No. DLA / 2012-010

AANWIJZING

van 3 december 2012

De Directeur van de Directie Luchtvaart

Gelet op:

Artikel 3, aanhef en sub f van de Regeling Brevettering en Vluchtuitvoering (AB 1995 no. 73), zoals laatst gewijzigd;

HEEFT BESLOTEN:

Artikel 1

De voorwaarden met betrekking tot vluchtuitvoering met een vliegtuig, zoals bedoeld in artikel 3 aanhef en sub f van de regeling brevettering en vluchtuitvoering (AB 1995 no. 73), worden vastgelegd in de bijgevoegde Engelstalige tekst document zoals laatst gewijzigd, genoemd "AUA-OPS deel 2 General Aviation (Aeroplanes)".

Artikel 2

De in artikel 1 bedoelde voorwaarden liggen voor een ieder kosteloos ter inzage bij de Directie Luchtvaart. Tegen betaling van een bedrag waarvan de hoogte is bepaald in het Algemeen Retributie- en Legesbesluit, kunnen afschriften van deze voorwaarden worden verkregen.

Artikel 3

1. Deze aanwijzing treedt in werking op de dag na die van haar plaatsing in het Landscourant van Aruba en kan worden aangehaald als "Luchtvaartvoorschriften voor Vluchtuitvoering met een Vliegtuig", afgekort als "AUA-OPS 2 (A)"

2. De Aanwijzing DLA/2010-04 wordt hierbij ingetrokken

Oranjestad, 3 december 2012

De Directeur voornoemd,
Directie Luchtvaart,
Aruba.

DIRECTIE LUCHTVAART * ARUBA *

Bijlage behorende bij de beschikking van de Directeur van de Directie Luchtvaart, de datum 3 december, nr. DL/2012-010

AUA-OPS 2
GENERAL AVIATION (AEROPLANES)

FOREWORD

1. AUA-OPS 2 General Aviation (Aeroplanes) – AUA-OPS 2 (A)- is applicable for the operations of aeroplanes in the general aviation. For operations regulations in the general aviation for helicopters see AUA-OPS 2 General Aviation (Helicopters) – AUA-OPS 2-(H).

For operations regulations for Commercial Air Transportation (Aeroplanes) see JAR-OPS 1 for Aruba; for Commercial Air Transportation (Helicopters), see JAR-OPS 3 for Aruba.

2. This revision of AUA-OPS 2 shall be applicable in Aruba after 31 January 2012.

3. The editing practices used in this document are as follows.

(a) The AUA-OPS 2 are concise statements of the regulation.

(b) The appendices and attachments to the AUA-OPS 2 contain the detail applicable to the AUA-OPS 2 and have the same status as AUA-OPS 2.

(c) “Shall” is used to indicate a mandatory requirement and may appear in AUA-OPS 2

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ABBREVIATIONS AND SYMBOLS

(USED IN THIS AUA-OPS 2)

ABBREVIATIONS	
AC	ALTERNATING CURRENT
ACAS	AIRBORNE COLLISION AVOIDANCE SYSTEM
ADREP	ACCIDENT/INCIDENT REPORTING
ADS	AUTOMATIC DEPENDENT SURVEILLANCE
AFCS	AUTOMATIC FLIGHT CONTROL SYSTEM
AGA	AERODROMES, AIR ROUTES AND GROUND AIDS
AIG	ACCIDENT INVESTIGATION AND PREVENTION
AOC	AERONAUTICAL OPERATIONAL CONTROL
APU	AUXILIARY POWER UNIT
ASE	ALTIMETRY SYSTEM ERROR
ASIA/PAC	ASIA/PACIFIC
ATC	AIR TRAFFIC CONTROL
ATM	AIR TRAFFIC MANAGEMENT
ATS	AIR TRAFFIC SERVICES
CAT I	CATEGORY I
CAT II	CATEGORY II
CAT III	CATEGORY III
CAT IIIA	CATEGORY IIIA
CAT IIIB	CATEGORY IIIB
CAT IIIC	CATEGORY IIIC
CFIT	CONTROLLED FLIGHT INTO TERRAIN
CM	CENTIMETRE
CVR	COCKPIT VOICE RECORDER
DA	DECISION ALTITUDE
DA/H	DECISION ALTITUDE/HEIGHT
DC	DEVICE CONTROL
D-FIS	DATA LINK-FLIGHT INFORMATION SERVICES
DH	DECISION HEIGHT
DME	DISTANCE MEASURING EQUIPMENT
DSTRK	DESIRED TRACK
ECAM	ELECTRONIC CENTRALIZED AIRCRAFT MONITOR
EFIS	ELECTRONIC FLIGHT INSTRUMENT SYSTEM
EGT	EXHAUST GAS TEMPERATURE
EICAS	ENGINE INDICATION AND CREW ALERTING SYSTEM
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 ORGANIZATION FOR CIVIL AVIATION EQUIPMENT
EVS	ENHANCED VISION SYSTEM
FDAU	FLIGHT DATA ACQUISITION UNIT
FDR	FLIGHT DATA RECORDER

ABBREVIATIONS	
GNSS	GLOBAL NAVIGATION SATELLITE SYSTEM
GPWS	GROUND PROXIMITY WARNING SYSTEM
HPA	HECTOPASCAL
HUD	HEAD-UP DISPLAY
IAOPA	INTERNATIONAL COUNCIL OF AIRAFT OWNER AND PILOT ASSOCIATION
IBAC	INTERNATIONAL BUSINESS AVIATION COUNSIL
IFR	INSTRUMENT FLIGHT RULES
ILS	INSTRUMENT LANDING SYSTEM
IMC	INSTRUMENT METEOROLOGICAL CONDITIONS
INS	INERTIAL NAVIGATION SYSTEMS
kg	KILOGRAM
km	KILOMETRE
km/h	KILOMETRES PER HOUR
kt	KNOT
m	METRE
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 SPECIFICATIONS
MOPS	MINIMUM OPERATIONAL PERFORMANCE SPECIFICATION
NAV	NAVIGATION
NM	NAUTICAL MILE
N1	LOW PRESSURE COMPRESSOR SPEED (TWOSTAGE COMPRESSOR); FAN SPEED (THREE-STAGE COMPRESSOR)
N2	HIGH PRESSURE COMPRESSOR SPEED (TWOSTAGE COMPRESSOR); INTERMEDIATE PRESSURE COMPRESSOR (THREE-STAGE COMPRESSOR)
N3	HIGH PRESSURE COMPRESSOR SPEED (THREE-STAGE COMPRESSOR)
OCA/H	OBSTACLE CLEARANCE ALTITUDE/HEIGHT
OCH	OBSTACLE CLEARANCE HEIGHT
RNP	REQUIRED NAVIGATION PERFORMANCE
RNPSOR	REQUIRED NAVIGATION PERFORMANCE AND SPECIALOPERATIONAL REQUIREMENTS
RVR	RUNWAY VISUAL RANGE
RVSM	REDUCED VERTICAL SEPARATION MINIMA
SI	INTERNATIONAL SYSTEM OF UNITS
SICASP	SECONDARY SURVEILLANCE RADAR IMPROVEMENTS AND COLLISION AVOIDANCE SYSTEMS PANEL
SOP	STANDARD OPERATION PROCEDURE
TAWS	TERRAIN AWARENESS SYSTEM

FL	FLIGHT LEVEL
FM	FREQUENCY MODULATION
FT	FOOT
g	NORMAL ACCELERATION
GCAS	GROUND COLLISION AVOIDANCE SYSTEM
UTC	COORDINATED UNIVERSAL TIME
VD	DESIGN DIVING SPEED
VFR	VISUAL FLIGHT RULES
VMC	VISUAL METEOROLOGICAL CONDITIONS
VOR	VHF OMNIDIRECTIONAL RADIO RANGE
VSM	VERTICAL SEPARATION MINIMA
TCAS	TRAFFIC ALERT AND COLLISION AVOIDANCE SYSTEM
TLA	THRUST LEVER ANGLE
TLS	TARGET LEVEL OF SAFETY
TVE	TOTAL VERTICAL ERROR
VS0	STALLING SPEED OR THE MINIMUM STEADY FLIGHT SPEED IN THE LANDING CONFIGURATION
WXR	WEATHER

SYMBOLS

°C	DEGREES CELSIUS
%	PER CENT

INTENTIONALLY LEFT BLANK

1 DEFINITIONS

When the following terms are used in the AUA-OPS 2 for the operation of aeroplanes in international general aviation, they have the following meanings:

Acts of unlawful interference. These are acts or attempted acts such as to jeopardize the safety of civil aviation and air transport, i.e.

- unlawful seizure of aircraft in flight,
- unlawful seizure of aircraft on the ground,
- hostage-taking on board an aircraft or on aerodromes,
- forcible intrusion on board an aircraft, at an airport or on the premises of an aeronautical facility,
- introduction on board an aircraft or at an airport of a weapon or hazardous device or material intended for criminal purposes,
- communication of false information as to jeopardize the safety of an aircraft in flight or on the ground, of passengers, crew, ground personnel or the general public, at an airport or on the premises of a civil aviation facility.

Aerial work. 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. 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. 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 precision approach and landing operations, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H) as appropriate to the category of the operation;

c) landing in approach and landing operations with vertical guidance, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H); and

d) landing in non-precision approach and landing operations, expressed in terms of visibility and/or runway visual range, minimum descent altitude/height (MDA/H) and, if necessary, cloud conditions.

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

Aircraft. 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.

Airworthy. 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. 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. Alternate aerodromes include the following:

Take-off alternate. An alternate aerodrome at which an aircraft can land should this become necessary shortly after take-off and it is not possible to use the aerodrome of departure.

En-route alternate. An aerodrome at which an aircraft would be able to land after experiencing an abnormal or emergency condition while en route.

Destination alternate. An alternate aerodrome to which an aircraft may proceed should 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). 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.

Approach and landing operations using instrument approach procedures. Instrument approach and landing operations are classified as follows:

Non-precision approach and landing operations. An instrument approach and landing which utilizes lateral guidance but does not utilize vertical guidance.

Approach and landing operations with vertical guidance. An instrument approach and landing which utilizes lateral and vertical guidance but does not meet the requirements established for precision approach and landing operations.

AUA-RLW: Aruban airworthiness regulations AB 1995, No. 71 as last revised

Precision approach and landing operations. An instrument approach and landing using precision lateral and vertical guidance with minima as determined by the category of operation.

Note. - Lateral and vertical guidance refers to the guidance provided either by:
a) a ground-based navigation aid; or
b) computer generated navigation data

***Categories of precision approach and landing operations**:*

Category I (CAT I) operation. A precision instrument approach and landing with:

a) a decision height not lower than 60 m (200 ft); and

b) with either a visibility not less than 800 m or a runway visual range not less than 550 m.

Category II (CAT II) operation. A precision instrument approach and landing with:

a) a decision height lower than 60 m (200 ft), but not lower than 30 m (100 ft); and

b) a runway visual range not less than 300 m.

Category IIIA (CAT IIIA) operation. A precision instrument approach and landing with:

a) a decision height lower than 30 m (100 ft) or no decision height; and

b) a runway visual range not less than 175 m.

Category IIIB (CAT IIIB) operation. A precision instrument approach and landing with:

a) a decision height lower than 15 m (50 ft) or no decision height; and

b) a runway visual range less than 175 m but not less than 50 m.

Category IIIC (CAT IIIC) operation. A precision instrument approach and landing with no decision height and no runway visual range limitations.

Note. - Where decision height (DH) and runway visual range (RVR) fall into different categories of operation, the instrument approach and landing 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 IIIA but with an RVR in the range of CAT IIIB would be considered a CAT IIIB 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).

Area navigation (RNAV). A method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or spaced-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.

Cabin crew member. 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.

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

***Continuing airworthiness*.** 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.

Corporate aviation operation. The non-commercial operation or use of aircraft by a company for the carriage of passengers or goods as an aid to the conduct of company business, flown by a professional pilot(s) employed to fly the aircraft.

Dangerous goods. 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 Annex 18, Chapter 3.

DCA-Aruba. The Department of Civil Aviation of Aruba

Decision altitude (DA) or ***decision height (DH)***. A specified altitude or height in the precision approach or approach with vertical guidance 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 should 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 abbreviated "DA/H".

Emergency locator transmitter (ELT). A generic term describing equipment, which broadcast 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)). An automatically activated ELT, which is permanently attached to an aircraft.

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

Automatic deployable ELT (ELT(AD)). 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 (ELT(S)). 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. 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). A system to display electronic real-time images of the external scene achieved through the use of image sensors.

Extended flight over water. A flight operated over water at a distance of more than 93 km (50 NM), or 30 minutes at normal cruising speed, whichever is the lesser, away from land suitable for making an emergency landing.

Flight crewmember. A licensed crewmember charged with duties essential to the operation of an aircraft during a flight duty period.

Flight manual. 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 crewmembers for the safe operation of the aircraft.

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

Flight simulation training device. 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 recorder. Any type of recorder installed in the aircraft for the purpose of complementing accident/incident investigation.

Flight time — aeroplanes. 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. An aircraft operation other than a commercial air transport operation or an aerial work operation.

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

Industry codes of practice. Guidance material developed by an industry body, for a particular sector of the aviation industry to comply with the requirements of the International Civil Aviation Organization's Standards and Recommended Practices, other aviation safety requirements and the best practices deemed appropriate.

Instrument meteorological conditions (IMC). 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 the Air Traffic State Decree AB 2008 no44.

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

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

Maintenance release. A document which contains a certification confirming that the maintenance work to which it relates has been completed in a satisfactory manner, either

in accordance with the approved data and the procedures described in the maintenance organization's procedures manual or under an equivalent system.

Meteorological information. Meteorological report, analysis, forecast, and any other statement relating to existing or expected meteorological conditions.

Minimum descent altitude (MDA) or ***minimum descent height (MDH).*** A specified altitude or height in a non-precision approach or circling approach 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 made an assessment of 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 descent altitude/height" and abbreviated "MDA/H".

Navigation specification. 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. A navigation specification based on area navigation that includesthe requirement for performance monitoring and alerting, designated by the prefix RNP, e.g. RNP 4, RNP APCH.

Area navigation (RNAV) specification. A 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 1.— The Performance-based Navigation Manual *(Doc 9613), Volume II, contains detailed guidance on navigation specifications*

Note 2.— The term RNP, previously defined as "a statement of the navigation performance necessary for operation within a defined airspace", has been removed from this Annex as the concept of RNP has been overtaken by the concept of PBN. The term RNP in this Annex is now solely used in the context of navigation specifications that require performance monitoring and alerting, e.g. RNP 4 refers to the aircraft and operating requirements, including a 4 NM lateral performance with on-board performance monitoring and alerting that are detailed in Doc 9613.

Night. The hours between the end of evening civil twilight and the beginning of morning civil twilight or such other period between sunset and sunrise.

Note. - Civil twilight ends in the evening when the centre of the sun's disc is 6 degrees below the horizon and begins in the morning when the centre of the sun's disc is 6 degrees below the horizon.

Obstacle clearance altitude (OCA) or ***obstacle clearance height (OCH).*** 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 approaches 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 is referenced to the aerodrome elevation.

Note 2. - For convenience when both expressions are used they may be written in the form "obstacle clearance altitude/height" and abbreviated "OCA/H".

Operating base. The location from which operational control is exercised.

Note.— An operating base is normally the location where personnel involved in the operation of the aeroplane work and the records associated with the operation are located. An operating base has a degree of permanency beyond that of a regular point of call.

Operational control. 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. The operator's 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.

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

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

Note.— In the context of AUA-OPS 2, the operator is not engaged in the transport of passengers, cargo or mail for remuneration or hire.

Performance-based navigation (PBN). 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.

Pilot-in-command. 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.

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

Required communication performance (RCP). A statement of the performance requirements for operational communication in support of specific ATM functions.

Required communication performance type (RCP type). A label (e.g. RCP 240) that represents the values assigned to RCP parameters for communication transaction time, continuity, availability and integrity.

Repair. The restoration of an aeronautical product to an airworthy condition to ensure that the aircraft continues to comply with the design aspects of the appropriate airworthiness requirements used for the issuance of the type certificate for the respective aircraft type, after it has been damaged or subjected to wear.

