

FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

FIFTH EDITION - 2011



**CIVIL AVIATION AUTHORITY
of NEPAL**

Adoption of the Standards of the Annexes to the Chicago Convention of ICAO under Article 81 and approved for publication by the Director General, Civil Aviation Authority of Nepal, under Article 82 of the Civil Aviation Rules, 2058 BS.

Flight Operations Division, Aviation Safety Department, CAAN.

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FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

Foreword

FOREWORD

Flight Operations Requirements, known hereafter as FOR, is hereby issued by the Director General of Civil Aviation Authority of Nepal in pursuant the Article 82 of Civil Aviation Regulation 2058 B.S. (2002 A.D.).

These Requirements complement and amplify the Civil Aviation Regulation 2058 issued by Civil Aviation Authority of Nepal under the authority of Civil Aviation Authority Act. 2053 B.S. (1996A.D.) and applicable to personnel involved in Flight Operation of Nepalese Civil Registration Aircraft.

First, Second, Third and Fourth Editions of Flight Operations Requirements were issued on August 1990, May 1998, October 2005 and January 2009 respectively. This Fifth Edition of FOR is issued as FLIGHT OPERATIONS REQUIREMENTS (AEROPLANE) as required by ICAO Annex 6 Part I (including the Standards up to Amendment No. 34) and inclusive of FOD No. 1 to FOD No. 4 of the Fourth edition of the FOR-A.

It shall be the obligation of the operator to adhere to and maintain flight operations in accordance with the requirements of this manual.

This manual has been prepared to maintain compliance with the Standards of the ICAO Annexes and Documents as far as practicable. *Recommendations* of the Annexes have been marked here as RESERVED. Matters relating to Personnel Licensing have been removed and will be incorporated in the Personnel Licensing Requirements (PELR) manual. SMS implementation requirements previously issued as Flight Operations Order 001 has been included in this edition as Appendix 7. The chapter on Operations with Leased Aircraft has been removed from the FOR and will be included in the AOCR.

This Fifth edition shall be applicable immediately and will be amended as necessary. Any suggestions to improve this manual should be addressed to the DG, CAAN.

Director General
Civil Aviation Authority of Nepal
12 January 2011



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

Record of
Amendments

RECORD OF AMENDMENTS

This manual shall be updated as and when necessary. It shall be the responsibility of the owner of the manual to ensure that it is continuously updated and the entries to be recorded.

No.	DATE APPLICABLE	DATE ENTERED	ENTERED BY	No.	DATE APPLICABLE	DATE ENTERED	ENTERED BY
01	15/03/2012	21/03/2012	<i>[Signature]</i>				
02	18/06/2013	23/06/2013	<i>[Signature]</i>				
03	02/09/2013	04/09/2013	<i>[Signature]</i>				
04a	24/12/2013	24/12/2013	<i>[Signature]</i>				
05	24/11/2015	24/11/2015	<i>[Signature]</i>				
06	01/06/2016	01/01/2016	<i>[Signature]</i>				
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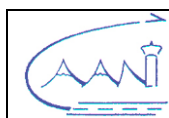
LIST OF EFFECTIVE PAGES

**FOR-Aeroplane 5th edition
Amendment No. 08**

Amendment Date: 17 July 2016

Replace or add the following pages

CHAPTER NUMBER	PAGE REFERENCE NO.
3	3-9
9	9-4
15	15-7 15-8
APP 1	APP 1-1
APP 2	APP 2-1 to 2-10



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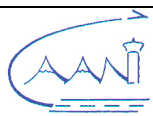
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CHAPTER 1

DEFINITIONS AND ABBREVIATIONS

DEFINITIONS

When the following terms are used in the Flight Operations Requirements have the following meanings:

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

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 2D instrument approach operations, expressed in terms of visibility and/or runway visual range, minimum descent altitude/height (MDA/H) and, if necessary, cloud conditions; and
- c) landing in 3D instrument approach operations, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H) as appropriate to the type and/or category of the operation.

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

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.



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

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

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

ETOPS en-route alternate. A suitable and appropriate alternate aerodrome at which an aeroplane would be able to land after experiencing an engine shutdown or other abnormal or emergency condition while en route in an ETOPS operation.

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.

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:

1. a ground-based navigation aid; or
2. computer generated navigation data.



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Cargo: Things other than passengers carried on aircraft.

Category A STOL Airfield: Those STOL airfields located below 5500 feet AMSL and where missed approach is possible.

Category B STOL Airfield: Those STOL airfields which are below 7000 feet above mean sea level and where missed approach is critical.

Category C STOL Airfield: Those STOL airfields which are at or above 7000 feet above mean sea level, approach is difficult due to local weather conditions and where missed approach is not advisable or possible after a certain point during the approach and landing phase.

COMAT. Operator material carried on an operator's aircraft for the operator's own purposes.

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

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

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

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.

Continuous descent final approach (CDFA). A technique, consistent with stabilized approach procedures, for flying the final approach segment of a non-precision instrument approach procedure as a continuous descent, without level-off, from an altitude/height at or above the final approach fix altitude/height to a point approximately 15 m (50 ft) above the landing runway threshold or the point where the flare manoeuvre should begin for the type of aircraft flown.

Co-pilot. A licensed pilot serving in any piloting capacity other than as pilot-in-command but excluding a pilot who is on board the aircraft for the sole purpose of receiving flight instruction.

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

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

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



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CHAP 1-4

Damp Lease means wet lease with partial - crew

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 ICAO Annex 18, Chapter 3.

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

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

Note 2.— The required visual reference means that section of the visual aids or of the approach area which 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”.

Director General. Director General of Civil Aviation Authority of Nepal.

Differences Training. - The training required for crew members and dispatchers who have qualified and served on a particular type of aircraft but the differences training is necessary before a crewman serves in the same capacity on a particular variation of that aircraft.

Dry Lease. means a lease of aircraft without the crew. In this case the aircraft is normally registered in the AOC holder's State, bears the lessee's AOC holder name/logo and is operated under the AOC of the Lessee;

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

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

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



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

Note.— Attachment D contains guidance on EDTO critical fuel scenarios.

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

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

Emergency locator transmitter (ELT). A generic term describing equipment which 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.

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

Fatigue. A physiological state of reduced mental or physical performance capability resulting from sleep loss or extended wakefulness, circadian phase, or workload (mental and/or physical activity) that can impair a crew member's alertness and ability to safely operate an aircraft or perform safety-related duties.



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

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

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

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

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

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

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

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

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

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

Flight simulation training device. 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



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CHAP 1-7

functions, the normal environment of flight crew members, and the performance and flight characteristics of that **type** of aircraft are realistically simulated;

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

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

Flight time — aeroplanes. 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.

Glider A non-power-driven heavier-than-air aircraft, deriving its lift in flight chiefly from aerodynamic reaction on surfaces which remain fixed under given conditions of flight.

Glider flight time. The total time occupied in flight whether being towed or not, from the moment the glider first moves for the purpose of taking off until the moment it comes to rest at the end of the flight.

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

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

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

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

In-flight – refers to manouevers procedures or functions that must be conducted in the aircraft.

Initial Training - The training required for crew members and dispatchers who have not qualified and served in the same capacity on another aircraft of the same group.



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CHAP 1-8

Inspector means Flight Operation Inspector authorized by the Director General.

Instrument flight time. Time during which a pilot is piloting an aircraft solely by reference to instruments and without external reference points.

Instrument ground time. Time during which a pilot is practicing, on the ground, simulated instrument flight in a synthetic flight trainer approved

Instrument time. Instrument flight time or instrument ground time.

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

- a) a two-dimensional (2D) instrument approach operation, using lateral navigation guidance only; and
- b) a three-dimensional (3D) instrument approach operation, using both lateral and vertical navigation guidance.

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

- a) a ground-based radio navigation aid; or*
- b) computer-generated navigation data from ground-based, space-based, self-contained navigation aids or a combination of these.*

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

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

Note.— Non-precision approach procedures may be flown using a continuous descent final approach (CDFA) technique. CDFAs with advisory VNAV guidance calculated by on-board equipment (see PANS-OPS (Doc 8168), Volume I, Part I, Section 4, Chapter 1, paragraph 1.8.1) are considered 3D instrument approach operations. CDFAs with manual calculation of the required rate of descent are considered 2D instrument approach operations. For more information on CDFAs, refer to PANS-OPS (Doc 8168), Volume I, Part I, Section 4, Chapter 1, paragraphs 1.7 and 1.8.

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



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

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

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

Instrument meteorological conditions (IMC). Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling (as defined in ICAO Annex 2) less than the minima specified for visual meteorological conditions.

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

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

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

Large aeroplane. An aeroplane of a maximum certificated take-off mass of over 5 700 kg.

Leased Aircraft. means an aircraft as one used under a contractual leasing arrangement;

Lessor. means the person, party or the AOC holder from whom the aircraft is leased;

Lessee. means the person, party or the AOC holder to which the aircraft is leased;

Long Term Lease. means an operating lease for a period exceeding 90 days;

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 organization's procedures manual. A document endorsed by the head of the maintenance organization which details the maintenance organization's structure and management responsibilities, scope of work, description of facilities, maintenance procedures and quality assurance or inspection systems.

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

Maintenance release. 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.



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

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

Maximum mass. Maximum certificated take-off mass.

Medical Assessment. The evidence issued by a Contracting State that the license holder meets specific requirements of medical fitness. It is issued following an evaluation by the Licensing Authority of the report submitted by the designated medical examiner who conducted the medical examinations.

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

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

A minimum descent height for a circling approach is referenced to the aerodrome elevation.

Note 2.— The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have 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”.

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

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 includes the requirement for performance monitoring and alerting, designated by the prefix RNP, e.g. RNP 4, RNP APCH.



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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 (PBN) 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, as may be prescribed by the appropriate authority.

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 approach procedures to the aerodrome elevation or the threshold elevation if that is more than 2 m (7 ft) below the aerodrome elevation. An obstacle clearance height for a circling approach procedure is referenced to the aerodrome elevation.

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

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.



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CHAP 1-12

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

Operations specifications. The authorizations, conditions and limitations associated with the air operator certificate and subject to the conditions in the operations manual.

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

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

Performance-based 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.

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

Pressure-altitude. An atmospheric pressure expressed in terms of altitude which corresponds to that pressure in the Standard Atmosphere (as defined in ICAO Annex 8).

Problematic use of substances. The use of one or more psychoactive substances by aviation personnel in way that:

- a) constitutes a direct hazard to the user or endangers the lives, health or welfare of others; and / or
- b) causes or worsens an occupational, social, mental or physical problem or disorder.

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

Rating. An authorization entered on or associated with a licence and forming part thereof, stating special conditions, privileges or limitations pertaining to such license.



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

CHAP 1-13

Relief Crew. Means a crew member licensed for duties who takes over the running of the aircraft.

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.

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.

Rest Facilities On Board. places and facilities sufficiently comfortable and completely separated from the passengers to enable crew members to rest and to provide them with rest in due proportion to the flight time.

Rest period. A continuous and defined period of time, subsequent to and/or prior to duty, during which flight or cabin crew members are free of all duties.

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.

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

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

Safety programme. An integrated set of regulations and activities aimed at improving safety.

Safety Recommendation. A proposal of the accident investigation authority of the State conducting the investigation, based on information derived from the investigation, made with the intention of preventing accidents or incidents.

Serious Incident. An incident involving circumstances indicating that an accident nearly occurred.

Note 1 – The difference between an accident and a serious incident lies only in the result.



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Note 2 – Examples of serious incidents can be found in Attachment C of Annex 13 and in the Accident/Incident Reporting Manual (Doc 9156).

Serious Injury. An injury which is sustained by a person in an accident and which:

- a) requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was received; or
- b) results in a fracture of any bone (except simple fractures of fingers, toes or nose); or
- c) involves lacerations which cause severe hemorrhage, nerve, muscle or tendon damage; or
- d) involves injury to any internal organ; or
- e) involves second or third degree burns, or any burns affecting more than 5 percent of the body surface; or
- f) involves verified exposure to infectious substances or injurious radiation

Short Term Lease. means a lease designed to meet an AOC holder's need for additional aircraft for seasonal or short period not exceeding 90 days;

Small aeroplane. An aeroplane of a maximum certificated take-off mass of 5 700 kg or less.

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

Note.— In the case of the registration of aircraft of an international operating agency on other than a national basis, the States constituting the agency are jointly and severally bound to assume the obligations which, under the Chicago Convention, attach to a State of Registry. See, in this regard, the Council Resolution of 14 December 1967 on Nationality and Registration of Aircraft Operated by International Operating Agencies which can be found in Policy and Guidance Material on the Economic Regulation of International Air Transport (Doc 9587).

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

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

State safety programme. An integrated set of regulations and activities aimed at improving safety.

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



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CHAP 1-15

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

Transition Training - The training required for crew members and dispatcher who have qualified and served in the same capacity on another aircraft of the same group.

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

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

Upgrade Training - The training required For crew members who have qualified and served as Co-pilot or Flight Engineer on a particular aircraft type before they serve as pilot in command or second command respectively on that aircraft.

Visual meteorological conditions (VMC). Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling (as defined in ICAO Annex 2), equal to or better than specified minima.

Note :- The specified minima are contained in Chapter 4 of ICAO Annex 2.

Wet Lease. Lease of aircraft with the crew under a contractual arrangement.



ABBREVIATIONS AND SYMBOLS

(used in this FOR)

Abbreviations

AC	Alternating current
ACAS	Airborne collision avoidance system
ADF	Automatic Direction Finding
ADRS	Aircraft data recording system
ADS	Automatic dependent surveillance
ADS-C	Automatic dependent surveillance — contract
AEO	All engines operative
AFCS	Automatic flight control system
AGA	Aerodromes, air routes and ground aids
AGL	Above Ground Level
AIP	Aeronautical Information Publication
AMT	Aircraft Maintenance Technician
AIG	Accident investigation and prevention
AIR	Airborne image recorder
AIRS	Airborne image recording system
AOC	Air operator certificate
APU	Auxiliary power unit
ARINC	Aeronautical Radio, Incorporated
ASDA	Accelerate stop distance available



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

CHAP 1-17

ASE	Altimetry system error
ASIA/PAC	Asia/Pacific
ATC	Air traffic control
ATM	Air traffic management
ATN	Aeronautical Telecommunication Network
ATPL	Airline Transport Pilot License
ATS	Air traffic services
CARS	Cockpit Audio Recording System
C of A	Certificate of Airworthiness
C of G	Center of Gravity
CAAN	Civil Aviation Authority of Nepal
CARS	Cockpit audio recording system
CAS	Calibrated airspeed
CAT I	Category I
CAT II	Category II
CAT III	Category III
CAT IIIA	Category IIIA
CAT IIIB	Category IIIB
CAT IIIC	Category IIIC
CDL	Configuration deviation list
CFIT	Controlled flight into terrain
cm	Centimetre
COMAT	Operator Material
CPDLC	Controller-pilot data link communications



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

CHAP 1-18

CVR	Cockpit voice recorder
CVS	Combined Vision System
DA	Decision altitude
DA/H	Decision altitude/height
DG,CAAN	Director General, Civil Aviation Authority of Nepal
DC	Device control
D-FIS	Data link-flight information services
DH	Decision height
DLR	Data link recorder
DLRS	Data link recording system
DME	Distance measuring equipment
DSTRK	Desired track
ECAM	Electronic centralized aircraft monitor
EDTO	Extended diversion time operations
EFB	Electronic flight bag
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



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CHAP 1-19

ETA	Estimated Time of Arrival
FOD	Flight Operations Directive
F/E	Flight Engineer
F/O	First Officer
FD	Flight Dispatcher
FDR	Flight Data Recorder
FFS	Full Flight Simulator
FOO	Flight Operations Officer
FOR	Flight Operations Requirements
EUROCAE	European Organization for Civil Aviation Equipment
EVS	Enhanced vision system
FANS	Future air navigation system
FDAP	Flight data analysis programmes
FDAU	Flight data acquisition unit
FDR	Flight data recorder
FL	Flight level
FM	Frequency modulation
ft	Foot
ft/min	Feet per minute
g	Normal acceleration
GCAS	Ground collision avoidance system
GNSS	Global navigation satellite system
GPWS	Ground proximity warning system
hPa	Hectopascal



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

CHAP 1-20

HF	High Frequency
HSI	Horizontal Situation Indicator
HUD	Head-up display
ICAO	International Civil Aviation Organization
IFR	Instrument flight rules
ILS	Instrument landing system
IMC	Instrument meteorological conditions
in-Hg	Inch of mercury
INS	Inertial navigation system
IRS	Inertial Reference System
ISA	International standard atmosphere
kg	Kilogram
kg/m ²	Kilogram per metre squared
km	Kilometre
km/h	Kilometre per hour
kt	Knot
kt/s	Knots per second
lb	Pound
lbf	Pound-force
LDA	Landing distance available
LED	Light emitting diode
m	Metre
mb	Millibar
MDA	Minimum descent altitude



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

CHAP 1-21

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
m/s	Metres per second
m/s ²	Metres per second squared
N	Newton
N ₁	Low pressure compressor speed (two-stage compressor); fan speed (three-stage compressor)
N ₂	High pressure compressor speed (two-stage compressor); intermediate pressure compressor speed (three-stage compressor)
N ₃	High pressure compressor speed (three stage compressor)
NAV	Navigation
NCAR	Nepalese Civil Airworthiness Requirements
NM	Nautical mile
NOTAM	Notice to Airman
NVIS	Night vision imaging systems
OBS	Omni Bearing Selector
OCA	Obstacle clearance altitude
OCA/H	Obstacle clearance altitude/height
OCH	Obstacle clearance height



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

CHAP 1-22

OEI	One engine inoperative
PANS	Procedures for Air Navigation Services
PBN	Performance-based navigation
PIC	Pilot-In-Command
PPC	Pilot Proficiency Check
PPL	Private Pilot License
PUC	Pilot Under Check
QDM	Bearing to station
QDR	Bearing from station
RCP	Required communication performance
RNAV	Area navigation
RNP	Required navigation performance
RNP-AR	Required Navigation Performance-Authorization Required
RTCA	Radio Technical Commission For Aeronautics
RVR	Runway visual range
RVSM	Reduced vertical separation minima
SB	Satisfactory with briefing
SID	Standard Instrument Departure
Sim	Simulator
SICASP	Secondary Surveillance Radar Improvements and Collision Avoidance Systems Panel
SOP	Standard operating procedures
SST	Supersonic transport
STOL	Short take-off and landing
SVS	Synthetic vision system



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CHAP 1-23

TAS	True airspeed
TAWS	Terrain awareness warning system
TCAS	Traffic alert and collision avoidance system
TLA	Thrust lever angle
TLS	Target level of safety
TODA	Take-off distance available
TORA	Take-off run available
TSO	Technical Standard Order
TVE	Total vertical error
U/s	Unserviceable
UTC	Coordinated universal time
VASI	Visual Approach Slope Indicator
VFR	Visual flight rules
V _D	Design diving speed
VMC	Visual meteorological conditions
V _{MC}	Minimum control speed with the critical engine inoperative
VOR	VHF omnidirectional radio range
V _{S0}	Stalling speed or the minimum steady flight speed in the landing configuration
V _{S1}	Stalling speed or the minimum steady flight speed in a specified configuration
VSM	Vertical Separation Minima
VTOL	Vertical take-off and landing
WXR	Weather



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

CHAP 1-24

Symbols

°C Degrees Celsius

% Per cent



CHAPTER 2

APPLICABILITY

- 2.1 Requirements mentioned in this Flight Operations Requirements shall be applicable to the operation of aeroplanes by operators authorized to conduct domestic and international commercial air transport operations.

Note 1. Requirements applicable to domestic and international general aviation operations with aeroplanes are to be found in Flight Operations Requirements – General Aviation

Note 2. Requirements applicable to domestic and international commercial and general aviation air operations with helicopters are to be found in Flight Operations Requirements – Helicopters

Note 3. – Chapter 3, 3.3 is applicable on and after 08 November 2018.

- 2.2 *Appendices* contain comprising material grouped separately for convenience but form part of the Flight Operations Requirements.
- 2.3 *Notes* are included in the text, where appropriate, to give factual information or references bearing on the Requirements in question but not constitute a part of these Requirements.



CHAPTER 3

GENERAL

3.1 COMPLIANCE WITH LAWS, REGULATIONS AND PROCEDURES

- 3.1.1 An operator shall ensure that all employees when abroad know that they must comply with the laws, regulations and procedures of those States under which operations are conducted.
- 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.
- 3.1.3 An operator or a designated representative shall have responsibility for operational control.
- 3.1.4 Responsibility for operational control shall be delegated only to the pilot-in-command and to a flight operations officer/flight dispatcher if an operator's approved method of control and supervision of flight operations requires the use of flight operations officer/flight dispatcher personnel.

Note.- Guidance on the operational control organization and the role of the flight operations officer/flight dispatcher is contained in the Manual of Procedures for Operations Inspection, Certification and Continued Surveillance (Doc 8335). Detailed guidance on the authorization, duties and responsibilities of the flight operations officer/flight dispatcher is contained in the Preparation of an Operations Manual (Doc 9376). The requirements for age, skill, knowledge and experience for licensed flight operations officers/flight dispatchers are contained in the Personnel Licensing Requirements (PELR).

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



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

CHAP 3-2

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 State of the Operator. Such reports shall be submitted as soon as possible and normally within ten days.

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

3.1.8 An operator shall ensure that flight crew members demonstrate the ability to speak and understand the English language used for radiotelephony communications as specified by ICAO Annex 1.

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

3.2.1 When CAAN identifies a case of non-compliance or suspected non-compliance by a foreign operator with laws, regulations and procedures applicable within the territory of Nepal or a similar serious safety issue with that operator, CAAN shall immediately notify the operator and, if the issue warrants it, the State of the Operator. Where the State of the Operator and the State of Registry are different, such notifications shall also be made to the State of Registry, if the issue falls within the responsibilities of that State and warrants a notification.

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

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

3.3 SAFETY MANAGEMENT

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

3.3.1. RESERVED

	FLIGHT OPERATIONS REQUIREMENTS AEROPLANE	CHAP 3-3

3.3.2 An operator of an aeroplane of a maximum certificated take-off mass in excess of 27, 000 kg shall establish and maintain a flight data analysis programme as part of its safety management system.

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

3.3.3 A flight data analysis programme shall be non-punitive and contain adequate safeguards to protect the source(s) of the data.

Note 1.— Guidance on the establishment of flight data analysis programmes is included in the Manual on Flight Data Analysis Programmes (FDAP) (Doc 10000).

Note 2.— Legal guidance for the protection of information from safety data collection and processing systems is contained in Attachment B to ICAO Annex 19.

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

Note.— Guidance on the development and organization of a flight safety documents system is provided in Attachment C.

3.4 USE OF PSYCHOACTIVE SUBSTANCES

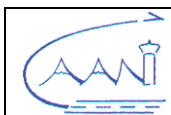
3.4.1 Holders of licenses provided for in this FOR as well as PELR shall not exercise the privileges of their licenses and related ratings while under the influence of any psychoactive substance which might render them unable to safely and properly exercise these privileges.

3.4.2 Holders of licenses provided for in this FOR as well as PELR shall not engage in any problematic use of substances.

3.4.3 CAAN shall ensure, as far as practicable, that all license holders who engage in any kind of problematic use of substances are identified and removed from their safety-critical functions.

3.4.4 No person whose function is critical to the safety of aviation (safety-sensitive personnel) shall undertake that function while under the influence of any psychoactive substance, be reason of which human performance is impaired. No such person shall engage in any kind of problematic use of substances.

3.4.5 Holders of licences provided for in this CAAN PELR, shall not exercise the privileges of their licences and related ratings while under the influence of any psychoactive substance which might render them unable to safely and properly exercise these privileges.



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

CHAP 3-4

3.4.6 Holders of licences provided for in CAAN PELR, shall not engage in any problematic use of substances.

3.4.7 No person whose function is critical to the safety of aviation (safety-sensitive personnel) shall undertake that function while under the influence of any psychoactive substance, by reason of which human performance is impaired. No such person shall engage in any kind of problematic use of substances.

3.5 AIRCRAFT TRACKING

(Applicable on and after 8 November 2018)

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

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

3.5.2 RESERVED

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

a) the aeroplane has a maximum certificated take-off mass of over 45 500 kg and a seating capacity greater than 19; and

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

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

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

3.5.4 The operator shall establish procedures, approved by the State of the Operator, for the retention of aircraft tracking data to assist SAR in determining the last known position of the aircraft.

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

3.6 RESERVED

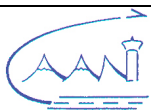


3.7 INSPECTION AUTHORITY

- 3.7.1 Each certificate holder shall allow the inspectors of Director General in their respective fields at any time or place to make an inspection or test to determine its compliance with the civil air regulation, its operating certificate and its operations specifications or its eligibility to continue to hold its certificate.
- 3.7.2 Any person appointed by Director General as an authorized officer or inspector shall be permitted at any time to board and to enter and remain on the flight deck, provided that the commander of the Aeroplane, during in flight phase, may refuse to allow the authorized officer to enter or remain in the flight deck if in his opinion, the safety of the Aeroplane would thereby be endangered.
- 3.7.3 All authorized officers of CAAN for liaison and inspection carry a CAAN identity document, which will be produced on request. Request for arrangements of tickets on free passage and other required facilities to help to complete the task of inspection, will normally be made in advance. Except in case of the random surveillance inspection on base, while preparing the flight and in-flight, notification will not be made in advance.
- 3.7.4 Authorized Inspector(s) shall visit to observe the conduct of ground classes, demonstration classes etc of an operator and Flight Operation Inspectors shall observe the ground and training flights of pilots, competency checks, type rating ground and flight tests and instrument issuance and/or renewal tests. They are also empowered to inspect flight crew licenses and records of trainings and tests.
- 3.7.5 All matters relating to pilots that require an Observer shall be conducted by CAAN Flight Operations Inspectors or pilots.
- 3.7.6 The holder of an Air Operator certificate shall notify to the Director General of Civil Aviation of Nepal, not less than 14 days notice in writing of the intended abolition of any of its responsible posts or of any intended change in the person holding the post or his duties.
- 3.7.7 Any person authorized by the Director General of Civil Aviation in that regard shall have access to any premises in the occupation or control of the holder of this Certificate for the purpose of examining the premises and any document, equipment, tools, material or other thing of whatsoever nature, relating to the operation of Aeroplane there under kept or used or intended to be used in connection with the operation of the Aeroplane.
- 3.7.8 Every flight under this certificate shall be conducted in accordance with the relevant provisions of the aforesaid operations manual and instructions.

3.8 OFFENCE AND PENALTY

- 3.8.1 Any person who :
- a) contravenes or fails to comply with any provision of this Requirement.



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- a) performs any duty or exercises or any functions for which a license or rating is required under this Flight Operation Requirements.
- b) makes a false or deceptive statement or in connection with any application for a license rating or certificate issued under Flight Operations Requirement.
- c) Makes, procures or assists in the making or procuring of any false or deceptive entry in any document book or record made or kept under any rules made under Flight Operation Requirements.
- d) Destroys, mutilates or alters any document book or record made or kept under any rules made under Flight Operation Requirements.
- e) obstructs or hinders an investigation carried;
- f) obstructs or impedes any authorized person acting in the performance or exercise of any duties powers of functions conferred on him by this Requirements.
- g) does or attempts to do anything likely to imperil the safety of an Aeroplane or its passengers or crew shall be guilty of an offence and shall be liable on conviction to any of
 - a) a warning
 - b) a temporary suspension to perform his duty
 - c) suspension or revocation of license (or including suspension and cancellation of an authorization, permission, ratings or other endorsements)
 - d) a fine and/or possible imprisonment as applicable.

3.8.2 The Owner, Operator, Hirer or a Pilot-In-Command of an Aeroplane which flies in contravention of any rules made under Flight Operations Requirement, shall be guilty of an offence and shall be liable on conviction to any of a warning, suspension or revocation of license, a fine and possible imprisonment as applicable, unless it is proved that the alleged contravention took place without that person in actual fault.

3.9 OPERATORS TO PROVIDE FLIGHT INSTRUCTORS AND GROUND INSTRUCTORS

- 3.9.1 The holder of an Air Operator Certificate issued by the Director General who is engaged in commercial operations shall ensure that sufficient number of Flight Instructor(s) and instructor(s) for ground courses who are qualified with not less than that mentioned in FOR/PELR.
- 3.9.2 The Privileges of Instructor Pilot shall be to carry out the tests/checks/trainings as mentioned below:
 - i) Training of Pilots for aircraft type, Instrument Rating and Instructor Rating
 - ii) Pilot Proficiency check for renewal (when the company does not have a Designated Check Pilot)



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- iii) Pilot Proficiency check for Renewal of Instrument Rating (when the company does not have a Designated Check Pilot)
- iv) Conducting Line/STOL Clearances
- v) Route checks
- vi) Training of pilots in Flight Simulation Training Devices

3.10 OPERATORS TO PROVIDE OPERATIONS DIRECTORS

The holder of an Air Operator Certificate issued by the Director General who is engaged in commercial operations shall assign a pilot (or experienced as a pilot) as an Operations Director in the Operation Department.

3.11 RESERVED

3.12 OPERATORS TO ENSURE THAT FLIGHT CREW ARE QUALIFIED

3.12.1 The holder of an Air Operator Certificate issued by the Director General shall not permit an aircraft to fly unless:

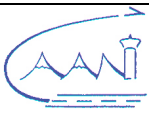
- a) The number and composition of the flight crew are not less than the minimum specified in the Operations Manual or as approved by the CAAN for that aircraft and the route to be flown; or the number of crew;
- b) A pilot in the flight crew is designated as pilot-in-command for that flight;
- c) All members of the flight crew are properly qualified as mentioned in this Flight Operations Requirements and medically fit to carry out their duties.
- d) The flight and cabin crew have successfully received Initial and Recurrent Ground and Flight Trainings.

3.12.2 Such an operator shall not permit an aircraft to fly for other than training purposes unless;

- a) Each member of the flight crew holds a valid license appropriate to his duties;
- b) Each member has demonstrated his competence to perform those duties by successfully completing the training program required under this directive; and
- c) Each member of the flight crew is in regular and full time employment of the holder or has been authorized by the Director General to make the flight.

3.12.3 Crew member requirements and their qualifications shall not be less than that as specified in the FOR.

3.12.4 Flight crewmember emergency duties



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An operator shall, for each type of aeroplane, assign to all flight crew member the necessary functions they are to perform in an emergency or in a situation requiring 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.

