders	Example: A system from which a position can be determined; and one ADFR with an integrated ELT; and one combined recorder; or A system from which a position can be determined and one ELT and two fixed recorders and an additional means to retrieve flight recorder data in a timely manner.

Note.— A system from which a position can be determined and used to comply with Chapter 6, 6.18, may replace one of the ELTs required by Chapter 6, 6.17.

ATTACHMENT I. GUIDE TO CURRENT FLIGHT RECORDER PROVISIONS

(Supplementary to Chapter 6, 6.38)

1. INTRODUCTION

Since 1973, and the inclusion in Annex 6 of SARPs for the carriage of flight recorders, new and revised requirements were introduced concerning flight recorders. These amendments include an update of the provisions pertaining to flight recorders, recording of digital communications, FDR requirements for new aircraft, revised parameter listings; two-hour duration CVRs. Through the years, the applicability date and the carriage of flight recorders to be installed, as defined by the SARPs, were complex.

The tables below summarize the current flight recorders carriage requirements.

Table I-1. FDR/AIR/ADRS/AIRS installation SARPs

<table>
<tr><td></td><td colspan="9">MCTOM</td></tr>
<tr><td></td><td colspan="3">Over 27 000 kg</td><td colspan="3">Over 5 700 kg</td><td colspan="3">5 700 kg and below</td></tr>
<tr><td></td><td>All aeroplanes new type certificate</td><td>All aeroplanes first certificate of airworthiness</td><td>All turbine aeroplanes first certificate of airworthiness</td><td>All aeroplanes new type certificate</td><td>All aeroplanes first certificate of airworthiness</td><td>All turbine aeroplanes first certificate of airworthiness</td><td>All turbine aeroplanes new type certificate</td><td>All turbine aeroplanes first certificate of airworthiness</td><td>Multi-turbine aeroplanes first certificate of airworthiness</td></tr>
<tr><td></td><td rowspan="4"></td><td rowspan="2"></td><td>6.3.1.1.6
6.3.1.1.9</td><td rowspan="4"></td><td rowspan="2"></td><td>6.3.1.1.6</td><td rowspan="4"></td><td rowspan="4"></td><td rowspan="4"></td></tr>
<tr><td>1987
⇒</td><td>6.3.1.1.8</td><td>6.3.1.1.7</td></tr>
<tr><td>1989
⇒</td><td colspan="2" rowspan="2">6.3.1.1.3</td><td colspan="2" rowspan="2">6.3.1.1.4</td><td rowspan="3"></td></tr>
<tr><td>1990
⇒</td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2">6.3.1.1.5</td></tr>
<tr><td>2005
⇒</td></tr>
<tr><td>2016
⇒</td><td>Table A8-1 (Some parameters are sampled at an increased frequency)</td><td colspan="2">6.3.1.1.10</td><td>Table A8-1 (Some parameters are sampled at an increased frequency)</td><td colspan="2">6.3.1.1.10</td><td>6.3.1.1.1</td><td>6.3.1.1.2</td><td></td></tr>
<tr><td>2023
⇒</td><td>6.3.1.1.11</td><td>6.3.1.1.12</td><td></td><td>6.3.1.1.11</td><td>6.3.1.1.12</td><td></td><td></td><td></td><td></td></tr>
</table>

Table I-2. CVR/CARS installation SARPs

<table>
<tr><th rowspan="3">Date</th><th colspan="6">MCTOM</th></tr>
<tr><th colspan="2">Over 27 000 kg</th><th colspan="2">Over 5 700 kg</th><th colspan="2">Over 2 250 kg</th></tr>
<tr><th>All aeroplanes</th><th>All turbine aeroplanes first certificate of airworthiness</th><th>All aeroplanes first certificate of airworthiness</th><th>All turbine aeroplanes first certificate of airworthiness</th><th>All turbine aeroplanes more than 1 pilot new type certificate</th><th>All turbine aeroplanes more than 1 pilot first certificate of airworthiness</th></tr>
<tr><td></td><td colspan="2" rowspan="3"></td><td></td><td>6.3.2.1.5</td><td colspan="2" rowspan="3"></td></tr>
<tr><td>1987 ⇒</td><td colspan="2" rowspan="2">6.3.2.1.4</td><td rowspan="2">6.3.2.1.3</td><td rowspan="2"></td></tr>
<tr><td>2003 ⇒</td></tr>
<tr><td>2016 ⇒</td><td>6.3.2.3.1</td><td colspan="3" rowspan="2"></td><td colspan="2" rowspan="2"></td></tr>
<tr><td>2021 ⇒</td><td>6.3.2.3.2</td><td></td><td>6.3.2.1.1</td><td>6.3.2.1.2</td></tr>
</table>

Table I-3. Combination recorder installation SARPs

Date	MCTOM			
	Over 15 000 kg	Over 5 700 kg		Less than 5 700 kg
	All aeroplanes new type certificate requiring CVR and FDR	All aeroplanes new type certificate requiring CVR and FDR	All aeroplanes requiring CVR and FDR	All multi-engined turbine- powered aeroplanes requiring FDR and/or CVR
2016 ⇒	6.3.5.5.2	6.3.5.5.1	6.3.5.5.3	6.3.5.5.4