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

Safety management system. A systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures.

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

Target level of safety (TLS). A generic term representing the level of risk, which is considered acceptable in particularcircumstances.

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

Visual meteorological conditions (VMC). 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 the Air Traffic State Decree AB 2008 no44.

2 APPLICABILITY

The regulations contained in AUA-OPS 2 (A) are applicable to international general and corporate aviation operations with aeroplanes.

Note 1.— Standards and Recommended Practices applicable to the operation of aeroplanes by operators authorized to conduct international commercial air transport operations are to be found in JAROPS 1 for Aruba.

Note 2.— Standards and Recommended Practices applicable to international commercial air transport operations with helicopters are to be found JAROPS 3 for Aruba.

Note 3. — Standards and Recommended Practices applicable to international general aviation operations with helicopters are to be found in AUA-OPS 2 (H)

Note 4.— All Chapters of AUA-OPS 2, except chapter 12, applies to all international general aviation aeroplane operations, including those covered in chapter 12. Chapter 12 adds additional requirements for large aeroplanes, turbojet aeroplanes and corporate aviation operations.

3 GENERAL

3.1 The pilot-in-command shall comply with the relevant laws, regulations and procedures of the States in which the aeroplane is operated.

3.1.1 Every aircraft, engaged in international navigation, shall carry the following documents in conformity with the conditions prescribed in the Convention:

a) Its certificate of registration;
b) Its certificate of airworthiness;
c) The appropriate licenses for each member of the crew
d) Its journey log book;
e) If it is equipped with radio apparatus, the aircraft radio station license
f) If it carries passengers, a list of their names and places of embarkation and destination;
g) If it carries cargo, a manifest and detailed declarations of the cargo.

Note 1.- Compliance with more restrictive measures, not in contravention of the provisions of 3.1, may be required by the DCA.

Note2. - Rules covering flight over high seas are contained in the Air Traffic State Decree AB 2008 no44- Rules of the Air

3.1.2 The pilot-in-command shall be familiar with the laws, regulations and procedures, pertinent to the performance of his or her duties, prescribed for the areas to be traversed, the aerodromes to be used and the air navigation facilities relating thereto. The pilot-in-command 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.

3.1. The pilot-in-command shall ensure that flight crew members demonstrate the ability to speak and understand the language used for aeronautical radiotelephony communications as specified in Annex 1.

3.2 The pilot-in-command shall be responsible for the safety of all crewmembers, passengers and cargo on board when the doors are closed. The pilot-in-command shall also have responsibility for operational control.

3.3 If an emergency situation, which endangers the safety of the aeroplane or persons, necessitates the taking of action, which involves a violation of local regulations or procedures, the pilot-in-command shall notify the appropriate local authority without delay. If required by the State in which the incident occurs, the pilot-in-command shall submit a report on any such violation to the appropriate authority of such State; in that

event, the pilot-in-command shall also submit a copy of it to the DCA. Such reports shall be submitted as soon as possible and normally within ten days

3.4 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.

3.5 The pilot-in-command shall have available on board the aeroplane essential information concerning the search and rescue services in the areas over which the aeroplane will be flown.

3.6 Transportation of dangerous goods is prohibited.

3.7 Use of psychoactive substances.

3.7.1 Flight crewmembers shall not exercise the privileges of their licenses and related ratings while under the influence of any psychoactive substances, which might render them unable to safety and properly exercise these privileges.

3.7.2 Flight crewmembers shall not engage in any problematic use of substances.

3.7.3 Cabin crewmembers and operations personnel other than crewmembers (dispatchers, ground personnel, etc.) shall not exercise their assigned duties while under the influence of any psychoactive substances, which might render them unable to safety and properly exercise these privileges.

3.7.4 Cabin crewmembers and operations personnel other than crewmembers shall not engage in any problematic use of substances.

3.7.5 Any licensed crewmember or licensed operations personnel who is identified in being engaged in any kind of problematic use of substances shall be removed fro their safety-critical functions immediately. Return to the safety-critical functions may be considered after successful treatment or, in cases where no treatment is necessary, after cessation of the problematic use of substances and upon determination that the person’s continued performance of the function is unlikely to jeopardize safety.

3.7.6 Private or corporate operators shall introduce a suitable method of identification, which may include biochemical testing on such occasions as pre-employment, upon reasonable suspicion, after accidents/incidents, at intervals, and at random.

3.7.7 Positive identification of psychoactive substances shall be reported to the DCA within 48 hours.

4 FLIGHT PREPARATION AND IN-FLIGHT PROCEDURES

4.1 *Adequacy of operating facilities*

The pilot-in-command shall not commence a flight unless it has been ascertained 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 aeroplane are adequate, including communication facilities and navigation aids.

Note. — "Reasonable means" in this Standard is intended to denote the use, at the point of departure, of information available to the pilot-in-command either through official information published by the aeronautical information services or readily obtainable from other sources.

4.2 *Operational management*

4.2.1 Operating instructions — general

An aeroplane shall not be taxied on the movement area of an aerodrome unless the person at the controls is an appropriately qualified pilot or:

a) has been duly authorized by the owner or in the case where it is leased the lessee, or a designated agent;

b) is fully competent to taxi the aeroplane;

c) is qualified to use the radio if radio communications are required; and

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

4.2.2 Aerodrome operating minima

The pilot-in-command shall not operate to or from an aerodrome using operating minima lower than those, which may be established for that aerodrome by the State in which it is located, except with the specific approval of that State.

Note. - It is the practice in some States to declare, for flight planning purposes, higher minima for an aerodrome when nominated as an alternate, than for the same aerodrome when planned as that of intended landing.

Note 2.— The use of head-up displays (HUD) or enhanced vision systems (EVS) may allow operations with lower visibilities than normally associated with the aerodrome operating minima.

4.3 *Briefing*

4.3.1 The pilot-in-command shall ensure that crewmembers and passengers are made familiar, by means of an oral briefing or by other means, with the location and the use of:

a) seat belts; and, as appropriate,

b) emergency exits;

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

d) oxygen dispensing equipment; and

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

4.3.2 The pilot-in-command shall ensure that all persons on board are aware of the location and general manner of use of the principal emergency equipment carried for collective use.

4.3.2 The pilot-in-command 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.

4.4 *Flight Preparation*

4.4.1 A flight shall not be commenced until the pilot-in command is satisfied that:
a) the aeroplane is airworthy, duly registered and that appropriate certificates with respect thereto are aboard the aeroplane;

b) the instruments and equipment installed in the aeroplane are appropriate, taking into account the expected flight conditions;

c) any necessary maintenance has been performed in accordance with Chapter 8;

d) the mass of the aeroplane and centre of gravity location are such that the flight can be conducted safely, taking into account the flight conditions expected;

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

f) the aeroplane operating limitations, contained in the flight manual, or its equivalent, will not be exceeded.

4.4.2 The pilot-in-command shall have sufficient information on climb performance with all engines operating to enable determination of the climb gradient that can be achieved during the departure phase for the existing take-off conditions and intended take-off technique.

4.5 *Weather reports and forecasts*

Before commencing a flight the pilot-in-command shall be familiar with all available meteorological information appropriate to the intended flight. Preparation for a flight away from the vicinity of the place of departure, and for every flight under the instrument flight rules, shall include:

1) a study of available current weather reports and forecasts; and
2) the planning of an alternative course of action to provide for the eventuality that the flight cannot be completed as planned, because of weather conditions.

Note. - The requirements for flight plans are contained in the Air Traffic State Decree AB 2008 no44- Rules of the Air.

4.6 *Limitations imposed by weather conditions*

4.6.1 Flight in accordance with the visual flight rules.

A flight, except one of purely local character in visual meteorological conditions, to be conducted in accordance with the visual flight rules shall not be commenced unless available 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 the visual flight rules, will, at the appropriate time, be such as to render compliance with these rules possible.

4.6.2 Flight in accordance with the instrument flight rules.

4.6.2.1 When a destination alternate aerodrome is required.

A flight to be conducted in accordance with the instrument flight rules shall not be commenced unless the available information indicates that conditions, at the aerodrome of intended landing and at least one destination alternate will, at the estimated time of arrival, be at or above the aerodrome operating minima.

4.6.2.2 When no destination alternate aerodrome is required.

A flight to be conducted in accordance with the instrument flight rules to an aerodrome when no alternate aerodrome is required shall not be commenced unless:

a) a standard instrument approach procedure is prescribed for the aerodrome of intended landing; and

b) available current meteorological information indicates that the following meteorological conditions will exist from two hours before to two hours after the estimated time of arrival:

1) a cloud base of at least 300 m (1 000 ft) above the minimum associated with the instrument approach procedure; and
2) visibility of at least 5.5 km or of 4 km more than the minimum associated with the procedure.

4.6.3 Aerodrome operating minima.

4.6.3.1 A flight shall not be continued towards the aerodrome of intended landing unless the latest available meteorological information indicates that conditions at that aerodrome, or at least one destination alternate aerodrome, will, at the estimated time of arrival, be at or above the specified aerodrome operating minima.

4.6.3.2 An instrument approach shall not be continued beyond the outer marker fix in case of precision approach, or below 300 m (1 000 ft) above the aerodrome in case of non-precision approach, unless the reported visibility or controlling RVR is above the specified minimum.

4.6.3.3 If, after passing the outer marker fix in case of precision approach, or after descending below 300 m (1000 ft) above the aerodrome in case of non-precision approach, 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 beyond a point at which the limits of the aerodrome operating minima 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 State criteria.

4.6.4 Flight in icing conditions.

4.6.4.1 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.

4.6.4.2 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.

4.7 *Destination alternate aerodromes*

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 flight plan, unless:

a) the duration of the flight and the meteorological conditions prevailing are such that there is reasonable certainty that, at the estimated time of arrival at the aerodrome of intended landing, and for a reasonable period before and after such time, the approach and landing may be made under visual meteorological conditions; or

b) the aerodrome of intended landing is isolated and there is no suitable destination alternate aerodrome.

1) a standard instrument approach procedure is prescribed for the aerodrome of intended landing; and

2) available current meteorological information indicates that the following meteorological conditions will exist from two hours before time of arrival:

i) a cloud base of at least 300 m (1 000 ft) above the minimum associated with the instrument approach procedure; and

ii) visibility of at least 5.5 km or of 4 km more than the minimum associated with the procedure.

4.8 *Fuel and oil supply*

4.8.1 A flight shall not be commenced unless, taking into account both the meteorological conditions and any delays that are expected in flight, the aeroplane carries sufficient fuel and oil to ensure that it can safely complete the flight, and, as applicable, the following special provisions are complied with:

a) when the flight is conducted in accordance with the instrument flight rules and a destination alternate aerodrome is not required in accordance with 4.6.2.2, flight to the aerodrome of intended landing, and after that, for at least 45 minutes at normal cruising altitude; or

b) when the flight is conducted in accordance with the instrument flight rules and a destination alternate aerodrome is required, flight from the aerodrome of intended landing to an alternate aerodrome, and after that, for at least 45 minutes at normal cruising altitude; or

c) when the flight is conducted in accordance with the visual flight rules by day, flight to the aerodrome of intended landing, and after that, for at least 30 minutes at normal cruising altitude; or

d) when the flight is conducted in accordance with the visual flight rules by night, flight to the aerodrome of intended landing and thereafter for at least 45 minutes at normal cruising altitude.

Note. — Nothing in 4.8 precludes amendment of a flight plan in flight in order to re-plan the flight to another aerodrome, provided that the requirements of 4.8 can be complied with from the point where the flight is re-planned.

4.9 *Oxygen supply*

4.9.1 The pilot-in-command shall ensure that breathing oxygen is available to crew members and passengers in sufficient quantities for all flights at such altitudes where a lack of oxygen might result in impairment of the faculties of crewmembers or harmfully affect passengers.

4.9.1.1 A flight to be operated at 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 at least 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) all crew members and passengers for any period that the atmospheric pressure in compartments occupied by them will be less than 620 hPa.

4.9.1.2 A flight to be operated with a pressurized aeroplane shall not be commenced unless a sufficient quantity of stored breathing oxygen is carried to supply all 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 10-minute supply for the occupants of the passenger compartment.

4.10 *Use of oxygen*

The pilot-in-command shall ensure that breathing oxygen is available to crew members and passengers in sufficient quantities for all flights at such altitudes where a lack of oxygen might result in impairment of the faculties of crew members or harmfully affect passengers.

4.10.1 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 4.9 of this chapter.

4.10.2 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 indicated to be necessary in 4.9.1.1 and 4.9.1.2 of this chapter.

4.10.3 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 mask, which will readily supply oxygen upon demand.

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

Absolute pressure	Metres	Feet
700 hPa	*3 000*	*10 000*
620 hPa	*4 000*	*13 000*
376 hPa	*7 600*	*25 000*

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

Cabin crew shall 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 shall have such means of protection as will enable them to administer first aid to passengers during stabilized flight following the emergency. Passengers shall 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.

4.11 *In-flight emergency instruction*

In an emergency during flight, the pilot-in-command shall ensure that all persons on board are instructed in such emergency action as may be appropriate to the circumstances.

4.12 *Weather reporting by pilots*

When weather conditions likely to affect the safety of other aircraft are encountered, they shall be reported as soon as possible.

4.13 *Hazardous flight conditions*

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

4.14 *Duties of the pilot-in command*

4.14.1 The pilot-in-command shall be responsible for the operation, safety and security of the aeroplane and the safety of all crew members, passengers and cargo on board.

4.14.2 The pilot-in-command shall be responsible for ensuring that a flight:

a) will not be commenced if any flight crew member is incapacitated from performing duties by any cause such as injury, sickness, fatigue, the effects of psychoactive substance and

b) will not be continued beyond the nearest suitable aerodrome when flight crew members' capacity to perform functions is significantly reduced by impairment of faculties from causes such as fatigue, sickness, lack of oxygen.

4.14.3 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 Annex 13.

4.15 *Flight crewmembers at duty stations*

4.15.1 Take-off and landing

All flight crewmembers required to be on flight deck duty shall be at their stations.

4.15.2 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.

4.15.3 Seat belts

All flight crewmembers shall keep their seat belts fastened when at their stations.

4.15.4 Safety harness

When safety harnesses are provided, 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 strap(s) and a seat belt, which may be used independently.

4.16 *Instrument flight procedures*

4.16.1 One or more instrument approach procedures designed in accordance with the classification of instrument approach and landing 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.

4.16.2 All aeroplanes operated in accordance with instrument flight rules shall comply with the instrument flight procedures approved by the State in which the aerodrome is located.

Note 1. - Definitions for the classification of instrument approach and landing operations are in Chapter 1.

4.17 *Instruction — general*

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 owner or in the case where it is leased the lessee, or a designated agent;

b) is fully competent to taxi the aeroplane;

c) is qualified to use the radio telephone if radio communications are required; and

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

4.18 *Refuelling with passengers on board*

4.18.1 An aeroplane shall not be refuelled when passengers are embarking, on board or disembarking except when refueling aviation kerosene in a closed line, and in accordance with the conditions below.

4.18.2 An aeroplane shall not be refuelled when passengers are embarking, on board or disembarking unless it is attended by the pilot-in-command or other qualified personnel ready to initiate and direct an evacuation of the aeroplane by the most practical and expeditious means available.

4.18.3 When refuelling with passengers embarking, on board or disembarking, two-way communications should be maintained by aeroplane intercommunications system or other suitable means between the ground crew supervising the refuelling and the pilot-in command or other qualified personnel required by 4.18.2.

Note 1. - The provisions of 4.18.2 do not necessarily require the deployment of integral aeroplane stairs or the opening of emergency exits as a prerequisite to refuelling.

Note 2. - Provisions concerning aircraft refuelling and guidance on safe refuelling practices are contained in the Airport Services Manual *(Doc 9137), Parts 1 and 8.*

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

4.19 *Aeroplane operating procedures for rate of climb and descent*

To avoid unnecessary airborne collision avoidance system (ACAS II) resolution advisories in aircraft at adjacent levels, pilots shall consider using appropriate procedures to ensure that a rate of climb or descent of less than 8m/sec (1500ft/min) is achieved throughout the last 300m (1000ft) of climb or descent to the assigned level, when made aware of another aircraft at an adjacent altitude or flight level by an airborne traffic deploy.