3.13 *RESERVED*

3.14 OPERATORS TO ENSURE NON-MISUSE OF FLIGHT CREW IDENTITY

3.14.1 An Operator shall make the necessary provisions in company Operations Manual and any other regulation to ensure that the identities of Flight Crew are not misused. *refer Chapter 13 Security.*

3.14.2 *RESERVED*

3.15 OPERATORS TO PROVIDE FLIGHT DISPATCHERS/FLIGHT OPERATIONS OFFICERS

3.15.1 The holder of an Air Operator Certificate issued by the Director General shall not commence its operations where the number of aircraft being involved in operations is two or more, unless it has employed the person(s) holding the Flight Dispatcher or Flight Operations Officer license for operational control including dispatching of the aircraft.

3.15.2 The holder of an Air Operator Certificate issued by the Director General shall not commence its operations unless he or his designated representative shall have responsibility for operational control.

3.15.3 Where the duties assigned for the dispatch of the aircraft is conducted by the flight crew, the requirement mentioned in 3.15.1 will not apply provided the flight time and duty time limitations of the pilot is not violated and the pilot's job description is mentioned in company's Operations Manual.

3.16 REVENUE, TRAINING AND TEST FLIGHTS

3.16.1 With the exception of En-route Inspection flight or Route Check, no commercial air operator shall conduct **any** type of training flight including Pilot Proficiency Checks (PPC), for the issuance or renewal of a license, during a flight filed with the ATC as a commercial or revenue flight i.e. scheduled, non-scheduled or chartered.

3.16.2 Any commercial aircraft, when it is carrying passengers or Cabin Crew, shall not be used to flight test the aircraft, or its power plant, or any item included in the Minimum Equipment List.

3.17 *RESERVED*



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3.18 OPERATORS TO PROVIDE TRAININGS

- 3.18.1 With respect to 3.12.1 (d), operators must provide Initial and Recurrent ground and flight trainings to all its Crew members, Flight Dispatchers and any other personnel involved in the safe conduct of operations as per their requirements.
- 3.18.2 The details of the trainings mentioned in 3.18.1 shall be as required in Chapter 15 of this FOR.
- 3.18.3 The AOC holder shall maintain records of the qualifications and the training of each crew member and flight dispatcher.

3.19 OPERATORS TO ENSURE THAT CREW COMPLY WITH INTERCEPTION ORDERS

- 3.19.1 An Operator shall ensure that their crew receive appropriate trainings on and comply with Interception Orders from other States.
- 3.19.2 Attachment A contains the instructions that crew of an intercepted aircraft must follow when complying with Interception Orders from Interceptor aircraft of other States.

Refer Appendix 1 Contents of an Operations Manual para 2.1.32.

3.20 OPERATORS TO ESTABLISH A PUBLICATIONS LIBRARY

- 3.20.1 An Operator shall maintain a library of publications required for its operations.
- 3.20.2 The library shall also contain a list of publications that the Operator has determined is necessary for its operations.
- 3.20.3 The Operations library shall include as a minimum:
- (i) CAAN Rules and Regulations
 - (ii) Air Operator Certificate Requirements
 - (iii) Flight Operations Requirements
 - (iv) Aeronautical Information Publications
 - (v) Personnel Licensing Requirements
 - (vi) Dangerous Goods Handling Requirements
 - (vii) Cabin Crew Training Manual
 - (viii) Aircraft Flight Manual
 - (ix) Company Operations Manual
 - (x) Standard Operating Procedures manual
 - (xi) Flight Crew Operating Manual
 - (xii) Maps and Charts



CHAPTER 4

FLIGHT OPERATIONS

4.1 OPERATING FACILITIES

- 4.1.1 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 available and directly required on such flight, for the safe operation of the aeroplane and the protection of the passengers, are adequate for the type of operation under which the flight is to be conducted and are adequately operated for this purpose.

Note.- “Reasonable means” in this FOR is intended to denote the use, at the point of departure, of information available to the operator either through official information published by the local Civil Aviation Authority or aeronautical information services or readily obtainable from other sources.

- 4.1.2 An operator shall ensure that any inadequacy of facilities observed in the course of operations is reported to the authority responsible for them, without undue delay.
- 4.1.3 Subject to their published conditions of use, aerodromes and their facilities shall be kept continuously available for flight operations during their published hours of operations, irrespective of weather conditions.
- 4.1.4 An operator shall, as part of its Safety Management System, assess the level of Rescue and Fire Fighting Service (RFFS) protection available at any aerodrome intended to be specified in the operational flight plan in order to ensure that an acceptable level of protection is available for the aeroplane intended to be used.

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

- 4.1.5 Information related to the level of RFFS protection that is deemed acceptable by the operator shall be contained in the operations manual.

Note 1.—Attachment J of ICAO Annex 6 part I contains guidance on assessing an acceptable level of RFFS protection at aerodromes.



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

4.2 OPERATIONAL CERTIFICATION AND SUPERVISION

4.2.1 The Air Operator Certificate

4.2.1.1 An air operator shall not engage in commercial air transport operations unless in possession of a valid Air Operator Certificate issued by the Director General, Civil Aviation Authority of Nepal.

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

Note.- Provisions for the content of the Air Operator Certificate and its associated Operations Specifications are contained in the AOCR.

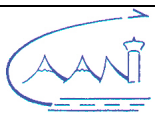
4.2.1.3 The issue of an Air Operator Certificate by the Director General, Civil Aviation Authority of Nepal shall be dependent upon the operator demonstrating an adequate organization, method of control and supervision of flight operations, training programme as well as ground handling and maintenance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

- i) The operator shall develop a manual detailing the training requirements, subcontracting policies, handling processes, procedures and practices for all ground handling operations.
- ii) The operator shall ensure that the ground handling responsibility is permanently maintained, when all or part of the functions and tasks related to ground handling services have been contracted to a service provider.

4.2.1.4 The continued validity of an Air Operator Certificate shall depend upon the operator maintaining the requirements of 4.2.1.3 under the supervision of the DG, CAAN.

4.2.1.5 The Air Operator Certificate shall contain at least the following information in addition to following the layout as mentioned in the Air Operator Certificate Requirements (AOCR):

- a) the State of the Operator and the issuing authority;
- b) the Air Operator Certificate number and its expiration date;
- c) the operator name, trading name (if different) and address of the principal place of business;
- d) the date of issue and the name, signature and title of the authority representative; and
- e) the location, in a controlled document carried on board, where the contact details of operational management can be found.



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4.2.1.6 The Operations Specifications associated with the Air Operator Certificate shall contain at least those information that are listed in the AOCR.

4.2.1.7 Air operator certificates and their associated operations specifications shall follow the layouts as per the AOCR.

4.2.1.8 Certification for operation of aircraft is to be obtained through the established system of Civil Aviation Authority of Nepal as specified in AOCR. All operators shall be subjected to continued surveillance by the Director General, Civil Aviation Authority of Nepal to ensure that the required standards of operations established in 4.2 are maintained.

Note.- Surveillance and inspection of AOC holders shall be conducted by authorized personnel in accordance with their respective Inspector Manuals in addition to other regulatory documents and manuals.

4.2.2 Surveillance of operations by a foreign operator

4.2.2.1 Civil Aviation Authority of Nepal shall recognize as valid an Air Operator Certificate issued by a Contracting State, provided that the requirements under which the certificate was issued are at least equal to the applicable Standards specified by Annex 6 and Annex 19 of ICAO.

4.2.2.2 Surveillance of foreign air operators' operations within Nepal and taking appropriate action when necessary to preserve safety shall be conducted in accordance with CAAN regulatory documents.

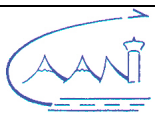
4.2.2.3 An operator shall meet and maintain the requirements established by CAAN when the operations are being conducted within Nepal.

Note.— Guidance on the surveillance of operations by foreign operators may be found in the Manual of Procedures for Operations Inspection, Certification and Continued Surveillance (Doc 8335).

4.2.3 Operations Manual

4.2.3.1 a) An operator shall provide, for the use and guidance of operations personnel concerned - an Operations Manual in accordance with Appendix I containing all such information and instructions as are relevant to the flight operations of all types of aeroplanes which are operated by the operator.

b) 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.



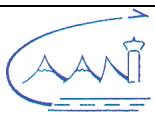
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- 4.2.3.2 a) All operators are required to provide a copy of the Operations Manual together with all amendments and/or revisions for review and approval. Certain documents/manuals may be accepted and an approval may not be required. The DG, CAAN shall determine which documents may be accepted without requiring an approval. The operator shall incorporate in the Operations Manual such mandatory material as required by the DG, CAAN.
- b) An Operations Manual which may be issued in separate parts corresponding to specific aspects of operations shall not conflict with any rule, Flight Operations Requirements or other directives issued by the DG, CAAN and in the case of an operator engaged in international operations, shall also not be in conflict with the laws, regulations and procedures of the countries into and over which the operator's aeroplanes are operated.
- c) The Operations Manual shall be organized in accordance with the following structure as mentioned in Appendix 1:
- i) Part A : General
 - ii) Part B : Aircraft Operating Matters Type Related
 - iii) Part C : Route and Aerodrome Instructions and Information
 - iv) Part D : Training

4.2.4 Operating Instructions — General

- 4.2.4.1 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.
- 4.2.4.2 An aeroplane shall not be taxied on the movement area of an aerodrome unless the person at the controls:
- a) has been duly authorized by the operator or a designated agent;
 - b) is fully competent to taxi the aeroplane;
 - c) is qualified to use the radiotelephone; and
 - d) has received instruction from a competent person in respect of aerodrome layout, routes, signs, marking, lights, air traffic control (ATC) signals and instructions, phraseology and procedures, and is able to conform to the operational standards required for safe aeroplane movement at the aerodrome.
- 4.2.4.3 The operator shall issue operating instructions and provide information on aeroplane climb performance with all engines operating to enable the pilot-in-command to determine the climb gradient that can be achieved during the departure phase for the existing take-off conditions and intended take-off technique. This information should be included in the Operations Manual.



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4.2.5 In – flight simulation of emergency situation

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

4.2.6 Checklists

The checklists provided in accordance with 6.1.4 shall be used by flight crews prior to, during and after all phases of operations, and in emergency, to ensure compliance with the operating procedures contained in the aircraft operating manual and the Aeroplane Flight Manual or other documents associated with the Certificate Of Airworthiness and otherwise in the Operations Manual, 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 Human Factors Training Manual (Doc 9683).

4.2.7 Minimum flight altitudes

4.2.7.1 An operator shall be permitted to establish minimum flight altitudes for those routes flown for which minimum flight altitudes have been established by the State flown over or the responsible State, provided that they shall not be less than those established by that State.

4.2.7.2 An operator shall specify the method by which it is intended to determine minimum flight altitudes for operations conducted over routes for which minimum flight altitudes have not been established by the State flown over or the responsible State, and shall include this method in the Operations Manual. The minimum flight altitudes determined in accordance with the above method shall not be lower than that specified by Director General, Civil Aviation Authority of Nepal.

4.2.7.3 RESERVED

4.2.7.4 RESERVED

4.2.8 Aerodrome Operating Minima

4.2.8.1 An operator shall establish Aerodrome Operating Minima for each aerodrome to be used in operations, and shall obtain approval of Civil Aviation Authority of Nepal for the method of determination of such minima. Such minima shall not be lower than any that may be established for such aerodromes by the State of the Aerodrome, except when specifically approved by that State.



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

4.2.8.1.1 The State of the Operator may approve operational credit(s) for operations with aeroplanes equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS. Such approvals shall not affect the classification of the instrument approach procedure.

Note 1.— Operational credit includes:

- a) for the purposes of an approach ban (4.4.1.2), a minima below the aerodrome operating minima;*
- b) reducing or satisfying the visibility requirements; or*
- c) requiring fewer ground facilities as compensated for by airborne capabilities.*

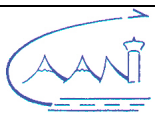
Note 2.— Guidance on operational credit for aircraft equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS and CVS is contained in Attachment B and in the Manual of All-Weather Operations (Doc 9365)

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

4.2.8.2 In establishing the aerodrome operating minima which will apply to any particular operation, full account shall be taken of:

- a) the type, performance and handling characteristics of the aeroplane;
- b) the composition of the flight crew, their competence and experience;
- c) the dimensions and characteristics of the runways which may be selected for use;
- d) the adequacy and performance of the available visual and non-visual ground aids;
- e) the equipment available on the aeroplane for the purpose of navigation and/or control of the flight path during the approach to landing and the missed approach;
- f) the obstacles in the approach and missed approach areas and the obstacle clearance altitude/height for the instrument approach procedures;
- g) the means used to determine and report meteorological conditions; and
- h) the obstacles in the climb-out areas and necessary clearance margins.

Note.— Guidance on the establishment of aerodrome operating minima is contained in the Manual of All-Weather Operations (Doc 9365).



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

- a) Type A: a minimum descent height or decision height at or above 75 m (250 ft); and
- b) Type B: a decision height below 75 m (250 ft). Type B instrument approach operations are categorized as:
 - 1) Category I (CAT I): a decision height not lower than 60 m (200 ft) and with either a visibility not less than 800 m or a runway visual range not less than 550 m;
 - 2) Category II (CAT II): a decision height lower than 60 m (200 ft) but not lower than 30 m (100 ft) and a runway visual range not less than 300 m;
 - 3) Category IIIA (CAT IIIA): a decision height lower than 30 m (100 ft) or no decision height and a runway visual range not less than 175 m;
 - 4) Category IIIB (CAT IIIB): a decision height lower than 15 m (50 ft) or no decision height and a runway visual range less than 175 m but not less than 50 m; and
 - 5) Category IIIC (CAT IIIC): no decision height and no runway visual range limitations.

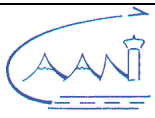
Note 1.— Where decision height (DH) and runway visual range (RVR) fall into different categories of operation, the instrument approach operation would be conducted in accordance with the requirements of the most demanding category (e.g. an operation with a DH in the range of CAT IIIA but with an RVR 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).

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 operation, the required visual reference is the runway environment.

Note 3.— Guidance on approach classification as it relates to instrument approach operations, procedures, runways and navigation systems is contained in the Manual of All-Weather Operations (Doc 9365).

4.2.8.4 Category II and Category III instrument approach and landing operations shall not be authorized unless RVR information is provided.

4.2.8.5 For instrument approach and landing operations, aerodrome operating minima below 800 m visibility shall not be authorized unless RVR information is provided.



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

Note.— For guidance on applying a continuous descent final approach (CDFA) flight technique on non-precision approach procedures, refer to PANS-OPS (Doc 8168), Volume I, Part I, Section 4, Chapter 1, paragraph 1.7.

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

4.2.9 Threshold Crossing Height for 3D Instrument Approach Operations

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

4.2.10 Fuel and oil records

4.2.10.1 An operator shall maintain fuel records to enable the DG, CAAN to ascertain that, for each flight, the requirements of 4.3.6 and 4.3.7.1 have been complied with.

4.2.10.2 An operator shall maintain oil records to enable the DG, CAAN to ascertain that trends for oil consumption are such that an aeroplane has sufficient oil to complete each flight.

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

4.2.11 Flight and Cabin Crew

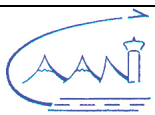
4.2.11.1 *Pilot-in-command.* For each flight, the operator shall designate one pilot to act as pilot-in-command.

4.2.11.2 *Fatigue Management.* An operator shall establish flight time and duty period limitations and a rest scheme that enable it to manage the fatigue of all its flight and cabin crew members. This shall comply with the regulations established by CAAN and shall be included in the Operations Manual.

4.2.11.3 RESERVED

4.2.11.4 To comply with the regulations established by CAAN an operator shall maintain records for all its flight and cabin crew members of flight time, flight duty periods and rest periods.

4.2.11.5 For each flight of an aeroplane above 15 000 m (49 000 ft), the operator shall



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maintain records so that the total cosmic radiation dose received by each crew member over a period of 12 consecutive months can be determined.

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

4.2.11.6 RESERVED

4.2.11.7 No air operator may assign a person as a flight crew member unless that person holds a valid license or authorization letter/certificate as the case may be, issued by the Director General.

4.2.11.8 No air operator shall operate an aeroplane with less than the minimum flight crew as specified in the Certificate of Airworthiness or the Aeroplane Flight Manual.

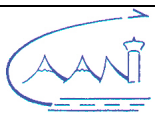
4.2.11.9 No air operator shall operate:

- a) an aeroplane without a co-pilot if that aeroplane has a passenger seating configuration, excluding any pilot seats, of five seats or more.
- b) an aeroplane without a co-pilot and cabin crew if that aeroplane has a passenger seating configuration, excluding any pilot seats, of nine seats or more. The number of Cabin Crew to be determined by the Operator shall be as follows:
 - (i) a minimum of one Cabin Crew when the number of passengers carried is more than ten and up to fifty.
 - (ii) a minimum of two Cabin Crew when the number of passengers carried is more than forty and up to one hundred.
 - (iii) when the number of passengers carried exceed eighty, minimum of one additional Cabin Crew shall be added for every additional fifty passengers.

4.2.11.10 No air operator shall carry passengers in a single-engined aeroplane:

- a) in day IFR flight conditions with a single pilot; for two-pilot day IFR flight conditions, refer to Chapter 5.4.
- b) at night
- c) for a published schedule flight
- d) over such routes and diversions there from that does not permit a safe forced landing to be executed in the event of engine failure.

4.2.11.11 No air operator shall operate a single-engined aeroplane on multi-pilot operations or any multi-engined aeroplane unless the flight crew includes at least two pilots, one of whom shall be designated by the operator as Pilot-in-Command and the other as Second-in-Command.



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4.2.11.12 No air operator shall let the pilot or co-pilot have an endorsement on more than two types of aeroplanes weighing less than 5700 kgs for commercial operations.

4.2.11.13 When a flight crew is engaged in commercial air operations involving aeroplanes with a certificated MTOW of more than 5700 kgs, the person shall be limited to a single aeroplane type.

4.2.12 Passengers

4.2.12.1 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.

4.2.12.2 The operator shall inform the passengers of the location and general manner of use of the principal emergency equipment carried for collective use.

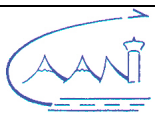
4.2.12.3 In an emergency during flight, passengers shall be instructed in such emergency action as may be appropriate to the circumstances.

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

4.3 FLIGHT PREPARATION

4.3.1 A flight shall not be commenced until flight preparation forms have been completed certifying that the pilot-in-command is satisfied that:

- a) the aeroplane is airworthy;
- b) the instruments and equipment prescribed in Chapter 6, for the particular type of operation to be undertaken, are installed and are sufficient for the flight;
- c) a Maintenance Release as prescribed has been issued in respect of the aeroplane;
- 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;



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- f) a check has been completed indicating that the operating limitations of Chapter 5 can be complied with for the flight to be undertaken; and
- g) the requirements of 4.3.3 relating to operational flight planning have been complied with.

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

4.3.3 Operational flight planning

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

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

4.3.3.2 The Operations Manual shall describe the content and use of the operational flight plan.

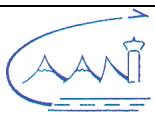
4.3.4 Alternate aerodromes

4.3.4.1 *Take-off alternate aerodrome*

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

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

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



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operating manual, calculated in ISA and still-air conditions using the actual take-off mass; or

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

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

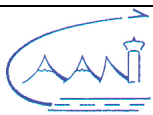
4.3.4.2 *En-route alternate aerodromes*

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

4.3.4.3 *Destination alternate aerodromes*

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

- a) the duration of the flight from the departure aerodrome, or from the point of in-flight replanning to the destination aerodrome is such that, taking into account all meteorological conditions and operational information relevant to the flight, at the estimated time of use, a reasonable certainty exists that:
 - 1) the approach and landing may be made under visual meteorological conditions; and
 - 2) separate runways are usable at the estimated time of use of the destination aerodrome with at least one runway having an operational instrument approach procedure; or
- b) the aerodrome is isolated. Operations into isolated aerodromes do not require the selection of a destination alternate aerodrome(s) and shall be planned in accordance with 4.3.6.3 d) 4);
 - 1) for each flight into an isolated aerodrome a point of no return shall be determined; and



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

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

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

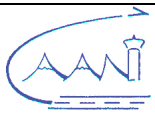
4.3.4.3.2 Two destination alternate aerodromes shall be selected and specified in the operational and ATS flight plans when, for the destination aerodrome:

- a) meteorological conditions at the estimated time of use will be below the operator's established aerodrome operating minima for that operation; or
- b) meteorological information is not available.

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

- a) capabilities of the operator;
- b) overall capability of the aeroplane and its systems;
- c) available aerodrome technologies, capabilities and infrastructure;
- d) quality and reliability of meteorological information;
- e) identified hazards and safety risks associated with each alternate aerodrome variation; and
- f) specific mitigation measures.

Note.— Guidance on performing a safety risk assessment and on determining variations, including examples of variations, are contained in the Flight Planning and Fuel Management Manual (Doc 9976) and the Safety Management Manual (SMM) (Doc 9859).



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4.3.5 Meteorological conditions

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

4.3.5.2 A flight to be conducted in accordance with the instrument flight rules;

- a) shall not take off from the departure aerodrome unless the meteorological conditions, at the time of use, are at or above the operator's established aerodrome operating minima for that operation; and
- b) shall not take off or continue beyond the point of in-flight re-planning unless at the aerodrome of intended landing or at each alternate aerodrome to be selected in compliance with 4.3.4, current meteorological reports or a combination of current reports and forecasts indicate that the meteorological conditions will be, at the estimated time of use, at or above the operator's established aerodrome operating minima for that operation.

4.3.5.3 To ensure that an adequate margin of safety is observed in determining whether or not an approach and landing can be safely carried out at each alternate aerodrome, the operator shall specify appropriate incremental values, acceptable to the DG, CAAN, for height of cloud base and visibility to be added to the operator's established aerodrome operating minima.

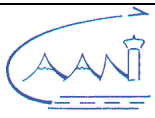
Note.— Guidance on the selection of these incremental values is contained in the Flight Planning and Fuel Management Manual (Doc 9976).

4.3.5.4 A margin of time when established by the operator for the estimated time of use of an aerodrome shall require an approval from the DG, CAAN.

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

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

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



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Note.- Guidance material is given in the Manual of Aircraft De-icing/Anti-icing Operations (Doc 9640).

4.3.6 Fuel Requirements

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

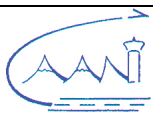
4.3.6.2 The amount of usable fuel to be carried shall, as a minimum, be based on:

- a) the following data:
 - 1) current aeroplane-specific data derived from a fuel consumption monitoring system, if available; or
 - 2) if current aeroplane-specific data is not available, data provided by the aeroplane manufacturer; and
- b) the operating conditions for the planned flight including:
 - 1) anticipated aeroplane mass;
 - 2) Notices to Airmen;
 - 3) current meteorological reports or a combination of current reports and forecasts;
 - 4) air traffic services procedures, restrictions and anticipated delays; and
 - 5) the effects of deferred maintenance items and/or configuration deviations.

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

- a) *taxi fuel*, which shall be the amount of fuel expected to be consumed before take-off, taking into account local conditions at the departure aerodrome and auxiliary power unit (APU) fuel consumption;
- b) *trip fuel*, which shall be the amount of fuel required to enable the aeroplane to fly from takeoff or the point of in-flight re-planning until landing at the destination aerodrome taking into account the operating conditions of 4.3.6.2 b);
- c) *contingency fuel*, which shall be the amount of fuel required to compensate for unforeseen factors. It shall be 5 per cent of the planned trip fuel or of the fuel required from the point of in flight re-planning based on the consumption rate used to plan the trip fuel but in any case shall not be lower than the amount required to fly for five minutes at holding speed at 450 m (1,500 ft) above the destination aerodrome in standard conditions;

Note.— Unforeseen factors are those which could have an influence on the fuel consumption to the destination aerodrome, such as deviations of an individual aeroplane from the expected fuel consumption data, deviations from forecast meteorological conditions, extended taxi times before take-off, and deviations from planned routings and/or cruising levels.

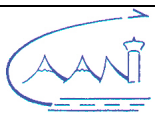


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d. *destination alternate fuel*, which shall be:

- 1) where a destination alternate aerodrome is required, the amount of fuel required to enable the aeroplane to:
 - i) perform a missed approach at the destination aerodrome;
 - ii) climb to the expected cruising altitude;
 - iii) fly the expected routing;
 - iv) descend to the point where the expected approach is initiated; and
 - v) conduct the approach and landing at the destination alternate aerodrome; or
- 2) where two destination alternate aerodromes are required, the amount of fuel, as calculated in 4.3.6.3 d) 1), required to enable the aeroplane to proceed to the destination alternate aerodrome which requires the greater amount of alternate fuel; or
- 3) where a flight is operated without a destination alternate aerodrome, the amount of fuel required to enable the aeroplane to fly for 15 minutes at holding speed at 450 m (1 500 ft) above destination aerodrome elevation in standard conditions; or
- 4) where the aerodrome of intended landing is an isolated aerodrome:
 - i) for a reciprocating engine aeroplane, the amount of fuel required to fly for 45 minutes plus 15 per cent of the flight time planned to be spent at cruising level, including final reserve fuel, or two hours, whichever is less; or
 - ii) for a turbine engine aeroplane, the amount of fuel required to fly for two hours at normal cruise consumption above the destination aerodrome, including final reserve fuel;
- e) *final reserve fuel*, which shall be the amount of fuel calculated using the estimated mass on arrival at the destination alternate aerodrome or the destination aerodrome, when no destination alternate aerodrome is required:
 - 1) for a reciprocating engine aeroplane, the amount of fuel required to fly for 45 minutes, under speed and altitude conditions specified by the State of the Operator; or
 - 2) for a turbine engine aeroplane, the amount of fuel required to fly for 30 minutes at holding speed at 450 m (1 500 ft) above aerodrome elevation in standard conditions;
- f) *additional fuel*, which shall be the supplementary amount of fuel required if the minimum fuel calculated in accordance with 4.3.6.3 b), c), d) and e) is not sufficient to:



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- 1) allow the aeroplane to descend as necessary and proceed to an alternate aerodrome in the event of engine failure or loss of pressurization, whichever requires the greater amount of fuel based on the assumption that such a failure occurs at the most critical point along the route;
 - i) fly for 15 minutes at holding speed at 450 m (1 500 ft) above aerodrome elevation in standard conditions; and
 - ii) make an approach and landing;
- 2) allow an aeroplane engaged in EDTO to comply with the EDTO critical fuel scenario as established by the State of the Operator;
- 3) meet additional requirements not covered above;

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

Note 2.—Guidance on EDTO critical fuel scenarios are contained in Attachment D;

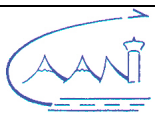
- g) *discretionary fuel*, which shall be the extra amount of fuel to be carried at the discretion of the pilot-in-command.

4.3.6.4 RESERVED

4.3.6.5 A flight shall not commence unless the usable fuel on board meets the requirements in 4.3.6.3 a), b), c), d), e) and f) if required and shall not continue from the point of in-flight re-planning unless the usable fuel on board meets the requirements in 4.3.6.3 b), c), d), e) and f) if required.

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

- a) flight fuel calculations;
- b) capabilities of the operator to include:
 - i) a data-driven method that includes a fuel consumption monitoring programme; and/or
 - ii) the advanced use of alternate aerodromes; and
- c) specific mitigation measures.



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

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

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

4.3.7 In-flight fuel management

4.3.7.1 An operator shall establish policies and procedures, approved by the DG, CAAN to ensure that in-flight fuel checks and fuel management are performed.

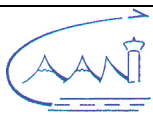
4.3.7.2 The pilot-in-command shall continually ensure that the amount of usable fuel remaining on board is not less than the fuel required to proceed to an aerodrome where a safe landing can be made with the planned final reserve fuel remaining upon landing.

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

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

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

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



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

4.3.7.2.3 The Pilot-In-Command shall declare a situation of fuel emergency by broadcasting “MAYDAY MAYDAYMAYDAY FUEL”, when the calculated usable fuel predicted to be available upon landing at the nearest aerodrome where a safe landing can be made is less than the planned final reserve fuel.

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

Note 2.— The words “MAYDAY FUEL” describe the nature of the distress conditions as required in ICAO Annex 10, Volume II, 5.3.2.1.1 b) 3.

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

4.3.8 Refueling with passengers on board

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

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

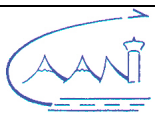
Note 1.— The provisions of 4.3.8.1 do not necessarily require the deployment of integral aeroplane stairs or the opening of emergency exits as a prerequisite to refuelling.

Note 2 – Provisions concerning aircraft refueling are contained in ICAO Annex 14, Volume I, and guidance on safe refueling practice is contained in the Airport Services Manual, (Doc 9137), Parts 1 and 8.

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

4.3.9 Oxygen supply

Note.- Approximate altitude in the Standard Atmosphere corresponding to the values of absolute pressure used in the text as follows:



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

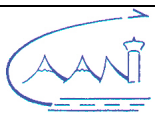
- 4.3.9.1 A flight to be operated at flight altitudes at which the atmospheric pressure in personnel compartments will be less than 700 hPa shall not be commenced unless sufficient stored breathing oxygen is carried to supply:
- a) all crew members and 10 per cent of the passengers for any period in excess of 30 minutes that the pressure in compartments occupied by them will be between 700 hPa and 620 hPa; and
 - b) the crew and passengers for any period that the atmospheric pressure in compartments occupied by them will be less than 620 hPa.
- 4.3.9.2 A flight to be operated with a pressurized aeroplane shall not be commenced unless 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.

4.4 IN-FLIGHT PROCEDURES

4.4.1 Aerodrome operating minima

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

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



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- 4.4.1.3 If, after entering the final approach segment or after descending below 300 m (1 000 ft) above the aerodrome elevation, the reported visibility or controlling RVR falls below the specified minimum, the approach may be continued to DA/H or MDA/H. In any case, an aeroplane shall not continue its approach-to-land at any aerodrome beyond a point at which the limits of the operating minima specified for that aerodrome would be infringed.

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

4.4.2 Meteorological Observations

Note.- The procedures for making meteorological observations on board aircraft in flight and for recording and reporting them are contained in AIP Nepal, GEN 3.5 METEOROLOGICAL SERVICES Chapter 6 Aircraft Reports as well as Annex 3, the PANS-ATM (Doc 4444) and the appropriate Regional Supplementary Procedures (Doc 7030).