Table I-4. Flight crew-machine interface recordings

Date	MCTOM	
	Over 27 000 kg	Over 5 700 kg
	All aeroplanes new type certificate	All aeroplanes first certificate of airworthiness
2023 ⇒	6.3.4.1.1	6.3.4.1.2

Table I-5. Data link communications (DLC) recording installation clarification

Rows	**Date individual certificate of airworthiness was first issued**	**Date aircraft type certificate issued or modification for DLC equipment first approved**	**Date of activation for use of DLC equipment**	**DLC recording required**	**SARPs reference**
1	On or after 1 January 2016	On or after 1 January 2016	On or after 1 January 2016	Yes	6.3.3.1.1
2	On or after 1 January 2016	Before 1 January 2016	On or after 1 January 2016	Yes	6.3.3.1.1
3	Before 1 January 2016	On or after 1 January 2016	On or after 1 January 2016	Yes	6.3.3.1.2
4	Before 1 January 2016	Before 1 January 2016	Before 1 January 2016	No	6.3.3.1.2
5	Before 1 January 2016	Before 1 January 2016	On or after 1 January 2016	No1	6.3.3.1.2 *6.3.3.1.3*

1 Not required, but recommended.

2. TABLE HEADINGS

2.1 *Date individual certificate of airworthiness* was first issued is self-explanatory.

2.2 *Date aircraft type certificate issued or modification for DLC equipment first approved* is the date that allows the installation of DLC equipment on the aircraft and refers to the airworthiness approval of the installation of aircraft components, such as the structural and wiring provisions with which the DLC equipment needs to be compliant. These airworthiness approvals are usually in a form of a type certificate, a supplemental type certificate or an amended type certificate.

2.2.1 It is not uncommon for original customers of an aircraft that have airworthiness approvals related to DLC capability to choose not to install the DLC equipment or choose not to have it activated even if the aircraft is prepared for it.

2.3 *Date of activation for use of DLC equipment* refers to the date that a DLC application referred to in 5.1.2 of Appendix 8 was first activated for use.

2.3.1 Datalink communication (DLC) equipment as used in these provisions, refer to the physical unit(s) (e.g. box(es)) that was approved to a minimum performance standard issued by a certification authority (e.g. TSO or ETSO).

2.3.2 The activation of DLC functions refer to approved software activation of DLC functions or software updates.

2.4 *DLC recording required* refers to the requirement to record DLC messages in accordance with provisions 6.3.3.1.1, 6.3.3.1.2 and 6.3.3.1.3.

3. GENERAL

3.1 It is the date on which the CVR capabilities of the aircraft were approved that determines the DLC recording requirement. The date in which the DLC equipment was approved to a minimum performance standard is not relevant for CVR recording requirement purposes.

3.2 For the DLC equipment to be compliant with an airworthiness approval, it needs to be able to use, without modification, the installed aircraft components that are necessary to provide the DLC function, such as the:

a) datalink router (e.g. hosted in the communications management unit);

b) radios (e.g. VHF, HF datalink, SATCOM) and related antennas.

3.3 Approved software updates to installed equipment or software activation of functions normally do not alter the DLC equipment compliance with the rest of the aircraft systems.

4. EXAMPLES

4.1 For rows 1 and 2:

– The recording requirement is driven by Standard 6.3.3.1.1 which is based on when the individual certificate of airworthiness was first issued. Any subsequent airworthiness modifications related to DLC capability do not exempt the aircraft from the requirement to record DLC messages.

4.2 For rows 3 to 5 — General:

–The recording requirement is driven by Standard 6.3.3.1.2 and is based on whether or not the aircraft has an airworthiness approval for DLC capabilities and the date of its issue.

–Since there was no requirement to record DLC messages prior to 1 January 2016, airworthiness approvals related to DLC capability issued before that date did not necessarily include this function.

4.3 For row 3:

–The recording requirement applies regardless of when the certificate of airworthiness was issued because an airworthiness approval related to DLC capability was issued on or after 1 January 2016. The date of installation of the equipment would typically be after the airworthiness approval.

4.4 For row 4:

– The recording requirement does not apply because the aircraft's certificate of airworthiness and an airworthiness approval related to DLC capability was issued before 1 January 2016. The date of installation of DLC equipment is not a factor for DLC message recording requirements, as long as the equipment is compliant with that airworthiness approval.

4.5 For row 5:

– The recording requirement does not apply because the aircraft's certificate of airworthiness and an airworthiness approval related to DLC capability was issued before 1 January 2016. The date of installation of DLC equipment is not a factor for DLC message recording requirements, as long as the equipment is compliant with that airworthiness approval.

Notwithstanding the above, if the activation for use of the DLC equipment is on or after 1 January 2016, DLC messages should be recorded in accordance with Recommendation 6.3.3.1.3

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