Note. – Material concerning the development of these procedures is contained Attachment A.

4.20 *Cabin baggage (take-off and landing)*

The pilot-in-command shall ensure that all baggage carried onto an aeroplane and taken into the passenger cabin is securely stowed.

5 AEROPLANE PERFORMANCE OPERATING LIMITATIONS

5.1 An aeroplane shall be operated:

a) in compliance with the terms of its airworthiness certificate;

b) within the operating limitations prescribed by the certificating the DCA; and

c) within the mass limitations imposed by compliance with the applicable noise certification Standards in Annex 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 Placards, listings, instrument markings, or combinations thereof, containing those operating limitations prescribed by the certificating authority of the DCA for visual presentation, shall be displayed in the aeroplane.

5.3 The pilot-in-command shall determine that aeroplane performance will permit the take-off and departure to be carried out safely.

6 AEROPLANE INSTRUMENTS AND EQUIPMENT

Note. -1 Specification for the provision of aeroplane communication and navigation equipment is contained in Chapter 7.

Note. - 2 See (Appendix1)

6.1 *All aeroplanes on all flights*

6.1.1 General

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 DCA.

6.1.2 Instruments

An aeroplane shall be equipped with instruments which will enable the flight crew to control the flight path of the aeroplane, carry out any required procedural maneuver, and observe the operating limitations of the aeroplane in the expected operating conditions.

6.1.3 Equipment

6.1.3.1 All aeroplanes on all flights.

6.1.3.1.1 All aeroplanes on all flights shall be equipped with:

a) an accessible first-aid kit;

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.— Refer to 6.1.3.1.2 *for fire extinguishing agents.*

c) 1) a seat or berth for each person of age two and older; and

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

d) the following manuals, charts and information:

1) the flight manual or other documents or information concerning any operating limitations prescribed for the aeroplane by the certificating authority of the DCA, required for the application of Chapter 5;

2) current and suitable charts for the route of the proposed flight and all routes along which it is reasonable to expect that the flight may be diverted;

3) procedures, as prescribed in Annex 2, for pilots-in command of intercepted aircraft; and

4) visual signals for use by intercepting and intercepted aircraft, as contained in Annex 2;

5) the journey log book for the aeroplane;

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

6.1.3.1.2 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 2016 shall:

a) meet the applicable minimum performance requirements of the DCA Aruba; 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 La*yer, Annex A, Group II.
c)

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

6.1.3.1.3 All aeroplanes on all flights shall be equipped with the ground-air signal codes for search and rescue purposes.

6.1.3.14 All aeroplanes on all flights shall be equipped with a safety harness for each flight crew member seat.

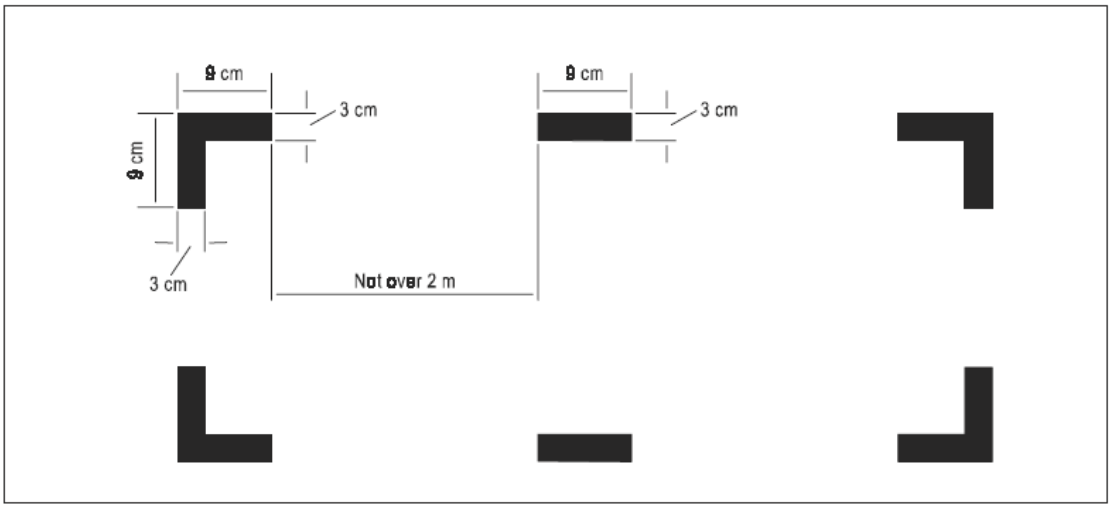
Note. - Safety harness includes shoulder strap(s) and a seat belt, which may be used independently.

6.1.4 Marking of break-in points

6.1.4.1 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 color of the markings shall be red or yellow, and if necessary they shall be outlined in white to contrast with the background.

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

Note. - This Standard does not require any aeroplane to have break-in areas.



MARKING OF BREAK-IN POINTS (see 6.1.4)

6.2 *All aeroplanes operated as VFR flights*

6.2.1 All aeroplanes when operated as VFR flights shall be equipped with:

a) a magnetic compass;

b) a sensitive pressure altimeter;

c) an airspeed indicator; and

d) such additional instruments or equipment as may be prescribed by the appropriate authority.

6.2.2 VFR flights, which are operated as controlled flights, shall be equipped in accordance with 6.6.

6.3 *All aeroplanes on flights over water*

6.3.1 Seaplanes

All seaplanes for all flights shall be equipped with:

a) one life jacket, or equivalent individual floatation device, for each person on board, stowed in a position readily accessible from the seat or berth;

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

c) one anchor;

d) one sea anchor (drogue), when necessary to assist in maneuvering.

Note. - "Seaplanes" includes amphibians operated as seaplanes.

6.3.2 Landplanes

6.3.2.1 Single-engined aeroplanes

All single-engined landplanes when flying en route over water beyond gliding distance from the shore should carry one life jacket or equivalent individual floatation 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. - "Landplanes" includes amphibians operated as landplanes.

6.3.3 All aeroplanes on extended flights over water

All aeroplanes when operated on extended flights over water shall be equipped with:

a) when the aeroplane may be over water at a distance of more than 93 km (50 NM) away from land suitable for making an emergency landing or when taking off or landing at an aerodrome where 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, a minimum of 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) when over water away from land suitable for making an emergency landing at a distance of more than 185 km (100 NM), in the case of single-engined aeroplanes, and more than 370 km (200 NM), in the case of multi-engined aeroplanes capable of continuing flight with one engine inoperative:

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

2) equipment for making the pyrotechnical distress signals described in the Air Traffic State Decree AB 2008 no44.

6.4 *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 signalling devices and life-saving equipment (including means of sustaining life) as may be appropriate to the area over flown.

6.5 *All aeroplanes on high altitude flights*

6.5.1 All aeroplanes intended to be operated at high altitudes shall be equipped with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required in 4.9.

6.5.2 Aeroplanes for which the individual certificate of airworthiness is first issued on or after 1 January 1990

Pressurized aeroplanes 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.

6.5.3 Aeroplanes for which the individual certificate of airworthiness is first issued before 1 January 1990

Pressurized aeroplanes 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.

6.6 *All aeroplanes operated in accordance with the instrument flight rules*

All aeroplanes when operated in accordance with the instrument flight rules or when the aeroplane cannot be maintained in a desired attitude without reference to one or more flight instruments, shall be equipped with:

a) a magnetic compass;

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

c) a sensitive pressure altimeter; (*the use of drum-pointer altimeters is not permitted).*

d) an airspeed indicating system with a 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 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) means of indicating whether the supply of power to the gyroscopic instruments 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 appropriate authority.

6.7 *All aeroplanes when operated at night*

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

a) all the equipment specified in 6.6;

b) the lights required by the Air Traffic State Decree AB 2008 no44 for aircraft in flight or operating on the movement area of an aerodrome;

Note.— Specifications for lights meeting the requirements of the Air Traffic State Decree AB 2008 no44 for navigation lights are contained in the Appendix.

c) a landing light;

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

e) lights in all passenger compartments; and

f) an electric torch for each crew member station.

6.8 *All aeroplanes complying with the noise certification Standards in AUA-RLW*

An aeroplane shall carry a document attesting noise certification.

Note. - The attestation may be contained in any document, carried on board, approved by the DCA.

6.9 *Aeroplanes required being equipped with ground proximity warning systems (GPWS)*

6.9.1 All turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than nine passengers, for which the individual certificate of airworthiness is first issued on or after 1 January 2004, shall be equipped with a ground proximity warning system which has a forward looking terrain avoidance function.

6.9.2 From 1 January 2007, all turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than nine passengers, shall be equipped with a ground proximity warning system which has a forward looking terrain avoidance function.

6.9.3 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 shall be equipped with a ground proximity warning system which has a forward looking terrain avoidance function.

6.9.4 All piston-engined aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than nine passengers shall be equipped with a ground proximity warning system which has a forward looking terrain avoidance function.

6.9.5 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.

6.9.6 A ground proximity warning system shall provide, as a minimum, warnings of at least the following circumstances:

a) excessive descent rate;

b) excessive terrain closure rate;

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

d) unsafe terrain clearance.

6.9.7 All turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than nine passengers, shall be equipped with a ground proximity warning system which has a forward looking terrain avoidance function.

6.10 *Flight recorders*

Note 1.— 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) and/or a data link recorder (DLR). 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 systems: an aircraft data recording system (ADRS), a cockpit audio recording system (CARS), an airborne image recording system (AIRS) and/or a data link recording system (DLRS). Image and data link information may be recorded on either the CARS or the ADRS.

Note 3.— Detailed guidance on flight recorders is contained in Appendix D1

6.10.1 Flight data recorders and aircraft data recording systems

Note 1.— FDR and AIR performance requirements are as contained in the EUROCAE ED-112, Minimum Operational Performance Specification (MOPS) for Crash Protected Airborne Recorder Systems, or equivalent documents.

Note 2.— ADRS performance requirements are as contained in the EUROCAE ED-155, Minimum Operational Performance Specification (MOPS) for Lightweight Flight Recording Systems, or equivalent documents.

Note 3.— Parameters to be recorded are listed in Tables D1 and D-3 of Appendix D2

6.10.1.1 Types

6.10.1.1.1 Types I and IA FDRs shall record the parameters required to determine accurately the aeroplane flight path, speed, attitude, engine power, configuration and operation.

6.10.1.1.2 Type II FDRs shall record the parameters required to determine accurately the aeroplane flight path, speed, attitude, engine power and configuration of lift and drag devices.

6.10.1.2 Operation

Note.— Airborne image recorders classification is defined in 4.1 of Appendix D2

6.10.1.2.1 All aeroplanes for which the application for type certification is submitted to the State of Design on or after 1 January 2016 and which are required to be fitted with an FDR, shall record the following parameters at a maximum recording interval of 0.125 seconds:

– Pilot input and/or control surface position – primary controls (pitch, roll, yaw).

Note 1.— 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 independent moveable surfaces, each surface needs to be recorded separately. In aeroplanes with independent pilot input on primary controls, each pilot input on primary controls needs to be recorded separately.

Note 2.— "The application for type certification that is submitted to a Contracting State" refers to the date of issuance application of the original "Type Certificate" for the aeroplane type, not the date of certification of particular aeroplane variants or derivative models.

6.10.1.3 Discontinuation

6.10.1.3.1 The use of engraving metal foil FDRs shall be discontinued.

6.10.1.3.2 ***Reserved***

6.10.1.3.3 The use of analogue FDRs using frequency modulation (FM) shall be discontinued

6.10.1.3.4 The use of photographic film FDRs shall be discontinued.

6.10.1.3.5 ***Reserved***

6.10.1.3.6 The use of magnetic tape FDRs shall be discontinued by 1 January 2016.

6.10.1.4 Duration
All FDRs shall be capable of retaining the information recorded during at least the last 25 hours of their operation.

6.10.2 Cockpit voice recorders and cockpit audio recording systems

Note 1.— CVR performance requirements are as contained in the EUROCAE ED-112 Minimum Operational Performance Specification (MOPS) for Crash Protected Airborne Recorder Systems, or equivalent documents.
Note 2.— CARS performance requirements are as contained in the EUROCAE ED-155, Minimum Operational Performance Specification (MOPS) for Lightweight Flight Recording Systems, or equivalent documents.

6.10.2.1 Operation
(reserved)

6.10.2.2 Discontinuation

6.10.2.2.1 The use of magnetic tape and wire CVRs shall be discontinued by 1 January 2016.

6.10.2.2.2 ***Reserved***

6.10.2.3 Duration

6.10.2.3.1 All CVRs shall be capable of retaining the information recorded during at least the last 30 minutes of their operation.

6.10.2.3.2 From 1 January 2016, all CVRs shall be capable of retaining the information recorded during at least the last two hours of their operation.

6.10.2.3.3 ***Reserved***

6.10.3 Data link recorders
Note.— Data link recorders performance requirements are as contained in the EUROCAE ED-112, Minimum Operational Performance Specification (MOPS) for Crash Protected Airborne Recorder Systems*, or equivalent documents.*

6.10.3.1 Applicability

6.10.3.1.1 All aeroplanes for which the individual certificate of airworthiness is first issued on or after 1 January 2016, which utilize any of the data link communications applications listed in 5.1.2 of Appendix D2 and are required to carry a cockpit voice recorder (CVR), shall record on a flight recorder all data link communications messages.

6.10.3.1.2 All aeroplanes which are modified on or after 1 January 2016 to install and utilize any of the data link communications applications listed in 5.1.2 of Appendix 3.1

2.3 and are required to carry a CVR, shall record on a flight recorder the data link communications messages.
Note 1.— Data link communications are currently conducted by either ATN-based or FANS 1/Aequipped aircraft.
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.

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

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

6.10.4 Flight recorders — general

6.10.4.1 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.

Note 1.— Industry crashworthiness and fire protection specifications for FDR, CVR, AIR and DLR are as contained in the EUROCAE ED-112, Minimum Operational Performance Specification (MOPS) for Crash Protected Airborne Recorder Systems, or equivalent documents.

Note 2.— Industry crashworthiness and fire protection specifications for ADRS and CARS are as contained in the EUROCAE ED-155, Minimum Operational Performance Specifications (MOPS) for Lightweight Flight Recording Systems, or equivalent documents.

6.10.4.2 Operation

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

6.10.4.2.2 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 Annex 13.

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

Note 2.— The pilot-in-command's responsibilities regarding the retention of flight recorder records are contained in 6.10.4.3

6.10.4.3 Flight recorder records
The pilot-in-command, and/or the owner/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 ICAO Annex 13.

6.10.4.4 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 D2

2.4.16.4.5 Reserved

Note. - Procedures for the inspections of the flight data and cockpit voice recorder systems are given in Attachment D.

6.11 *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.

6.12 *Emergency locator transmitter (ELT)*

6.12.1 Except as provided for in 6.12.2, all aeroplanes shall be equipped with at least one ELT of any type.

6.12.2 All aeroplanes with a MTOW above 5700 kg, shall be equipped with at least one automatic ELT.

6.12.3 All aeroplanes operated on extended flights over water as described in 6.3.3 b) and when operated on flights over designated land areas as described in 6.4 shall be equipped with one automatic ELT.

6.12.4 ELT equipment carried to satisfy the requirements of 6.12.1, 6.12.2, and 6.12.3 shall operate in accordance with the relevant provisions of Annex 10, Volume III.

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.

6.13 *Aeroplanes required to be equipped with a pressure-altitude reporting transponder*

6.13.1 All aeroplanes shall be equipped with a pressure-altitude reporting transponder which operates in accordance with the relevant provisions of Annex 10, Volume IV.

6.13.2 Unless exempted by the appropriate authorities, aeroplanes operating as VFR flights shall be equipped with a pressure-altitude reporting transponder which operates in accordance with the relevant provision of Annex 10, Volume IV.

Note.— These provisions are intended to support the effectiveness of ACAS as well as to improve the effectiveness of air traffic services.