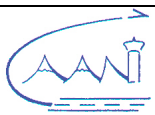
4.4.3 Hazardous flight conditions

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

4.4.4 Flight crew members at duty stations

- 4.4.4.1 *Take-off and landing.* All flight crew members required to be on flight deck duty shall be at their stations.
- 4.4.4.2 *En route.* All flight crew members required to be on flight deck duty shall remain at their stations except when their absence is necessary for the performance of duties in connection with the operation of the aeroplane or for physiological needs.
- 4.4.4.3 *Seat belts.* All flight crew members shall keep their seat belts fastened when at their stations.
- 4.4.4.4 *Safety harness.* Any flight crew member occupying a pilot's seat shall keep the safety harness fastened during the take-off and landing phases; all other flight crew members shall keep their safety harnesses fastened during the take-off and landing phases unless the shoulder straps interfere with the performance of their duties, in which case the shoulder straps may be unfastened but the seat belt must remain fastened.

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



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4.4.5 Use of oxygen

- 4.4.5.1 All flight crew members, when engaged in performing duties essential to the safe operation of an aeroplane in flight, shall use breathing oxygen continuously whenever the circumstances prevail for which its supply has been required in 4.3.9.1 or 4.3.9.2.
- 4.4.5.2 All flight crew members of pressurized aeroplanes operating above an altitude where the atmospheric pressure is less than 376 hPa shall have available at the flight duty station a quick-donning type of oxygen mask which will readily supply oxygen upon demand.

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

- 4.4.6.1 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 should have such means of protection as will enable them to administer First Aid to passengers during stabilized flight following the emergency. Passengers should be safeguarded by such devices or operational procedures as will ensure reasonable probability of their surviving the effects of hypoxia in the event of loss of pressurization.

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

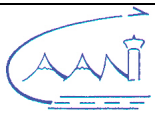
4.4.7 In-flight operational instructions

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

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

4.4.8 Instrument flight procedures

- 4.4.8.1 One or more instrument approach procedures designed in accordance with the classification of instrument approach and landing operations shall be approved and promulgated by the DG, CAAN when the aerodrome is located in Nepal to serve each instrument runway or aerodrome utilized for instrument flight operations.



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- 4.4.8.2 An operator shall ensure that 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.— See 4.2.8.3 for instrument approach operation classifications.

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

4.4.9 Aeroplane operating procedures for noise abatement

4.4.9.1 RESERVED

4.4.9.2 RESERVED

4.4.10 Aeroplane operating procedures for rates of climb and descent

4.4.10.1 RESERVED

4.5 DUTIES OF PILOT-IN-COMMAND

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

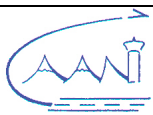
4.5.2 The pilot-in-command shall ensure that the checklists specified in 4.2.6 are complied with in detail.

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

Note.- A definition of the term “serious injury” is contained in Chapter 1.

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

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

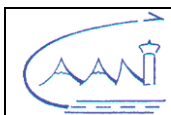


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Note.— By virtue of Resolution A10-36 of the Tenth Session of the Assembly (Caracas, June–July 1956) “the General Declaration, [described in Annex 9] when prepared so as to contain all the information required by Article 34 [of the Convention on International Civil Aviation] with respect to the journey log book, may be considered by Contracting States to be an acceptable form of journey log book”.

- 4.5.6 The pilot-in-command shall have the authority to give all commands he/she deems necessary for the purpose of securing the safety of the aeroplane and of persons or property carried therein.
- 4.5.7 The pilot-in-command shall have authority to disembark any person, or any part of the cargo, which, in his/her opinion, may represent a potential hazard to the safety of the aeroplane or its occupants.
- 4.5.8 The pilot-in-command shall not allow a person to be carried in the aeroplane who appears to be under the influence of alcohol or drugs to the extent that the safety of the aeroplane or its occupants is likely to be endangered.
- 4.5.9 The pilot-in-command shall have the right to refuse transportation of inadmissible passengers, deportees or persons in custody if their carriage poses any risk to the safety of the aeroplane or its occupants.
- 4.5.10 The pilot-in-command shall ensure that all passengers are briefed on the location of emergency exits and the location and use of relevant safety and emergency equipment.
- 4.5.11 The pilot-in-command shall ensure that all operational procedures and check lists are complied with in accordance with the Operations Manual.
- 4.5.12 The pilot-in-command shall not permit any crew member to perform any activity during take-off, initial climb, final approach and landing except those duties required for the safe operation of the aeroplane.
- 4.5.13 The pilot-in-command shall not permit:
- (i) a Flight Data Recorder to be disabled, switched off or erased during flight nor permit recorded data to be erased after flight in the event of an accident or an incident subject to mandatory reporting;
 - (ii) a Cockpit Voice Recorder to be disabled or switched off during flight unless he/she believes that the recorded data, which otherwise would be erased automatically, should be preserved for incident or accident investigation nor permit recorded data to be manually erased during or after flight in the event of an accident or an incident subject to mandatory reporting;



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4.5.12 The pilot-in-command shall decide whether or not to accept an aeroplane with unserviceabilities allowed by the CDL or MEL.

4.5.14 The pilot-in-command shall ensure that the pre-flight inspection has been carried out.

4.5.15 The commander or the pilot to whom conduct of the flight has been delegated shall, in an emergency situation that requires immediate decision and action, take any action he/she considers necessary under the circumstances. In such cases he/she may deviate from rules, operational procedures and methods in the interest of safety.

4.6 DUTIES OF FLIGHT OPERATIONS OFFICER/FLIGHT DISPATCHER

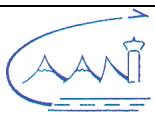
4.6.1 A flight operations officer/flight dispatcher in conjunction with a method of control and supervision of flight operations in accordance with 4.2.1.3 shall:

- a) assist the pilot-in-command in flight preparation and provide the relevant information;
- b) assist the pilot-in-command in preparing the operational and ATS flight plans, sign when applicable and file the ATS flight plan with the appropriate ATS unit; and
- c) furnish the pilot-in-command while in flight, by appropriate means, with information which may be necessary for the safe conduct of the flight.
- d) notify the appropriate ATS unit when the position of the aeroplane cannot be determined by an aircraft tracking capability, and attempts to establish communication are unsuccessful.

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

- a) initiate such procedures as outlined in the operations manual while avoiding taking any action that would conflict with ATC procedures; and
- b) convey safety-related information to the pilot-in-command that may be necessary for the safe conduct of the flight, including information related to any amendments to the flight plan that become necessary in the course of the flight.

Note.— The pilot-in-command also should convey similar information to the flight operations officer/ flight dispatcher during the course of the flight, particularly in the context of emergency situations.



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4.7 Additional Requirements For Operations By Aeroplanes With Turbine Engines Beyond 60 Minutes To An En-Route Alternate Aerodrome Including Extended Diversion Time Operations (EDTO)

4.7.1 Requirements for operations beyond 60 minutes to an en-route alternate aerodrome

4.7.1.1 Operators conducting operations beyond 60 minutes from a point on a route to an en-route alternate aerodrome shall ensure that:

a) for all aeroplanes:

- 1) en-route alternate aerodromes are identified; and
- 2) the most up-to-date information is provided to the flight crew on identified en-route alternate aerodromes, including operational status and meteorological conditions;

b) for aeroplanes with two turbine engines, the most up-to-date information provided to the flight crew indicates that conditions at identified en-route alternate aerodromes will be at or above the operator's established aerodrome operating minima for the operation at the estimated time of use.

Note.— Guidance on compliance with the requirements of these provisions is contained in Attachment D of ICAO Annex 6 Part I.

4.7.1.2 In addition to the requirements in 4.7.1.1, all operators shall ensure that the following are taken into account and provide the overall level of safety intended by the provisions of ICAO Annex 6, Part I:

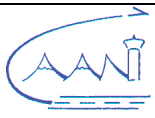
- a) operational control and flight dispatch procedures;
- b) operating procedures; and
- c) training programmes.

4.7.2 Requirements for extended diversion time operations (EDTO)

4.7.2.1 Unless the operation has been specifically approved by the DG, CAAN, an aeroplane with two or more turbine engines shall not be operated on a route where the diversion time to an en-route alternate aerodrome from any point on the route, calculated in ISA and still-air conditions at the one-engine-inoperative cruise speed for aeroplanes with two turbine engines and at the all engines operating cruise speed for aeroplanes with more than two turbine engines, exceeds a threshold time established for such operations by the DG, CAAN.

Note 1.— When the diversion time exceeds the threshold time, the operation is considered to be an extended diversion time operation (EDTO).

Note 2.— Guidance on the establishment of an appropriate threshold time and on approval of extended diversion time operations is contained in Attachment D of ICAO Annex 6 Part I.



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Note 3.— For the purpose of EDTO, the take-off and/or destination aerodromes may be considered en-route alternate aerodromes.

4.7.2.2 The maximum diversion time for an operator of a particular aeroplane type engaged in extended diversion time operations shall be approved by the DG, CAAN.

Note.— Guidance on the conditions to be used when converting diversion times to distances is contained in Attachment D of ICAO Annex 6 Part I.

4.7.2.3 When approving the appropriate maximum diversion time for an operator of a particular aeroplane type engaged in extended diversion time operations, the DG, CAAN shall ensure that:

- a) *for all aeroplanes:* the most limiting EDTO significant system time limitation, if any, indicated in the aeroplane flight manual (directly or by reference) and relevant to that particular operation is not exceeded; and
- b) *for aeroplanes with two turbine engines:* the aeroplane is EDTO certified.

Note 1.— EDTO may be referred to as ETOPS in some documents.

Note 2.— Guidance on compliance with the requirements of this provision is contained in Attachment D of ICAO Annex 6 Part I.

4.7.2.3.1 Notwithstanding the provisions in 4.7.2.3 a), the DG, CAAN may, based on the results of a specific safety risk assessment conducted by the operator which demonstrates how an equivalent level of safety will be maintained, approve operations beyond the time limits of the most time-limited system. The specific safety risk assessment shall include at least the:

- a) capabilities of the operator;
- b) overall reliability of the aeroplane;
- c) reliability of each time-limited system;
- d) relevant information from the aeroplane manufacturer; and
- e) specific mitigation measures.

Note.— Guidance on the specific safety risk assessment is contained in Attachment D of ICAO Annex 6 Part I.



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4.7.2.4 For aeroplanes engaged in EDTO, the additional fuel required by 4.3.6.3 f) 2) shall include the fuel necessary to comply with the EDTO critical fuel scenario as established by the DG, CAAN.

Note.— Guidance on compliance with the requirements of this provision is in Attachment D of ICAO Annex 6 Part I.

4.7.2.5 A flight shall not proceed beyond the threshold time in accordance with 4.7.2.1 unless the identified en-route alternate aerodromes have been re-evaluated for availability and the most up-to-date information indicates that, during the estimated time of use, conditions at those aerodromes will be at or above the operator's established aerodrome operating minima for the operation. If any conditions are identified that would preclude a safe approach and landing at that aerodrome during the estimated time of use, an alternative course of action shall be determined.

4.7.2.6 The DG, CAAN shall, when approving maximum diversion times for aeroplanes with two turbine engines, ensure that the following are taken into account in providing the overall level of safety intended by the provisions of ICAO Annex 8:

- a) reliability of the propulsion system;
- b) airworthiness certification for EDTO of the aeroplane type; and
- c) EDTO maintenance programme.

Note 1.— EDTO may be referred to as ETOPS in some ICAO documents.

Note 2.—The Airworthiness Manual (Doc 9760) contains guidance on the level of performance and reliability of aeroplane systems intended by 4.7.2.6, as well as guidance on continuing airworthiness aspects of the requirements of 4.7.2.6.

4.7.2.7 RESERVED

4.8 CARRIAGE OF CARGO INCLUDING CARRY-ON BAGGAGE

- (a) The operator shall ensure that all baggage carried onto an aeroplane and taken into the passenger cabin is adequately and securely stowed.
- (b) No person may carry cargo, including carry-on baggage, in or on any aircraft unless :
 - (i) it is carried in an approved cargo rack, bin or compartment installed in or on the aircraft.
 - (ii) it is secured by an approved means, or
 - (iii) it is carried in accordance with the following:
 - (1) for cargo, it is properly secured by a safety belt or other tie-down having



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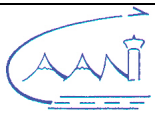
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enough strength to eliminate the possibility of shifting under all normally anticipated flight and ground conditions, or for carry-on baggage, it is restrained so as to prevent its movement during air turbulence.

- (2) it is packaged or covered to avoid possible injury to occupants.
- (3) it does not impose any load on seats or on the floor structure that exceeds the load limitation for those components.
- (4) it is not located in a position that obstructs the access to, or use of any required emergencies or regular exit, or the use of the aisle between the crew and the passenger compartment, or located in a position that obscures any passenger's view of the "seat belt" or "no smoking" sign, or any required exit sign, unless an auxiliary sign or other approved means for proper notification of the passengers is provided.
- (5) it is not stowed directly above seated occupants.
- (6) for cargo only operations, paragraph (iii) (4) does not apply if the cargo is loaded so that at least one emergency or regular exit is available to provide all occupants of the aircraft a means of unobstructed exit from the aircraft if an emergency occurs.
- (iv) Each passenger seat under which the baggage is stowed shall be fitted with a means to prevent articles of baggage stowed under it from sliding under crash impacts severe enough to induce damage or injury to the occupants.
- (v) When cargo is carried in cargo compartments that are designed to require the physical entry of a crewmember to extinguish any fire that may occur during flight, the cargo must be loaded so as to allow a crewmember to effectively reach all parts of the compartment with the contents of a hand fire extinguisher.

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

- 4.9.1 A single-enginedaeroplane shall not be operated under the IFR by a single pilot or at night for commercial operations.



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4.10 FATIGUE MANAGEMENT

4.10.1 Requirements in this FOR have been established for the purpose of managing fatigue with the aim of ensuring that flight and cabin crew members are performing at an adequate level of alertness. *Refer Chapter 9 AEROPLANE FLIGHT CREW.*

- a) The DG, CAAN may permit an operator to implement its Fatigue Risk Management System (FRMS) to manage fatigue, provided it meets the guidelines established for such systems.

Note.—Guidance for the development of prescriptive regulations to manage fatigue is given in ICAO Annex 6 Part I, Attachment A and detailed requirements for an FRMS are in ICAO Annex 6 Part I, Appendix 7.

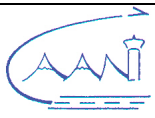
4.10.2 An Operator shall, in compliance with 4.10.1 and for the purposes of managing its fatigue-related safety risks, establish either:

- a) flight time, flight duty period, duty period and rest period limitations that are within the prescriptive fatigue management regulations established by the requirements of this FOR Chapter 9; or
- b) a Fatigue Risk Management System (FRMS) in compliance with 4.10.6 for all operations; or
- c) an FRMS in compliance with 4.10.6 for part of its operations and the requirements of 4.10.2 a) for the remainder of its operations.

Note.— Guidance for the implementation and oversight of an FRMS is given in the Fatigue Risk Management Systems Manual for Regulators (Doc 9966).

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

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



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4.10.5 The DG, CAAN when approving an operator's FRMS shall establish a process to ensure that an FRMS provides a level of safety equivalent to, or better than, the prescriptive fatigue management regulations. As part of this process, the DG, CAAN shall:

- a) require that the operator establish maximum values for flight times and/or flight duty periods(s) and duty period(s), and minimum values for rest periods. These values shall be based upon scientific principles and knowledge, subject to safety assurance processes, and acceptable to the DG, CAAN;
- b) mandate a decrease in maximum values and an increase in minimum values in the event that the operator's data indicates these values are too high or too low, respectively; and
- c) approve any increase in maximum values or decrease in minimum values only after evaluating the operator's justification for such changes, based on accumulated FRMS experience and fatigue-related data.

Note.— Safety assurance processes are described in ICAO Annex 6, Part I Appendix 7.

4.10.6 Where an operator implements an FRMS to manage fatigue-related safety risks, the operator shall, as a minimum:

- a) incorporate scientific principles and knowledge within the FRMS;
- b) identify fatigue-related safety hazards and the resulting risks on an ongoing basis;
- c) ensure that remedial actions, necessary to effectively mitigate the risks associated with the hazards, are implemented promptly;
- d) provide for continuous monitoring and regular assessment of the mitigation of fatigue risks achieved by such actions; and
- e) provide for continuous improvement to the overall performance of the FRMS.

Note.— Detailed requirements for an FRMS are in Appendix 7 of ICAO Annex 6 Part I.

4.10.7 *RESERVED*

Note.— The integration of FRMS and SMS is described in the Fatigue Risk Management Systems Manual for Regulators (Doc 9966).

4.10.8 An operator shall maintain records for all its flight and cabin crew members of flight time, flight duty periods, duty periods, and rest periods for a period of at least one year.

4.11 *RESERVED*



4.12 PORTABLE ELECTRONIC DEVICES

4.12.1 Except as provided in paragraph 4.12.2 of this chapter, no person may operate, nor may any operator or Pilot-In-Command of an aircraft allow the operation of any portable electronic device on any CAAN registered aircraft.

4.12.2 Paragraph 4.12.1 of this chapter does not apply to the following:

- a) Hearing aids
- b) Heart pacemakers
- c) Portable voice recorders
- d) Electric Shavers
- e) Any electronic device besides those described above that has been determined by the operator that will not interfere in the smooth functioning of the electronic communication and navigation equipment onboard.
 - i) The determination of the effect of a particular device on the navigation and communication system of the aircraft on which it is to be used or operated must, in case of an aircraft operated by the holder of an Air Operator Certificate or other operating certificate, be made by that operator (i.e., certificate holder).
 - ii) In all other cases, a determination must be made and it may be made by the operator and/or the pilot-in-command (PIC).
 - iii) In some cases, the determination may be based on operational tests conducted by the operator without sophisticated testing equipment. When safely at cruise altitude, the PIC may allow the devices to be operated. If interference is experienced, the types of devices causing interference must be isolated, along with the applicable conditions recorded. The device responsible for the interference must then be turned off.
 - iv) Personnel specifically designated by the air carrier or commercial operator for this purpose may make this determination.



CHAPTER 5

AEROPLANE PERFORMANCE OPERATING LIMITATIONS

5.1 GENERAL

- 5.1.1 Aeroplanes shall be operated in accordance with a comprehensive and detailed code of performance established by the Civil Aviation Authority of Nepal in compliance with the applicable requirements of this chapter.
- 5.1.2 Single-engine aeroplanes shall only be operated in conditions of weather and light, and over such routes and diversions therefrom, that permit a safe forced landing to be executed in the event of engine failure.

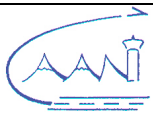
5.1.3 RESERVED

5.2 APPLICABLE TO AEROPLANES CERTIFICATED IN ACCORDANCE WITH PARTS IIIA AND IIIB OF ICAO ANNEX 8.

- 5.2.1 The requirements contained in 5.2.2 to 5.2.11 inclusive are applicable to the large aeroplanes to which Parts IIIA and IIIB of ICAO Annex 8 are applicable.
- 5.2.2 The level of performance defined by the appropriate parts of the comprehensive and detailed national code referred to in 5.1.1 for the aeroplanes designated in 5.2.1 shall be at least substantially equivalent to the overall level embodied in the requirements of this chapter.

Note.— APPENDIX 13 contains guidance material which indicates the level of performance intended by the requirements of this chapter.

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



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- 5.2.4 The State of Registry shall take such precautions as are reasonably possible to ensure that the general level of safety contemplated by these provisions is maintained under all expected operating conditions, including those not covered specifically by the provisions of this chapter.
- 5.2.5 A flight shall not be commenced unless the performance information provided in the flight manual indicates that the requirements of 5.2.6 to 5.2.11 can be complied with for the flight to be undertaken.
- 5.2.6 When applying the requirements of this chapter, account shall be taken of all factors that significantly affect the performance of the aeroplane, including but not limited to: the mass of the aeroplane, the operating procedures, the pressure-altitude appropriate to the elevation of the aerodrome, the ambient temperature, the wind, the runway slope and conditions of the 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.
- 5.2.7 Mass limitations
- a) The mass of the aeroplane at the start of take-off shall not exceed the mass at which 5.2.8 is complied with, nor the mass at which 5.2.9, 5.2.10 and 5.2.11 are complied with, allowing for expected reductions in mass as the flight proceeds, and for such fuel jettisoning as is envisaged in applying 5.2.9 and 5.2.10 and, in respect of alternate aerodromes, 5.2.7 c) and 5.2.11.
 - b) In no case shall the mass at the start of take-off exceed the maximum take-off mass specified in the flight manual for the pressure-altitude appropriate to the elevation of the aerodrome, and, if used as a parameter to determine the maximum take-off mass, any other local atmospheric condition.
 - c) In no case shall the estimated mass for the expected time of landing at the aerodrome of intended landing and at any destination alternate aerodrome, exceed the maximum landing mass specified in the flight manual for the pressure-altitude appropriate to the elevation of those aerodromes, and if used as a parameter to determine the maximum landing mass, any other local atmospheric condition.
 - d) In no case shall the mass at the start of take-off, or at the expected time of landing at the aerodrome of intended landing and at any destination alternate aerodrome, exceed the relevant maximum masses at which compliance has been demonstrated with the applicable noise certification mentioned in Annex-16, Vol-1 Aircraft Noise, Part II Aircraft Noise Certification unless otherwise authorized in



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exceptional circumstances for a certain aerodrome or a runway where there is no noise disturbance problem, in which the aerodrome is situated.

- e) Before the commencement of a public transport flight, the operator, or the person in charge of the loading of the aircraft or the pilot-in-command, shall prepare load and trim sheets that shall contain:
 - i) the registration mark of the aircraft to which the load and trim sheets relate;
 - ii) particulars of the intended flight;
 - iii) the total mass of the aircraft as loaded for that flight;
 - iv) the mass of several items from which the total mass of the aircraft has been calculated including, in particular, the mass of the aircraft prepared for service and the respective total mass of the crew (unless included in the mass of the aircraft prepared for service), passengers, baggage, and cargo intended to be carried on the flight;
 - v) the manner in which the load is distributed and the resulting position of the centre of gravity of the aircraft;
- f) Load and trim sheets shall be signed by the Operator, or the person(s) identified by the Operator as responsible for despatching the aircraft who is duly trained and certified, as certifying that it has been loaded in accordance with the instructions issued by the operator and approved by the Director General.
- g) For the purpose of calculating the total mass of the aircraft, the respective total mass of the passengers and crew entered in the load and trim sheets shall be computed from the actual mass of each person, and for that purpose, each person shall be separately weighed for aircraft carrying up to six passengers. For aircraft carrying seven or more passengers refer to Flight Operations Directive No. 08
- h) An Air Operator shall determine the weights to be used for passengers in its Operations Manual. It may conduct a sampling of an adequate number of passengers prior to determining a fixed value. Operators shall define weights for 'adult male, adult female, child and infant' passengers; where 'adult' means a person older than 12 years and 'child' means between 02 and 12 years and 'infant' means below 2 years of age.
- i) An Air Operator shall in addition to the passenger weight, also determine the weight of hand baggage, if so permitted. Such determined hand baggage value shall be clearly defined in the Operations Manual.



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

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

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

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

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

5.3 OBSTACLE DATA

5.3.1 Obstacle data from the AIP-Nepal shall be used by the operator when developing procedures to comply with 5.2.8 when taking off from aerodromes located within Nepal. When using aerodromes located abroad, the operator shall use the obstacle data provided by the local civil aviation authority of the States in which the aerodromes are located.

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



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

- 5.4.1 (i) A single-engine aeroplane is not permitted to be operated at night within the territory of Nepal for commercial purposes.
- (ii) When approving operations by single-engine turbine-powered aeroplanes in day IMC, CAAN shall ensure that the airworthiness certification of the aeroplane is appropriate; that the manufacturer and the State of manufacture have certified the aeroplane for IFR operations and that the overall level of safety intended by the DG, CAAN is provided by:
- a) the reliability of the turbine engine
 - b) the operator's maintenance procedures, operating practices, flight dispatch procedures and crew training programmes;
 - c) equipment and other requirements provided in accordance with Chapter 6.9.
 - d) the utilization of at least two pilots for the conduction of such operations
- 5.4.2 All single-engine turbine-powered aeroplanes engaged in commercial operations shall have an engine trend monitoring system, and those aeroplanes for which the individual Certificate of Airworthiness is first issued on or after 01 January 2005 shall have an automatic trend monitoring system.

CHAPTER 6

AEROPLANE INSTRUMENTS, EQUIPMENT AND FLIGHT DOCUMENTS

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

6.1 GENERAL

- 6.1.1 a) An aeroplane registered in Nepal shall not be operated unless the requirements in respect of emergency and life saving equipment, navigational equipment, instrument approach equipment, flight recorders, oxygen and its dispensing apparatus, flight controls and other equipment specified in this chapter are complied with.
- b) 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.
- 6.1.2 An operator shall carry a certified true copy of the Air Operator Certificate specified in 4.2.1 and a copy of the Operations Specifications relevant to the aeroplane type, issued in conjunction with the certificate. When the certificate and the associated Operations Specifications are issued in a language other than English, an English translation shall be included.

Note.- Provisions for the content of the Air Operator Certificate and its associated Operations Specifications are contained in the Air Operator Certificate Requirements (AOCR).

- 6.1.3 The operator shall include in the operations manual a Minimum Equipment List (MEL), approved by the Director General of CAAN 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. Where the State of the Operator is not the State of Registry, the State of the Operator shall ensure that the MEL does not affect the aeroplane's compliance with the airworthiness requirements applicable in the State of Registry.

Note.— Appendix 3 contains guidance on the minimum equipment list.



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

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

6.2 ALL AEROPLANES ON ALL FLIGHTS

- 6.2.1 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 maneuvers and observe the operating limitations of the aeroplane in the expected operating conditions.

- 6.2.2 An aeroplane shall be equipped with:

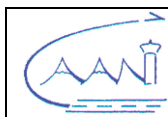
- a) Accessible and adequate medical supplies appropriate to the number of passengers the aeroplane is authorized to carry, as specified by Director General, CAAN.

Medical supplies should comprise;

- 1) One or more first aid kits for the use of cabin crew in managing incidents of ill health; and
- 2) For aeroplanes required to carry cabin crew as part of the operating crew, one universal precaution kit (two for aeroplanes authorized to carry more than 250 passengers) for the use of cabin crew members in managing incidents of ill health associated with a case of suspected communicable disease, or in the case of illness involving contact with body fluids; and
- 3) For aeroplanes authorized to carry more than 100 passengers, on a sector length of more than two hours, a medical kit, for the use of medical doctors or other qualified persons in treating in-flight medical emergencies.

Note.- Types, number, location and contents of medical supplies are contained in Appendix 4.

- 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:
- i) the pilot's compartment; and



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- ii) each passenger compartment that is separate from the pilot's compartment and that is not readily accessible to the flight crew;

Note 1 — Any portable fire extinguisher so fitted in accordance with the Certificate Of Airworthiness of the aeroplane may count as one prescribed.

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

- c)
 - i) a seat or berth for each person over an age of two years.
 - ii) a seat belt for each seat and restraining belts for each berth; and
 - iii) 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;
 - iv) a safety harness for each cabin crew seat when the aircraft is so equipped, who is associated with emergency evacuation duties.

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

- d) means of ensuring that the following information and instructions are conveyed to passengers:
 - i) when seat belts are to be fastened;
 - ii) when and how oxygen equipment is to be used if the carriage of oxygen is required;
 - iii) restrictions on smoking;
 - iv) location and use of life jackets or equivalent individual flotation devices where their carriage is required; and
 - v) location and method of opening emergency exits; and
- e) spare electrical fuses of appropriate ratings for replacement of those accessible in flight.

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

- a) meet the applicable minimum performance requirements of the State of Registry; and
- b) not be of a type listed in the 1987 *Montreal Protocol on Substances that Deplete the Ozone Layer* as it appears in the Eighth Edition of the *Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer*, Annex A, Group II.

Note.— Information concerning extinguishing agents is contained in the UNEP Halons Technical Options Committee Technical Note No. 1 – New Technology Halon Alternatives



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And FAA Report No. DOT/FAA/AR-99-63, Options to the Use of Halons for Aircraft Fire Suppression Systems.

6.2.3 An aeroplane shall carry the following documents:

- a) the operations manual in parts that pertain to flight operations;
- b) the Nepalese Certificate of Registration issued in relation to that aeroplane;
- c) current and suitable charts to cover the route of the proposed flight and any route along which it is reasonable to expect that the flight may be diverted.
- d) the Nepalese Certificate of Airworthiness issued in relation to that aeroplane;
- e) the current Maintenance Release issued in relation to that aeroplane;
- f) the flight manual for the aeroplane, or other documents containing performance data required for the application of Chapter 5 and any other information necessary for the operation of the aeroplane within the terms of its certificate of airworthiness, unless these data are available in the operations manual; and;
- g) the Mobile Radio Station Licenses issued in relation to the radio equipment installed in the aeroplane;
- h) the current licenses held by each member of the flight crew;
- i) the aeroplane journey log book or general declaration;
- j) if passengers are carried, a list of their names, places of embarkation and intended place of disembarkation;
- k) if cargo is carried, bills of loading and manifests relating to that cargo;
- l) a copy of the operational flight plan;
- m) a copy of the Air Traffic Control flight plan, if applicable;
- n) the load sheet relating to the calculation of mass of the aeroplane;
- o) the trim sheets relating to the disposition of the load and balance of the aeroplane and;
- p) Aeroplane search procedure checklist
Checklist of the procedures to be followed in searching for a bomb in case of suspected sabotage. The checklist shall be supported by guidance on the course of action to be taken should a bomb or suspicious object be found and information on the least-risk bomb location specific to the aeroplane.
- q) Standard Operating Procedure
- r) A certified true copy of the AOC and Operations Specifications for aeroplanes engaged in commercial operations
- s) A certified true copy of validated noise certificate for international operations
- t) Emergency response guidance for aircraft incidents involving dangerous goods (for air operators certified to carry Dangerous Goods)

6.2.4 Marking of break-in points

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

6.2.4.2 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 requirement does not require any aeroplane to have break-in areas.

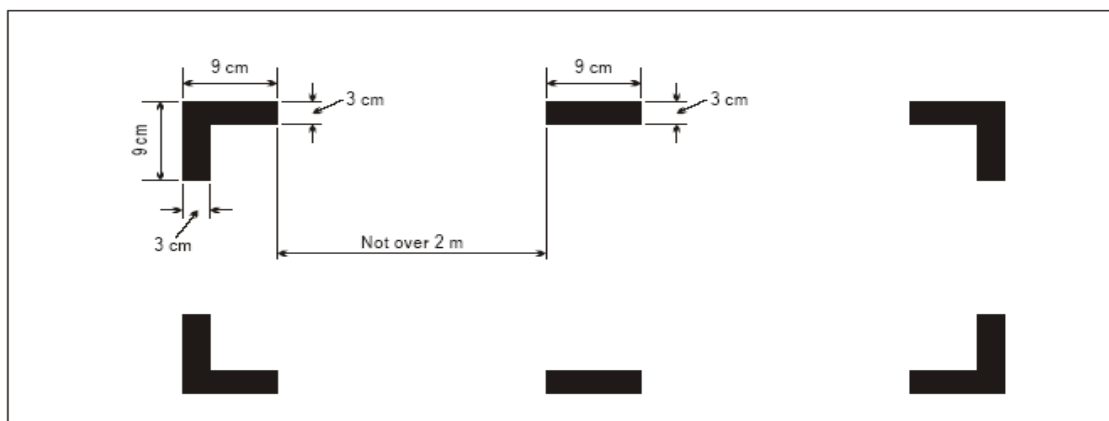


Figure: Marking of break-in points

6.3 FLIGHT RECORDERS

Note 1.-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). Image and data link information may be recorded on either the CVR or the FDR.

Note 2.- Lightweight flight recorders comprise four systems: an aircraft data recording system (ADRS), a cockpit audiorecording system (CARS), an airborne image recording system (AIRS) and 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 8.

Note 4.— For aeroplanes for which the application for type certification is submitted to a Contracting State before 1 January 2016, specifications applicable to flight recorders may be found in EUROCAE ED-112, ED-56A, ED-55, Minimum Operational Performance Specifications (MOPS), or earlier equivalent documents.

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

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

6.3.1 FLIGHT DATA RECORDERS AND AIRCRAFT DATA RECORDING SYSTEMS



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

6.3.1.1 Types

6.3.1.1.1 A Type I and IA FDR shall record the parameters required to determine accurately the aeroplane flight path, speed, attitude, engine power, configuration and operation.

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

6.3.1.2 Operation

6.3.1.2.1 All turbine-engined aeroplanes of a maximum certificated take-off mass of 5 700 kg or less for which a typecertificate is first issued on or after 1 January 2016 shall be equipped with:

- a) a Type II FDR; or
- b) a Class C AIR capable of recording flight path and speed parameters displayed to the pilot(s); or
- c) an ADRS capable of recording the essential parameters defined in Table A8-3 of Appendix 8.

Note 1.— “The application for type certification is submitted to a Contracting State” refers to the date of application of the original “Type Certificate” for the aeroplane type, not the date of certification of particular aeroplane variants or derivative models.

Note 2.— AIR or AIRS classification is defined in 4.1 of Appendix 8.

6.3.1.2.2 RESERVED

6.3.1.2.3 All aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate ofairworthiness is first issued on or after 1 January 1989 shall be equipped with a Type I FDR.

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

6.3.1.2.5 RESERVED

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6.3.1.2.6 All turbine-engined aeroplanes, for which the individual certificate of airworthiness was first issued on or after 1 January 1987 but before 1 January 1989, with a maximum certificated take-off mass of over 5 700 kg, except those in 6.3.1.2.8, shall be equipped with an FDR which shall record time, altitude, airspeed, normal acceleration and heading.

6.3.1.2.7 RESERVED

6.3.1.2.8 All turbine-engined aeroplanes, for which the individual certificate of airworthiness was first issued on or after 1 January 1987 but before 1 January 1989, with a maximum certificated take-off mass of over 27 000 kg that are of types of which the prototype was certificated by the appropriate national authority after 30 September 1969 shall be equipped with a Type II FDR.

6.3.1.2.9 All turbine-engined aeroplanes, for which the individual certificate of airworthiness was first issued before 1 January 1987, with a maximum certificated take-off mass of over 5 700 kg shall be equipped with an FDR which shall record time, altitude, airspeed, normal acceleration and heading.

6.3.1.2.10 RESERVED

6.3.1.2.11 All aeroplanes of a maximum certificated take-off mass of over 5 700 kg for which the individual certificate of airworthiness is first issued after 1 January 2005 shall be equipped with a Type IA FDR.

6.3.1.2.12 All aeroplanes which are required to record normal acceleration, lateral acceleration and longitudinal acceleration for which the application for type certification is submitted to a Contracting State on or after 1 January 2016 and which are required to be fitted with an FDR shall record those parameters at a maximum sampling and recording interval of 0.0625 seconds.

6.3.1.2.13 All aeroplanes which are required to record pilot input and/or control surface position of primary controls (pitch, roll, yaw) for which the application for type certification is submitted to a Contracting State on or after 1 January 2016 and which are required to be fitted with an FDR shall record those parameters at a maximum sampling and recording interval of 0.125 seconds.

Note.—

- *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.*



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6.3.1.3 Discontinuation

- 6.3.1.3.1 The use of engraving metal foil FDRs shall be discontinued.
- 6.3.1.3.2 The use of analogue FDRs using frequency modulation (FM) shall be discontinued.
- 6.3.1.3.3 The use of photographic film FDRs shall be discontinued
- 6.3.1.3.4 RESERVED.
- 6.3.1.3.5 The use of magnetic tape FDRs shall be discontinued by 1 January 2016.

6.3.1.4 Flight Data Recorders – Duration

All FDRs shall be capable of retaining the information recorded during at least the last 25 hours of their operation, except for the Type IIA FDR which shall be capable of retaining the information recorded during at least the last 30 minutes of its operation.

6.3.2 COCKPIT VOICE RECORDERS (CVR) AND COCKPIT AUDIO RECORDING SYSTEMS (CARS)

6.3.2.1 Operation

- 6.3.2.1.1 All turbine-engined aeroplanes of a maximum certificated take-off mass of over 2 250 kg, up to and including 5 700 kg, for which the application for type certification is submitted to a Contracting State on or after 1 January 2016 and required to be operated by more than one pilot shall be equipped with either a CVR or a CARS.
- 6.3.2.1.2 RESERVED
- 6.3.2.1.3 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 2003, shall be equipped with a CVR capable of retaining the information recorded during at least the last two hours of its operation.
- 6.3.2.1.4 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 1987 shall be equipped with a CVR.
- 6.3.2.1.5 All turbine-engined aeroplanes, for which the individual certificate of airworthiness was first issued before 1 January 1987, with a maximum certificated take-off mass of over 27 000 kg that are of types of which the

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prototype was certificated by the appropriate national authority after 30 September 1969 shall be equipped with a CVR.

6.3.2.1.6 RESERVED

6.3.2.2 Discontinuation

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

6.3.2.2.2 RESERVED

6.3.2.3 Duration

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

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

6.3.2.3.3 RESERVED

6.3.2.4 Cockpit voice recorder alternate power

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

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

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

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

6.3.2.4.3 RESERVED

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6.3.2.5 Serviceability

6.3.2.5.1 All multi-engine aeroplanes engaged in commercial operations shall be equipped with a CVR.

6.3.2.5.2 With reference to 6.3.2.5.1, in case of a non-operative CVR, aeroplanes shall be permitted to return to base on a one-time basis provided the flight is conducted in Day VFR conditions.

6.3.3 DATA LINK RECORDERS

6.3.3.1 Applicability

6.3.3.1.1 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 8 and are required to carry a CVR, shall record on a flight recorder the data link communications messages.

6.3.3.1.2 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 8 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 I/A-equipped 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.

6.3.3.2 Duration

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

6.3.3.3 Correlation

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

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6.3.4 FLIGHT RECORDERS – GENERAL

6.3.4.1 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.

6.3.4.2 Operation

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

6.3.4.2.2 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 re-activated before their disposition as determined in accordance with ICAO Annex 13 or as advised by the Director General of CAAN.

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 operations.

Note 2 – The operator's responsibilities regarding the retention of flight recorders are contained in 11.6.

6.3.4.3 Continued serviceability

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

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

6.3.4.4 Flight recorder electronic documentation

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

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

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6.3.4.5 Combination recorders

6.3.4.5.1 RESERVED

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

6.3.4.5.3 All aeroplanes of a maximum certificated take-off mass over 5 700 kg, required to be equipped with an FDR and a CVR, may alternatively be equipped with two combination recorders (FDR/CVR).

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

6.3.4.5.4 All multi-engined turbine-powered aeroplanes of a maximum certificated take-off mass of 5 700 kg or less, required to be equipped with an FDR and/or a CVR, may alternatively be equipped with one combination recorder (FDR/CVR).

6.4 ALL AEROPLANES OPERATED AS VFR FLIGHTS

6.4.1 All aeroplanes when operated as VFR flights 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;
- d) an airspeed indicator; and
- e) such additional instruments or equipment as may be prescribed by the Director General of CAAN.

6.4.2 VFR flights which are operated as controlled flights shall be equipped in accordance with 6.9 (*All Aeroplanes Operated In Accordance With Instrument Flight Rules*).

6.5 ALL AEROPLANES ON FLIGHTS OVER WATER

6.5.1 Seaplanes

All seaplanes for all flights shall be equipped with:

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- a) One life jacket, or equivalent individual flotation device, for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided;
- b) Equipment for making the sound signals prescribed in the International Regulations for Preventing Collisions at Sea, where applicable; and
- c) One sea anchor (drogue).

Note.- “Seaplanes” includes amphibians operated as seaplanes.

6.5.2 Landplanes

6.5.2.1 Aeroplanes shall carry the equipment prescribed in 6.5.2.2

- a) when flying over water and at a distance of more than 93 km (50 NM) away from the shore, in the case of landplanes operated in accordance with 5.2.9 or 5.2.10.
- b) when flying en route over water beyond gliding distance from the shore, in the case of all other landplanes; and
- c) when taking off or landing at an aerodrome where in the opinion of the DG, CAAN, the take-off or approach path is so disposed over water that in the event of a mishap there would be a likelihood of a ditching.

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

Note — “Landplanes” includes amphibians operated as landplanes.

6.5.3 All aeroplanes on long-range over-water flights

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

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



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

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

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

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

6.6 ALL AEROPLANES ON FLIGHTS OVER DESIGNATED LAND AREAS

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

6.7 ALL AEROPLANES ON HIGH ALTITUDE FLIGHTS

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

<u>Absolute pressure</u>	<u>Meters Feet</u>	
700 hPa	3 000	10 000
620 hPa	4 000	13 000
376 hPa	7 600	25 000

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

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

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

6.7.4 RESERVED

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

6.7.6 RESERVED

6.8 ALL AEROPLANES IN ICING CONDITIONS

All 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.

6.9 ALL AEROPLANES OPERATED IN ACCORDANCE WITH INSTRUMENT FLIGHT RULES

6.9.1 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 clock indicating the time in hours, minutes and seconds in sweeping hand; or an approved equivalent;
- c) two sensitive pressure altimeters with counter drum-pointer or equivalent presentation;

Note – Neither three-pointer nor drum-pointer altimeters satisfy the requirement in 6.9.1 c).

- d) for each pilot station, an airspeed indicating system with means of preventing malfunctioning due to either condensation or icing;
- e) for each pilot station, a turn and slip indicator;
- f) for each pilot station, one attitude indicator (artificial horizon);

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- g) for each pilot station, one heading indicator (directional gyroscope);

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

- h) a means of indicating whether the power supply to the gyroscopic instrument is adequate;
- i) a means of indicating in the flight crew compartment the outside air temperature;
- j) for each pilot station, a rate-of-climb and descent indicator;
- k) a Transponder with Mode C capability,
- l) a power failure warning device or vacuum indicator to show the power available for gyroscopic instruments from each power source.
- m) an alternate source of static pressure for the altimeter and the airspeed and vertical speed indicators.
- n) for single-engine aeroplanes:
- (i) two independent electrical power generating sources each of which is able to supply all probable combinations of continuous in-flight electrical loads for required instruments and equipment – where *continuous in-flight electrical load* includes one that draws current continuously during flight, such as radio equipment, electrically driven instruments and lights but does not include occasional intermittent loads; or
 - (ii) in addition to the primary electrical power generating source, a standby battery or an alternate source of electric power that is capable of supplying 150% of the electrical loads of all required instruments and equipment necessary for safe emergency operation of the aircraft for at least one hour.
- o) for multi-engine aeroplanes, at least two generators or alternators each of which is on a separate engine, of which any combination of one-half of the total number are rated sufficiently to supply the electrical loads of all required instruments and equipment necessary for safe emergency operation of the aeroplane.
- p) two independent sources of energy (with means of selecting either) of which at least one is an engine driven pump or generator, each of which is able to drive all required gyroscopic instruments powered by, or to be powered by, that particular source and installed so that failure on one instrument or source, does not interfere with the energy supply to the remaining instruments or the

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other energy source. For multi-engine aeroplanes, each engine driven source of energy must be on a different engine.

- q) such additional instruments or equipment as may be prescribed by the Director General of CAAN.

6.9.2 All aeroplanes over 5,700 kg — Emergency power supply for electrically operated attitude indicating instruments

6.9.2.1 All aeroplanes of a maximum certificated take-off mass of over 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, which may include either the aircraft battery or an independent power pack of the artificial horizon, or both, shall be:

- (i) automatically operative after the total failure of the main electrical generating system; and
- (ii) in the case of dedicated power supply, clear indication shall be given on the instrument panel that the attitude indicator(s) is being operated by emergency power.

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

6.10 ALL AEROPLANES WHEN OPERATED AT NIGHT

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

- a) all equipment specified in 6.9 ALL AEROPLANES OPERATED IN ACCORDANCE WITH INSTRUMENT FLIGHT RULES.
- b) the lights required by ICAO Annex 2 for aircraft in flight or operating on the movement area of an aerodrome;

Note.-Specifications for lights meeting the requirements of ICAO Annex 2 for navigation lights are contained in Appendix 14. The general characteristics of lights are specified in ICAO Annex 8.

- c) two landing lights

Note – aeroplanes not certificated in accordance with ICAO Annex 8 which are equipped with a single landing light having two separately energized filaments will be considered to have complied with 6.10 c).

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

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- e) lights in all passenger compartments; and
- f) an electric torch for each crew member station;

6.11 PRESSURIZED AEROPLANES WHEN CARRYING PASSENGERS -- WEATHER RADAR

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

6.12 ALL AEROPLANES OPERATED ABOVE 15,000 m (49,000 ft) — RADIATION INDICATOR

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

Note – The equipment is calibrated on the basis of assumptions acceptable to the DG, CAAN.

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

An aeroplane engaged in international air transportation operations, shall carry a document attesting noise certification. When the document, or a suitable statement attesting noise certification as contained in another document approved by the State of Registry, is issued in a language other than English, it shall include an English translation.

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

6.14 MACH NUMBER INDICATOR

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

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

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

6.15.1 RESERVED

6.15.2 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 a ground proximity warning system which has a forward looking terrain avoidance function, meeting the requirements for Class A equipment in (Technical Standard Order) TSO-C151 or equivalent.

6.15.3 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, meeting the requirements for Class A equipment in (Technical Standard Order) TSO-C151 or equivalent.

6.15.4 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, meeting the requirements for Class A equipment in (Technical Standard Order) TSO-C151 or equivalent.

6.15.5 All turbine-engined aeroplanes authorized to carry more than five but not more than nine passengers and first issued with a Nepalese Certificate of Registration after 12 January 2011 shall be equipped with a ground proximity warning system which has a forward looking terrain avoidance function, meeting the requirements for Class B equipment in (Technical Standard Order) TSO-C151 or equivalent.

6.15.6 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 provides the warnings in 6.15.8 a) and c), warning of unsafe terrain clearance and a forward looking terrain avoidance function.

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

6.15.8 A ground proximity warning system shall provide, unless otherwise specified herein, warnings of the following circumstances:

- a) excessive descent rate;
- b) excessive terrain closure rate;
- c) excessive altitude loss after take-off or go-around;

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- d) unsafe terrain clearance while not in landing configuration;
 - i) gear not locked down;
 - ii) flaps not in a landing position; and
- e) excessive descent below the instrument glide path.

6.16 AEROPLANES CARRYING PASSENGERS — CABIN CREW SEATS

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

All aeroplanes shall be equipped with a forward or rearward facing (within 15 degrees of the longitudinal axis of the aeroplane) seat, fitted with a safety harness for the use of each cabin crew member required to satisfy the intent of 12.1 in respect of emergency evacuation. However safety harness shall not be mandatory for cabin crew seats for commuter as define in NCAR 145 Definitions if not so equipped.

6.16.2 RESERVED

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

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

6.17 EMERGENCY LOCATOR TRANSMITTER (ELT)

6.17.1 RESERVED

6.17.2 Except as provided for in 6.17.3, all aeroplanes authorized to carry more than 19 passengers shall be equipped with at least one automatic ELT or two ELTs of any type.

6.17.3 All aeroplanes authorized to carry more than 19 passengers for which the individual certificate of airworthiness is first issued after 1 July 2008 shall be equipped with at least two ELTs, one of which shall be automatic.

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

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

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- 6.17.6 ELT equipment carried to satisfy the requirements of 6.17.1, 6.17.2, 6.17.3, 6.17.4 and 6.17.5 shall operate in accordance with the relevant provisions of ICAO 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.

6.18 AEROPLANES REQUIRED TO BE EQUIPPED WITH AN AIRBORNE COLLISION AVOIDANCE SYSTEM (ACAS II)

- 6.18.1 a) All turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than 19 passengers shall be equipped with an airborne collision avoidance system (ACAS II).
- b) Reference to para 6.18.2 a), aircraft engaged in STOL operations certified to carry more than nine passengers may be equipped with airborne collision avoidance system ACAS I.
- 6.18.2 RESERVED
- 6.18.3 An airborne collision avoidance system shall operate in accordance with the relevant provisions of ICAO Annex 10, Volume IV.

Note - Guidance on the use of ACAS equipment is contained in Appendix 7

6.19 REQUIREMENTS FOR PRESSURE-ALTITUDE REPORTING TRANSPONDER

- 6.19.1 All aeroplanes shall be equipped with a pressure-altitude reporting transponder which operates in accordance with the relevant provisions of Annex 10, Volume IV.
- 6.19.2 All aeroplanes for which the individual certificate of airworthiness is first issued after 1 January 2009 shall be equipped with a data source that provides pressure-altitude information with a resolution of 7.62 m (25 ft), or better.
- 6.19.3 All aeroplanes shall be equipped with a data source that provides pressure - altitude information with a resolution of 7.62m (25ft), or better.
- 6.19.4 The Mode S transponder should be provided with the airborne/on-the-ground status if the aeroplane is equipped with an automatic means of detecting such status.



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Note 1 – These provisions will improve the effectiveness of airborne collision avoidance systems as well as air traffic services that employ Mode S radar. In particular, tracking processes are significantly enhanced with a resolution of 7.62m (25 ft) or better.

Note 2 - Mode C replies of transponders always report pressure altitude in 30.50m (100 ft) increments irrespective of the resolution of the data source.

6.20 MICROPHONES

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

6.21 TURBO-JET AEROPLANES – FORWARD LOOKING WINDSHEAR WARNING SYSTEM

6.21.1 All turbo-jet aeroplanes of a maximum certificated take-off mass in excess of 5700kg or authorized to carry more than nine passengers should be equipped with a forward – looking wind shear warning system.

6.21.2 A forward-looking wind shear warning system should be capable of providing the pilot with a timely aural and visual warning of wind shear ahead of the aircraft and the information required to permit the pilot to safely comments and the continue a missed approach or go-around or to execute an escape manoeuvre if necessary. The system should also provide an indication to the pilot when the limits specified for the certification of automatic landing equipment are being approached, when such equipment is in use.

6.22 ALL AEROPLANES OPERATED BY A SINGLE PILOT UNDER THE INSTRUMENT FLIGHT RULES (IFR) OR AT NIGHT

6.22.1 A single-engine aeroplane shall not be operated under the IFR by a single pilot or at night for commercial operations.

6.23 Aeroplanes Equipped With Automatic Landing Systems, A Head-Up Display (HUD) or Equivalent Displays, Enhanced Vision Systems (EVS), Synthetic Vision Systems (SVS) and/or Combined Vision Systems (CVS)

6.23.1 Where aeroplanes are equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS, or any combination of those systems into a hybrid system, the use of such systems for the safe operation of an aeroplane shall be approved by the DG, CAAN.

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

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6.23.2 In approving the operational use of automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS, the DG, CAAN shall ensure that:

- a) the equipment meets the appropriate airworthiness certification requirements;
- b) the operator has carried out a Safety Risk Assessment of the operations supported by the automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS;
- c) the operator has established and documented the procedures for the use of, and training requirements for, automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS.

Note 1.— Guidance on safety risk assessments is contained in the Safety Management Manual (SMM) (Doc 9859).

Note 2.— Guidance on operational approvals is contained in Appendix 16

6.24 ELECTRONIC FLIGHT BAGS (EFBs)

Note.— Guidance on EFB equipment, functions and operational approval is contained in the Manual on Electronic Flight Bags (Doc 10020).

6.24.1 EFB equipment

Where portable EFBs are used on board an aeroplane, the operator shall ensure that they do not affect the performance of the aeroplane systems, equipment or the ability to operate the aeroplane.

6.24.2 EFB functions

6.24.2.1 Where EFBs are used on board an aeroplane the operator shall:

- a) assess the safety risk(s) associated with each EFB function;
- b) establish and document the procedures for the use of, and training requirements for, the device and each EFB function; and
- c) ensure that, in the event of an EFB failure, sufficient information is readily available to the flight crew for the flight to be conducted safely.

Note.— Guidance on safety risk assessments is contained in the Safety Management Manual (SMM) (Doc 9859).

6.24.2.2 The DG, CAAN shall approve the operational use of EFB functions to be used for the safe operation of aeroplanes.



6.24.3 EFB operational approval

In approving the use of EFBs, the DG, CAAN shall ensure that:

- a) the EFB equipment and its associated installation hardware, including interaction with aeroplane systems if applicable, meet the appropriate airworthiness certification requirements;
- b) the operator has assessed the safety risks associated with the operations supported by the EFB function(s);
- c) the operator has established requirements for redundancy of the information (if appropriate) contained in and displayed by the EFB function(s);
- d) the operator has established and documented procedures for the management of the EFB function(s) including any database it may use; and
- e) the operator has established and documented the procedures for the use of, and training requirements for, the EFB and the EFB function(s).

Note.— Guidance on safety risk assessments is contained in the Safety Management Manual (SMM) (Doc 9859).



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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 its operational flight plan;
- b) in accordance with the requirements of air traffic services;

except when the DG, CAAN is satisfied that navigation for flights under the Visual Flight Rules is accomplished by visual reference to landmarks

7.2.2 Performance Based Navigation

7.2.2.1 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 shall enable it to operate in accordance with the prescribed navigation specification(s); and
- b) be authorized by DG, CAAN for such operations.

7.2.2.2 a) No person may operate flights along ATS routes, on an instrument approach procedure, or in a designated airspace where a Navigation Specification has been prescribed unless:

- i) The person has received authorization from the Director General, CAAN;
- ii) The aircraft is equipped with the navigation equipment to enable it to operate in accordance with the prescribed Navigation Specification; and
- iii) The aircraft is equipped with navigation equipment that continuously provides information to the flight crew of adherence to or departure from track with respect to the required degree of accuracy at any point along that track.

- b) No person may operate an aircraft unless it has sufficient navigation equipment that will enable the aircraft to navigate in accordance with paragraph (a) above, such that in the event of the failure of any piece of navigation equipment at any stage of flight, the remaining equipment will enable the aircraft to continue to a destination or an alternate destination.

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.



CHAPTER 7

AEROPLANE COMMUNICATION AND NAVIGATION EQUIPMENT

7.1 COMMUNICATION EQUIPMENT

7.1.1 An aeroplane shall be provided with radio communication equipment capable of:

- a) conducting two-way communication for aerodrome control purposes;
- b) receiving meteorological information at any time during 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 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 The radio communication equipment required in accordance with 7.1.1 shall provide for communication on the aeronautical emergency frequency 121.5 MHz.

7.1.3 For flights 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 7.1.1:

- 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 DG, CAAN for operations in such airspace.

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

7.1.4 Installation of H.F. communication is mandatory for aeroplanes engaged in STOL operations and *recommended* to be installed on aeroplanes operating on non-STOL routes.



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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 Director General of CAAN for MNPS operations concerned.

Note — The prescribed minimum navigation performance specifications and the procedures governing their application are published in the Regional Supplementary Procedures (Doc 7030).

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:
 - i) indicating to the flight crew the flight level being flown;
 - ii) automatically maintaining a selected flight level;
 - iii) 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
 - iv) automatically reporting pressure-altitude; and
- b) shall be authorized by the DG, CAAN for operation in the airspace concerned.
- c) shall demonstrate a vertical navigation performance in accordance with APPENDIX 12.

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

- a) the vertical navigation performance capability of the aeroplane satisfies the requirements specified in APPENDIX 12;
- b) the operator has instituted appropriate procedures in respect of continued airworthiness (maintenance and repair) practices and programmes; and
- c) the operator has instituted appropriate flight crew procedures for operations in RVSM airspace.

Note – An RVSM 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.



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7.2.6 The DG, CAAN, in consultation with the State of Registry, 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 ICAO 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 An operator approved for RVSM operations shall ensure that a minimum of two aeroplanes of each aircraft type grouping of the operator have their height-keeping performance monitored, at least once every two years or within intervals of 1 000 flight hours per aeroplane, whichever period is longer. If an operator aircraft type grouping consists of a single aeroplane, monitoring of that aeroplane shall be accomplished within the specified period.

Note.— Monitoring data from any regional monitoring programme established in accordance with Annex 11, 3.3.5.2, may be used to satisfy the requirement.

7.2.8 Appropriate action will be taken as per CAAN Aviation Enforcement Policy Manual 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 is 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.

Note 2.— Guidance material relating to the approval for operation in RVSM airspace is contained in the Manual on Implementation of a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive (Doc 9574).

7.2.9 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 – Guidance material relating to aircraft equipment necessary for flight in airspace where RVSM is applied is contained in the Manual on Implementation of a 300m (1000 ft) Vertical Separation Minimum Between FL 250 and FL 410 Inclusive (Doc 9574).

7.2.10 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



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capable of providing such guidance at each aerodrome at which it is intended to land in instrument meteorological conditions and at any designated alternate aerodromes.

7.2.10.1 For flights under Instrument Flight Rules, an aeroplane shall be equipped with at least the following:

- a) One VOR receiver for each pilot station; *or*
one VOR receiver and one Horizontal Situation Indicator (HSI).
- b) One DME receiver
- c) One Radio Magnetic Indicator (RMI) for each pilot station which enable flight crew to select either VOR or NDB frequency.

7.3 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.

7.4 ELECTRONIC NAVIGATION DATA MANAGEMENT

7.4.1 a) An operator shall not employ electronic navigation data products that have been processed for application in the air and on the ground unless the DG, CAAN 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.

b) The DG, CAAN 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.

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

7.5 RESERVED

7.6 DUAL FLIGHT CONTROLS

An aeroplane registered in Nepal shall not fly on any flight when operational considerations require that two pilots are required in the flight crew unless dual flight controls are installed for use by the second pilot together with equipment for inter-communication between the pilots and unless the instruments that will be used on that flight by any one pilot are positioned so as to permit the pilot to see both set of indications



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from his station with the minimum practicable deviation from the position and line of vision which he normally adopts when looking forward along the flight path.

7.7 GNSS EQUIPMENT

- 7.7.1 Panel mounted GNSS equipment shall be mandatory unless equipped with IRS/DME. The limitations imposed by the aircraft or equipment manufacturer shall apply and thereby limit the nature of the operation of the flight accordingly.
- 7.7.2 Prior approval shall be required from CAAN for the installation of the GNSS equipment.
- 7.7.3 Navigation database shall be current and updated as per 7.4.2.
- 7.7.4 An operator shall ensure that the flight crew is properly trained on the use of such GNSS equipment.



CHAPTER 8

RESERVED



CHAPTER 9

AEROPLANE FLIGHT CREW

DEFINITIONS

Operators and crew members

Augmented flight crew. A flight crew that comprises more than the minimum number required to operate the aeroplane and in which each flight crew member can leave his or her assigned post and be replaced by another appropriately qualified flight crew member for the purpose of in-flight rest.

Cabin crew member. A crew member who performs, in the interest of the 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.

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

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

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

Flight or block times

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.

Duty and flight duty

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

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



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Flight duty period. A period which commences when a crew member is required to report for duty that includes a flight or a series of flights and which finishes when the aeroplane finally comes to rest at the end of the last flight on which he/she is a crew member.

Rest period and standby

Rest period. For the purpose of this FOR, a continuous and defined period of time, subsequent to and/or prior to flight duty, during which flight or cabin crew members are free of all flight duties.

Standby. A defined period of time during which a flight or cabin crew member is required by the operator to be available to receive an assignment for a specific duty without an intervening rest period.

General

Home base. The location nominated by the operator to the crew member from where the crew member normally starts and ends a duty period or a series of duty periods.

Positioning. The transferring of a non-operating crew member from place to place as a passenger at the behest of the operator.

Note.— “Positioning” as here defined is synonymous with the term “Deadheading”.

Reporting time. The time at which flight and cabin crew members are required by an operator to report for duty.

Roster. A list provided by an operator of the times when a crew member is required to undertake duties.

Note.— “Roster” as here defined is synonymous with “Schedule”, “Line of Time”, “Pattern”, and “Rotation”.

Rest facility. A bunk or seat accommodation installed in an aircraft that provides a flight crew member with a sleep opportunity.

(1) **Class 1 rest facility.** A bunk or other surface that allows for a flat sleeping position and is located separate from both the flight deck and passenger cabin in an area that is temperature-controlled, allows the flight crew member to control light, and provides isolation from noise and disturbance.

(2) **Class 2 rest facility.** A seat in an aircraft cabin that allows for a flat or near flat sleeping position; is separated from passengers by a minimum of a curtain to provide darkness and some sound mitigation; and is reasonably free from disturbance by passengers or flight crew members.

(3) **Class 3 rest facility.** A seat in an aircraft cabin or flight deck that reclines at least 40 degrees and provides leg and foot support.

Suitable accommodation. A furnished bedroom which provides for the opportunity of adequate rest.

Unforeseen operational circumstance. An unplanned event, such as unforecast weather, equipment malfunction, or air traffic delay that is beyond the control of the operator.



9.1 COMPOSITION OF THE FLIGHT CREW

9.1.1 The number and composition of the flight crew shall not be less than that specified in the operations manual. The flight crews shall include flight crew members in addition to the minimum numbers specified in the flight manual or other documents associated with the certificate of airworthiness, when necessitated by considerations related to the type of aeroplane used, the type of operation involved and the duration of flight between points where flight crews are changed.

9.1.2 Radio operator

The flight crew shall include at least one member who holds a valid license, issued or rendered valid by the State of Registry, authorizing operation of the type of radio transmitting equipment to be used.

9.1.3 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 license, without interference with regular duties.