6.14 *Aeroplanes equipped with head-up displays (HUD) and/or enhanced vision systems (EVS)*

Where aeroplanes are equipped with HUD and/or EVS, the use of such systems shall be approved by the DCA

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Note.— Guidance on HUD and EVS is contained in AMC-034

6.15 *Microphones*

All flight crewmembers required to be on flight deck duty shall communicate through boom or throat microphones below the transition level/altitude.

7 AEROPLANE COMMUNICATION AND NAVIGATION EQUIPMENT

7.1 *Communication equipment*

7.1.1 All aeroplanes shall be provided with radio communication equipment.
Such equipment shall be capable of conducting two-way communication with those aeronautical stations and on those frequencies prescribed by the appropriate authority.

Note. - The requirements of 7.1.1 are considered fulfilled if the ability to conduct the communications specified therein is established during radio propagation conditions, which are normal for the route.

7.1.2 When compliance with 7.1.1 requires that more than one communication equipment unit be provided, each shall be independent of the other or others to the extent that a failure in any one will not result in failure of any other.

7.1.3 An aeroplane to be operated on a flight to which the provisions of 6.3.3 or 6.4 apply shall, unless exempted by the appropriate authority, be provided with radio communication equipment capable of conducting two-way communication at any time during flight with such aeronautical stations and on such frequencies as may be prescribed by the appropriate authority.

7.1.4 The radio communication equipment required in accordance with 7.1.1 to 7.1.4 shall provide for communication on the aeronautical emergency frequency 121.5 MHz.

7.1.5 For flight operations in defined portions of airspace or on routes where an RCP type has been prescribed, an aeroplane shall, in addition to the requirements specified in 2.5.1.1 to 2.5.1.5:

a) be provided with communication equipment which will enable it to operate in accordance with the prescribed RCP type(s); and

b) be authorized by the DCA-Aruba for such operations.

Note.— Information on RCP and associated procedures, and guidance concerning the approval process, are contained in the Manual on Required Communication Performance (RCP) *(Doc 9869). This document also contains references to other documents produced by States and international bodies concerning communication systems and RCP.*

7.2 *Navigation equipment*

7.2.1 An aeroplane shall be provided with navigation equipment which will enable it to proceed:

a) in accordance with the flight plan; and

b) in accordance with the requirements of air traffic services; except when, if not so precluded by the appropriate authority, navigation for flights under the visual flight rules is accomplished by visual reference to landmarks at least every 110 km (60 NM).

7.2.2 For operations where a navigation specification for performance-based navigation has been prescribed, an aeroplane shall, in addition to the requirements specified in 7.2.1:

a) be provided with navigation equipment which will enable it to operate in accordance with the prescribed navigation specification(s); and

b) be authorized by the DCA for operations in such airspace.

Note.— Information on performance-based navigation, and guidance concerning the implementation and operational approval process, are contained in the Performance-based Navigation Manual *(Doc 9613). This document also contains a comprehensive list of references to other documents produced by States and international bodies concerning navigation systems.*

7.2.3 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 DCA for MNPS operations concerned.

7.2.4 For flights in defined portions of airspace where, based on Regional Air Navigation Agreement, a reduced vertical separation minimum (RVSM) of 300 m (1 000 ft) is applied between FL 290 and FL 410 inclusive, an aeroplane:

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 be authorized by the DCA for operation in the airspace concerned.

7.2.5 Prior to granting the RVSM approval required in accordance with 7.2.4 b), the DCA shall be satisfied that:

a) the vertical navigation performance capability of the aeroplane satisfies the requirements specified in Appendix 2;

b) the operator has instituted appropriate procedures in respect of continued airworthiness (maintenance and repair) practices and programs; and

c) the operator has instituted appropriate flight crew procedures for operations in RVSM airspace.

Note1. - An RVSM approval is valid globally on the understanding that any operating procedures specific to a given region will be stated in the operations manual or appropriate crew guidance.

Note 2 See Appendix 2

7.2.6 The State of the Operator, in consultation with the DCA if appropriate, shall ensure that, in respect of those aeroplanes mentioned in 7.2.4, adequate provisions exist for:

a) receiving the reports of height-keeping performance issued by the monitoring agencies established in accordance with Annex 11, 3.3.4.1; 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 operation in airspace where RVSM is applied.

7.2.7 All States that are responsible for airspace where RVSM has been implemented, or have issued RVSM approvals to operators within their State, shall establish provisions and procedures, which ensure that appropriate action will be taken in respect of aircraft and operators found to be operating in RVSM airspace without a valid RVSM approval.

Note 1. - These provisions and procedures need to address both the situation where the aircraft in question was operating without approval in the airspace of the State, and the situation where an operator for which the State has regulatory oversight responsibility is found to be operating without the required approval in the airspace of another State.

7.2.8 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, 7.2.3 and 7.2.4.

Note 1. - This requirement may be met by means other than the duplication of equipment.

7.2.9 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 effected. 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.

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8 AEROPLANE MAINTENANCE

8.1 *Responsibilities*

8.1.1 The owner of an aeroplane, or in the case where it is leased, the lessee, shall ensure that:

a) the aeroplane is maintained in an airworthy condition;

b) the operational and emergency equipment necessary for the intended flight is serviceable;

c) the Certificate of Airworthiness of the aeroplane remains valid; and

d) the maintenance of the aeroplane is performed in accordance with a maintenance program acceptable to the DCA.

8.1.2 The aeroplane shall not be operated unless it is maintained and released to service under a system approved to the DCA.

8.1.3 When the maintenance release is not issued by a DCA approved maintenance organization the person signing the maintenance release shall be licensed in accordance with AUA-RLW.

8.1.4 The owner or the lessee shall ensure that the maintenance of the aeroplane is performed in accordance with a maintenance program acceptable to the DCA-Aruba

8.2 *Maintenance records*

8.2.1 The owner shall ensure that the following records are kept for the periods mentioned in 8.2.2:

a) the total time in service (hours, calendar time and cycles, as appropriate) of the aeroplane and all life limited components;

b) the current status of compliance with all mandatory continuing airworthiness information;

c) appropriate details of modifications and repairs;

d) the time in service (hours, calendar time and cycles, as appropriate) since last overhaul of the aeroplane or its components subject to a mandatory overhaul life;

e) the current status of the aeroplane's compliance with the maintenance program; and

f) the detailed maintenance records to show that all requirements for signing a maintenance release have been met.

8.2.2 The records referred to in 8.2.1 a) to e) shall be kept for a minimum period of two (2) years after the unit to which they refer has been permanently withdrawn from service and the records in 8.2.1 f) for a minimum period of two (2) year after the signing of the maintenance release.

8.2.3 The lessee of an aeroplane shall comply with the requirements of 8.2.1 and 8.2.2, as applicable, while the aeroplane is leased.

Note. - Maintenance records or related documents, other than a valid certificate of airworthiness, need not be carried in the aeroplane during international flights.

8.3 *Continuing airworthiness information*

The owner of an aeroplane over 5 700 kg maximum certificated take-off mass, or in the case where it is leased, the lessee, shall, as prescribed by the DCA, ensure that the information resulting from maintenance and operational experience with respect to continuing airworthiness such as information on faults, malfunctions, defects and other occurrences that might cause adverse effects on the continuing airworthiness of the aircraft, is transmitted to the organization responsible for the type design of that aircraft. Additional information and procedures to be transmitted shall be as required by the AUA-RLW.

8.4 *Modifications and repairs*

All modifications and repairs shall comply with airworthiness requirements acceptable to the DCA. Procedures shall be established to ensure that the substantiating data supporting compliance with the airworthiness requirements are retained.

8.5 *Maintenance release*

8.5.1 A maintenance release shall be completed and signed, as prescribed by the provisions of the AUA-RLW, to certify that the maintenance work performed has been completed satisfactorily.

8.5.2 A maintenance release shall contain a certification including:

a) basic details of the maintenance carried out;

b) date such maintenance was completed;

c) when applicable, the identity of the approved maintenance organization; and

d) the identity of the person or persons signing the release.

9 AEROPLANE FLIGHT CREW

9.1 *Qualifications*

9.1.1 The pilot-in-command shall:

a) ensure that each flight crew member holds a valid licence issued by the DCA, or if issued by another Contracting State, rendered valid by the DCA;

b) ensure that flight crew members are properly rated; and

c) be satisfied that flight crew members have maintained competency

9.1.2 The pilot-in-command of an aeroplane equipped with an airborne collision avoidance system (ACAS II) shall ensure that each flight crew member has been appropriately trained to competency in the use of ACAS II equipment and the avoidance of collisions.

Note 1. - Procedures for the use of ACAS II equipment are specified in PANS-OPS, *Volume I. ACAS II Training Guidelines for Pilots are provided in AUA-OPS 2 Attachment B.*

Note 2. - Appropriate training, to the satisfaction of the DCA, to competency in the use of ACAS II equipment and the avoidance of collisions may be evidenced, for example, by:

a) possession of a type rating for an aeroplane equipped with ACAS II, where the operation and use of ACAS II are included in the training syllabus for the type rating; or

b) possession of a document issued by a training organization or person approved by the State to conduct training for pilots in the use of ACAS II, indicating that the holder has been trained in accordance with the guidelines referred to in Note 1; or

c) a comprehensive pre-flight briefing by a pilot who has been trained in the use of ACAS II in accordance with the guidelines referred to in Note 1.

9.2 *Composition of the flight crew*

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.

10 MANUALS, LOGS AND RECORDS

Note.— The following documents are associated with this Annex but are not included in this chapter:
Maintenance records — see 8.2

10.1 *Flight manual*

Note.— The aeroplane flight manual contains the information specified in AUA-RLW.

The aeroplane flight manual shall be updated by implementing changes made mandatory by the State of Registry.

10.2 *Journey log book*

10.2.1 A journey log book shall be maintained for every aeroplane engaged in international air navigation in which shall be entered particulars of the aeroplane, its crew and each journey.

10.2.2**.** — The aeroplane journey log shall contain the following items:

a) aeroplane nationality and registration;

b) date;

c) crew member names and duty assignments;

d) departure and arrival points and times;

e) purpose of flight;

f) observations regarding the flight; and

g) signature of the pilot-in-command.

10.3 *Records of emergency and survival equipment carried*

The owner of the aeroplane, or in the case where it is leased, the lessee, shall at all times have available for immediate communication to rescue coordination centres, lists containing information on the emergency and survival equipment carried on board the aeroplane 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 Security

11.1 *Security of aircraft*

The pilot-in-command shall be responsible for the security of the aircraft during its operation.

11.2 *Reporting acts of unlawful interference*

Following an act of unlawful interference, the pilot-in-command shall submit a report of such an act to the designated local authority.

Note.— In the context of this Chapter, the word "security" is used in the sense of prevention of acts of unlawful interference against civil aviation.

12 LARGE AND TURBOJET AEROPLANES

12.1 *APPLICABILITY*

12.1.1 The following operations shall be subject to AUA-OPS 2 chapter 1 through 9, and those of this chapter.

International general and corporate aviation operations with:

a) aeroplanes with a maximum certificated take-off mass exceeding 5 700 kg; or
b) aeroplanes equipped with one or more turbojet engines.

12.1.2 An operation involving an aeroplane with a seating configuration of more then 9 passenger seats shall be conducted in accordance with this chapter.

Note. - The applicability of 12.1.2 does not preclude a general aviation operator from satisfying the requirements of this chapter where it may be to the operator's advantage.

12.2 *CORPORATE AVIATION OPERATIONS*

A corporate aviation operation involving three or more aircraft that are operated by pilots employed for the purpose of flying the aircraft shall be conducted in accordance with this chapter.

12.3 *GENERAL*

12.3.1 Compliance with laws, regulations and procedures

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

12.3.1.2 An 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.

12.3.1.3 The pilot-in-command is responsible for operational control. An operator shall describe the operational control system in the operations manual and identify the roles and responsibilities of those involved with the system.

12.3.1.4 An operator shall ensure that the pilot-in-command has 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.

12.3.1.5 An operator shall ensure that flight crew members demonstrate the ability to speak and understand the language used for aeronautical radiotelephony communications as specified AUA-FCL 1.

12.3.2 Safety management system

12.3.2.1 An operator shall establish and maintain a safety management system that is appropriate to the size and complexity of the operation.

12.3.2.2 The safety management system should as minimum include:

a) a process to identify actual and potential safety hazards and assess the associated risks;

b) a process to develop and implement remedial action necessary to maintain an acceptable level of safety; and

c) provision for continuous monitoring and regular assessment of the appropriateness and effectiveness of safety management activities.

Note. - Guidance on safety management systems is contained in the Safety Management Manual (SMM) (Doc 9859) and industry codes of practice.

12.4 *FLIGHT OPERATIONS*

12.4.1 Operating facilities

An operator shall ensure that a flight will not be commenced unless it has been ascertained by every reasonable means available that the ground and/or water facilities including communication facilities and navigation aids available and directly required on such flight, for the safe operation of the aeroplane, are adequate for the type of operation under which the flight is to be conducted.

Note. - "Reasonable means" in this requirement 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.

12.4.2 Operational management

12.4.2.1 Operator notification

12.4.2.1.1 If an operator has an operating base in a State other than Aruba, the operator shall notify the State in which the operating base is located.

12.4.2.1.2 Upon notification in accordance with 12.4.2.1.1, safety and security oversight shall be coordinated between the State in which the operating base is located and the DCA of Aruba.

12.4.2.2 Operations manual

12.4.2.2.1 An operator shall provide, for the use and guidance of personnel concerned, an operations manual containing all the instructions and information necessary for operations personnel to perform their duties. 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.

Note 1. - Attachment B contains guidance on the organization and content of an operations manual.

12.4.2.3 Operating instructions — general

12.4.2.3.1 An operator shall ensure that all operations personnel are properly instructed in their particular duties and responsibilities and the relationship of such duties to the operation as a whole.

12.4.2.3.2 An operator should issue operating instructions and provide information on aeroplane climb performance 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.

12.4.2.4 In-flight simulation of emergency situations

An operator shall ensure that when passengers are being carried, no emergency or abnormal situations shall be simulated.

12.4.2.5 Checklists

Checklists 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, are followed. 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 ICAO Human Factors Training Manual (Doc 9683).

12.4.2.6 Minimum flight altitudes

An operator shall specify, for flights that are to be conducted in accordance with the instrument flight rules, the method of establishing terrain clearance altitudes.

12.4.2.7 Aerodrome operating minima

An operator shall ensure that no pilot-in-command operates to or from an aerodrome using operating minima lower than those which may be established for that aerodrome by the State in which it is located, except with the specific approval of that State.

12.4.2.8 Fatigue management

12.4.2.8.1 Fatigue management program.

An operator shall establish and implement a fatigue management program acceptable to the DCA that ensures that all operator personnel involved in the operation and maintenance of aircraft do not carry out their duties when fatigued. The program shall address flight and duty times and be included in the operations manual.

12.4.2.8.2 If deviations from the flight and or duty time limitations are permitted, the program shall include provisions for:

a) assessing the associated risks and applying appropriate mitigation to ensure that there is no degradation of safety, and

b) identifying the management person who is authorized to approve the deviation.

12.4.2.8.3 In the case of deviations, the risk assessment and related mitigation shall be recorded in writing.

12.4.2.8.4 Deviations shall be made only with the approval of all personnel involved.

Note. - Accepted industry codes of practice may be used in the development of such a program.

12.4.2.9 Passengers

12.4.2.9.1 An operator shall ensure that passengers are made familiar with the location and use of:

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.

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

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

12.4.2.9.4 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 are secured in their seats by means of the seat belts or harnesses provided.

12.4.3 Flight preparation

12.4.3.1 The operator shall develop procedures to ensure that a flight is not commenced unless:

a) the aeroplane is airworthy, duly registered and that appropriate certificates with respect thereto are aboard the aeroplane;

b) the instruments and equipment installed in the aeroplane are appropriate, taking into account the expected flight conditions;

c) any necessary maintenance has been performed in accordance with chapter 12.8 of the relevant section of this part;

d) the mass of the aeroplane and centre of gravity location are such that the flight can be conducted safely, taking into account the flight conditions expected;

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

f) the aeroplane operating limitations, contained in the flight manual, or its equivalent, will not be exceeded.