9.1.4 Flight navigator

The flight crew shall include at least one member who holds a flight navigator license in all operations where, as determined by the Director General Civil Aviation Authority of Nepal, navigation necessary for the safe conduct of the flight cannot be adequately accomplished by the pilots from the pilot station.

9.2 FLIGHT CREW MEMBER EMERGENCY DUTIES

An operator shall, for each type of aeroplane, assign to all flight crew members the necessary functions they are to perform in an emergency or in a situation requiring emergency evacuation. Annual training in accomplishing these functions shall be contained in the operator's training programme and shall include instruction in the use of all emergency and lifesaving equipment required to be carried, and drills in the emergency evacuation of the aeroplane.

9.3 FLIGHT CREW MEMBER TRAINING PROGRAMMES

9.3.1 An operator shall establish and maintain a ground and flight training programme, approved by Director General Civil Aviation Authority of Nepal, which ensures that all flight crew members are adequately trained to perform their assigned duties. The facilities, qualifications of the instructors, the ground and flight training programs shall be subject to the approval of the Director General, CAAN. The training programme shall:



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- a) include ground and flight training facilities and properly qualified instructors as determined by Director General Civil Aviation Authority of Nepal;
- b) consist of ground and flight training in the type(s) of aeroplane on which the flight crew member serves;
- c) include proper flight crew coordination and training in all types of emergency and abnormal situations or procedures caused by power plant, airframe or systems malfunctions, fire or other abnormalities;
- d) include upset prevention and recovery training;
- e) include training in knowledge and skills related to visual and instrument flight procedures for the intended area of operation, human performance including threat and error management and in the transport of dangerous goods;
- f) ensure that all flight crew members know the functions for which they are responsible and the relation of these functions to the functions of other crew members, particularly in regard to abnormal or emergency procedures;
- g) be given on a recurrent basis, once within a calendar year and shall include an assessment of competence ; and
- h) include training on (i) human performance limitations and Crew Resource Management (ii) Controlled Flight Into Terrain (CFIT) (iii) use of Minimum Equipment List.
- i) Include training and checkout on Line Indoctrination for crew who are newly licensed, type rated or hired.

Note 1 – Paragraph 4.2.5 prohibits the in-flight simulation of emergency or abnormal situations when passengers or cargo are being carried.

Note 2 – Flight training may, to the extent deemed appropriate by the DG, CAAN, be given in flight simulation training devices approved by the DG, CAAN for that purpose.

Note 3 – The scope of the recurrent training required by 9.2 and 9.3 may be varied and need not be as extensive as the initial training given in a particular type of aeroplane.

Note 4 –The use of correspondence courses and written examinations as well as other means may, to the extent deemed feasible by the DG,CAAN, be utilized in meeting the requirements for periodic ground training.

Note 5 – Provisions for training in the transport of dangerous goods are contained in the CAAN Dangerous Goods Handling Requirements 2009.

Note 6 – Guidance material to design training programmes to develop knowledge and skills in human performance can be found in the Human Factors Training Manual (Doc 9683).



Note 7.— Information for pilots and flight operations personnel on flight procedure parameters and operational procedures is contained in PANS-OPS (Doc 8168), Volume I. Criteria for the construction of visual and instrument flight procedures are contained in PANS-OPS (Doc 8168), Volume II. Obstacle clearance criteria and procedures used in certain States may differ from PANS-OPS, and knowledge of these differences is important for safety reasons.

Note 8.— Guidance material to design flight crew training programmes can be found in the Manual of Evidence-based Training (Doc 9995).

Note 9.— Guidance material on the different means used to assess competence can be found in the Attachment to Chapter 2 of the Procedures for Air Navigation Services — Training (PANS-TRG, Doc 9868).

Note 10.— Procedures for upset prevention and recovery training in a flight simulation training device are contained in the Procedures for Air Navigation Services — Training (PANS-TRG, Doc 9868).

Note 11.— Guidance on upset prevention and recovery training in a flight simulation training device is contained in the Manual on Aeroplane Upset Prevention and Recovery Training (Doc 10011).

9.3.2 The requirement for recurrent flight training in a particular type of aeroplane shall be considered fulfilled by:

- a) the use, (to the extent deemed feasible by Director General CAAN), of flight simulation training devices approved by the same for that purpose; or
- b) the completion within the appropriate period of the proficiency check required by 9.4.4 (Pilot Proficiency Checks) in that type of aeroplane.

9.3.3 RESERVED

9.3.4 Initial PBN Operations Training

- (a) No person may serve nor may any AOC holder use a person as a flight crew member or flight operations officer (if applicable) unless he or she has completed the appropriate initial PBN operations training curriculum approved by the Director General, CAAN.
- (b) The initial PBN training curriculum for each Navigation Specification shall ensure that each pilot and flight operations officer (if applicable) is qualified in the type of operation in which he or she serves and in any specialized or new equipment, procedures, and techniques such as:



- (1) Knowledge of specialized navigation procedures;
 - (2) Knowledge of specialized equipment;
 - (3) SIDs and STARs (if applicable);
 - (4) The ability of the airborne equipment to fly the designed flight path. This may involve pilot intervention where the equipment functionality is limited;
 - (5) Management of changes (procedure, runway, track, etc.);
 - (6) Turn management (turn indications, airspeed & bank angle, lack of guidance in turns);
 - (7) Route modification (insertion/deletion of waypoints, direct to waypoint) and restrictions on route modification;
 - (8) Intercepting route, radar vectors; and
 - (9) Where GNSS is used, flight crews will be trained in GNSS principles..
- (c) Each AOC holder shall require each pilot and flight operations officer (if applicable) to complete a demonstration of competence to a defined standard of knowledge and performance.

9.4 QUALIFICATIONS

Note – Manual of Procedures for the Establishment of a State's Personnel Licensing System (Doc 9379) provides a generic guidance on cross-crew qualification, mixed-fleet flying and cross-credit.

9.4.1 Recent experience — pilot-in-command and co-pilot

9.4.1.1 An operator shall not assign a pilot-in-command or a co-pilot to operate at the flight controls of a type or variant of a type of aeroplane during take-off and landing unless that pilot has operated the flight controls during at least three take-offs and landings within the preceding 90 days on the same type of aeroplane or in a flight simulator approved for the purpose.

9.4.1.2 When a pilot-in-command or a co-pilot is flying several variants of the same type of aeroplane or different types of aeroplanes with similar characteristics in terms of operating procedures, systems and handling, the Director General of CAAN shall decide under which conditions the requirements of 9.4.1.1 for each variant or each type of aeroplane can be combined.



9.4.2 Recent experience — cruise relief pilot

9.4.2.1 An operator shall not assign a pilot to act in the capacity of cruise relief pilot in a type or variant of a type of aeroplane unless, within the preceding 90 days that pilot has either:

- a) Operated as a pilot-in-command, co-pilot or cruise relief pilot on the same type of aeroplane; or
- b) Carried out flying skill refresher training including normal, abnormal and emergency procedures specific to cruise flight on the same type of aeroplane or in a flight simulator approved for the purpose, and has practiced approach and landing procedures, where the approach and landing procedure practice may be performed as the pilot who is not flying the aeroplane.

9.4.2.2 When a cruise relief pilot is flying several variants of the same type of aeroplane or different types of aeroplanes with similar characteristics in terms of operating procedures, systems and handling, the DG, CAAN shall decide under which conditions the requirements of 9.4.2.1 for each variant or each type of aeroplane can be combined.

9.4.3 Pilot-in-command area, route and aerodrome qualification

9.4.3.1 An operator shall not utilize a pilot as pilot-in-command of an aeroplane on a route or route segment for which that pilot is not currently qualified until such pilot has complied with 9.4.3.2 and 9.4.3.3.

9.4.3.2 Each such pilot shall demonstrate to the operator an adequate knowledge of:

- a) the route to be flown, and the aerodromes which are to be used. This shall include knowledge of:
 - 1) the terrain and minimum safe altitudes;
 - 2) the seasonal meteorological conditions;
 - 3) the meteorological, communication and air traffic facilities, services and procedures;
 - 4) the search and rescue procedures; and



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- 5) the navigational facilities and procedures, including any long-range navigation procedures, associated with the route along which the flight is to take place; and
- b) procedures applicable to flight paths over heavily populated areas and areas of high air traffic density, obstructions, physical layout, lighting, approach aids and arrival, departure, holding and instrument approach procedures, and applicable operating minima.

Note.— That portion of the demonstration relating to arrival, departure, holding and instrument approach procedures may be accomplished in an appropriate training device which is adequate for this purpose.

9.4.3.3 A pilot-in-command shall have made an actual approach into each aerodrome of landing on the route, accompanied by a pilot who is qualified for the aerodrome, as a member of the flight crew or as an observer on the flight deck, unless:

- a) the approach to the aerodrome is not over difficult terrain and the instrument approach procedures and aids available are similar to those with which the pilot is familiar, and a margin to be approved by Director General Civil Aviation Authority of Nepal is added to the normal operating minima, or there is reasonable certainty that approach and landing can be made in visual meteorological conditions; or
- b) the descent from the initial approach altitude can be made by day in visual meteorological conditions; or
- c) the operator qualifies the pilot-in-command to land at the aerodrome concerned by means of an adequate pictorial presentation; or
- d) the aerodrome concerned is adjacent to another aerodrome at which the pilot-in-command is currently qualified to land.

9.4.3.4 The operator shall maintain a record, sufficient to satisfy Civil Aviation Authority of Nepal of the qualification of the pilot and of the manner in which such qualification has been achieved.

9.4.3.5 An operator shall not continue to utilize a pilot as a pilot-in-command on a route or within an area specified by the operator and approved by Civil Aviation Authority of Nepal unless, within the preceding 12 months, that pilot has made at least one trip as a pilot member of the flight crew, or as a check pilot, or as an observer in the flight crew compartment (where applicable):



- a) within that specified area; and
- b) if appropriate, on any route where procedures associated with that route or with any aerodromes intended to be used for take-off or landing require the application of special skills or knowledge.

9.4.3.6 In the event that more than 12 months elapse in which a pilot-in-command has not made such a trip on a route in close proximity and over similar terrain, within such a specified area, route or aerodrome, and has not practiced such procedures in a training device which is adequate for this purpose, prior to again serving as a pilot-in-command within that area or on that route, that pilot must re-qualify in accordance with 9.4.3.2 and 9.4.3.3.

9.4.3.7 In the event that more than ninety days elapse in which a pilot-in-command has not made a trip on a particular STOL route, the operator shall ensure that the pilot-in-command flies to that STOL field with an Instructor Pilot or Line Captain who has previously flown at least once on that route within the last sixty days prior to being released to that STOL field with co-pilots. When the PIC concerned is himself an IP, he shall fly with another IP or Line Captain who fulfills this requirement.

9.4.3.8 Where an operator has not conducted a flight to a particular STOL or non-STOL aerodrome for more than six months, an operator shall ensure that the first flight to such aerodromes are conducted by pilots other than co-pilots, with proper briefing and flight planning.

9.4.3.9 In addition to the above, pilot-in-command clearance for STOL airfields shall be conducted as per APPENDIX 9.

9.4.3.10 No pilot upon attaining their 60th birthday shall be permitted to operate a single-engined aeroplane for STOL operations either as PIC or First Officer.

9.4.4 Pilot proficiency checks

9.4.4.1 An operator shall ensure that piloting technique and the ability to execute emergency procedures is checked in such a way as to demonstrate the pilot's competence on each type or variant of a type of aeroplane. Where the operation may be conducted under 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 to a representative of Civil Aviation Authority of Nepal. Such checks shall be performed twice within any period of one year. Any two such checks which are similar and which occur within a period of four consecutive months shall not alone satisfy this requirement.



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Note 1. - Flight simulation training devices of aeroplane category approved by Director General Civil Aviation Authority of Nepal may be used for those parts of the checks for which they are specifically approved. See Appendix 5.

Note 2. - For the renewal of Flight Instructor rating, the applicant must produce required documents for renewal of his pilot license except in this case, his proficiency check report should include the details on flight occupying position as an instructor.

9.4.4.2 Operators shall ensure that PPCs of their flight crew are conducted in the following manner:

- a) When an operator schedules flight crew on several variants of the same type of aeroplane with similar characteristics in terms of operating procedures, systems and handling, the PPC shall be conducted on the aeroplane of the higher performance capability.
- b) When the license holder of aeroplanes weighing less than 5700 kgs, is rated in two different aeroplane types, then at least one PPC in each type shall be required annually.

9.4.4.3 RESERVED

9.4.4.4 No flight crew member shall be rated on more than one type of aeroplane, for commercial operations, when the license holder receives or is currently rated on a type having a maximum certificated Take-off weight of more than 5700 kgs.

9.4.4.5 At least one Pilot Proficiency Check per year shall be conducted in an appropriate, approved simulator on type for aeroplanes engaged in commercial operations and:

- a) is authorized to carry more than nineteen passengers; or
- b) is pressurized

9.4.4.6 Instructor Pilots rated in multi-engine STOL aeroplanes engaged in commercial STOL operations shall perform at least one Pilot Proficiency Check at least every two years in an appropriate, approved simulator on the type of aeroplane for which the pilot is rated.

9.4.5 SINGLE PILOT OPERATIONS UNDER THE INSTRUMENT FLIGHT RULES (IFR) OR AT NIGHT

9.4.5.1 A single-engined aeroplane shall not be operated under the IFR by a single pilot or at night for commercial operations.



9.4.5.2 RESERVED

9.4.5.3 The initial and recurrent flight training and proficiency checks indicated in 9.3.1 and 9.4.4 shall be performed by the pilot-in-command in the single pilot role on the class of aeroplane in an environment representative of the operation.

9.5 FLIGHT CREW EQUIPMENT

A flight crew member assessed as fit to exercise the privileges of a licence, subject to the use of suitable correcting lenses, shall have a spare set of the correcting lenses readily available when exercising those privileges.

9.6 FLIGHT TIME, FLIGHT DUTY PERIODS AND REST PERIODS

9.6.1 The Operator shall establish for approval by Director General Civil Aviation Authority of Nepal the limitations applicable to the flight time and flight duty periods for flight crew members including the provision for adequate rest periods and shall be such as to ensure that fatigue occurring either in a flight or successive flights or accumulated over a period of time due to these and other tasks, does not endanger the safety of a flight.

9.6.1.1 The definition of flight duty period is intended to cover a continuous period of duty that always includes a flight or series of flights for a flight or cabin crew member. It is meant to include all duties a crew member may be required to carry out from the moment he or she reports for duty until he or she completes the flight or series of flights and the aeroplane finally comes to rest and the engines are shut down. It is considered necessary that a flight duty period should be subject to limitations because a crew member's activities over extended periods would eventually induce fatigue — transient or cumulative — which could adversely affect the safety of a flight.

9.6.1.2 A flight duty period does not include the period of travelling time from home to the point of reporting for duty. It is the responsibility of the flight or cabin crew member to report for duty in an adequately rested condition.

9.6.1.3 Time spent positioning at the behest of the operator is part of a flight duty period when this time immediately precedes (i.e., without an intervening rest period) a flight duty period in which that person participates as a flight or cabin crew member.



- 9.6.1.4 An operator shall recognize the responsibility of a flight crew member to refuse further flight duty when suffering from fatigue of such a nature as to adversely affect the safety of flight.
- 9.6.1.5 An operator shall not require a flight crew member to operate an aeroplane if it is known or suspected that the flight crew member is fatigued to the extent that the safety of flight may be adversely affected.
- 9.6.1.6 The operator shall nominate a home base for each flight and cabin crew member, from where the flight and cabin crew member will normally start and end a duty period or a series of duty periods. The home base shall be assigned with a degree of permanence.

Standby

- 9.6.1.7 An operator shall define the start time and end time of standby and shall indicate the number of hours it will notify the crew in advance for standby duty, and shall indicate the maximum number of hours it will put the crew on standby duty.
- 9.6.1.8 Where **airport standby** is immediately followed by a flight duty period, the relationship between such airport standby and the assigned flight duty shall be defined. In such a case, airport standby, if it is likely to induce fatigue, shall be considered as part of a duty period and shall be taken into account to calculate the minimum rest preceding a subsequent flight duty period.
- 9.6.1.9 When flight and cabin crew members are required to be on standby at an accommodation arranged by the operator, then adequate rest facilities shall be provided.

Availability

- 9.6.1.10 When flight and cabin crew members are required to be available for contact over a brief period of time to receive instructions concerning a possible change of roster, that requirement should not prevent that crew member from having a rest period before reporting for duty. The time spent being available shall not be counted as duty.

Positioning

- 9.6.1.11 All time spent positioning counts as duty, and positioning followed by operating without an intervening rest period also counts as flight duty. However, positioning should not count as an operating sector when planning or calculating a flight duty period.



9.6.2 Flight Crew Duty Time Limitations:

9.6.2.1 Single-pilot operations

- a) The maximum Flight Duty Period in any period of 24 hours for a pilot engaged in single pilot operation shall be 10 hours of which not more than 6 hours shall be Flight Time.
- b) The minimum Rest Period between two consecutive Flight Duty Periods shall be 9 hours, and if the preceding Flight Duty Period was 10 hours or more, it shall not be less than 10 hours. Any period between two consecutive Flight Duty Periods which is spent at place where there is no facility for supine rest shall not qualify as a Rest Period.

9.6.2.2 TWO-PILOT OPERATIONS

a) FOR INTERNATIONAL OPERATIONS

(i) Two Pilot Operations: Single-set crew operations

The maximum Flight Duty Period in any period of 24 hours for pilots engaged in two-pilot operations shall be 13 hours of which not more than 10 hours shall be Flight Time.

(ii) Three Pilot Operations: (One augmented crew operations)

The maximum Flight Duty Period in any period of 24 hours for pilot engaged in three pilot operations shall be 15 with (Class 2 or 3 rest facility) and / or 17 hours with (Class 1 rest facility or Bunk) of which not more than 12 hours shall be Flight Time.

(iii) Four Pilot Operations: (Two augmented crew operations)

The maximum Flight Duty Period in any period of 24 hours for pilot engaged in four pilot operations shall be 16 with (Class 2 or 3 rest facility) and / or 18 hours with (Class 1 rest facility or Bunk) of which not more than 12 hours shall be Flight Time.

iv) In case of augmented/ double flight crew, the division of duty and rest between flight crew members being reviewed will be balance, which would be spelt out in detail in Operators Manual.



b) FOR DOMESTIC NON-STOL OPERATIONS

The maximum Flight Duty Period in any period of 24 hours for aeroplane pilots engaged in two-pilot operations shall be 11 hours of which not more than 9 hours shall be Flight Time.

c) FOR DOMESTIC STOL OPERATIONS

The maximum Flight Duty Period in any period of 24 hours for aeroplane pilots engaged in two-pilot STOL operations shall be 10 hours of which not more than 8 hours shall be Flight Time.

9.6.2.3 The minimum Rest Period between two consecutive Flight Duty Periods shall be 9 hours, and if the preceding Flight Duty Period was 10 hours or more, it shall not be less than 11 hours. Any period between two consecutive Flight Duty Periods which is spent at place where there is no facility for supine rest shall not qualify as a Rest Period

9.6.2.4 Relaxation of limitations

- a) Where an operator has established flight time and duty period limitations which are more restrictive than those specified in this directive, pilots-in-command may be authorized by the operator to extend flight times and duty periods up to the limits of those specified in this directive subject to such conditions as the operator may establish.
- b) A pilot-in-command of an aircraft may be authorized to exceed the limits specified in this directive if in his judgement it is safe to do so for the following purposes:
 - i) search and rescue action;
 - ii) provisions of relief in cases of distress; and
 - iii) completion of a flight where unforeseen operational conditions has extended beyond the limitations.
- c) Whenever flight times or duty periods exceed the limitations specified, the pilot-in-command and the operator shall submit a report in writing to the Director General.
- d) Reduction of the rest periods specified in this directive to facilitate search and rescue action or for provision of relief in cases of emergency or distress, shall be subject to the prior approval of the Director General.



9.6.2.5 Rest Period

- i) A "Rest Period" requires that flight and cabin crew members be relieved of all duties for the purpose of recovering from fatigue. The way in which this recovery is achieved shall be the responsibility of the flight or cabin crew member.
- ii) Rest periods shall not include standby if the conditions of the standby would not enable flight and cabin crew members to recover from fatigue.
- iii) An operator shall establish for flight crew members, a minimum rest period that allows them to obtain:
 - a) adequate rest prior to flight duty time, calculated by taking into account the number and type of flight crew member duties that precede and follow the rest period and ;
 - b) at least one rest period of not less than 24 consecutive hours, which should include two nights, once within each seven day period; the preceding six days to include both those days when flight duties or airport standby duties have been performed;
 - c) the minimum rest period immediately before commencing a Flight Duty Period may not be less than 9 hours.
- iv) Rest provisions should be introduced to take into account the impact of time zone crossings and night operations.
- v) Longer rest periods should be granted on a regular basis to preclude cumulative fatigue.
- vi) Minimum rest periods may be reduced in unforeseen operational circumstances by no more than one hour only at the discretion of the pilot-in-command.
- vii) Travelling time spent by a flight or cabin crew member in transit between the place of rest and the place of reporting for duty is not counted as duty, even though it is a factor contributing to fatigue. Excessive travelling time undertaken immediately before commencing a flight duty period could therefore detract from a flight or cabin crew member's ability to counter fatigue arising whilst on duty, and should therefore be taken into account when deciding where pre-flight rest should be taken.



9.6.2.6 Flight and Duty Time Limitation of Cabin Crew

- a) The maximum Flight Duty Period in any period of 24 hours shall be 13 hours of which not more than 11 hours shall be Flight Time.
- b) The minimum Rest Period between two consecutive Flight Duty Periods shall be 9 hours, and if the preceding Flight Duty Period was 10 hours or more, it shall not be less than 11 hours. Any period between two consecutive Flight Duty Periods which is spent at place where there is no facility for supine rest shall not qualify as a Rest Period.
- c) The Operator shall determine the maximum number of landings for Cabin Crew per day taking into consideration the nature and the duration of the flights.

9.7 Discretion that may be exercised by the pilot-in-command

- 9.7.1 The pilot-in-command, at his or her discretion in consideration of special circumstances that could lead to unforeseen levels of fatigue and after discussion with flight or cabin crew members affected, may reduce an actual flight duty period and/or increase a minimum rest period (see 4.8.1.3) in order to remove any adverse effect on flight safety.
- 9.7.2 The pilot-in-command should report to the operator the use of discretion to reduce a duty period or extend a rest period.

9.8 CUMULATIVE HOURS

Flight Crew and Cabin Crew members shall not fly:

- more than 100 hours in any period of one calendar month,
- more than 290 hours in any period of three consecutive months,
- more than 1000 hours in any period of twelve consecutive months.

9.9 NUMBER OF LANDINGS

For domestic fixed-wing operations, the maximum number of landings permitted for aeroplane flight crew-members engaged in single-pilot or multi-pilot operations shall not exceed ten landings within one calendar date.

Note – Guidance for the development of prescriptive fatigue management regulations is given in Attachment A of the ICAO Annex 6 Part I.

9.10 RECORDS



9.10.1 To enable the operator to ascertain that the company fatigue management scheme is functioning as intended and as approved, records shall be kept for a minimum period of six months of the duties performed and rest periods achieved so as to facilitate inspection by the operator's authorized personnel and audit by the DG, CAAN.

9.10.2 The operator should ensure that these records include for each flight and cabin crew member, at least:

- a) the start, duration and end of each flight duty period;
- b) the start, duration and end of each duty period;
- c) rest periods; and
- d) flight time.

9.10.3 The operator shall also keep records of occasions when a pilot-in-command has exercised his or her discretion (as described in 9.7.1). If discretion has to be applied for similar reasons on more than 10 per cent of occasions when a particular route or route pattern is flown, it is likely that the intention of this Chapter is not being met and undue fatigue may result. Arrangements should be made to change the schedule or the crewing arrangements so as to reduce the frequency at which such events occur. The DG, CAAN may require that, in addition, copies of certain records should be submitted.

9.10.4 Flight crew members shall maintain a personal record of their daily flight time. Only one continuous personal record of their daily flight time shall be maintained by each crew member at any one time regardless of the place, ownership and nature of operations.

9.11 RESERVED

9.12 PILOT-IN-COMMAND (PIC/P1) QUALIFICATIONS

(a) No air carrier may use a pilot to act as pilot-in-command in any single-engined aeroplane unless that pilot;

- i) holds at least a Commercial Pilot License with appropriate class and type rating; and
- ii) has at least 100 hours of flight time as pilot-in-command with an Instructor Pilot in the type of aeroplane; however, a pilot who holds a P1 or PIC rating in a multi-engine aeroplane and converting to a single-engine aeroplane or a CPL holder who already has more than 1000 hours in aeroplanes in Nepal in commercial operations and converting to another single-engine aeroplane type for commercial operations shall fly a minimum of 50 hours with an instructor on type prior to being released with a copilot. *For STOL clearances refer to Appendix 9*



- (b) No air carrier may use a pilot to act as pilot in command of a multi-engined aeroplane unless that pilot;
- i) holds at least an Airline Transport Pilot License with appropriate class and type rating; and
 - ii) has at least 50 hours of flight time as pilot-in-command with an Instructor Pilot in type of Aeroplane.
- (c) While upgrading a pilot to the position of pilot in command he shall demonstrate his competency in all maneuvers applicable in Aeroplane type and in the rating he holds.

9.13 SECOND-IN-COMMAND (SIC/P2) QUALIFICATIONS

- (a) No air carrier may use a pilot to act as co-pilot of an Aeroplane under IFR unless that person:
- i) holds a valid CPL license with appropriate class and type rating; and
 - ii) holds an instrument rating endorsed by CAAN, valid for the class and type of aeroplane.
- (b) Under supervision flying for co-pilot:
- i) Under supervision flying for copilots for upgrading to a pilot license of a higher category shall be conducted only with the prior authorization from the chief-pilot.
 - ii) Such flight as mentioned in clause (i) above, may be initiated only after a co-pilot has accumulated not less than 1500 flying hours in aeroplanes in Nepal.
 - iii) Prior to initiation of such Under-supervision flights for copilots, the operator shall inform in writing to the CAAN of such a program.
 - iii) Flight time experienced under supervision as specified above that is credited towards an Airline Transport Pilot License shall not exceed 500 hours.

9.14 PILOT LOGBOOK

- 9.14.1 Every flight crewmember shall maintain at any time he is engaged in active flight duties, a personal logbook that shall include as a minimum the following:
- i) Date
 - ii) Aircraft make and model
 - iii) Aircraft registration number
 - iv) Time of departure and landing in UTC
 - v) Origin and destination aerodromes



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- vi) Flight or block time
- vii) Number of landings
- viii) Name of PIC
- ix) Name of SIC
- x) Name of Flight Engineer (when applicable)
- xi) Single-engine flight details including day and/or night flight time
- xii) Multi-engine flight details including day and/or night flight time
- xiii) Instrument hours (simulated or actual)
- xiv) Records of trainings conducted in synthetic flight training device

9.14.2 No flight crewmember shall at any one time maintain more than one flight logbook containing non-identical data nor falsify any data in the logbooks.

9.15 CREWMEMBERS AND ALCOHOL CONSUMPTION

9.15.1 A crew member shall not perform duties on an aeroplane:

- a) while under the influence of any drug that may affect his/her faculties in a manner contrary to safety;
- b) following deep sea diving except when a reasonable time period has elapsed;
- c) following blood donation except when a reasonable time period has elapsed;
- d) if applicable medical requirements are not fulfilled, or if he/she is in any doubt of being able to accomplish his/her assigned duties; or
- e) if he/she knows or suspects that he/she is suffering from fatigue, or feels unfit to the extent that the flight may be endangered.

9.15.2 A crew member shall be subject to appropriate requirements on the consumption of alcohol which shall be established by the operator and acceptable by the Authority, and which shall not be less restrictive than the following:

- a) no alcohol shall be consumed prior to a reasonable amount of time before the specified reporting time for flight duty or the commencement of standby;
- b) alcohol should not be present in the blood from the start of and during the entire flight duty period;
- c) alcohol shall not be consumed whilst on standby.



CHAPTER 10

FLIGHT OPERATIONS OFFICER/FLIGHT DISPATCHER

- 10.1 The Operator shall ensure that a flight operations officer/flight dispatcher, employed in conjunction with an approved method of control and supervision of flight operations, be licensed, in accordance with the provisions of Personnel Licensing Requirements (PELR).
- 10.2 In accepting proof of qualifications other than the option of holding of a flight operations officer/flight dispatcher license, the Operator, in accordance with the approved method of control and supervision of flight operations, shall ensure that, as a minimum, such persons meet the requirements specified in the Personnel Licensing Requirements (PELR) for the flight operations officer/flight dispatcher license.
- 10.3 A flight operations officer/flight dispatcher shall not be assigned to duty unless that person has:
- a) satisfactorily completed an operator-specific training course that addresses all the specific components of its approved method of control and supervision of flight operations specified in 4.2.1.3;

Note – Guidance on the composition of such training syllabi is provided in the Training Manual (Doc 7192), Part D-3 – Flight Operations Officers/Flight Dispatchers.

- b) made, within the preceding 12 months, at least a one way qualification flight in the flight crew compartment of an aeroplane over any area for which that individual is authorized to exercise flight supervision. The flight should include landings at as many aerodromes as practicable;

Note.— For the purpose of the qualification flight, the flight operations officer/flight dispatcher must be able to monitor the flight crew intercommunication system and radio communications, and be able to observe the actions of the flight crew.

- c) demonstrated to the operator a knowledge of:
 - 1) the contents of the operations manual;
 - 2) the radio equipment in the aeroplanes used; and
 - 3) the navigation equipment in the aeroplanes used;



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- d) demonstrated to the operator a knowledge of the following details concerning operations for which the officer is responsible and areas in which that individual is authorized to exercise flight supervision:
- 1) the seasonal meteorological conditions and the sources of meteorological information;
 - 2) the effects of meteorological conditions on radio reception in the aeroplanes used;
 - 3) the peculiarities and limitations of each navigation system which is used by the operation; and
 - 4) the aeroplane loading instructions;
- e) demonstrated to the operator knowledge and skills related to human performance relevant to dispatch duties; and
- f) demonstrated to the operator the ability to perform the duties specified in 4.6.

10.4 A flight operations officer/flight dispatcher assigned to duty shall maintain complete familiarization with all features of the operation which are pertinent to such duties, including knowledge and skills related to human performance.

Note.— Guidance material to design training programmes to develop knowledge and skills in human performance can be found in the Human Factors Training Manual (Doc 9683).

10.5 A flight operations officer/flight dispatcher shall not be assigned to duty after 12 consecutive months of absence from such duty, unless the provisions of 10.3 are met.