12.4.3.2 The operator shall make available sufficient information on climb performance with all engines operating to enable determination of the climb gradient that can be achieved during the departure phase for the existing take-off conditions and intended take-off technique.

12.4.3.3 Operational flight planning

An operator shall specify flight-planning procedures to provide 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. These procedures shall be included in the operations manual.

12.4.3.4 Alternate Aerodromes

12.4.3.4.1 Take-off alternate aerodrome

12.4.3.4.1.1 A take-off alternate aerodrome shall be selected and specified in the flight plan if the weather conditions at the aerodrome of departure are at or below the applicable aerodrome operating minima or it would not be possible to return to the aerodrome of departure for other reasons.

12.4.3.4.1.2 The take-off alternate aerodrome shall be located within the following distance from the aerodrome of departure:

a) aeroplanes having two power-units. Not more than a distance equivalent to a flight time of one hour at the single-engine cruise speed; and

b) aeroplanes having three or more power-units. Not more than a distance equivalent to a flight time of two hours at the one-engine inoperative cruise speed.

12.4.3.4.1.3 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 aerodrome operating minima for that operation.

12.4.3.5 Refueling with passengers on board

12.4.3.5.1 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.

12.4.3.5.2 When refueling with passengers embarking, on board or disembarking, two-way communication shall be maintained by the aeroplane's intercommunication 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 12.4.3.5.1 do not necessarily require the deployment of integral aeroplane stairs or the opening of emergency exits as a prerequisite to refueling.

Note 2. - 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.

12.4.3.6 Oxygen supply

12.4.3.6.1 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.

12.4.3.6.2 A flight to be operated with a pressurized aeroplane shall not be commenced unless a sufficient quantity of 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 10-minute supply for the occupants of the passenger compartment.

12.4.4 In-flight procedures

12.4.4.1 Precision instrument approaches – use of RVR

12.4.4.1.1 A precision instrument approach where RVR is reported shall not be continued beyond the final approach fix unless the controlling RVR is equal to or above the specified minimum.

12.4.4.1.2 If, after the final approach fix is passed, the controlling RVR falls below the specified minimum, the approach may be continued to DA/H.

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 State criteria.

12.4.4.1.3 An operator shall include operating procedures for conducting instrument approaches in the standard operating procedures of 12.6.1.2

12.4.4.2 Use of oxygen

12.4.4.2.1 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 3.4.3.6.1 or 3.4.3.6.2.

12.4.4.2.2 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.

12.4.4.3 Aeroplane operating procedures for noise abatement

12.4.4.3.1 Aeroplane operating procedures for noise abatement shall comply with the provisions of PANS-OPS (Doc 8168), Volume I, Section 7, Chapter 3.

12.4.4.3.2 Noise abatement procedures specified by an operator for any one-aeroplane type shall be the same for all aerodromes.

Note. - A single procedure may not satisfy requirements at some aerodromes.

12.4.5 Duties of pilot-in-command

12.4.5.1 The pilot-in-command shall ensure that the checklists specified in 12.4.2.5 are complied with in detail.

12.4.5.2 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. In the event that the pilot-in-command is incapacitated the operator shall take the forgoing action.

Note. - A definition of the term "serious injury" is contained in Annex 13.

12.4.5.3 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.

12.4.5.4 The pilot-in-command shall be responsible for the journey log book or the general declaration containing the information listed in 2.8.2.

12.4.6 Cabin baggage (take-off and landing)

An operator shall specify procedures to ensure that all baggage carried onto an aeroplane and taken into the passenger cabin is adequately and securely stowed.

12.5 *AEROPLANE PERFORMANCE OPERATING LIMITATIONS*

12.5.1 General

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 DCA should ensure that the level of performance specified in 12.5.2 should be met as far as practicable.

12.5.2 Applicable to aeroplanes certificated in accordance with Parts IIIA and IIIB of Annex 8

12.5.2.1 The Standards contained in 12.5.2.2 to 12.5.2.9 inclusive are applicable to the aeroplanes to which Parts IIIA and IIIB of Annex 8 are applicable.

Note. - The Standards of Annex 8 — Airworthiness of Aircraft, Parts IIIA and IIIB, apply to all aeroplanes of over 5 700 kg maximum certificated take-off mass intended for the carriage of passengers or cargo or mail in international air navigation. For Aruban registered aeroplanes these standards are incorporated in AUA-RLW

12.5.2.2 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.

12.5.2.3 The DCA has taken 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.

12.5.2.4 A flight shall not be commenced unless the performance information provided in the flight manual indicates that the Standards of 12.5.2.5 to 12.5.2.9 can be complied with for the flight to be undertaken.

12.5.2.5 In applying the standards of this chapter, account shall be taken of all factors that significantly affect the performance of the aeroplane (such as: mass, operating procedures, the pressure-altitude appropriate to the elevation of the aerodrome, temperature, wind, runway gradient and condition of runway, i.e. presence of 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.

12.5.2.6 Mass limitations

a) The mass of the aeroplane at the start of take-off shall not exceed the mass at which 12.5.2.7 is complied with, nor the mass at which 12.5.2.8 and 12.5.2.9 are complied with, allowing for expected reductions in mass as the flight proceeds, and for such fuel jettisoning as is envisaged in applying 12.5.2.8 and 12.5.2.9 and, in respect of alternate aerodromes, 12.5.2.6 c) and 12.5.2.9.

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 Annex 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.

12.5.2.7 *Take-off*. The aeroplane shall be able, in the event of a critical power-unit failing at any point in the take-off, either to discontinue the take-off and stop within the accelerate-stop distance available [or runway available], or to continue the take-off and clear all obstacles along the flight path by an adequate margin until the aeroplane is in a position to comply with 12.5.2.8.

Note. - "An adequate margin" referred to in this provision is illustrated by the appropriate examples included in Attachment C to Annex 6 part I.

12.5.2.7.1 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.

12.5.2.8 *En route — one power-unit 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 12.5.2.9 can be met, without flying below the minimum obstacle clearance altitude at any point.

12.5.2.9 *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.

12.6 *AEROPLANE INSTRUMENTS, EQUIPMENT AND FLIGHT DOCUMENTS*

Note. - Specifications for the provision of aeroplane communication and navigation equipment are contained in Chapter 12.7.

12.6.1 General

12.6.1.1 Where a master minimum equipment list (MMEL) is established for the aircraft type, the operator shall include in the operations manual a minimum equipment list (MEL) approved by the State of Registry of the aeroplane 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.

Note. - Attachment C contains guidance on the minimum equipment list.

12.6.1.2 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 should be consistent with the aircraft flight manual and checklists to be used. The design of the manual should 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).

12.6.2 Aeroplanes on all flights

12.6.2.1 In addition to the requirements contained in 6.1.3, an aeroplane shall be equipped with:

a) accessible and adequate medical supplies appropriate to the number of passengers the aeroplane is authorized to carry.

b) Medical supplies shall comprise one or more first-aid kits.

Note. - The types, number, location and contents of the medical supplies is given in Attachment E.

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

d) The safety harness for each pilot seat shall 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.

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

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;

5) location of emergency equipment; and

6) location and method of opening emergency exits.

12.6.2.2 An aeroplane shall carry:

a) the operations manual prescribed in 12.4.2.2, or those parts of it that pertain to flight operations;

b) the flight manual for the aeroplane, or other documents containing performance data required for the application of Chapter 12.5 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

c) the checklists referred to in 12.4.2.5.

12.6.3 Flight recorders

12.6.3.1. Flight data recorders

12.6.3.1.1 Operation

12.6.3.1.1.1 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 2005 shall be equipped with a Type IA FDR.

12.6.3.1.1.2 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 1989 shall be equipped with a Type I FDR.

12.6.3.1.1.3 All aeroplanes of a maximum certificated take-off mass of over 5 700 kg, up to and including 27 000 kg, for which the individual certificate of airworthiness is first issued on or after 1 January 1989, should be equipped with a Type II FDR.

12.6.3.2 Cockpit voice recorders

12.6.3.2.1 Operation

12 .6.3.2.1.1 All turbine-engined aeroplanes of a maximum certificated take-off mass of over 5 700 kg for which a the application for type certificate is first issued certification is submitted to a The DCA Aruba on or after 1 January 2016 and required to be operated by more than one pilot shall be equipped with a CVR

12.6.3.2.1.2 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 1987 shall be equipped with a CVR.

126.3.2.1.3 **Reserved**

12.6.3.3 Reserved

12.6.4 Aeroplanes on long-range over-water flights

12.6.3.11.1 The operator of an aeroplane operated on an extended flight overwater shall determine the risks to survival of the occupants of the aeroplane in the event of a ditching. The operator shall take into account the operating environment and conditions such as, but not limited to, sea state and sea and air temperatures, the distance from land suitable for making an emergency landing, and the availability of search and rescue facilities. Based upon the assessment of these risks, the operator shall, in addition to the equipment required in 6.3.3, ensure that the aeroplane is appropriately equipped with:

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

b) equipment for making the distress signals described in Annex 2.

12.6.3.11.2 Each life jacket and equivalent individual flotation device, when carried in accordance with 6.3.3, shall be equipped with a means of electric illumination for the purpose of facilitating the location of persons, except where the requirement of 6.3.3 (a) is met by the provision of individual flotation devices other than life jackets.

12.6.3.12 Aeroplanes for which the individual certificate of airworthiness was first issued before 1 January 1990.

12.6.12.1 Pressurized aeroplanes intended to be operated at flight altitudes at which the atmospheric pressure will be less than 376 hPa shall be equipped with a device to provide positive warning to the flight crew of any dangerous loss of pressurization.

12.6.3.12.2 An aeroplane intended to be operated at flight altitudes at which the atmospheric pressure in personnel compartments is be 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 12.4.3.6.1.

12.6.3.12.3 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 12.4.3.6.2.

12.6.5 Aeroplanes in icing conditions

Aeroplanes shall be equipped with suitable de-icing and/or anti-icing devices when operated in circumstances in which icing conditions are reported to exist or are expected to be encountered.

12.6.6 Aeroplanes operated in accordance with the instrument flight rules

12.6.5.1 In addition to the requirements contained in 6.6, aeroplanes when operated in accordance with the instrument flight rules or when the aeroplane cannot be maintained in a desired attitude without reference to one or more flight instruments, shall be equipped with two independent altitude measuring and display systems.

12.6.5.2 Aeroplanes over 5 700 kg — Emergency power supply for electrically operated attitude indicating instruments

12.6.5.2.1 Aeroplanes of a maximum certificated take-off mass of over 5 700 kg newly introduced into service after 1 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.

12.6.5.2.2 Aircraft with advanced cockpit automation systems (glass cockpits) shall have system redundancy that provides the flight crew with attitude, heading, airspeed and altitude indications in case of failure of the primary system or display.

12.6.5.2.3 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.

12.6.7 Pressurized aeroplanes when carrying passengers — weather-detecting equipment

Pressurized aeroplanes when carrying passengers shall be equipped with operative weather-detecting equipment capable of detecting thunderstorms whenever such aeroplanes are being operated in areas where such conditions may be expected to exist along the route either at night or under instrument meteorological conditions.

12.6.8 Aeroplanes operated above 15 000 m (49 000 ft) — radiation indicator

12.6.7.1 Aeroplanes intended to be primarily operated above 15 000 m (49 000 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 crewmember.

12.6.7.2 The equipment shall be calibrated on the basis of assumptions acceptable to the DCA.

12.6.9 Aeroplanes required to be equipped with ground proximity warning systems (GPWS)

12.6.8.1 All turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than nine passengers shall be equipped with a ground proximity warning system which has a forward-looking terrain avoidance function.

12.6.8.2 All piston-engined aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than nine passengers shall be equipped with a ground proximity warning system which has a forward-looking terrain avoidance function.

12.6.10 Aeroplanes carrying passengers — cabin crew seats

12.6.9.1 Aeroplanes for which the individual certificate of airworthiness is first issued on or after 1 January 1981 Aeroplanes shall be equipped with a forward or rearward facing seat (within 15 degrees of the longitudinal axis of the aeroplane), fitted with a safety harness for the use of each cabin crew member required to satisfy the intent of 3.12.1 in respect of emergency evacuation.

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

12.6.9.2.1 Aeroplanes shall be equipped with a forward or rearward facing seat (within 15 degrees of the longitudinal axis of the aeroplane), fitted with a safety harness for the use of each cabin crewmember required to satisfy the intent of 12.12.1 in respect of emergency evacuation.

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

12.6.9.2.2 Cabin crew seats provided in accordance with 12.6.9.1 or 12.6.9.2.1 shall be located near floor level and other emergency exits as required by the DCA for emergency evacuation.

12.6.11 Aeroplanes required to be equipped with an airborne collision avoidance system (ACAS)

12.6.10.1 All turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 15 000 kg or authorized to carry more than 30 passengers, shall be equipped with an airborne collision avoidance system (ACAS II).

12.6.10.2 All turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg but not exceeding 15 000 kg, or authorized to carry more than 19 passengers, shall be equipped with an airborne collision avoidance system (ACAS II).

12.6.12 Aeroplanes required to be equipped with a pressure-altitude reporting transponder

12.6.11.1 Aeroplanes shall be equipped with a pressure-altitude reporting transponder, which operates in accordance with the relevant provisions of Annex 10, Volume IV or as determined by the DCA.

Note. - This provision is intended to improve the effectiveness of air traffic services as well as airborne collision avoidance systems.

12.6.13 Microphones

All flight crewmembers required to be on flight deck duty shall communicate through boom or throat microphones below the transition level/altitude.

12.7 *AEROPLANE COMMUNICATION AND NAVIGATION EQUIPMENT*

12.7.1 Communication equipment

In addition to the requirements of 7.1.1 to 7.1.5, 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 flight; and

c) conducting two-way communication 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 of 12.7.1 are considered fulfilled if the ability to conduct the communications specified therein is established during radio propagation conditions, which are normal for the route.

12.7.2 Installation

The equipment installation shall be such that the failure of any single unit required for either communications or navigation purposes or both will not result in the failure of another unit required for communications or navigation purposes. Electronic navigation data management

12.7.3.1 An operator of an aeroplane shall not employ electronic navigation data products that have been processed for application in the air and on the ground unless the DCA has approved 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. The DCA shall ensure that the operator continues to monitor both process and products.

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.

12.7.3.2 An operator shall implement procedures that ensure the timely distribution and insertion of current and unaltered electronic navigation data to all aeroplanes that require it.

12.8 *AEROPLANE MAINTENANCE*

12.8.1 Operator's maintenance responsibilities

12.8.1.1 An operator shall comply with the requirements of AUA-RLW.

12.8.1.2 An operator shall ensure that all maintenance personnel receive initial and continuation training acceptable to the DCA and appropriate to their assigned tasks and responsibilities. This should include Human Factors and coordination with other maintenance personnel and flight crew.

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

12.8.2 Operator's maintenance control manual

An operator shall provide a maintenance control manual for the use and guidance of maintenance and operational personnel.

12.8.3 Maintenance program

12.8.3.1 An operator shall provide, for the use and guidance of maintenance and operational personnel concerned, a maintenance program, acceptable to the DCA, containing the information required by

12.11.2. The design and application of the operator's maintenance program shall observe human factors principles according to a guidance material acceptable to the DCA.

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

12.8.3.2 Copies of all amendments to the maintenance program shall be furnished promptly to all organizations or persons to whom the maintenance program has been issued.

12.8.4 Continuing airworthiness information

An operator of an aeroplane over 5 700 kg maximum-certificated take-off mass shall, as prescribed by the State of Registry, ensure that the information resulting from maintenance and operational experience with respect to continuing airworthiness, is transmitted as required by AUA-RLW.

12.8.5 Maintenance release

12.8.5.1 A maintenance release shall be completed and signed, as prescribed by the DCA, to certify that the maintenance work has been performed in accordance with the maintenance program or other data and procedures acceptable to the DCA.

12.8.5.2 A maintenance release shall contain a certification including:

a) basic details of the maintenance performed;

b) the date such maintenance was completed;

c) when applicable, the identity of the approved maintenance organization; and

d) the identity of the person or persons signing the release.