10.6 FLIGHT DISPATCHER MANUAL

The operator shall prepare and implement a Flight Dispatcher Manual other than the company Operations Manual for the use by its Flight Dispatchers (Flight Operations Officers) for the conduct of flight operations. The manual shall include among others:

- a) the duties and responsibilities of the FD and other concerned operations personnel,
- b) the fuel policy,
- c) procedures for acquiring and briefing weather information to the flight crew,
- d) briefing any navigational information pertinent to the flight,
- e) flight time and duty time limitation restrictions,
- f) qualification and trainings required,
- g) currency requirements,
- h) procedures to be followed in case of emergency or abnormal situations, hijacking, bomb threats etc.



CHAPTER 11

MANUALS, LOGS AND RECORDS

Note – The following additional manuals, logs and records are associated with this FOR but are not included in this chapter.

Fuel and oil records – 4.2.10

Maintenance records – NCAR

Flight time records – 4.2.11.4

Flight preparation forms – 4.3

Operational flight plan – 4.3.3.1

Pilot-in-command route and airport qualification records – 9.4.3.4

11.1 Aeroplane Flight Manual

Note.— The flight manual contains the information specified in ICAO Annex 8.

11.1.1 The Aeroplane Flight Manual shall be updated by implementing changes made mandatory by the State of Registry.

11.1.2 Each aeroplane shall have its own Aeroplane Flight Manual indicating the Manufacturer's Serial Number and the Registration Number.

11.2 Operator's maintenance control manual

The operator's maintenance control manual shall be prepared and approved as per the NCAR.

11.3 Maintenance program

The operator's maintenance for each aeroplane shall be prepared and approved as per the NCAR.

11.4 JOURNEY LOG BOOK

11.4.1 The aeroplane journey log book shall contain the following items and the corresponding roman numerals:



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I	—	Aeroplane nationality and registration.
II	—	Date.
III	—	Names of crew members.
IV	—	Duty assignments of crew members.
V	—	Place of departure.
VI	—	Place of arrival.
VII	—	Time of departure.
VIII	—	Time of arrival.
IX	—	Hours of flight.
X	—	Nature of flight (private, aerial work, scheduled or non-scheduled).
XI	—	Incidents, observations, if any.
XII	—	Signature of person in charge.

11.4.2 Entries in the journey log book shall be made currently and in ink or indelible pencil.

11.4.3 Completed journey log book shall be retained to provide a continuous record of the last six months' operations.

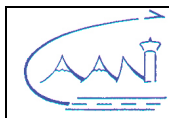
11.5 RECORDS OF EMERGENCY AND SURVIVAL EQUIPMENT CARRIED

11.5.1 Operators 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 any of their aeroplanes engaged in international air navigation.

11.5.2 The information required by 11.5.1 shall include, as applicable, the number, colour and type of life rafts and pyrotechnics, details of emergency medical supplies, water supplies and the type and frequencies of the emergency portable radio equipment.

11.6 FLIGHT RECORDER RECORDS

An 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 the instructions of the DG, CAAN.



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11.7 TIME

11.7.1 Coordinated Universal Time (UTC) shall be used and shall be expressed in hours and minutes and, when required, seconds of the 24-hour day beginning at midnight.

11.7.2 A time check shall be obtained prior to operating a controlled flight and at such other times during the flight as may be necessary.

Note.— Such time check is normally obtained from an air traffic services unit unless other arrangements have been made by the operator or by the appropriate ATS authority.

11.7.3 Wherever time is utilized in the application of data link communications, it shall be accurate to within 1 second of UTC.



CHAPTER 12

CABIN CREW

12.1 ASSIGNMENT OF EMERGENCY DUTIES

An operator shall establish, to the satisfaction of Civil Aviation Authority of Nepal, the minimum number of cabin crew required for each type of aeroplane, based on seating capacity or the number of passengers carried, in accordance with 4.2.11.9, 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.

12.2 CABIN CREW AT EMERGENCY EVACUATION STATIONS

Each cabin crew member assigned to emergency evacuation duties shall occupy a seat provided in accordance with 6.16 during take-off and landing and whenever the pilot-in-command so directs.

12.3 PROTECTION OF CABIN CREW DURING FLIGHT

Each cabin crew member shall be seated with seat belt or, when provided, safety harness fastened during take-off and landing and whenever the pilot-in-command so directs.

Note – The foregoing does not preclude the pilot-in-command from directing the fastening of the seat belt only, at times other than during take-off and landing.

12.4 TRAINING

An operator shall establish and maintain a training programme, approved by Director General Civil Aviation Authority of Nepal, to be completed by all persons before being assigned as a cabin crew member. Cabin crew shall complete a recurrent training programme annually. These training programmes shall ensure that each person is:

- a) competent to execute those safety duties and functions which the cabin crew member is assigned to perform in the event of an emergency or in a situation requiring emergency evacuation;
- b) drilled and capable in the use of emergency and lifesaving equipment required to be carried, such as life jackets, life rafts, evacuation slides, emergency exits, portable fire extinguishers, oxygen equipment, first aid and universal precaution kits, and automated external defibrillators;



- c) when serving on aeroplanes operated above 3,000 m (10,000 ft), knowledgeable as regards the effect of lack of oxygen and, in the case of pressurized aeroplanes, as regards physiological phenomena accompanying a loss of pressurization;
- d) aware of other crew members' assignments and functions in the event of an emergency so far as is necessary for the fulfillment of the cabin crew member's own duties;
- e) aware of the types of dangerous goods which may, and may not, be carried in a passenger cabin and has completed the dangerous goods training programme required by Dangerous Goods Handling Requirements 2009; and
- f) knowledgeable about human performance as related to passenger cabin safety duties including flight crew-cabin crew coordination (Crew Resource Management).

Note 1.— Requirements for the training of cabin crew members in the transport of dangerous goods are included in the Dangerous Goods Training Programme contained in Annex 18 — The Safe Transport of Dangerous Goods by Air and the Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284).

Note 2.— For more information on dangerous goods operational requirements, see Chapter 14.

Note 3.— Guidance material to design training programmes to develop knowledge and skills in human performance can be found in the Human Factors Training Manual (Doc 9683).

12.5 FLIGHT TIME, FLIGHT DUTY PERIODS AND REST PERIODS

12.5.1 The Operator shall establish the limits applicable to flight time, flight duty periods and rest periods for cabin crew not exceeding the limitations set by this FOR.

- a) The probability that fatigue will affect cabin attendants in the performance of their assigned duty to an extent that will adversely affect the safety of the operation is obviously lower than that which applies to flight crews, but it must be remembered that the time that a cabin attendant is most likely to be called upon to perform emergency duties is on landing when the person is nearing the end of a duty period. The duty period limitations applied to cabin crew may be less stringent than those for flight crew but similar rest periods should be provided.
- b) Duty Periods and Flight Duty Periods limitations for Cabin Crew shall be as per para 9.6.2.6.
- c) Monthly, Ninety Days and Yearly Flight Time Limitations of Cabin Crew shall be the same as that of the Flight Crew.
- d) Relaxation of flight time or duty period limitations of cabin attendants shall be at the discretion of the pilot-in-command of the aircraft for the purpose specified in



paragraph 9.6.2.4 but whenever the limitations are exceeded, the pilot-in-command and the operator shall submit a written report to the DG, CAAN.

12.5.2 Rest Period

An operator shall establish for flight crew members a minimum rest period that allows them to obtain:

- a) adequate rest prior to flight duty time, calculated by taking into account the number and type of flight crew member duties that precede and follow the rest period and ;
- b) at least one rest period of not less than 24 consecutive hours, which should include two nights, once within each seven day period.

12.5.3 RESERVED

12.6 CABIN CREW INSTRUCTOR QUALIFICATIONS

12.6.1 Operators shall establish qualifications for cabin crew instructors as required by CAAN Cabin Crew Training Manual, 2015 Para 3.2.15, and maintain an instructor training program to the satisfaction of DG, CAAN. Cabin Crew Instructors shall obtain necessary authorization before being assigned on any instructional tasks.

12.6.2 Operators shall appoint adequate number of cabin crew examiners (check cabin crew) based upon the criteria as per CAAN Cabin Crew Manual, 2015 Para 3.2.16, to carry out necessary checks and evaluation of the cabin crew.

12.6.3 Cabin Crew Instructors are to be updated regularly and have to be assigned with instructional tasks as frequently as possible. They shall be reassessed by CAAN Inspectors within each 12 months period to monitor that the required level of knowledge and skills are adequately maintained. Cabin Crew Instructors who have not been engaged in instructional tasks in the preceding 12 months period shall go through an update/refresher training.

12.7 RESERVED

12.8 PASSENGER SAFETY BRIEFING CARD

12.8.1 A Passenger Safety Briefing Card, which may be a part of the Cabin Crew Manual and which must be clear and legible of reasonable quality, preferably laminated, shall be required onboard every aircraft in each passenger seat. The Card must also contain instructions in the national language.

12.8.2 Where there is no such provision for placing the Card in every passenger seat, then at least one Card shall be affixed in various prominent positions which will enable every passenger to view the Card and comply with its instructions.



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12.8.3 The Passenger Safety Briefing Card shall contain information on:

- (a) procedures to follow in the case of fire, decompression, smoke etc. during flight
- (b) procedures to follow in the case of emergency evacuation on land and water including the use of all emergency equipment
- (c) the use of breathing apparatus (if installed)
- (d) the use of life vests (if installed)
- (e) restrictions on the use of personal electronic equipment
- (f) smoking and seat belt signs
- (g) the pictorial display of location of survival equipment eg. Crash axe, fire extinguishers, oxygen bottles, first aid kits, flashlights etc. on board including survival rations (if carried)

12.8.4 When the operator operates more than one type or variants of a type, the Passenger Safety Briefing Card shall also indicate the type or series of the type.

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CHAPTER 13

SECURITY

13.0 In the context of this chapter, the word “security” is used in the sense of prevention of illicit acts against civil aviation.

13.1 DOMESTIC COMMERCIAL OPERATIONS

Information set forth in this Chapter is applicable to all operators engaged in domestic and international commercial air operations.

13.2 SECURITY OF THE FLIGHT CREW COMPARTMENT

13.2.1 In all aeroplanes which are equipped with a flight crew compartment door, this door shall be capable of being locked, and means shall be provided by which cabin crew can discreetly notify the flight crew in the event of suspicious activity or security breaches in the cabin.

13.2.2 All passenger-carrying aeroplanes of a maximum certificated take-off mass in excess of 45,500 kg or with a passenger seating capacity greater than 60 shall be equipped with an approved flight crew compartment door that is designed to resist penetration by small arms fire and grenade shrapnel, and to resist forcible intrusions by unauthorized persons. This door shall be capable of being locked and unlocked from either pilot’s station.

13.2.3 In all aeroplanes which are equipped with a flight crew compartment door in accordance with 13.2.2:

- a) this door shall be closed and locked from the time all external doors are closed following embarkation until any such door is opened for disembarkation, except when necessary to permit access and egress by authorized persons; and
- b) means shall be provided for monitoring from either pilot’s station the entire door area outside the flight crew compartment to identify persons requesting entry and to detect suspicious behaviour or potential threat.

13.2.4 RESERVED

13.2.5 RESERVED

13.3 AEROPLANE SEARCH PROCEDURE CHECKLIST

An operator shall ensure that there is on board a checklist of the procedures to be followed in searching for a bomb in case of suspected sabotage and for inspecting aeroplanes for concealed weapons, explosives or other dangerous devices when a well-founded suspicion exists that the aeroplane may be the object of an act of unlawful interference. The checklist shall be supported by guidance on the appropriate



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course of action to be taken should a bomb or suspicious object be found and information on the least-risk bomb location specific to the aeroplane.

13.4 TRAINING PROGRAMMES

13.4.1 An operator shall establish and maintain an approved security training programme which ensures crew members act in the most appropriate manner to minimize the consequences of acts of unlawful interference. The training programme shall be compatible with the National Aviation Security programme and shall be evaluated by CAAN. As a minimum, this programme shall include the following elements:

- a) determination of the seriousness of any occurrence;
- b) crew communication and coordination;
- c) appropriate self-defense responses;
- d) use of non-lethal protective devices assigned to crew members whose use is authorized by the State of the Operator;
- e) understanding of behaviour of terrorists so as to facilitate the ability of crew members to cope with hijacker behaviour and passenger responses;
- f) live situational training exercises regarding various threat conditions;
- g) flight deck procedures to protect the aeroplane;
- h) aeroplane search procedures and guidance on least-risk bomb locations where practicable;
- i) security of the flight crew compartment; and
- j) post-flight concerns for the crew

13.4.2 An operator shall also establish and maintain a training programme to acquaint appropriate employees with preventive measures and techniques in relation to passengers, baggage, cargo, mail, equipment, stores and supplies intended for carriage on an aeroplane so that they contribute to the prevention of acts of sabotage or other forms of unlawful interference.

13.4.3 Such a training should be provided to the crew and concerned personnel on an initial and recurrent basis.

13.5 REPORTING ACTS OF UNLAWFUL INTERFERENCE

Following an act of unlawful interference, the pilot-in command shall submit, without delay, a report of such an act to Civil Aviation Authority of Nepal as well as to the designated local authority.



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13.6 WEAPONS AND LEAST-RISK BOMB LOCATION

- 13.6.1 Specialized means of attenuating and directing the blast shall be provided for use at the least-risk bomb location.
- 13.6.2 Where an operator accepts the carriage of weapons removed from passengers, the aeroplane shall have provision for stowing such weapons in a place so that they are inaccessible to any person during flight time.

13.7 RESERVED

13.8 NON-IMPERSONATION OF FLIGHT CREWMEMBERS

- 13.8.1 An Operator shall ensure that unauthorized entries into the flight deck are strictly prohibited.
- 13.8.2 Only persons assigned on duty may occupy jump seats (observer seats). Such persons shall either be company staff or CAAN officials.



CHAPTER 14

RESERVED



CHAPTER 15

TRAINING REQUIREMENTS AND SAFE TRAINING PRACTICES

15.1 GENERAL

15.1.1 This chapter prescribes the requirements applicable to each certificate holder for establishing and maintaining a training program for crew members, aircraft dispatchers and other operations personnel and for the approval and use of training devices in the conduct of the program as well as the contains of safe training practices.

15.1.2 DEFINITIONS. The following terms are used throughout this chapter and are defined as follows:

- *Training Program:* A system of instruction which includes curriculums, facilities instructors, check airmen and examiners, courseware, instructional delivery methods, and testing and checking procedures. This system must satisfy the training program requirements of the CIVIL AVIATION AUTHORITY OF NEPAL and ensure that each crewmember and dispatcher remains adequately trained for each aircraft, duty position, and kind of operation in which the person serves.
- *Modular Training:* The concept of program development in which logical subdivisions of training programs are developed, reviewed, approved, and modified as individual units. Curriculum segments and modules may be used in multiple curriculums. The modular approach allows great flexibility in program development and reduces the administrative workload on both operators and instructors in the development and approval of these programs.
- *Categories of Training:* The classification of instructional programs by the requirement the training fulfills. Categories of training consist of one or more curriculums. The categories of training are initial new-hire, initial equipment, transition, upgrade, recurrent (periodic), and requalification.
- *Curriculum:* A complete training agenda specific to an aircraft type, a crewmember or dispatcher duty position, and a category of training. An example is an “initial new-hire, Boeing 737 first officer curriculum.” Each curriculum consists of several curriculum segments.



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- *Curriculum Segment:* The largest subdivision of a curriculum containing broadly related training subjects and activities based on regulatory requirements. Curriculum segments are logical subdivisions of a curriculum which can be separately evaluated and individually approved. Examples are a “ground training” segment and a “flight training” segment. Each curriculum segment consists of one or more training modules.
- *Training Module:* A subpart of a curriculum segment which constitutes a logical, self-contained unit. A module contains elements or events which relate to a specific subject. For example, a ground training curriculum segment could logically be divided into modules pertaining to aircraft systems (such as hydraulic, pneumatic, and electrical). As another example, a flight training curriculum segment is normally divided into flight periods, each of which is a separate module. A training module includes the outline, appropriate courseware, and the instructional delivery methods. It is usually, but not necessarily, completed in a single training session.
- *Element:* An integral part of a training, checking, or qualification module that is subject oriented and not task-oriented. For example, an “electrical power” ground training module may include such elements as a DC power system, an AC power system, and circuit protection.
- *Event:* An integral part of a training, checking, or qualification module which is task-oriented and requires the use of a specific procedure or procedures. A training event provides a student an opportunity for instruction, demonstration, and/or practice using specific procedures. A checking or qualification event provides an evaluator the opportunity to evaluate a student’s ability to correctly accomplish a specific task without instruction or supervision.
- *Checking and Qualification Module:* An integral part of a qualification curriculum segment which contains checking and qualification requirements. For example, a qualification curriculum segment may contain a proficiency check module, a LOFT module and an operating experience (qualification) module.
- *Courseware:* Instructional material developed for each curriculum. This is information in lesson plans, instructor guides, computer software programs, audiovisual programs workbooks, aircraft operating manuals, and handouts. Courseware must accurately reflect curriculum requirements, be effectively organized, and properly integrate with instructional delivery methods.
- *Instructional Delivery Methods:* Methodology for conveying information to a student. For example, this may include lectures, demonstrations, audiovisual presentations, programmed and directed self study workshops, and drills. Training devices, simulators, aircraft, and computer work stations are also considered instructional delivery methods.



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- *Testing and Checking:* Methods for evaluating students as they demonstrate a required level of knowledge in a subject, and when appropriate apply the knowledge and skills learned in instructional situations to practical situations.
- *Training Hours:* The total amount of time necessary to complete the training required by a curriculum segment. This must provide an opportunity for instruction, demonstration, practice, and testing, as appropriate. This time must be specified in hours on the curriculum segment outline. A training hour includes time for normal breaks, usually 10 minutes each hour. Lunch breaks are not included.
- *Programmed Hours:* The hours specified for certain categories of training (initial new-hire, initial equipment, and recurrent). Programmed hours are specified in curriculum segment outlines in terms of training hours.
- *Duty Position:* The functional or operating position of a crewmember or aircraft dispatcher. Common duty positions are pilot-in-command (PIC), second-in-command (SIC), flight engineer (FE), flight attendant (FA), and aircraft dispatcher (AD).
- *Training/Checking Month (Base Month):* The calendar month during which a crewmember or aircraft dispatcher is due to receive required recurrent training, a required flight check, a required competency check, or required operating familiarization. Calendar month means the first day through the last day of a particular month.
- *Eligibility Period:* Three calendar months (the calendar month before the “training/checking month,” the “training/checking month,” and the calendar month after the “training/checking” month). During this period a crewmember or aircraft dispatcher must receive recurrent training, a flight check, or a competency check to remain in a qualified status. Training or checking completed during the eligibility period is considered to be completed during the “training/checking month” and is due in the “training/checking month” in the following year.
- *Initial Approval:* A CIVIL AVIATION AUTHORITY OF NEPAL letter which conditionally authorizes an operator to begin instruction to qualify personnel under a specific curriculum or curriculum segment pending an evaluation of training effectiveness. An initial approval letter must specify an expiration date for the conditional authorization.
- *Final Approval:* A CIVIL AVIATION AUTHORITY OF NEPAL letter, without an expiration date, which authorizes an operator to continue training in accordance with a specific curriculum or curriculum segment.

15.1.3 In order that Operators impart training to their Flight and Cabin Crew members to comply with the requirements of 3.12 OPERATORS TO ENSURE THAT FLIGHT CREW ARE QUALIFIED, Operators shall fulfill the requirements of



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Chapter 15.2; however, such training programs prepared by the Operator and approved by the DG, CAAN shall be only for the purpose of training those Flight and Cabin Crew who are currently employed by the Operator and hold an Appointment Letter or CAAN CPL/ATPL license holders who have been deputed to the company for the purpose of receiving such trainings with prior permission from the DG, CAAN.

- 15.1.4 a) An Instructor of pilots and/or cabin crew who has imparted flight training to a student or a group of students, shall not conduct the final checkride, final flight test or final clearance. Therefore an Operator shall ensure that it always has an adequate number of instructors and check personnel (Pilots or Cabin Crew).
- b) When there is only one Instructor or Check Pilot of the type for the purpose of training and checking pilots, the DG, CAAN may approve the same Instructor to impart both the training and conduct the checkride or final clearance provided that the Instructor has a proven record of unbiased trainings and checks, has not violated the Rules and Regulations of CAAN within the past two years and is determined to be fit for the duty by the DG, CAAN.

15.2 TRAINING PROGRAM CURRICULUM

15.2.1 Each certificate holder must prepare and keep current a written training program curriculum for each type of aircraft with respect to dispatcher and each crew member required for that type aircraft. Curriculum must include ground and flight training required by this chapter.

15.2.2 Each training program curriculum must include:

- a) a list of principal ground training subjects, including emergency training subjects that are provided.
- b) a list of all the training devices mockups, system trainers, procedures trainers or other training aids that the certificate holder will use.
- c) detailed descriptions or pictorial displays of the approved normal, abnormal and emergency maneuvers, procedures and functions that will be performed during each flight training phase or flight check indicating those maneuvers, procedures and functions that are to be performed during the in flight portion of flight training and flight checks.
- d) a list of aircraft simulators or other training devices approved, including approvals for particular maneuvers, procedures or functions.
- e) the program hours or training that will be applied to each phase of training.
- f) a copy of each statement issued by the Director General for reduction of program hours of training.



15.3 TRAINING PROGRAM AND REVISION; Initial and Final Approval

15.3.1 To obtain initial program, each certificate holder must submit to the Director General :

- a) an outline of the proposed program or revision, including an outline of the proposed or revised curriculum that provides enough information for a preliminary evaluation of the proposed training program or revised training program; and
- b) additional relevant information as may be requested by the Director General.

15.3.2 If the proposed training program or revision complies with this chapter the Director General grants initial approval in writing after which the certificate holder may conduct the training in accordance with that program. The Director General then evaluates the effectiveness of the training program and advises the certificate holder of deficiencies, if any, that must be corrected.

15.3.3 The Director General grants final approval of the program or revision if the certificate holder shows that the training conducted under the initial approval set forth in the above paragraph ensures that each person that successfully completes the training is adequately trained to perform his assigned duties.

15.3.4 In granting initial or final approval of training programs or revision, including reduction in program hours specified in this chapter, the Director General considers the training aids, devices, methods and procedures listed in the certificate to holders curriculum that increases the quality and effectiveness of the teaching-learning process.

15.3.5 If approval of reduced program hours of training is granted, the Director General provides the certificate holder with a statement for the basis for the approval.

15.3.6 Whenever the Director General finds that revisions are necessary for the continued adequacy of a training program that has been granted final approval, the certificate holder shall, after notification by the Director General, make any changes in the program that are found necessary by the Director General, within 30 days after the certificate holder receives such notice. However, if the Director General finds that there is an emergency that requires immediate action in the interest of safety in air transportation, he may, upon a statement of the reasons, require a change effective without stay.

15.4. GROUND INSTRUCTOR

15.4.1 No certificate holder may use a person to serve as a ground instructor for a course of approved training unless that person:



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- (a) In the case of pilots:
- (i) has demonstrated his knowledge and capacity on teaching subject matter by conducting a ground class satisfactorily to the DG, CAAN and is cleared by DG, CAAN to act as an instructor for the ground training.
 - (ii) for a single-engine aeroplane, holds a CPL with more than 2000 hours of flying experience in Nepal and successfully completes a Ground Instructor's course; and
 - (iii) for multi-engine aeroplanes, holds an ATP license for more than three years and successfully completes a Ground Instructor's course.
- (b) In the case of Engineers:
- (i) has demonstrated his knowledge and capacity on teaching subject matter by conducting a ground class satisfactorily to the DG, CAAN and is cleared by DG, CAAN to act as an instructor for the ground training.
 - (ii) For aeroplanes having a MTOW of less than 5,700 kgs:
 - holds an Aircraft Maintenance license with at least three years experience with an aviation organization applicable to the category; or
 - an Engineering degree of any discipline as well as having a work experience of at least three years with an aviation organization and whose affiliation with subject to instruct should be fit to satisfy the DG, CAAN.
 - (iii) For aeroplanes having a MTOW of more than 5,700 kgs:
 - holds an Aircraft Maintenance license with at least three years experience and one year experience on type with an aviation organization applicable to the category; or
 - an Engineering degree of any discipline and type rating as well as having a work experience of at least three years with an aviation organization and whose affiliation with subject to instruct should be fit to satisfy the DG, CAAN.

Note-A pilot whose license is not current but has qualification and experience mentioned above also may be considered to be eligible to apply for a position of Ground Instructor.

15.4.2 In case of ground instruction for flight operation officer and personnel involved in dispatching aircraft, a pilot or a FOO license holder, with experience of not less than 3 years shall be eligible to conduct ground instruction, if his qualification and background is satisfactory to DG, CAAN.



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15.4.2 In case of ground instruction for cabin attendants, a pilot or a FOO license holder or a cabin attendant, with experience of not less than 3 years shall be eligible to conduct ground instruction, if his qualification and background is satisfactory to DG, CAAN.

15.4.3 A ground instructor's authorization will have the duration of 24 months as the period of validity.

15.4.4 For the renewal of ground instructorship the applicant must produce an evidence of conducting a ground class of his subject at least once in a year.

15.5 PILOT TRAINING: Ground and Flight Training

15.5.1 Initial, Transition, Recurrent and Upgrade Ground Training.

15.5.1.1 Initial, transition and upgrade ground training for pilots must include instruction in at least the following, as applicable, to their assigned duties:

a) General Subjects:

- i) the certificate holders dispatch or flight release procedures.
- ii) principles and methods for determining weight and balance, and runway limitations for take-off and landing (regulated take-off and landing weight)
- iii) enough meteorology to ensure a practical knowledge of weather phenomena, including the principal of frontal systems, icing, fog, thunderstorms and high altitude weather situations.
- iv) air traffic control systems, procedures and phraseology.
- v) navigation and the use of navigation aids, including instrument approach procedures.
- vi) normal and emergency communication procedures.
- vii) visual cues prior to and during descent below DH or MDA; and
- viii) other instructions including CRM, CFIT, Dangerous Goods, Minimum Equipment List as necessary to ensure his competence.

b) For each aircraft type:

- i) a general description.
- ii) performance characteristics.
- iii) engines and propellers.
- iv) major components.
- v) major aircraft systems, appropriate procedures and limitations.
- vi) procedures for avoiding severe weather situations and for operating in or near thunderstorms, turbulent air, icing, hail, and other potentially hazardous meteorological conditions.



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- vii) operating limitations
- viii) fuel consumption and cruise control.
- ix) flight planning.
- x) each normal and emergency procedure; and
- xi) the approved aircraft flight manual.

15.5.1.2 Initial ground training for pilots must consist all the programmed hours of instructions in the required subjects specified in the above paragraph and approved by Director General.

15.5.2 Initial, Recurrent, Transition, Upgrade and differences Flight Training.

15.5.2.1 Initial, transition and upgrade training for pilots must include flight training and practice in the maneuvers and procedures set forth in the Operator's Operations Manual Part-D Training.

15.5.2.2 The maneuvers and procedures required by the above paragraph must be performed in-flight or (except to the extent that certain maneuvers and procedures may be performed) in a Flight Simulation Training Device accepted by the Director General.

15.5.2.3 The initial flight training required must include at least 5 hours for pilot-in-command and 8 hours for co-pilot or as per the approved training programme, prior to the checkride. The recurrent flight training shall consist of a minimum of one hour; however this shall not be limiting and shall be subject to the type of aircraft operated.

15.5.2.4 The checkride or PPC shall include at least three landings.

15.5.2.5 Operators shall use their own training programs and check forms when conducting recurrent flight trainings abroad in an aircraft or simulator.

15.5.2.6 Newly licensed, type-rated or hired Flight Crew must receive Line Indoctrination Training (minimum 50 hours for turbo-prop aircraft or 10 sectors for jet aircraft) followed by a Line Check prior to being released for normal flights with Line Captains or co-pilots. Operators shall have a Line Indoctrination Training and Check Program as part of Operations Manual – Part D.

15.6 CABIN CREW

Initial, recurrent, transition and differences ground training-

15.6.1 The initial transition and differences ground training for cabin crew must include instruction in at least the following-

- a) General subjects-
 - i) authority of the Pilot In Command
 - ii) passenger handling, including the procedures to be followed in the case of deranged persons or other persons or other persons whose conduct might jeopardize safety.
- b) For each aircraft type-



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- i) A general description of the aircraft of the aircraft emphasizing physical characteristics that may have a bearing on ditching, evacuation and inflight emergency procedures and on other related duties.
- ii) The use of both the public address system and the means of communicating with other crew members, including emergency means in the case of attempted hijacking or other unusual situations; and
- iii) Proper use of electrical galley equipment and the controls for cabin heat and ventilation.
- iv) drilled and capable in the use of emergency and life saving equipment required to be carried, such as life jackets, life rafts, evacuation slides, emergency exits, portable fire extinguishers, oxygen equipment and first aid kits;
- v) when serving on aeroplanes operated above 3000 m (10000 ft), knowledgeable as regards the effect of lack of oxygen and, in the case of pressurized aeroplanes, as regards physiological phenomena accompanying a loss of pressurization.
- vi) aware of other crew members' assignments and functions in the event of an emergency so far as is necessary for the fulfillment of the cabin crew member's own duties;
- vii) aware of the types of dangerous goods which may, and may not, be carried in a passenger cabin and has completed the dangerous goods training programme required by Annex 18; and
- viii) knowledgeable about human performance as related to passenger cabin safety duties including flight crew-cabin crew co-ordination.

15.6.2 Initial ground training for cabin crew must include a competence check to determine ability to perform duties and responsibilities.

15.6.3 Initial ground training for cabin crew must consist of all the programmed hours of instruction in the subjects specified in the above and approved by Director General.