12.9 *AEROPLANE FLIGHT CREW*

12.9.1 Composition of the flight crew

12.9.1.1 Designation of pilot-in-command

For each flight the operator shall designate a pilot to act as pilot-in-command.

12.9.1.2 Flight engineer

When a separate flight engineer's station is incorporated in the design of an aeroplane, the flight crew shall include at least one flight engineer especially assigned to that station, unless the duties associated with that station can be satisfactorily performed by another flight crew member, holding a flight engineer licence, without interference with regular duties.

12.9.2 Flight crewmember emergency duties

An operator shall, for each type of aeroplane, assign to all flight crewmembers the necessary functions they are to perform in an emergency or in a situation requiring emergency evacuation. Recurrent training in accomplishing these functions shall be contained in the operator's training program 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.

12.9.3 Flight crewmember training programs

12.9.3.1 An operator shall establish and maintain a training program that is designed to ensure that a person who receives training acquires and maintains the competency to perform assigned duties, including skills related to human performance. Ground and flight training programs shall be established either through internal programs or through a training services provider, and shall include or make reference to a syllabus for those training programs in the company operations manual. The training program shall include training to competency for all equipment installed.

12.9.3.2 Flight simulators shall be used to the maximum extent practicable for initial and annual recurrent training.

12.9.4 Qualifications

12.9.4.1 Flight crewmember licensing

12.9.4.1.1 An operator shall:

a) ensure that each flight crew member assigned to duty holds a valid licence, or if issued by another Contracting State, rendered valid by the DCA;

b) ensure that flight crew members are properly rated; and

c) be satisfied that flight crew members are competent to carry out assigned duties.

12.9.4.1.2 The operator of an aeroplane equipped with an airborne collision avoidance system (ACAS II) shall ensure that each flight crew member has been appropriately trained to competency in the use of ACAS II equipment and the avoidance of collisions.

Note 1. - Procedures for the use of ACAS II equipment are specified in the Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, Doc 8168), Volume I —

Flight Procedures. ACAS II Training Guidelines for Pilots are provided in AUA-OPS 2 Attachment A.

Note 2. - Appropriate training, to the satisfaction of the DCA, to competency in the use of ACAS II equipment and the avoidance of collisions may be evidenced, for example, by:

a) possession of a type rating for an aeroplane equipped with ACAS II, where the operation and use of ACAS II are included in the training syllabus for the type rating; or

b) possession of a document issued by a training organization or person approved by the DCA to conduct training for pilots in the use of ACAS II, indicating that the holder has been trained in accordance with the guidelines referred to in Note 1; or

c) a comprehensive pre-flight briefing by a pilot who has been trained in the use of ACAS II in accordance with the guidelines referred to in Note 1.

12.9.4.2 Recent experience — pilot-in-command
An operator shall not assign a pilot to act as pilot-in-command of an aeroplane unless that pilot has made 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.

12.9.4.3 Recent experience — co-pilot

An operator shall not assign a co-pilot to operate at the flight controls of an aeroplane during take-off and landing unless that pilot has made 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.

12.9.4.4 Pilot proficiency checks

An operator shall ensure that piloting technique and the ability to execute emergency procedures is checked periodically in such a way as to demonstrate the pilot's competence. Where the operation may be conducted under the instrument flight rules, an operator shall ensure that the pilot's competence to comply with such rules is demonstrated to either a check pilot of the operator or a representative of the State issuing the pilot licence.

12.9.4.5 Pilot proficiency checks periodicity

The maximum interval between proficiency checks shall not be more than 12 months.

Note. - The periodicity of the checks referred to in 12.9.4.4and 12.9.4.5 is dependent upon the complexity of both the aeroplane and the operation.

12.10 *FLIGHT OPERATIONS OFFICER/FLIGHT DISPATCHER*

An operator shall ensure that any person assigned as a flight operations officer/flight dispatcher is trained and maintains familiarization with all features of the operation, which are pertinent to their duties, including knowledge and skills related to Human Factors.

12.11 *MANUALS, LOGS AND RECORDS*

12.11.1 Operator's maintenance control manual

An operator's maintenance control manual provided in accordance with 12.8.2, which may be issued in separate parts, shall be developed and acceptable to the DCA**,** and shall contain information about:

a) the means for complying with the procedures required by 12.8.1.1;

b) the means of recording the names and duties of the person or persons required by 12.8.1.1;

c) the maintenance program required by 12.8.3.1;

d) the methods used for the completion and retention of the operator's maintenance records required by 12.8.5;

e) the procedures for complying with the service information reporting requirements of AUA-RLW;

f) the procedures for implementing action resulting from mandatory continuing airworthiness information;

g) a system of analysis and continued monitoring of the performance and efficiency of the maintenance program, in order to correct any deficiency in that program;

h) the aircraft types and models to which the manual applies;

i) the procedures for ensuring that unserviceabilities affecting airworthiness are recorded and rectified; and

j) procedures for advising the DCA Aruba of significant in-service occurrences.

12.11.2 Maintenance program

12.11.2.1 A maintenance program for each aeroplane as required by 12.8.3 shall contain the following information:

a) maintenance tasks and the intervals at which these are to be performed, taking into account the anticipated utilization of the aeroplane;

b) when applicable, a continuing structural integrity program;

c) procedures for changing or deviating from a) and b) above as approved by the DCA Aruba; and

d) when applicable and approved by the DCA, condition monitoring and reliability program descriptions for aircraft systems, components and powerplants.

12.11.2.2 Maintenance tasks and intervals that have been specified as mandatory in approval of the type design, or approved changes to the maintenance program, shall be identified as such.

12.11.2.3 The maintenance program should be based on maintenance program information made available by the State of Design or by the organization responsible for the type design, and any additional applicable experience.

12.11.3 Flight recorder records

The owner of the aeroplane, or in the case where it is leased, the lessee, 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 Annex 13.

12.12 *CABIN CREW*

12.12.1 Assignment of emergency duties

The requirement for cabin crew for each type of aeroplane shall be determined by the operator, based on seating capacity or the number of passengers carried, in order to effect 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.

12.12.2 Cabin crew at emergency evacuation stations

When cabin crew is required by the DCA, each cabin crewmember assigned to emergency evacuation duties shall occupy a seat provided in accordance with 12.6.9 during take-off and landing and whenever the pilot-in-command so directs.

12.12.3 Protection of cabin crew during flight

Each cabin crewmember 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.

12.12.4 Training

12.12.4.1 An operator shall ensure that a training program is completed by all persons before being assigned as a cabin crewmember.

12.12.4.2 An operator shall establish and maintain a cabin crew training program that is designed to ensure that persons who receive training acquire the competency to perform their assigned duties and includes or makes reference to a syllabus for the training program in the company operations manual. The training program shall include Human Factors training.

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

12.13 *SECURITY*

12.13.1 Security program

An operator conducting general aviation operations, including corporate operator aviation operations, using aircraft with a maximum take-off mass greater than 5 700 kg, shall establish, implement and maintain a written operator security program that meets the requirements of the DCA.

Note. - Accepted industry codes of practice may be used as the basis for the development of a written operator security program.

APPENDIX 1. LIGHTS TO BE DISPLAYED BY AEROPLANES

(Note. - See Chapter 6)

1 Terminology

When the following terms are used in 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. The plane containing the longitudinal axis and perpendicular to the plane of symmetry of the aeroplane.

Longitudinal axis of the aeroplane. 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. 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. An aeroplane on the surface of the water is ‘‘under command’’ when it is able to execute maneuvers as required by the International Regulations for Preventing Collisions at Sea for the purpose of avoiding other vessels.

Under way. 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. Planes perpendicular to the horizontal plane.

Visible. 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 Annex 2 for navigation lights.

As illustrated in Figure 1, the following unobstructed navigation lights shall be displayed:

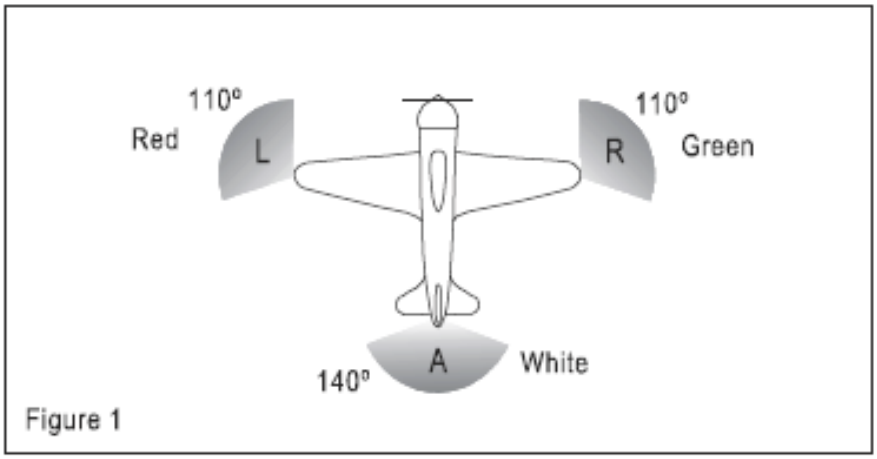


Figure 1

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.

3 Lights to be displayed on the water

3.1 General

Note. - The lights specified herein are intended to meet the requirements of Annex 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 a), b) and c) should be visible at a distance of at least 3.7 km (2 NM). The light described in 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.

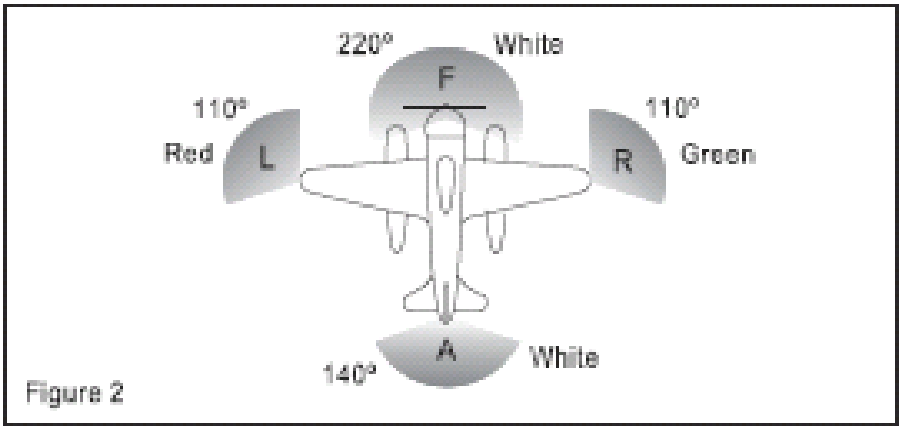


Figure 2

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 vertical line at least 2 m above it.

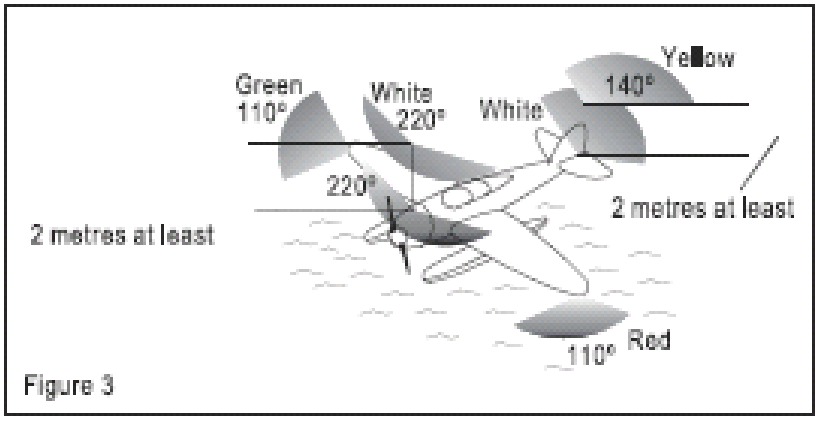


Figure 3

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).

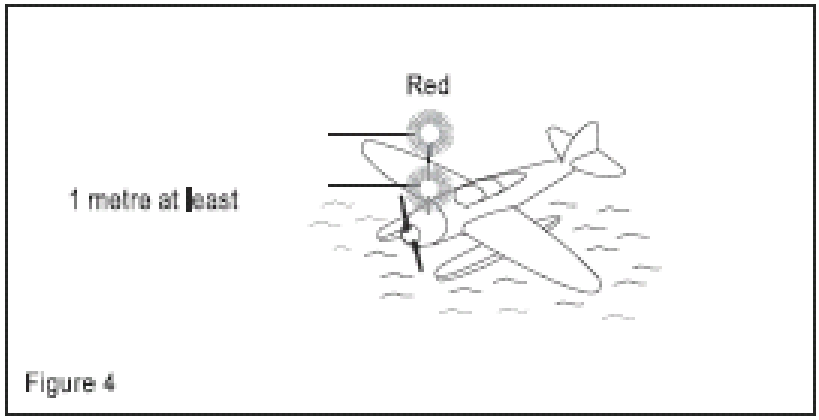


Figure 4

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.

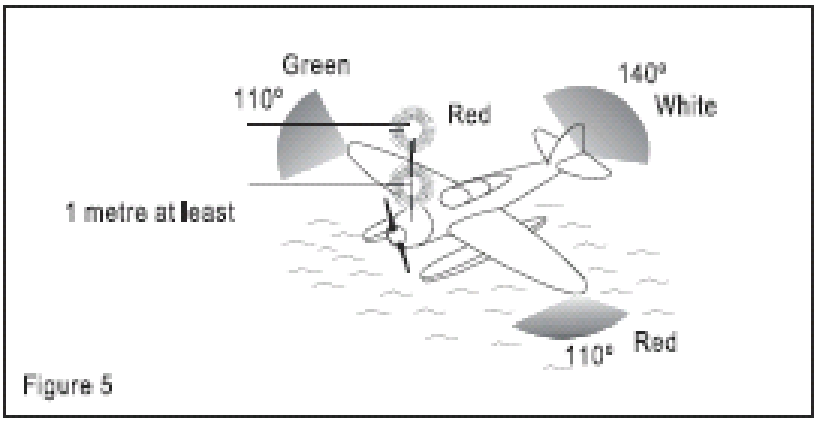


Figure 5

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).

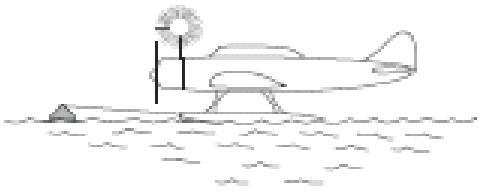


Figure 6

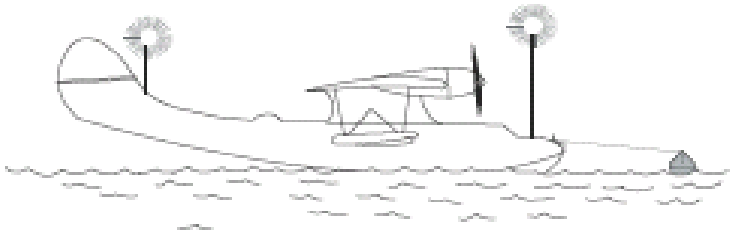
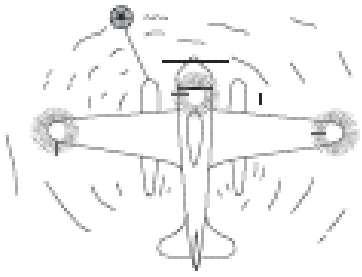
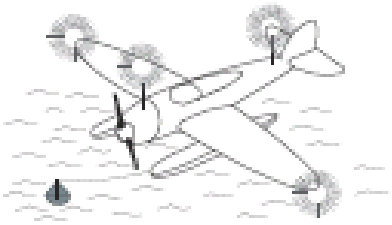


Figure 7



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. ALTIMETRY SYSTEM PERFORMANCE REQUIREMENTS FOR OPERATIONS IN RVSM AIRSPACE

(Note. - See Chapter 7, 7.2.5)

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.

ATTACHMENT A. ACAS II TRAINING GUIDELINES FOR PILOTS

Supplementary to 4.19

1. ACAS performance during High Vertical Rate (HVR) encounters

1.1 As of 2006, data collected by ACAS monitoring programs continue to show that a large percentage of ACAS RA's are a result of climbing or descending aircraft maintaining a high vertical speed while approaching their ATC-assigned altitude. Changes have been made to the ACAS SARP's and guidance material (see ICAO Annex 10) that have been effective in reducing the frequency of occurrence for these types of RA's, but these types of RA's continue to occur with a high degree of regularity in airspace throughout the world. It has been determined that no further changes are feasible within ACAS to address this issue without resulting in an unacceptable degradation of the safety provided by ACAS.

1.2 Modern aircraft and their flight guidance systems (autopilots, flight management systems, and auto throttles) are designed to fly specific flight profiles that provide fuel and time efficient flight paths. An integral concept of the design of the flight guidance systems includes allowing an aircraft to quickly climb to higher, more efficient operating altitudes and to remain at these altitudes as long as possible, which results in descents also being made with high vertical speeds. For economic benefits, the high vertical speeds used in a climb or decent are retained as long as feasible before initiating a smooth capture of the aircraft's assigned altitude.

1.3 The design of the flight guidance systems can result in vertical speeds in excess of 15 m/s (3 000 ft/min) until they are within 150 m (500 ft) of the aircraft's assigned altitude. When a climbing or descending aircraft maintains a vertical speed in excess of 15 m/s (3 000 ft/min) until it is within 150 m (500 ft) of the aircraft's assigned altitude, it is less than 30 seconds away from being at the adjacent IFR altitude, which may be occupied by an ACAS-equipped aircraft flying level at that altitude. If the intruder aircraft is horizontally within the protected area provided by ACAS, there is a high probability that an RA against the climbing or descending aircraft will be issued just as the intruder aircraft begins to reduce its vertical speed to capture its assigned altitude.

1.4 Figure 1 provides a representation of the encounter geometry of this scenario. ACAS typically issues a Climb RA, which calls for a climb at 8 m/sec (1 500 ft/min). Depending on the altitude of the level aircraft, this RA will typically be issued when the intruder aircraft is approximately 500 feet below its assigned altitude and the vertical speed of the intruder is in excess of 3 000 ft/min.

1.5 ACAS in the level aircraft is tracking a climbing/descending (intruder) aircraft and is using replies to its interrogations to determine the intruder's altitude and its vertical

speed. The ACAS track is updated once per second. The intruding aircraft's track information, along with the track of the level ACAS aircraft (own aircraft), is used within ACAS to determine if the intruder aircraft is currently a threat or will be in the near future.

1.6 In determining whether the intruder aircraft will be a threat in the future, ACAS projects the existing vertical speed of the intruder and own aircraft, to estimate the vertical separation that will exist at the closest point of horizontal approach during the encounter. These projections use the current vertical speed of both aircraft, and ACAS is not aware of the intruder aircraft's intent to level at an adjacent altitude above or below its own aircraft's current altitude. Should this projection be less than the ACAS desired vertical separation, an RA will be issued.

1.7 Should the intruder aircraft continue to climb/descend with the high vertical speed until it is 15 to 25 seconds from being at the same altitude as the level ACAS aircraft (again depending on the ACAS aircraft's altitude), ACAS will issue an RA calling for the own aircraft to maneuver to increase vertical separation from the intruder aircraft.

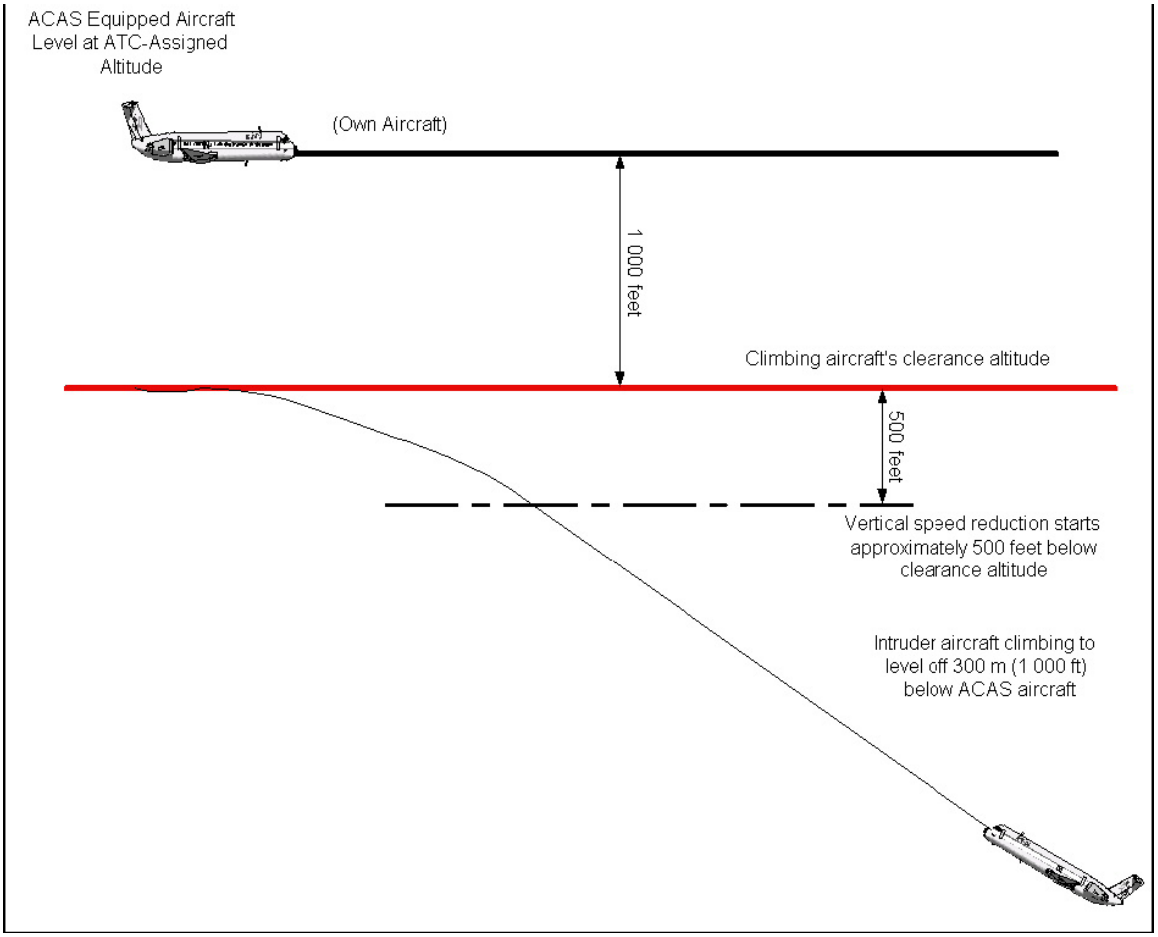


Figure III-3-3-1. Representative HVR Encounter Geometry

2. Operational impact of RA's resulting from HVR encounters

2.1 Shortly after ACAS issues the RA (Climb RA for the encounter geometry shown in Figure III-3-3-1), the intruder aircraft begins reducing its vertical rate to capture its assigned altitude.

2.2 While the intruder aircraft is initiating its level off, the ACAS aircraft has started responding to its RA and may have left its assigned altitude. Both pilots and controllers agree that RA's issued in this encounter geometry are unwelcome. The RA's can be disruptive to a controller's current traffic flow and plans, and thus represent an increase in their workload. The response to the RA can also result in a loss of standard ATC separation if another aircraft is above the ACAS aircraft.

2.3 Pilots have reported that these types of RA's decrease their confidence in the performance of ACAS. These RA's typically occur repeatedly in the same geographic area and repeated RA's of this type result in pilots being reluctant to follow the RA. This can be potentially hazardous in the event that the intruder aircraft passes through its assigned altitude.

3. Frequency of occurrence

3.1 ACAS monitoring shows that the frequency of occurrence is dependent on how airspaceis structured and managed. Data collected during 2001 indicate that up to 70% of the RA's issued are caused by the intruder aircraft maintaining a high vertical speed while approaching its assigned altitude.
Depending on the airspace structure and the flow of traffic, it is possible to have several of these RA's issued within one hour, although airspace containing a lower density of traffic will have relatively few RA's of this type. Some air traffic service providers have been able to change their traffic flows and/or operational procedures to reduce the occurrence of these types of RA's, but these types of RA's continue to occur with a high degree of regularity in airspace throughout the world. 3.2 HVR RA's have been observed in both terminal and en route airspace, although because of the previously higher vertical separation above FL 290 in non-RVSM airspace, very few RA's of this type have been observed above FL 290 in the past. With the current reduced separation, it is possible that HVR RA's may occur more frequently above FL 290 in RVSM airspace. Many HVR RA's occur in close proximity to large airports where departures are kept below arriving aircraft until some distance from the
airport before being allowed to climb to higher altitudes and a large percentage of these RA's occur in geographic areas where there is a concentration of climbing and descending aircraft.

4. ACAS features that reduce the likelihood of RA's being issued in these situations

4.1 ACAS recognizes HVR encounters, such as that shown in Figure III-3-3-1. When this encounter geometry is detected, the issuance of RA's can be delayed by up to ten seconds. This delay allows additional time for the intruder aircraft to initiate a level off and for ACAS to then detect this level off. However, when the intruder aircraft maintains a vertical speed in excess of 15 m/s (3 000 ft/min) until it is within 150 m (500 ft) of its assigned altitude, even this 10-second delay may be insufficient for ACAS to detect the level off, and an RA may be issued. Safety studies have shown that further delays in issuing the RA result in unacceptable degradation in the safety provided by ACAS.

4.2 Consideration has also been given to providing ACAS with information regarding the intruder aircraft's intent. This is not considered to be a viable approach to reducing these types of RA's while retaining the existing level of safety provided by ACAS. Currently, it has not been possible to identify any additional changes to ACAS that will provide a further reduction in the frequency of these potentially disruptive RA's.

5. Operator-specified procedures

5.1 Because of the operational impacts to pilots and controllers caused by these types of RA's, the continued existence of these RA's, and the constraints on further modifications to ACAS, operators shall specify procedures by which an aeroplane climbing or descending to an assigned altitude or flight level with an autopilot engaged may do so at a rate less than 8 m/sec (1 500 ft/min) within 300 m (1 000 ft) of the assigned level. Such procedural changes should provide an immediate operational benefit to both pilots and controllers by reducing the occurrence of HVR RA's.

5.2 The implementation of such procedures will not completely eliminate these RA's, but in the absence of other solutions such as the redesign of airspace, their implementation will reduce the frequency of these undesirable RA's until a technical solution can be developed. Options that operators should consider include flying the entire climb or descent at a pre-selected rate, modifying the climb or descent in the latter stage, and employing use of less than economic climb thrust in lower airspace.

5.3 A recommended procedure would call for a climbing or descending aircraft to adjust its vertical rate when approaching an assigned altitude, and when the pilot is aware that there is an aircraft level at an adjacent altitude. The crew can be made aware of the presence of the level aircraft by several means, including information provided by a controller, an ACAS TA, or by visual acquisition. When a crew of an intruder aircraft becomes aware that another aircraft is at an adjacent altitude, it is recommended that the vertical speed of the intruder aircraft be reduced to less than 8 m/s (1 500 ft/min) when approaching an altitude that is 300 m (1 000 ft) above or below the assigned altitude.

Note. - There is no intent in this recommendation to require a modification in vertical speed for every level off. This is not necessary and would introduce a significant increase in pilot workload.

5.4 Some autopilots may not properly capture the altitude if a mode change or vertical speed change is made after the altitude capture has started. Altitude deviations represent a significant percentage of pilot deviations and the performance of the autopilot during any altitude capture should be closely monitored in accordance with existing procedures.

5.5 Additional tasks may be required during some level off maneuvers. However, the procedure is a recommendation, not a requirement. Further, the procedure does not suggest that adjustments to the aircraft's vertical speed be made unless the pilot is aware that traffic is at an adjacent altitude.

5.6 The operator should specify procedures that the pilot may use to reduce vertical speed when an autopilot is engaged, as appropriate for the type of aircraft. Also, the operator should consider authorizing pilots to use a modest vertical speed throughout a climb or descent when the vertical interval is not large – such as a change of altitude in a holding pattern - specifying how this should be accomplished.

ATTACHMENT B. COMPANY OPERATIONS MANUAL

Supplementary to 12.4.2.2

The following is the suggested content of a company operations manual. It may be issued in separate parts corresponding to specific aspects of an operation. It should include the instructions and information necessary to enable the personnel concerned to perform their duties safely and shall contain at least the following information:

a) table of contents;

b) amendment control page and list of effective pages, unless the entire document is reissued with each amendment and the document has an effective date on it;

c) duties, responsibilities and succession of management and operating personnel;

d) operator safety management system;

e) operational control system;

f) MEL procedures (where applicable);

g) normal flight operations;

h) SOPs;

i) weather limitations;

j) flight and duty time limitations;

k) emergency operations;

l) accident/incident considerations;

m) personnel qualifications and training;

n) record keeping; and

o) a description of the maintenance control system.

p) security procedures (where applicable);

q) performance operating limitations;

r) use/protection of FDR/CVR records (where applicable);

s) handling of dangerous goods; and

t) use of head-up displays (HUD)/enhanced vision systems (EVS).

ATTACHMENT C. MINIMUM EQUIPMENT LIST (MEL)

Supplementary to 12.6.1.1

MINIMUM EQUIPMENT LIST (MEL)

1. If deviations from the requirements of States 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 un-serviceability can be accepted in the short term when the remaining operative systems and equipment provide for continued safe operations.

2. The State 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 State of the Operator, 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. The State of the Operator should require 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 program 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 the State of the Operator 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 deactivate 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 4.4.1.

ATTACHMENT D1 FLIGHT RECORDERS

Supplementary to 6.10

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 four systems: a flight data recorder (FDR), a cockpit voice recorder (CVR), an airborne image recorder (AIR) and/or a data link recorder (DLR). Lightweight flight recorders comprise one or more of the following four systems: an aircraft data recording system (ADRS), a cockpit audio recording system (CARS), an airborne image recording system (AIRS) and/or a data link recording system (DLRS).

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ATTACHMENT D2 FLIGHT RECORDERS

Supplementary to 6.10 and 12.6.3

Introduction

The material in this Attachment concerns flight recorders intended for installation in aeroplanes engaged in international air navigation. Crash protected flight recorders comprise four systems a flight data recorder (FDR), a cockpit voice recorder (CVR), an airborne image recorder (AIR) and a data link recorder (DLR). Lightweight flight recorders comprise fours systems: an aircraft data recording system (ADRS), a cockpit audio recording system (CARS), an airborne image recording system (AIRS) and a data link recording system (DLRS).

1. General requirements

1.1 The FDR container is to:

a) be painted a distinctive orange or yellow colour;
b) carry reflective material to facilitate its location; and
c) have securely attached an automatically activated underwater locating device.

1.2 The FDR is to be installed so that:

a) the probability of damage to the recording is minimized
b) it receives its electrical power from a bus that provides the maximum reliability for operation of the FDR without jeopardizing service to essential or emergency loads; and
c) there is an aural or visual means for pre-flight checking that the FDR is operating properly.
d) if the flight recorder systems have a bulk erasure device, the installation shall be designed to prevent operation of the device during flight time or crash impact.

1.3 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.

1.4 Means shall be provided for an accurate time correlation between the recorder systems recordings.

1.5 The manufacturer shall provide the appropriate certificating authority with the following information in respect of theflight recorder systems:

a) manufacturer’s operating instructions, equipment limitations and installation procedures; and
b) manufacturer’s test reports.

2 Flight data recorder (FDR)

2.1 The flight data recorder 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

2.2.1 Type I FDR. This FDR will be capable of recording, as appropriate to the aeroplane, at least the 32 parameters in Table D-1. However, other parameters may be substituted with due regard to the aeroplane type and the characteristics of the recording equipment.

2.2.2 Types II and IIA FDRs. These FDRs will be capable of recording, as appropriate to the aeroplane, at least the first 15 parameters in Table D-1. However, other parameters may be substituted with due regard to the aeroplane type and the characteristics of the recording equipment.