15.7 AIRCRAFT DISPATCHER; Initial and Transition Ground Training -

15.7.1 Initial and Transition Ground Training for aircraft dispatcher must include instruction in at least the following –

- a) General subjects-
 - i) Use of communication systems including the characteristics of those systems and the appropriate normal and emergency procedures



- ii) Meteorology, including various types of meteorological information and forecast, interpretation of weather data, (including forecasting of en route and terminal temperatures and weather conditions) frontal systems wind conditions and use of actual and prognostic weather charts for various altitudes
 - iii) The NOTAM system
 - iv) Navigational aids and publications
 - v) Joint dispatcher-Pilot responsibilities
 - vi) Characteristics of appropriate airports
 - vii) Prevailing weather phenomena and the available sources of weather information; and
 - viii) Air Traffic control and instrument approach procedures
- b) For each aircraft -
- i) A general description of the aircraft emphasizing operating and performance characteristics, navigation equipment, instrument approach and communication equipment and procedures and other subjects having a bearing on dispatcher duties and responsibilities.
 - ii) Flight operations procedures including procedures specified
 - iii) Weight and balance computation
 - iv) Basic aircraft performance dispatch requirements and procedures,
 - v) Flight planning including track selection, flight time analysis and fuel requirements, and;
 - vi) Emergency procedures
- 15.7.2 Emergency procedures must be emphasized, including the alerting of proper government, company and private agencies during emergencies to give maximum help to an aircraft in distress.
- 15.7.3 Initial and transition ground training for aircraft dispatchers must include a competence check given by an appropriate supervisor or ground instructor that demonstrate knowledge and ability with the subjects set forth in this chapter.
- 15.7.4 Initial ground training for the aircraft dispatchers must consist the programmed hours of instruction in the subjects specified in this paragraph and approved by Director General.
- 15.7.5 Recurrent ground training for dispatchers must include at least :
- a). the knowledge with respect to the aircraft type and
 - b). in the subjects required for initial ground training as appropriate in the form of a competency check.



15.8 FLIGHT INSTRUCTORS

Initial and Transition Training

15.8.1 The initial and transition ground training for pilot check airmen must include the following :

- a) pilot check airmen duties, functions and responsibilities;
- b) the applicable Civil Aviation Regulations and the certificate holders policies and procedures.
- c) the appropriate methods, procedures and techniques for conducting the required checks.
- d) proper evaluation of pilot performance including the detection of :
 - i) improper and insufficient training; and
 - ii) personal characteristics that could adversely effect safety.
- e) the appropriate corrective action in the case of unsatisfactory checks.
- f) the approved methods, procedures and limitations for performing the required normal, abnormal and emergency procedures in the aircraft.

15.8.2 The initial and transition flight training for pilot check airmen and instructors pilot must include the following :

- a) enough in flight training and practice in conducting flight checks from the left and right pilot seats in the required normal, abnormal and emergency maneuvers to ensure his competence to conduct the pilot flight check and flight training required by this chapter.
- b) the appropriate safety measures to be taken from either pilot seat for emergency situations that are likely to develop in training.
- c) the potential results of improper or untimely safety measures during training.

15.8.3 Recurrent Training

Recurrent Training /PPC of Instructor Pilot may be included in Pilot type Training.



15.9 FLIGHT ENGINEERS; Initial and Transition Flight training

15.9.1 Initial and transition flight engineers must include at least the following-

- a) Training and Practice in procedures related to the carrying out of flight engineer duties and functions. This training and practice may be accomplished either inflight or in aircraft simulator, or in a training device.
- b) A flight check that includes -
 - i) Preflight inspection
 - ii) Inflight performance of assigned duties accomplished from the flight engineer station during taxi, run-up, take-off, climb cruise, descent , approach and landings.
 - iii) Accomplishment of other functions, such as fuel management and preparation of fuel consumption records and normal and emergency or alternate operation of all aircraft flight systems, performed either inflight in an aircraft simulator or in a training device.

15.9.2 Flight engineers possessing a commercial pilot certificate with an instrument, class and category rating, or pilots already qualified as Co-pilot and reverting to flight engineer, may complete the entire flight check in an approved aircraft simulator.

15.9.3 Initial flight training must include at least 5 hours of programmed of flight training and practice

15.9.4 If the certificate holders approved training program includes a course of training utilizing an aircraft simulator or other training device, each flight engineer must successfully complete the followings:

- a) training and practice in at least all of the assigned duties, procedures and functions required by this chapter; and
- b) a flight check to a flight engineer level of proficiency in the assigned duties, procedures and functions.

15.9.5 Recurrent Ground and Flight Training must be conducted once within a one calendar year. The requirement of a recurrent flight training may be deemed to be satisfied by a Pilot Proficiency Check carried out to the examiner's satisfaction.



15.10 INDOCTRINATION GROUND TRAINING: Crew Member, Flight Engineer And Dispatcher

15.10.1 Each training program must provide the following basic indoctrination ground training as appropriate to the particular assignment of the crew member or dispatcher:

- a) duties and responsibilities of crew members or dispatchers, as applicable.
- b) appropriate provisions of the Civil Aviation Regulations.
- c) contents of the certificate holders operating certificate and operations specifications.
- d) appropriate provisions of the certificate holders operating manual and
- e) company manuals.

15.11 CREW MEMBER EMERGENCY TRAINING

15.11.1 Each training program must provide the emergency training set forth in this chapter with respect to each aircraft type model and configuration, each required crew member and each kind of operation conducted, in so far as appropriate for each crew member and the certificate holder.

15.11.2 Emergency training must provide the following:

- a) instruction in emergency assignments and procedures, including coordination among crew members.
- b) individual instruction in the location, function and operation of emergency equipment including :
 - i) equipment used in ditching and evacuation.
 - ii) first aid equipment and its proper use.
 - iii) portable fire extinguishers, with emphasis on type of extinguisher to be used on different classes of fire; and
 - iv) emergency exits in the emergency mode with the evacuation slide pack attached (if applicable), with training emphasis on the operation of the exits under adverse conditions.
- c) Instructions in the handling of emergency situations including :
 - i) rapid decompression.
 - ii) fire in flight or on the surface and smoke control procedures with emphasis on electrical equipment and related circuit breakers located in cabin areas including all galleys, service centers, lifts, lavatories and movie screens.



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- iii) ditching and other evacuation, including, the evacuation of persons and their attendants, if any, who may need the assistance of another person to move expeditiously to an exit in the event of an emergency.
 - iv) illness, injury, or other abnormal situations involving passengers or crew members; and
 - v) hijacking and other unusual situations.
- d) review and discussion of previous aircraft accidents and incidents.
- 15.11.3 Each crew member must perform at least the following emergency drills and actually operate the following emergency equipment during initial and recurrent training on each type aircraft in which they are to serve:
- a) each type emergency exit in the emergency and normal mode.
 - b) each type fire extinguisher.
 - c) each type of emergency oxygen system.
 - d) emergency evacuation including the use of a slide.
 - e) donning, use and inflation of individual floatation means, if applicable.
 - f) ditching, if applicable, including but not limited to, as appropriate :
 - i) cockpit preparation and procedures.
 - ii) crew coordination.
 - iii) passenger briefing and cabin preparation.
 - iv) donning and inflation of life preserves.
 - v) removal from the aircraft and inflation of each type raft.
 - vi) transfer of each type slide pack from one door to another.
 - vii) deployment, inflation and detachment from the aircraft of each type of slide.
 - viii) use of life lines.
 - ix) boarding of passengers into raft or slide pack.
 - g) crew members who serve in operations above 25,000 feet must receive instruction in the following :
 - i) respiration.
 - ii) hypoxia.
 - iii) duration of consciousness without supplemental oxygen at altitude.
 - iv) gas expansion.
 - v) gas bubble formation.
 - vi) physical phenomena and incidents of decompression.



15.12 DIFFERENCE TRAINING ; Crew Members and Dispatchers

15.12.1 Differences training for crew members and dispatchers must consist of at least the following, as applicable to their assigned duties and responsibilities :

- a) instruction in each appropriate subject or part thereof required for initial ground training in the aircraft unless the Director General finds that particular subjects are not necessary.
- b) flight training in each appropriate maneuver or procedure required for initial flight training in the aircraft unless the Director General finds that particular maneuvers or procedures are not necessary.
- c) the number of programmed hours of ground and flight training determined by the Director General to be necessary for the aircraft, the operator the crew member or the aircraft dispatcher involved.

15.12.2 Differences training for all variations of a particular type aircraft may be included in initial, transition, upgrading and recurrent training for the aircraft.

15.13 SAFE TRAINING PRACTICES

15.13.1 The goal of adherence of safe training practices by all pilots is to achieve an effective and safe level of pilot proficiency by practicing emergency procedures in a manner which will ensure that the practice does not become the real thing. Training beyond this level can be hazardous and unnecessary.

15.13.2 To preserve the highest degree of safety during training or checking, those conducting emergency exercises are to ensure that candidates are completely briefed on all aspects of the flight. *No sudden actions such as an engine shutdown or feathering are permitted.* The check or training pilot shall state the exercise required i.e. "engine fire drill". The pilots under training or checking shall complete the check in accordance with published Flight Manual Procedures and operator's Operating Procedures. The flying pilot will primarily fly the aircraft and delegate duties to the non-flying pilot. The non-flying pilot will act on the memory items then using the emergency written checklist, complete the remainder of the check. Emergency procedures requiring the closing of a throttle, condition lever, mixture control, feathering of a propeller or shutting down of any major system must be confirmed by both pilots before the lever or switch is moved.

15.13.3 Activation of fire bar handles, fuel firewall shutoff valves, fuel/oil shutoffs etc. are to be SIMULATED only or activated above 5000' AGL.

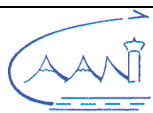
15.13.4 Multiple emergencies, except those which follow logically from the first malfunction, shall not be completed at the same time.



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- 15.13.5 It is not possible to compile safe training practices for all emergency procedures. Training sequences not specified may be conducted by training or check pilots. Common sense is essential in the preservation of flight safety.
- 15.13.6 Instrument checks should not be performed during an IMC or at night unless the aircraft is equipped with either approved thunderstorm detection equipment or approved airborne weather radar equipment.
- 15.13.7 Practices to real stalls on multiengine aircraft which has not been certified on demonstration of control in case of spin should not be practiced.
- 15.13.8 For aeroplanes above 5700 kgs and not certificated for STOL operations, touch-and-go shall not be permitted at night at airports having less than 5000 feet runway length.
- 15.13.9 When conducting Route Checks in aeroplanes equipped with a jump seat, the pilot conducting the check may occupy the jump seat, provided that it is equipped with a headset to enable the Check Pilot to monitor and/or instruct the Pilot Under Check (PUC).



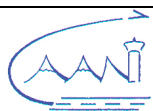
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15.14 TOLERANCE FOR P₂ INITIAL AND RECURRENT CHECK

EXERCISE	HEIGHT (ft)	SPEED (knots)	HEADING (degree)
01. Normal take-off (Rotation and climb speed)		+10 - 5	±10
02. STOL Take-off		+10 - 5	±10
03. X wind Take-off		+10 - 5	±10
04. SIM Power failure or engine fire after Take-off	- 0	+10 - 5	±20
05. SIM fire during landing	- 0	+10 - 5	±20
06. Normal turns	±100	±10	±10
07. 45° turns	±200	±10	±10
08. Approach to stall	-200		±10
09. Full stall clean configuration	-200		±10
10. Full stall landing configuration	-500		
11. Stall (25° bank)	-200		±10
12. Normal landing (approach and VRef speed)		+10 - 5	
13. Single engine landing		+10 - 0	
14. Rejected landing		+10 - 5	±10

- Notes :
1. Prevailing weather condition must be taken into consideration.
 2. Guidelines on required maneuvers for an initial and recurrent pilot proficiency check are mentioned in Appendix 2.



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15.15 TOLERANCE FOR P1 UPGRADING AND PROFICIENCY CHECK

EXERCISE	HEIGHT (ft)	SPEED (knots)	HEADING (degree)
01. Normal take-off (Rotation and climb speed)		+ 5 - 0	± 5
02. STOL Take-off		+ 5 - 0	± 5
03. X wind Take-off		+ 5 - 0	± 5
04. SIM Power failure after Take-off	- 0	+ 5 - 0	± 10
05. SIM fire after Take-off	- 0	+ 5 - 0	± 10
06. Normal turns	± 50	± 0	± 0
07. 45° turns	± 100	± 5	± 5
08. Approach to stall, clean configuration	- 100		± 5
09. Approach to stall, landing configuration	- 200		± 5
10. Approach to stall (25° bank)	- 100		± 5
11. Normal landing (approach and VRef speed)		+ 5 - 0	
12. Single engine landing		+ 10 - 0	
13. Rejected landing		+ 5 - 0	± 5

Notes : 1. Prevailing weather condition must be taken into consideration.
Guidelines on required maneuvers for an initial and recurrent pilot proficiency check are mentioned in Appendix 2 PPC.

15.16 GRADINGS SAMPLE

15.16.1 Grading Sample for Initial and Recurrent Trainings

Each exercise will be marked:

1 = Proficiency

2 = Normal Progression

3 = Additional Training Required

4 = Unsatisfactory

N/A = Not Applicable

D = Discussed and Simulated



15.16.2 Grading Sample for PPC and Check rides

(a) **Satisfactory (S)**- All exercises completed within tolerances. A sequence shall be rated "satisfactory" if:

1. It contains minor errors only;
2. Airspeed control is acceptable for prevailing condition;
3. Altitude control is acceptable for prevailing condition;
4. Due to lack of experience, the candidate's flying is not as smooth and accurate as would be expected from an experienced on-type-candidate.
5. Rating of "satisfactory" on initial proficiency check (check-ride flights) is necessary for the endorsement by CAAN.
6. The applicant PUC shall not be permitted for flight check unless he successfully completes an oral examination on General Aerodynamics and Technical Knowledge related to the type of aircraft.

(b) **Satisfactory with briefing (SB)**- All exercises completed within tolerance but required briefing for minor errors. A sequence shall be rated "satisfactory with briefing" if;

1. It is safe but contains minor errors due to misinterpretation of procedures and is repeated satisfactorily;
2. Aircraft control is safe but of a lower standard than would be expected;
3. An emergency procedure deviates from the check list but would not create a more hazardous situation if done in an actual emergency;
4. An approach, take-off, or landing briefing is not in accordance with the Company's Operations Manual or Company's Standard Operating Procedures;
5. A sequence deviates from Company's Standard Operating Procedures but can be corrected with a de-briefing.

(c) **Unsatisfactory (US)**- Exercises exceed tolerances and attempted gross error.

A sequence shall be rated "unsatisfactory" If:

1. Any attempt is made to follow a procedure which would violate an ATC clearance or endanger the aircraft;
2. An improper emergency procedure is used which would create a more hazardous situation than the original emergency.
3. The flight controls are grossly mishandled; or
4. Gross deviations in airspeed, altitude and direction occur.

Any unsatisfactory grading constitutes a failed check

Note- Any sequences that is recorded as "Satisfactory with Briefing" or "Unsatisfactory" shall be summarized in the space provided. Procedures may be repeated, if in the check pilot's view, the candidate can perform the sequence correctly the second time.



15.17 BRIEFING AND DE-BRIEFING PROCEDURES

15.17.1 Briefing:

A pre-flight briefing of the candidate is mandatory. It is expected that the candidate will fly the aircraft or simulator in accordance with the approved techniques and that he can do so within acceptable tolerances. The pre-flight briefing should therefore include the following:

- a. The duration of flight test;
- b. An outline of the proposed sequence of events;
- c. The candidate should be prepared to demonstrate any procedure applicable to the aircraft, and will be expected to provide the initiative in response to any event;
- d. It is anticipated that aircraft will be flown in accordance with:
 - i. Aircraft Flight Manual;
 - ii. Aircraft Training Manual;
 - iii. Company Operations Manual; and
 - iv. Company Standard Operating Procedures.
- e. Simulated emergencies will be introduced during the flight; however, the safety of flight must not be jeopardized at any time. He is expected to complete all actions that can be completed in the simulator and indicate those actions that must be simulated in the aircraft. All simulated emergencies given by the check pilot in the aircraft will be prefixed by the word "simulated".
- f. The candidate will not be subjected to multiple unrelated system failures, although related failures may be introduced to demonstrate specific emergency procedure, e.g. multiple engine failure, total hydraulic failure etc.
- g. When conducting flight checks in a simulator, emergency situations caused by an inappropriate response by the candidate will not be corrected by the check pilot.
- h. The simulated prevailing weather will be at or below minima for the approach being carried out.
- i. If "Field-in-Sight" is not indicated by the check pilot, at the published approach minima, a missed approach procedure or other appropriate action is to be carried out.

15.17.2 De-Briefing:

- a. Except where a candidate's ability is border lined and required considerable elevation, the candidate should always be advised at the conclusion of the flight test whether he has been rated "satisfactory" or "unsatisfactory".
- b. If the check is "satisfactory", the candidate should be advised accordingly and de-briefed following the sequence of occurrence. When necessary, the



candidate should be questioned to determine motive, reasoning and knowledge of a procedure before he is offered constructive criticism of a particular technique he has used. Criticism must always be given the correct emphasis, depending on its relative importance in the entire operation. Instance where the candidate indicates a particularly high standard of ability or demonstrates sound judgment, should be mentioned to balance the criticism.

- c. If the check is "unsatisfactory", the candidate must be advised accordingly and the specific instances resulting in the assessment discussed. After discussion of the unacceptable points, the de-briefing should continue in the sequence of occurrence.

15.18 INSTRUMENT RATING

15.18.1 General requirement for check

Candidates will be evaluated on the accuracy of their general instrument flying, operational planning, adherence to ATC procedures and ability to execute let down and approach procedures to the standard required.

15.18.2 Equipment to be provided

- (1) Instrument Flying Hood or eyepiece that limits all-round vision to within the cockpit panel or any suitable cockpit screens for simulated instrument flight shall be provided.
- (2) Disks or other means for blanking out certain flight and navigation instruments shall be provided.

15.18.3 Standards

1. Descent below decision height (DH) or minimum descent altitude (MDA) will involve mandatory failure of the examination.
2. If one item of the flight examination (other than descent below minima) is failed by the candidate, this item may be repeated once. Should the candidate fail that item again, he will have failed the complete test.
3. Tolerance limit for flight maneuvers are intended for calm, stable air conditions. Due allowance for adverse weather conditions and aircraft type may be made by the examiner if so required.

15.18.4 Navigation Aids and Equipment

1. The aircraft used for examination shall be equipped with functioning instruments and equipment required by ICAO Annex 6 (operation of



of aircraft) section 6.9 and 6.10 as appropriate for flight under IFR conditions and at night.

2. The flight check will be conducted at an aerodrome or aerodromes equipped with VOR/DME and NDB approach facilities.

15.18.5 Lighting System

For the night rating, candidate should have additional thorough knowledge of aerodrome lighting system, navigational lighting system as well as cockpit and aircraft interior.

15.18.6 Tolerances

- (A) Normal flight, flight with simulated engine failure, air-work and limited panel:

HEIGHT :

- i) 100 feet
- ii) For initiating overshoot from decision height or MDA
+50 -0 feet
- iii) Maintenance of MDA
+100 -0 feet

HEADING:

$\pm 10^\circ$ (for normal flight $\pm 5^\circ$)

SPEED:

+10 Kts
-15 Kts

- (B) Approach Aids

TRACKING $\pm 5^\circ$

VOR APPROACH Less than full scale deflection (when inbound from Final Approach Fix)

ADF APPROACH 5 Degree of inbound QDM

ILS APPROACH Not more than full scale deflection in localizer and glide path when inbound from Final Approach Fix.



- (C) Missed approach decision point or descent point on non-precision aids must be reached at a constant rate of descent to conform to a 3° Glide Slope.

15.19 NIGHT FLIGHT QUALIFICATION

15.19.1 General Procedure

The Instructor Pilot will be responsible to explain each and every item and ensure that the student understands them well before commencement of night flight training.

- a) As per requirements, the operator will initiate the night flight training to the pilot, who holds IR valid for the type of aircraft he is flying, in accordance with the training plan. Training and check should be conducted by night rated Instructor Pilot.
- b) Briefing and de-briefing procedures will be conducted as mentioned in 15.17 of this section.
- c) Items which will result in failure of the flight test at night is mentioned in 15.20

15.19.2 Essential Background Knowledge

- a) The considerations with respect to night vision, aero-medical factors for night flying, how to adapt to reduced lighting, and the need to avoid exposure to bright light.
- b) Airport beacons and runway lighting systems, turn-off points, taxiway lighting, strobes, VASIS threshold and runway and lighting, and obstruction light.
- c) Additional considerations for the aircraft external line check:
 - (1) Position, landing and taxi-light serviceability check.
 - (2) Instrument lighting-proper level and adjustment.
 - (3) Serviceable flashlight, spare fuses.
- d) The extra care necessary, due to deceptive speed illusion, for taxiing when ground references not visible and minima is reached.
- e) The proposed flight training in its various stages emphasizing the extra care necessary when taxiing at night, systematic check, and the need to maintain sufficient generator/alternator output to meet the additions demands when taxiing lights and other night illumination is used.



- f) For take-off, stress the basic similarity to that of a daylight take-off, except for the necessity to supplement visual references with instrument references to establish a safe climb-out.
- g) For the approach and landing, emphasize how runway lights can be used to assess drift, constant approach angle, and as a landing reference to approach and runway light.

15.19.3 Advice to Instructor

- a) Before commencing night flying, a student should be reasonably proficient in instrument flying.
- b) Ensure the student is thoroughly aware of the entire airport lighting system. Review the lights and visual signals that could be expected from the control tower in the event of radio failure.
- c) Insist on extreme care being taken while taxiing, due to the difficulty in estimating speed and distance.
- d) Point out the importance of the generator or alternator charging rate as both radio equipment and lighting depend upon it.
- e) Point out that night flying is a combination of visual and instrument flight and that the degree of instrument reference depends on the clarity of the horizon, or dependable ground lights.
- f) Insist on the student keeping a sharp look-out for other aircraft at all times. Do not allow him to concentrate only inside the cockpit.
- g) The student should be given practice in landing with and without the use of a landing light.

15.20 FAILURE OF THE FLIGHT TEST

Following are the items which will result in failure of the flight test :

- a) Failure to fly the aircraft within the prescribed tolerance.
- b) Failure to check the flight instruments or radio equipment before flight.
- c) Failure to check before flight or to use correctly in flight any one of the de-icing or anti-icing.
- d) Failure to check the electrical charging systems before flight.
- e) Failure to apply the correct altimeter setting.



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- f) Failure to check any vital action item contained in the appropriate check list provided by the manufacturer, which are vital to the safety of the aircraft being flown.
- g) Failure to obtain ATC or simulated ATC clearances when necessary or to comply with such clearances
- h) Failure to communicate with ATC using proper applicable terminology in both content and format, at any of the standard or requested reporting points except where reason for non-acceptance or non-compliance can be justified.
- i) Failure to correctly select or identify the appropriate navigational aids.
- j) Failure to follow the correct procedure in the event of communications Failure.
- k) Failure to identify failed engine.
- l) By reason of lack of skill, knowledge or experience , he is unable to
 - i) complete an orientation;
 - ii) establish a holding pattern within the allocated airspace ; or
 - iii) maintain control of the aircraft.

15.21 REMEDIAL TRAINING

- 15.21.1 During training or checkride, the instructor or examiner shall inform the Chief Pilot and the Chief of Training Department of a pilot's inability to meet company standards and recommend for further appropriate training. The Chief of Training Department in consultation with the Chief Pilot may assign a new instructor to impart further ground or flight trainings as appropriate. Further checkride may be authorized upon successful completion of the remedial training and a recommendation from the instructor.

15.22 Flight Simulation Training Devices (FSTD) USER APPROVALS

- 15.22.1 All flight synthetic (simulation) training devices (FSTD), such as full flight simulators (FFS) or flight training devices (FTD), that are located abroad and are used instead of an aeroplane for training or checking purposes of flight crew members including Flight Engineers, are to be qualified in accordance with local requirements applicable to synthetic training devices.
- 15.22.2 An operator intending to use such FSTD must obtain a User Approval from the DG, CAAN.
- 15.22.3 Organizations applying for a User Approval will normally hold a valid Air Operator Certificate (AOC) for the relevant aircraft type. Other cases for granting a User Approval



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are considered by the DG, CAAN on an individual basis taking into account the need for and the competencies required for the training activity.

Note - See Appendix 5 for User Approval form.

- 15.22.4 An applicant for Flight Simulator Instructor or Check Pilot Authorization shall meet the requirements as mentioned in the Personnel Licensing Requirements.
- 15.22.5 A User Approval shall remain valid only if the FSTD maintains its specified qualification level and if all related conditions and limitations listed on the Qualification Certificate for the FSTD and User Approval are complied with.
- 15.22.6 A declaration shall be made by the AOC holder in respect of the differences between the FSTD and the aircraft for which training is being undertaken on that FSTD. Additional information concerning identified differences and training mitigation must be submitted with the application where appropriate.
- 15.22.7 Upon receiving an application from an AOC holder for a User Approval, an initial inspection of the FSTD shall be conducted by a Flight Operations Inspector. A second application from another AOC holder for the same device may not require another inspection by an FOI unless the device has been moved to a new location in another State or has been modified or has been converted or if the application submitted suggests an issue that need further investigation.
- 15.22.8 A FSTD may be purchased by another Operator, relocated, modified, updated or upgraded. Such changes may affect the User Approval. It is the responsibility of the User to ensure that the device being used remains qualified to the appropriate level that supports his training needs.

15.22.9 Applying for a User Approval

- 15.22.9.1 Application form as mentioned in Appendix 5 of this FOR, together with the appropriate fees (and, if applicable, additional information concerning the differences between the FSTD and the User's aircraft), should be submitted.
- 15.22.9.2 A current copy of the Qualification Certificate and Evaluation Report must also be enclosed.
- 15.22.9.3 Application for an initial User Approval should be submitted as early as possible. For renewal of a User Approval application must be submitted to CAAN no later than 15 working days prior to the expiry of the current Approval.
- 15.22.9.4 A User Approval or renewal thereof shall be valid till the expiry date of the Qualification Certificate issued by the concerned Authority.



CHAPTER 16

APPROVAL OF TRAINING ORGANIZATION

16.1 GENERAL

- 16.1.1 Part 1 to ICAO Annex 6 requires that operators establish and maintain a ground and flight training program approved by the CAAN which ensures that all flight crew members are adequately trained to perform their assigned duties.
- 16.1.2 This Chapter prescribes conditions for grant, extension and renewal of approval by the Director General to a training organization providing courses of instruction for trainees requiring flight crew licenses and/or type ratings.
- 16.1.3 For the grant of endorsement or ratings in license, in any type of aircraft, it is mandatory that the applicant shall have successfully completed an approved course.
- 16.1.4 Upon training of an initial type conversion, the operator while conducting training is also required to arrange such training for CAAN authorized person.
- 16.1.5 The Director General, may in any case, order an inspection of such training facilities, at any time by a Flight Operations Inspector, at his discretion. Such cost of inspection should be borne by the operator(s) or training organizer or training organization whoever is involved in applying for such approval as a service charge.

16.2 REQUIREMENTS FOR GRANT OR APPROVAL FOR ENDORSEMENT AND/OR TYPE COURSE

- 16.2.1 An organization proposing to conduct a course of instruction on a particular aircraft type for endorsement and type rating, may apply to the Director General for the course to be approved. The application should be accompanied by;
- a) The name, qualification and experience of the instructor nominated to conduct the course.
 - b) A description of the classroom and the available facility.



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- c) A copy of the detailed course syllabus based on the programmed curriculum as required by Training Program Curriculum of this Section.

Note - Minimum of 10% (or the time for instructions) of the training time will be spent on system training, i.e. demonstration in actual aircraft.

- d) A list of teaching and demonstration facilities, audio visual training aids maintained to a satisfactory standard, and other facilities to be used during the course to facilitate complete comprehension of the instruction given.

Note - The ICAO Training Manual, Training Manual prescribed by the manufacturer, Flight Manual and/or the syllabus available with Director General should be used as a guideline by training organization.

- e) A copy of the training notes or training manual with diagrams, charts and graphs to be used for the training.
- f) The duration of course with not less than the hours as specified.
- g) Written progress examinations to be held at the conclusion of each section or phase of training. Examination papers in use shall cover the complete syllabus or section of the syllabus concerned.

16.2.2 A training organization which has applied for approval may be granted a Certificate of Approval provided the requirements specified in para 11.2.1 are met and CAAN authorized person upon inspection establishes that,

- a) The premises are clean and suitable.
- b) The facilities are adequate for training to the standard required by the syllabus.
- c) The library is adequate and all manuals in it are fully amended up to date.

16.2.3 The Director General may require that the course be monitored in whole for the first time by an authorized person. During the session of course whenever deemed necessary, the authorized person may make necessary co-ordination with the course-manager or instructor in case of any deficiency in the part of the instruction. The approval of the course will be dependent on a favourable report on the actual conduct of the course by the authorized person.

16.2.4 The Director General may require the course to be monitored in part if the training for type conversion initial/recurrent, is similar to the one previously conducted, or is in repetitive nature and the authorized instructor/s and facilities have been provided.



16.3 GRANT OF APPROVAL

- 16.3.1 Approval of training organization to conduct repetitive type courses will be granted by issue of a Certificate of Approval and an associated schedule of conditions.
- 16.3.2 Approval of a single course which will not necessarily be repeated will be signified by issuance of a Letter of Approval to the organization arranging the course.
- 16.3.3 Any organization conducting an approved course shall issue each successful trainee with a certificate showing the following information;
- a) The name of organization issuing the certificate.
 - b) The title of the course.
 - c) The approval status of the course.
 - d) The commencement and finishing dates of the course.
 - e) The full name of the trainee.
 - f) The examination percentages obtained during progress and final examinations.
- 16.3.4 A course certificate shall not be issued to any trainee Pilot or a crew who attended less than 80% of the course. A daily attendance record shall be maintained for each trainee and held available for inspection on request by an authorized person.
- 16.3.5 A course certificate issued to any participant who secures less than 70% marks in progress examinations conducted during the training period will not be recognized for licensing purposes. Training examination papers shall be preserved for six months following the conclusion of each course and shall be made available for inspection on request by an authorized person.

16.4 EXTENSION AND RENEWAL OF APPROVAL

- 16.4.1 An organization already approved to conduct certain courses may apply to conduct additional courses and such approval may be granted when the Director General is satisfied that the required conditions will be met.
- 16.4.2 A Certificate of Approval to a training organization will normally be valid for one year but may be renewed if the Director General is satisfied that the required condition for the grant of approval have been maintained. For this purpose any changes in staff, syllabus or facilities shall be notified to the Director General.



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16.5 FOREIGN TRAINING ORGANIZATION

A Foreign Training organizations that holds a Certificate of Approval, issued by the Civil Aviation Authority, of a Contracting State of I.C.A.O. may be granted a Certificate of Approval by the Director General, provided that, the operator applying for such approval proves to the satisfaction of the Director General that requirements in para. 16.2.1 is met.



CHAPTER 17

MINIMUM STANDARDS FOR THE APPROVAL OF SYNTHETIC FLIGHT TRAINER

Flight simulation training device FSTD. 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. air-craft systems control functions, the normal environment of flight crew members, and the performance and flight characteristics of that **type** of aircraft are realistically simulated; (used by Approved Training Organizations (ATO)s and air operators for providing initial and recurrent training to flight crew for type endorsement.)*

*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**; (normally used by ATOs and air operators for providing initial and recurrent training to flight crew in preparation for full flight simulator training; this alone does not qualify a person for type endorsement).*

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. (used by Flight Training Organizations (FTO)s or flying schools for PPL and basic CPL training for Instrument Rating).