1.3 Additional information

1.3.1 A Type IIA FDR, in addition to a 30-minute recording duration, is to retain sufficient information from the preceding take-off for calibration purposes.

1.3.2 The measurement range, recording interval and accuracy of parameters on installed equipment is usually verified by methods approved by the appropriate certificating authority.

1.3.3 The manufacturer usually provides the national certificating authority with the following information in respect of the FDR:

a) manufacturer’s operating instructions, equipment limitations and installation procedures;
b) parameter origin or source and equations which relate counts to units of measurement; and
c) manufacturer’s test reports.

1.3.4 Documentation concerning parameter allocation, conversion equations, periodic calibration and other serviceability/maintenance information should be maintained by the operator. The documentation must be sufficient to ensure that accident investigation authorities have the necessary information to read out the data in engineering units.

2. Cockpit voice recorder (CVR)

2.1 General requirements

2.1.1 The CVR is to be designed so that it will record 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;

d) voice or audio signals identifying navigation or approach aids introduced in the headset or speaker;

e) voice communication of flight crew members using the passenger address system, if installed; and

f) digital communications with ATS, unless recorded by the FDR.

2.1.2 The CVR container is to:

a) be painted a distinctive orange or yellow colour;

b) carry reflective material to facilitate its location; and

c) have securely attached an automatically activated under-water locating device.

2.1.3 To aid in voice and sound discrimination, microphones in the cockpit are to be located in the best position for recording voice communications originating at the pilot and co-pilot stations and voice communications of other crew members on the flight deck when directed to those stations. This can best be achieved by wiring suitable boom microphones to record continuously on separate channels.

2.1.4 The CVR is to be installed so that:

a) the probability of damage to the recording is minimized. To meet this requirement it should be located as far aft as practicable. In the case of pressurized aeroplanes it should be located in the vicinity of the rear pressure bulkhead;

b) it receives its electrical power from a bus that provides the maximum reliability for operation of the CVR without jeopardizing service to essential or emergency loads;

c) there is an aural or visual means for pre-flight checking of the CVR for proper operation; and

d) if the CVR has a bulk erasure device, the installation should be designed to prevent operation of the device during flight time or crash impact.

2.2 Performance requirements

2.2.1 The CVR will be capable of recording on at least four tracks simultaneously except for the CVR in Chapter 6.10.5.2. To ensure accurate time correlation between tracks, the CVR is to record in an inline format. If a bi-directional configuration is used, the in-line format and track allocation should be retained in both directions.

2.2.2 The preferred track allocation is as follows:

Track 1 — co-pilot headphones and live boom microphone

Track 2 — pilot headphones and live boom microphone

Track 3 — area microphone

Track 4 — time reference plus the third and fourth crewmembers' headphone and live microphone, if applicable.

Note 1. - Track 1 is located closest to the base of the recording head.

Note 2. - The preferred track allocation presumes use of current conventional magnetic tape transport mechanisms, and is specified because the outer edges of the tape have a higher risk of damage than the middle. It is not intended to preclude use of alternative recording media where such constraints may not apply.

2.2.3 The CVR, when tested by methods approved by the appropriate certificating authority, will be demonstrated to be suitable for the environmental extremes over which it is designed to operate.

2.2.4
Means will be provided for an accurate time correlation between the FDR and CVR.

Note. - One method of achieving this is by superimposing the FDR time signal on the CVR.

2.3 Additional information
The manufacturer usually provides the national certificating authority with the following information in respect of the CVR:

a) manufacturer's operating instructions, equipment limitations and installation procedures; and

b) manufacturer's test reports.

3. Inspections of FDR and CVR systems

3.1 Prior to the first flight of the day, the built-in test features on the flight deck for the CVR, FDR and Flight Data Acquisition Unit (FDAU), when installed, should be monitored.

3.2 Annual inspections should be carried out as follows:

a) the read-out of the recorded data from the FDR and CVR should ensure that the recorder operates correctly for the nominal duration of the recording;

b) the analysis of the FDR should evaluate the quality of the recorded data to determine if the bit error rate is within acceptable limits and to determine the nature and distribution of the errors;

c) a complete flight from the FDR should be examined in engineering units to evaluate the validity of all recorded parameters. Particular attention should be given to

parameters from sensors dedicated to the FDR. Parameters taken from the aircraft's electrical bus system need not be checked if their serviceability can be detected by other aircraft systems;

d) the read-out facility should have the necessary software to accurately convert the recorded values to engineering units and to determine the status of discrete signals;

e) an annual examination of the recorded signal on the CVR should be carried out by re-play of the CVR recording. While installed in the aircraft, the CVR should record test signals from each aircraft source and from relevant external sources to ensure that all required signals meet intelligibility standards; and

f) where practicable, during the annual examination, a sample of in-flight recordings of the CVR should be examined for evidence that the intelligibility of the signal is acceptable.

3.3 Flight recorder systems should 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.

3.4 A report of the annual inspection should be made available on request to the State's regulatory authority for monitoring purposes.

3.5 Calibration of the FDR system:

a) the FDR system should be re-calibrated at least every five years 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 should be a re-calibration performed as recommended by the sensor manufacturer, or at least every two years.

Table D-1

Table D-1
Parameters for Flight Data Recorders

Serial number	Parameter	Measurement range	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 GPS time sync)	24 hours	4	±0.125% per hour	1 second
2	Pressure altitude	–300 m (–1 000 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 kt) to max V_{S_0} (Note 1) V_{S_0} to 1.2 V_D (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 3)	–3 g to +6 g	0.125	±1% of maximum range excluding datum error of ±5%	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 4)	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
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 temperature	Sensor range	2	±2°C	0.3°C
15*	Autopilot/auto throttle/AFCS mode and engagement status	A suitable combination of discretes	1		
Note.— The preceding 15 parameters satisfy the requirements for a Type II FDR.					
16	Longitudinal acceleration (Note 3)	±1 g	0.25	±0.015 g excluding a datum error of ±0.05 g	0.004 g
17	Lateral acceleration (Note 3)	±1 g	0.25	±0.015 g excluding a datum error of ±0.05 g	0.004 g

Serial number	Parameter	Measurement range	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 3 and 5)	Full range	0.25	±2° unless higher accuracy uniquely required	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 2 500 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/GPS/GLS glide path MLS elevation, IRNAV/IAN vertical deviation)	Signal range	1	±3%	0.3% of full range
22*	Horizontal beam deviation (ILS/GPS/GLS localizer, MLS azimuth, IRNAV/IAN lateral deviation)	Signal range	1	±3%	0.3% of full range
23	Marker beacon passage	Discrete	1		
24	Master warning	Discrete	1		
25	Each NAV receiver frequency selection (Note 6)	Full range	4	As installed	
26*	DME 1 and 2 distance (includes distance to runway threshold (FLS) and distance to missed approach point (IRNAV/IAN) (Notes 6 and 7)	0–370 km (0–200 NM)	4	As installed	1 852 m (1 NM)
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 position)	Discrete	1		
29*	Angle of attack	Full range	0.5	As installed	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 8)	As installed	1	As installed	
32*	Landing gear and gear selector position	Discrete	4	As installed	

Note.— The preceding 32 parameters satisfy the requirements for a Type I FDR.

Serial number	Parameter	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
33*	Groundspeed	As installed	1	Data should be obtained from the most accurate system	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
35*	Additional engine parameters (EPR, N_1, indicated vibration level, N_2, EGT, fuel flow, fuel cut-off lever position, N_3)	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
44*	Selected flight path (all pilot selectable modes of operation) (course/DSTRK, path angle, final approach path (IRNAV/IAN))		1	As installed	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 position	Discrete(s)	4	As installed	

Serial number	Parameter	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
51*	APU bleed valve position	Discrete(s)	4	As installed	
52*	Computer failure	Discrete(s)	4	As installed	
53*	Engine thrust command	As installed	2	As installed	2% of full range
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	
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 engine vibration	As installed	1	As installed	
63*	Engine warning each engine over temperature	As installed	1	As installed	
64*	Engine warning each engine oil pressure low	As installed	1	As installed	
65*	Engine warning each engine over speed	As installed	1	As installed	
66*	Yaw trim surface position	Full range	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 systems selection	Discretes	4		
70*	Hydraulic pressure (each system)	Full range	2	±5%	100 psi
71*	Loss of cabin pressure	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 position roll	Full range	1	±5%	0.2% of full range or as installed
74*	Cockpit trim control input position yaw	Full range	1	±5%	0.2% of full range or as installed

Serial number	Parameter	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
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	

Note.— The preceding 78 parameters satisfy the requirements for a Type IA FDR.

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. Refer to 6.10.1.2.1 for increased recording requirements.

4. Record sufficient inputs to determine power.

5 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..

6. If signal available in digital form.

7. Recording of latitude and longitude from INS or other navigation system is a preferred alternative

8. If signals readily available.

If further recording capacity is available, recording of the following additional information should 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 autoflight 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;

4) the identity of displayed pages for emergency procedures and checklists;

b) retardation information including brake application for use in the investigation of landing overruns and rejected take-offs.

Table D-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 logon 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 (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, D-METAR, D-ATIS, D-NOTAM and other textual data link services.	C
5	Aircraft Broadcast Surveillance	This includes Elementary and Enhanced Surveillance Systems, as well as 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 source are recorded on the FDR.	M *
6	Aeronautical Operational Control Data	This includes any application transmitting or receiving data used for AOC purposes (per the ICAO definition of AOC).	M *

Key:

C: Complete contents recorded.
M: Information that enables correlation to any associated records stored separately from the aeroplane.
*: Applications that are to be recorded only as far as is practicable given the architecture of the system.

Table D-3
Parameter Guidance for Aircraft Data Recording Systems

N°	Parameter name	Parameter category	Minimum recording range	Maximum recording interval in seconds	Minimum recording accuracy	Minimum recording resolution	Remarks
1	Heading (Magnetic or True)	R*	±180 degrees	1	±2 degrees	0.5 degree	* If not available, record rates
2	Pitch attitude	E*	±90 degrees	0.25	±2 degrees	0.5 degree	* If not available, record rates
3	Roll attitude	E*	±180 degrees	0.25	±2 degrees	0.5 degree	* If not available, record rates
4	Yaw rate	E*	±300 degrees/s	0.25	±1% + drift of 360°/hr	2 degree/s	* Essential if no heading available
5	Pitch rate	E*	±300 degrees/s	0.25	±1% + drift of 360°/hr	2 degree/s	* Essential if no pitch attitude available
6	Roll rate	E*	±300 degrees/s	0.25	±1% + drift of 360°/hr	2 degree/s	* Essential if no roll attitude available
7	Positioning system: latitude/longitude	E	Latitude: ±90 degrees Longitude: ±180 degrees	2 (1 if available)	As installed (0.00015 degree recommended)	0.00005 degree	
8	Positioning system estimated error	E*	Available range	2 (1 if available)	As installed	As installed	* If available
9	Positioning system: altitude	E	-300 m (-1 000 ft) to maximum certificated altitude of aircraft +1 500 m (5 000 ft)	2 (1 if available)	As installed (±15 m (±50 ft) recommended)	1.5 m (5 ft)	
10	Positioning system: time*	E	24 hours	1	±0.5 second	0.1 second	* UTC time preferred where available.

Intentionally left blank

N°	Parameter name	Parameter category	Minimum recording range	Maximum recording interval in seconds	Minimum recording accuracy	Minimum recording resolution	Remarks
11	Positioning system: ground speed	E	0–1 000 kt	2 (1 if available)	As installed (±5 kt recommended)	1 kt	
12	Positioning system: channel	E	0–360 degrees	2 (1 if available)	As installed (±2 degrees recommended)	0.5 degrees	
13	Normal acceleration	E	–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	
14	Longitudinal acceleration	E	±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	
15	Lateral acceleration	E	±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	
16	External static pressure (or pressure altitude)	R	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)	
17	Outside air temperature (or total air temperature)	R	–50° to +90°C or available sensor range	2	As installed (±2°C recommended)	1°C	
18	Indicated air speed	R	As the installed pilot display measuring system or available sensor range	1	As installed (±3% recommended)	1 kt (0.5 kt recommended)	
19	Engine RPM	R	Full range including overspeed condition	Each engine each second	As installed	0.2% of full range	
20	Engine oil pressure	R	Full range	Each engine each second	As installed (5% of full range recommended)	2% of full range	
21	Engine oil temperature	R	Full range	Each engine each second	As installed (5% of full range recommended)	2% of full range	
22	Fuel flow or pressure	R	Full range	Each engine each second	As installed	2% of full range	

N°	Parameter name	Parameter category	Minimum recording range	Maximum recording interval in seconds	Minimum recording accuracy	Minimum recording resolution	Remarks
23	Manifold pressure	R	Full range	Each engine each second	As installed	0.2% of full range	
24	Engine thrust/power/torque parameters required to determine propulsive thrust/power*	R	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.
25	Engine gas generator speed (Ng)	R	0-150%	Each engine each second	As installed	0.2% of full range	
26	Free power turbine speed (Nf)	R	0-150%	Each engine each second	As installed	0.2% of full range	
27	Coolant temperature	R	Full range	1	As installed (±5°C recommended)	1°C	
28	Main voltage	R	Full range	Each engine each second	As installed	1 Volt	
29	Cylinder head temperature	R	Full range	Each cylinder each second	As installed	2% of full range	
30	Flaps position	R	Full range or each discrete position	2	As installed	0.5 degree	
31	Primary flight control surface position	R	Full range	0.25	As installed	0.2% of full range	
32	Fuel quantity	R	Full range	4	As installed	1% of full range	
33	Exhaust gas temperature	R	Full range	Each engine each second	As installed	2% of full range	
34	Emergency voltage	R	Full range	Each engine each second	As installed	1 Volt	
35	Trim surface position	R	Full range or each discrete position	1	As installed	0.3% of full range	
36	Landing gear position	R	Each discrete position *	Each gear every two seconds	As installed		* Where available, record up-and-locked and down-and-locked position
37	Novel/unique aircraft features	R	As required	As required	As required	As required	

Key:
E: Essential parameters
R: Recommended parameters

-END-

ATTACHMENT E. FIRST-AID MEDICAL SUPPLIES

(Supplementary to Chapter 12.6.2)

TYPES, NUMBER, LOCATION ANDCONTENTS OF MEDICAL SUPPLIES

1. Types

Two types of medical supplies shall be provided: first-aid kit(s) for carriage in all aeroplanes and a medical kit for carriage where the aeroplane is authorized to carry more than 250 passengers.

2. Number of 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 – 50	1
51 – 150	2
151 – 250	3
More than 250	4

3. Location

3.1 It is essential that the required first-aid kits be distributed as evenly as practicable throughout the passenger
cabin. They should be readily accessible to cabin crew, and, in view of the possible use of medical supplies outside the aeroplane in an emergency situation, they should be located near an exit.

3.2 The medical kit, when carried, should be stored in an appropriate secure location.

4. Contents

4.1 Different factors must be taken into consideration in deciding the contents of first-aid kits and medical kits. The following are typical contents of first-aid and medical kits for carriage aboard an aeroplane.

4.1.1 *First-aid kit:*
— a handbook on first aid

— ‘‘ground-air visual signal code for use by survivors’’ as contained in the Air Traffic State Decree AB 2008 no44
— materials for treating injuries
— ophthalmic ointment
— a decongestant nasal spray
— insect repellant
— emollient eye drops
— sunburn cream
— water-miscible antiseptic/skin cleanser
— materials for treatment of extensive burns
— oral drugs as follows: analgesic, antispasmodic, central nervous system stimulant, circulatory stimulant, coronary vasodilator, antidiarrhoeic and motion sickness medications
— an artificial plastic airway and splints.

4.1.2 *Medical kit:*
Equipment
— one pair of sterile surgical gloves
— sphygmomanometer
— stethoscope
— sterile scissors
— haemostatic forceps
— haemostatic bandages or tourniquet
— sterile equipment for suturing wounds
— disposable syringes and needles
— disposable scalpel handle and blade

Drugs
— coronary vasodilators
— analgesics
— diuretics
— anti-allergics
— steroids
— sedatives
— ergometrine
— where compatible with regulations of the appropriate authority, a narcotic drug in injectable form
— injectable broncho dilator.

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.