17.1 APPLICATION FOR APPROVAL

17.1.1 An application for approval of an aeroplane simulator shall be submitted to the Director General of Civil Aviation and shall include:

- (a) sufficient information to show that the simulator adequately simulates the type of aeroplane with respect to the items and systems listed in section 3 of this schedule; and
- (b) comparative data sheets showing that the performance and flight characteristics of the aeroplane simulator have been flight checked and found to be within the limits prescribed.

17.1.2 The aeroplane data used for comparison purposes referred to in paragraph 17.1.1 (b) shall be applicable to the aeroplanes currently in use by the air carrier and may be obtained from



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- a) the approved Aircraft Flight Manual, type inspection reports or other flight test data provided by the manufacturer ;
- b) flight tests conducted in the air carrier's own aeroplane (performance and flight characteristics data for the centre of gravity limits and weights used during training will be satisfactory) if an outline of the tests is to be conducted
 - i) has been prepared by the air carrier and coordinated with the Director,
 - ii) contains procedures to be followed and data to be obtained during each phase of the Flight Testing Program or
- c) other sources approved by the Director General of Civil Aviation.

17.1.3 Procedure and guidelines for the approval of Flight Simulators shall be as per the requirements of the PROCEDURES FOR PERSONNEL LICENSING REQUIREMENTS 2010.

17.2 GENERAL REQUIREMENTS

- 17.2.1 The effect of changes on the basic forces and movements shall be introduced for all combinations of drag and thrust normally encountered in flight, including the effect of changes in aeroplane attitude, power, drag, altitude, temperature, gross weight, centre of gravity location and configuration.
- 17.2.2 In response to control movements by a flight crew member , all instrument indications involved in the simulation of the applicable aeroplane must be entirely automatic in character, unless otherwise specified in this Schedule.
- 17.2.3 The rate of change of simulator instrument readings and of control forces shall, unless specific tolerances are otherwise specified in this Schedule, reasonably correspond to the rate of change which would occur in the applicable aeroplane under actual flight conditions for any given change in the applied load on the controls, in the applied power or in aeroplane configuration.
- 17.2.4 Control forces and degree of actuating control travel shall, unless specific tolerances are otherwise specified in this Schedule, reasonably correspond to that which would occur in the aeroplane under actual flight conditions.
- 17.2.5 The instrument indication on a simulator shall be such that it may be used for the training and checking of a pilot in the operational use of controls and instruments on the applicable aeroplane model during the simulated



execution of ground operation, take-off, landing, normal flight, unusual attitudes, navigation problems and instrument approach procedures.

17.2.6 A simulator shall be so designed that malfunction of aeroplane engines, propellers and primary systems may be presented and corrective action may be taken by the crew to cope with such emergencies.

17.2.7 A simulator shall be capable of simulating ground and in-flight operation of the communication and navigation systems of the applicable aeroplane.

17.3 MINIMUM STANDARD FOR SIMULATION OF AEROPLANE SYSTEMS

17.3.1 An aeroplane simulator shall simulate at least the following item and systems that are appropriate to the type of aeroplane being simulated:

- (a) all normal cockpit noise related to engine or aerodynamic noise (adjustable volume is permissible);
- (b) all flight controls;
- (c) gust locks;
- (d) trim tabs;
- (e) landing gear operation;
- (f) wheel brakes;
- (g) steering mechanisms used on the ground;
- (h) wing flaps and spoilers;
- (i) powerplant operations;
- (j) propeller controls and systems;
- (k) anti-detonation injection systems;
- (l) fuel and oil systems;
- (m) cockpit, representing a full scale mock-up, including normal pilot and flight engineer stations and accommodations for the instructor or check airman, and representing a typical fleet aeroplane;
- (n) circuit breaker stations manageable by the flight crew in the flight
- (o) hydraulic systems;
- (p) fire detection and extinguishing systems;
- (q) pneumatic systems (including emergency airbrakes);
- (r) electrical systems;
- (s) interior cockpit lights;
- (t) exterior light controls;
- (u) pressurization and air conditioning systems (instrument indication and warning signals);
- (v) de-icing and anti-icing systems; and



- (w) supplemental breathing systems (the systems may be charged with or vented to air)

17.4 MINIMUM STANDARDS OF PERFORMANCE

17.4.1 An aeroplane simulator shall simulate the performance characteristics of the particular type of aeroplane being simulated, aeroplane weight and centre of gravity optional, within the following limits:

- (a) propeller feathering time, ± 3 seconds;
- (b) landing gear operating time, ± 3 seconds;
- (c) wing flap operating time ± 3 seconds;
- (d) take-off acceleration time, ± 10 per cent;
- (e) average rate of turn on calibration of gyro-compass and turn-and-bank indicator in standard rate turns and 30-degree banked turns, through a range of 180° , ± 10 per cent;
- (f) minimum control speed (in-flight), ± 5 knots;
- (g) stall warning speed (initial buffet) in the take-off, approach, and landing configuration, (wings level), ± 3 knots;
- (h) stall speeds in the take-off, approach, and landing configuration, (wings level), ± 5 knots;
- (i) the difference between stall warning (initial buffet) and stall speed shall be within ± 5 knots of that for the appropriate aeroplane, but in no case should the stall occur before the stall warning;
- (j) speed versus power in level flight at cruise altitude, ± 5 knots, or 3 per cent, or .03 Mach;
- (k) rates of climb versus altitude in the case of
 - (i) propeller aeroplane simulators ± 50 feet or 10 per cent, and
 - (ii) jet aeroplane simulators ± 100 feet or 10 per cent;
- (l) the rates of climb versus altitude standards referred to in paragraph (k) shall apply to propeller aeroplane and jet aeroplane simulators in all of the following configurations:
 - (i) take-off gear down (one engine inoperative),
 - (ii) take-off gear up (one engine inoperative),
 - (iii) final take-off (one engine inoperative),
 - (iv) all engines enroute,
 - (v) one engine inoperative enroute climb,
 - (vi) two engines inoperative enroute climb (for aeroplanes with four or more engines),
 - (vii) approach (one engine inoperative), and
 - (viii) landing;



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- (m) the rates of climb versus altitude standards referred to in paragraph (k) shall satisfy :
 - (i) in one configuration referred to in paragraph 12.4.1 at least two aeroplane weights, and
 - (ii) in one other configuration referred to in paragraph 12.4.1 at least two outside air temperature values;
- (n) rates of climb versus airspeed in the case of
 - (i) propeller aeroplane simulators ± 50 feet or $\pm 10\%$, and
 - (ii) jet aeroplane simulators ± 100 feet or $\pm 10\%$ per cent;
- (o) the rates of climb versus airspeed standards referred to in paragraph (n) shall satisfy
 - (i) one take-off configuration, and
 - (ii) one enroute configuration;
- (p) engine power (thrust) calibration at take-off and maximum continuous ratings over an altitude range, in the case of
 - (i) reciprocating engines, MP, for a given BMEP and RPM, ± 1 inch,
 - (ii) turbine engines, N1 and N2 , for a given EPR, ± 2 per cent, and
 - (iii) critical altitude, piston engine simulators only, ± 800 feet or ± 10 per cent.

17.4.2 In determining compliance with paragraphs (j) to (o), the MP/BMEP/RPM relationship must conform to aeroplane data within the tolerance specified in subparagraph (i) of paragraph (p) and the EPR/ Compressor/ RPM relationship must conform to aeroplane data within the tolerance specified in subparagraph (ii) of paragraph (p).

17.4.3 When alternate tolerance limits are given, the higher or highest limits apply.

17.5 MINIMUM STANDARDS FOR FLIGHT CHARACTERISTICS

17.5.1 An aeroplane simulator shall simulate the flight characteristics of the particular type of aeroplane being simulated, aeroplane weight and centre of gravity being optional, in longitudinal control stability and stick breakout forces.

17.5.2 An aeroplane simulator shall display static longitudinal control stability in the following configurations, one of which shall cover a centre of gravity range:

- (a) landing;
- (b) approach;
- (c) cruise, high altitude;
- (d) cruise, low altitude; and
- (e) climb.



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- 17.5.3 When the simulator speed is caused to depart 15 per cent from trim speed in any of the configurations specified in subsection (2), the return to trim shall be within ± 9 knots of the approved aeroplane data.
- 17.5.4 In an aeroplane simulator, the slope of the static longitudinal stability stick force curve shall be positive.
- 17.5.5 Aeroplane simulator control forces shall be within ± 10 pounds or ± 20 per cent, in the following areas:
- (a) longitudinal control forces during
 - (i) flap retractions, with engine power or thrust on,
 - (ii) flap retractions, with engine power or thrust off,
 - (iii) flap extensions,
 - (iv) power or thrust applications , and
 - (v) a go-around following a balked landing;
 - (b) rudder and aileron forces at minimum in-flight control speed; and
 - (c) stick force per "g"
- 17.5.6 The roll rate of a simulator shall be within ± 2 seconds or ± 25 per cent, whichever is the greater, of the aeroplane data.
- 17.5.7 If the flight characteristics referred to in paragraphs (b) and (c) of subsection 17.5.5 and in subsection 17.5.6 are not contained in Type Inspection Report submitted by the air carrier, the Director may adjudge the adequacy of this simulation.
- 17.5.8 In the following areas of flight characteristics, when appropriate to the type of aeroplane being simulated, the adequacy of simulation shall be subject to approval by the Director:
- (a) compressibility trim change;
 - (b) approaches to stall in the take-off, approach, and landing configuration (wings level) from initial buffet to stall, except that at least one approach to stall must be done in a 20-degree bank turn;
 - (c) buffet at high Mach numbers up to design Mach limits;
 - (d) dutch roll; and
 - (e) emergency descents.

17.6 MINIMUM STANDARDS FOR NAVIGATIONAL ACCURACY

- 17.6.1 At any altitude, on any heading and at any airspeed, the navigational accuracy of an aeroplane simulator shall be as follows:



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- (a) the distance traveled with zero wind in a particular time interval shall be equivalent to ± 5 per cent of the horizontal component of the true airspeed multiplied by the time interval;
- (b) the track of the simulator with no wind shall equal the true heading of the simulator within ± 3 degrees including allowance for instrument error, and this shall apply when the simulator is turning as well as flying a constant heading; and
- (c) during simulated ILS approaches with zero wind, the descent path of the simulator, as indicated by airspeed, altitude, and rate of descent, shall equal the descent path as indicated by the flight instrument indicating glide path deviation within the following limits:
 - (i) from 0 to 200 feet above the runway height, within ± 20 feet,
 - (ii) from 200 to 1000 feet, within ± 10 per cent of the height above the runway, and
 - (iii) from 1000 to 5000 feet above the airport elevation, within ± 100 feet.

17.7 MINIMUM STANDARDS OF INSTRUMENT FLIGHT PROCEDURE TRAINER (TURBO-PROP AEROPLANE)

17.7.1 Application for Approval

An application for approval of an Instrument procedure trainer (Flight procedure trainer) to be used for turboprop aeroplanes shall be submitted to DG, CAAN and shall include,

- a. sufficient information showing that the instrument procedure trainer meets the requirements mentioned for simulation of aeroplane and instrument procedures in the category of turboprop aeroplanes.
- b. comparative data sheets showing that the performance and flight characteristics of the aeroplane have been checked from the manufacturer and/or by the state where it has been certified and found satisfactory within limit.

17.7.2 General Requirements

Instrument procedure trainer should simulate at least the following items and systems which are applicable to a turboprop aeroplane.



17.7.2.1 Technical specification of aeroplane system:

- a. All Flight Controls
- b. Trim Tabs
- c. Landing Gear Operation
- d. Wheel Brakes
- e. Nose Wheel Steering on the Ground
- f. Wing Flaps
- g. Power Plant Operations
- h. Propeller Controls
- i. Fuel and Oil Systems
- j. Hydraulic Systems
- k. Fire Detection and Extinguishing System
- l. Pneumatic System
- m. Electrical System
- n. Interior Cockpit Lights
- o. De-icing & Anti-icing System
- p. Pressurization
- q. Avionics
- r. Flight and Engine Instrument
- s. Annunciator System
- t. Sound Simulation System :
 - i) Air Noise
 - ii) Turbine Engine
 - iii) Propeller Noise
 - iv) Tire Screech upon touch down
 - v) Landing Gear Retraction & Extension
- u. Cockpit, Representing a mock-up, including normal captain & co-pilot station and accommodations for the Instructor & Check-pilot.

17.7.2.2 Aeroplane performance

- a. Propeller Feathering / Unfeathering
- b. Landing Gear Operations.
- c. Wing Flaps Operations
- d. Take-off Acceleration
- e. Turn and Bank Indicator in Standard Rate Turns.
- f. Stall Warning Speed in The Take-off, Approach and Landing Configuration.
- g. Engine Malfunction
 - i) Take-off Gear Down (One engine inoperative)
 - ii) Take-off Gear Up (One engine inoperative)
 - iii) One Engine Inoperative En-route Climb
 - iv) One Engine Inoperative Approach and Landing



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- h. Presentations of The Malfunction of The Aeroplane Engines and Primary Systems as well as corrective action taken by the crew to cope with such emergencies.
- i. Graphical Instructor Station (GIST)
 - i) GIST Control Module
 - ii) Map Module
 - iii) Snap Shot Function
 - iv) Approach Module
 - v) Records/ Replay Module
 - vi) Score Module
 - vii) Station Editor Module
 - viii) Performance Editor Module
 - ix) Print for Generating Screen Prints
- j. A colour vision system which should be able to project the image display of aircraft performance

17.7.2.3 Navigation and Communication

- a. VOR
- b. DME
- c. ADF
- d. ILS
- e. Auto Pilot
- f. Flight Director
- g. Magnetic Compass and Directional Gyro
- h. Radio Magnetic Indicator (RMI)
- i. Horizontal Situation Indicator (HSI)
- j. HF, VHF
- k. Approach Lights and PAPI Lights
- l. Runway and Aerodrome Lights



CHAPTER 18

OPERATIONS AT AN AERODROME AND AIRCRAFT

18.1 GENERAL

- 18.1.1 The Director general may specify such requirements relating to the ground operation and servicing of aircraft as he considers to be appropriate.
- 18.1.2 The Director General may specify such requirements related to the conduct of persons at an aerodrome as he may consider appropriate.
- 18.1.3 The Director General may specify such limitations on obstacles, obstructions, extraneous lighting, radio interference, or activities likely to attract birds at an aerodrome as he may consider appropriate.
- 18.1.4 A person on board an aircraft operating in Nepal, or on board a Nepalese Registered aircraft wherever it may be, shall comply with such requirements as may be specified by the Director General.

18.2 GROUND OPERATIONS

18.2.1 Fueling of aircraft

- 1) An aircraft shall not be refueled or defueled at an aerodrome;
 - a) within 15 meters of a building, or
 - b) at a time when passengers are embarking, or disembarking, or are on board, unless there are qualified personnel in the aircraft who are ready to initiate and direct an evacuation of the aircraft by the most practical and expeditious means available, and who are in two way communication with the ground crew supervising the refueling.
- 2) Refueling and defueling of an aircraft shall be supervised by a person appointed by the owner or operator of the aircraft, or by a member of the flight crew, or by a supervisor appointed by the fuel supplier; the person supervising shall ensure that the aircraft is bonded to the fuelling hose and to the fuelling unit and that both are earthed, and that no source of flame or sparks is in the vicinity of the aircraft.

18.2.2 Engines to be run by qualified personnel

- a) A person shall not start the engine of an aircraft on the ground, nor operate the controls of an aircraft engine which is running, unless



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that person is a pilot, or holding a rating on that aircraft, or is a licensed aircraft maintenance engineer or a member of an approved maintenance organization authorized to ground run the engines of that aircraft.

- b) The engine or engines of an aircraft shall not be started unless chocks are in position in front of the main wheels, or the aircraft brakes, if any, are on.
- c) No other persons other than the certified pilots are allowed to engage the rotors in helicopter.

18.2.3 Taxiing of aircraft

An aircraft shall not be taxied on the movement area of the aerodrome unless the person operating the controls of the aircraft is a pilot holding a rating on that aircraft, or is a person who has been properly authorized by the operator of the aircraft, or by his agent, has received instructions from the aerodrome manager or his representative in respect of the layout of the aerodrome, taxiing routes, and taxiway signals, and complies with instructions if any, related to taxiing issued by the Air Traffic Services Unit at that aerodrome where such a unit exists. The person operating the aircraft controls while taxiing, or another person in the flight deck who is in communication with the person at the control, shall be qualified and licensed to use the radio telephone.

18.2.4 Compliance with noise abatement procedures

Pilot-in-command of aircraft taking off and landing and persons responsible for ground running aircraft engines at aerodromes shall comply with the procedures, if any, authorized by the Director General as a noise abatement measure except where in the opinion of the pilot-in-command it would be unsafe to do so.

18.2.5 Parking of Aircraft

- a) An aircraft shall not be parked in any position on an aerodrome other than as prescribed by the aerodrome manager or the officer in duty in the Air Traffic Services Unit at the aerodrome.
- b) Except with the permission in writing of the Director General, an aircraft shall not be parked on the movement areas of an aerodrome for a period exceeding four weeks if the Certificate of Airworthiness issued in respect of that aircraft is no longer valid.
- c) In the case of an aircraft which is parked in contravention of this directive, the owner shall remove it in compliance with such instructions as may be issued by the Director General. Where the owner fails to comply within a reasonable period of time with such an instruction, the Director General, or an authorized representative may take such steps as may be necessary to remove the aircraft in compliance with the instruction.



18.3 MOVEMENT OF PERSONS AND VEHICLE AT AN AERODROME

18.3.1 Unauthorized persons and vehicles

No person shall enter and no vehicle shall be driven on the maneuvering area on aerodrome except with the permission of, and in compliance with instructions issued by, an officer on duty in the Air Traffic Services Unit at that aerodrome, or in the absence of such a unit, without the permission of the aerodrome manager at that aerodrome.

18.3.2 A person shall not operate a vehicle which is authorized to be driven on the movement area of an aerodrome, unless that person has been authorized to operate that vehicle by the Director General or the aerodrome manager.

18.3.3 Taxing on a Movement Area

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

- a) has been duly authorized by the operator or a designated agent.
- b) is competent to taxi the aircraft
- c) is qualified to use the radio telephone and
- d) has received instruction from a competent person in respect of aerodrome layout, routes, signs, marking, lights, air traffic control (ATC) signals, and instructions, phraseology and procedures, and is able to conform to the operational standards required for safe aeroplane movement at the aerodrome.

18.3.4 Persons not to smoke or create a fire hazard

No person shall smoke or generate a naked flame in any area of an aerodrome which is designated as a "no smoking" area by the aerodrome manager or do any act likely to create a fire hazard in any area of an aerodrome.

18.3.5 Trading at an aerodrome

- a) No person shall carry on any trade or business at an aerodrome except with the approval of the Director General and under such terms and conditions as he may direct.
- b) No person at an aerodrome shall solicit any person for any purpose except with the permission of aerodrome manager.
- c) No person shall operate for hire at any aerodrome any taxi cab, or omnibus, or other vehicle carrying passengers except with the permission of the Director General or the aerodrome manager and in such a way as he may direct.



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18.3.6 Movement of Vehicle

- a) No person shall operate any motor vehicle at an aerodrome other than in accordance with any regulations or directions issued by the aerodrome manager concerning motor vehicles and road traffic at that aerodrome.
- b) No person shall operate a motor or other vehicle at an aerodrome contrary to any sign erected or displayed for the control of vehicles by the aerodrome manager.
- c) No person shall park any motor or other vehicle at an aerodrome other than as authorized by the aerodrome manager.
- d) No person shall load or disembark passengers from a vehicle at an aerodrome other than at places designated for that purpose by the aerodrome manager.
- e) No person shall operate a motor or other vehicle at an aerodrome while under the influence of alcoholic liquor or drugs to an extent that his ability to operate the vehicle is impaired.
- f) No person shall operate a motor or other vehicle at an aerodrome other than on the roads, paths, or places provided for the use of the particular type or class of vehicle, or occupy such roads, paths or places in such a manner as to hinder or obstruct any use of them.
- g) Motor or other vehicles shall give way to pedestrians in areas at an aerodrome which are areas designated for use by pedestrians.
- h) For the purpose of the foregoing, "at an aerodrome" shall mean all areas within an aerodrome to which the public has access.

18.3.7 Reporting of incidents/accidents

Any person who is involved in any incident/accident at an aerodrome and all the witnesses to any incident/accident shall report without delay to the aerodrome manager or to the police at the aerodrome.

18.3.8 Articles lost and found

Any person finding a lost article shall deposit it with the aerodrome manager. Such articles which are unclaimed within thirty days, or in the case of perishable foodstuffs twelve hours, shall be disposed of in such a manner as may be directed from time to time by the Director General.



18.3.9 Keeping of animals

No person shall keep domestic or other animal at an aerodrome except with the permission of, and in accordance with such restrictions and conditions as may be imposed by the aerodrome manager.

18.3.10 Animals constituting a danger

Any bird/animal constituting a danger to the aircraft, or to the public at an aerodrome, may be shot by the persons authorized by Director General.

18.3.11 Firearms and offensive weapons

- a) A person shall not enter an aerodrome while in possession of any firearms, explosives, offensive weapons or other munitions of war unless that person is a duly authorized member of the Armed Forces of Nepal, or is a passenger intending to surrender such firearms or other weapons prior to carriage by air, or is a person authorized by Nepal Government or by the Director General to carry firearms or other weapons.
- b) A person, other than a duly authorized person, in possession of firearms, explosives, offensive weapons or other munitions of war shall surrender them to Security Force at the aerodrome for a period of time that person is in that aerodrome, or a passenger, shall surrender them to the person in charge of loading the aircraft on which that passenger intends to travel, before boarding the aircraft.

18.3.12 Damage to aerodrome property

No person shall destroy or deface any building, sign, equipment, marker or other property at an aerodrome.

18.3.13 Dumping of trash

- a) No person shall dispose of garbage, nor deposit refuse or any other object at an aerodrome except by placing it in the receptacle provided for the purpose.
- b) No person shall abandon any property or other thing at an aerodrome.

18.3.14 Prohibition of gambling

No person shall engage in gambling, or operate a gambling device, at an aerodrome.



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18.3.15 Disorderly conduct

No person shall create any nuisance or any disorderly act at an aerodrome, or use a sanitary convenience in a disorderly manner.

18.3.16 Prevention of fire

- a) Combustible liquids shall not be stored at an aerodrome unless they are stored in such a places and subject to such conditions as may be specified by the Director General or the aerodrome manager, except that this shall not apply to fuel contained in the fuel tank of an aircraft, a motor vehicle or other motor powered appliance.
- b) No person shall keep any oiled waste, waste oil, cleaning rags, or substances liable to suffer spontaneous combustion, or which are otherwise inflammable, on or near to aircraft on the ground, near any fuelling unit, hanger, or workshop, or other building or installation in which any flammable material is stored. Waste substances such as those referred to in this sub paragraph shall be disposed of daily in such a manner as may be specified by the Director General or the aerodrome manager.
- c) An owner, tenant, or occupant of any premises at an aerodrome shall provide on these premises, and maintain in good working order, fire fighting appliances and equipment to a standard approved by the Director General and during working hours, have available on the premises sufficient personnel trained in the use of such appliances and equipment.
- d) No owner, occupant or tenant of any building at an aerodrome shall install or cause to be installed for use in that building, any engine or electrical apparatus of any kind, or make or cause to be made, any alternation or addition to existing electrical installations in any building without the approval in writing of the Director General.
- e) Facilities for battery charging shall not be installed without the approval in writing of the Director General or the aerodrome manager, and if installed shall not be left unattended unless the power supply has been switched off and the battery leads disconnected.
- f) In the event of a fire occurring in any premises, hanger, or workshop, or in any other places at an aerodrome, a report in writing giving all the circumstances shall be submitted to the aerodrome manager within twenty-four hours by the person occupying or responsible for, the place of the occurrence.



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18.3.17 Danger from stock or equipment

No occupant of any hanger, or premises at an aerodrome utilized for commercial purposes shall store or stock, or permit to be stored and stocked, any material or equipment in such a manner as to constitute a danger to persons or property.

18.3.18 Provision of first-aid kits

All tenants or lessees of hangers, workshops, or other premises utilized for commercial purposes at an aerodrome shall provide first-aid kits of a type approved by the Director General or the aerodrome manager, located in such hangers, workshops or premises at a conveniently accessible place.

18.3.19 Prohibition of entry

No person shall enter any Air Traffic Service Unit, any hanger, any customs area, any communication center, any movement area or maneuvering area, or passenger arrival and departure area, except

- a) persons lawfully assigned to duty therein ;
- b) persons authorized to enter by the Director General or the aerodrome manager, or the Security Force ;
- c) passengers entering the movement area and the arrival and departure lounge for the purpose of disembarking or embarking ; or
- d) persons authorized by the Collector of Customs or the Commissioner of Excise with the permission of the Director General, or the aerodrome manager, or the Security Force.

18.3.20 Aerodrome Restricted Areas

No person shall enter any area designated by the Director General or the Aerodrome manager as an aerodrome restricted area except with the permission of the Director General or the aerodrome manager, and on such terms as may be included in the permission.

18.4 SAFEGUARDING AT AERODROMES

18.4.1 Limitation of obstructions

- a) No person shall erect any temporary or permanent structure, nor position a vehicle or other mobile object on or in the vicinity of an aerodrome that will protrude through any obstacle limitation at that aerodrome.



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- b) for the purpose of this rule an obstacle limitation surface at an aerodrome shall be those surface defined by the Director General in respect of that aerodrome in Air Navigation Directive.
- c) In the event that a person erects a structure or positions a vehicle or other mobile objects in contravention of this directive, the Director General shall take such action as he considers fit to cause the infringing object to be removed and shall not be liable for damage so caused . Any costs incurred by the Director General in taking such action shall be borne by the person causing the infringement.

18.4.2 Limitations of lights

- a) No person shall operate a light in the vicinity of an aerodrome which because of its glare is liable to dazzle pilots of aircraft taking off or landing at that aerodrome, or which can be mistaken for an aeronautical ground light.
- b) If such a light is operated it shall be extinguished or satisfactorily screened immediately upon notice being given to the person or persons operating the lights, by the Director General.

18.4.3 Interference with communications or navigational aids

No person shall operate a radio station or electrical equipment in the vicinity of an aerodrome, or of a radio aid to navigation which is serving an airway, an air route, or an approach to an aerodrome which is liable to cause interference with radio communication between aircraft and an Air Traffic Services unit, or which is liable to disturb the signal from a navigational radio aid.

18.4.4 Measures to avoid attraction of birds

- a) No person shall leave waste foodstuffs on, or bring waste foodstuffs onto, an area of land to which this paragraph applies.
- b) The Director General may, by notice in writing, require the owner of land where foodstuffs are, if that land is within an area to which this paragraph applies, to remove the waste foodstuffs or to deal with it within a time and in a manner as specified in the notice.
- c) A person shall not fail to comply with the requirement of a notice served on him under sub paragraph (b)
- d) For the purpose of this paragraph:

"area of land" means the area of land lying within a radius of 8 kms from either end of a runway at an aerodrome ; and

"waste foodstuffs" includes other waste substances attractive to birds.



18.5 CONDUCT OF PERSONS IN AN AIRCRAFT

18.5.1 Persons not to stow away on aircraft

A person shall not secrete himself in an aircraft or have access without the consent of the pilot-in-command or the operator of the aircraft.

18.5.2 Behavior of persons in an aircraft

A person shall not, while in an aircraft:

- a) interfere with a crew member ;
- b) behave in a disorderly or offensive manner ; or
- c) do any act that threatens the safety of the aircraft or of persons on board the aircraft.

18.5.3 Persons not to carry weapons

No passenger on board an aircraft shall carry or have in his charge any weapon except that a weapon that is not designed for use in warfare, or against the person, may be carried as passenger baggage provided it is stowed so as to be inaccessible to passengers during flight, and if it is a firearm, is unloaded.

18.5.4 Restrictions on smoking in aircraft

A person shall not smoke when on board an aircraft registered in Nepal

- a) in those areas in the aircraft designated as non-smoking areas; and
- b) at any time when the cabin crew or the flight crew of the aircraft indicate either verbally or by means of signs that smoking is prohibited.

18.5.5 Consumption of intoxicating liquor or drugs

- a) No person shall enter an aircraft while under the influence of intoxicating liquor, or drugs, nor shall any person consume intoxicating liquor, or drugs, in an aircraft registered in Nepal so as to become intoxicated.
- b) No person shall administer narcotic or hallucinogenic drugs except in the case of a person under qualified medical supervision.

18.5.6 Carriage of drugs

Narcotic drugs, mood changing or hallucinogenic drugs, depressant or stimulant drugs, or marijuana shall not be carried in an aircraft except as a medicament prescribed for the individual use of a passenger by a



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qualified medical practitioner or as part of the approved emergency medical kit approved by the Director General.

18.5.7 Entry to flight deck

- a) A person shall not enter the flight crew compartment of an aircraft, when the aircraft is in flight unless he is a member of the crew of the aircraft or has the permission of the pilot-in-command, or is a person authorized by the Director General to carry out a flight inspection of the aircraft operation, or flight checks of members of its crew.
- b) A pilot seat or other operating crew position in an aircraft shall not be occupied by any person other than a member of the operating crew of the aircraft who is licensed and qualified for the duties associated with that seat or position, or by a person authorized by the Director General to carry out flight inspections or flight checks in that aircraft.
- c) The provisions of this Paragraph notwithstanding, the Pilot-in-command of an aircraft shall have the authority to refuse to permit any person to enter the flight crew compartment during flight, or to occupy a pilot seat or other operating crew position, if in his opinion, the presence of that person, or his occupancy of a pilot seat or other operating crew position, would endanger the aircraft.
- d) If the person who is refused permission under the provisions of sub paragraph (c) is a person authorized by the Director General to carry out flight inspections or flight checks in that aircraft, the pilot-in-command shall state the reasons for his refusal to that person and immediately after completion of the flight shall furnish a report in writing to the Director General.

18.5.8 Authority of the pilot-in-command

The pilot-in-command of an aircraft, with such assistance as he requires, may :

- a) take such action, including the removal of a person from the aircraft or the placing of a person under restraint or custody by force, as he considers reasonably necessary to ensure compliance with these requirements in, or in relation to, the aircraft ; and
- b) detain the passengers, crew, and cargo for such periods as he considers reasonably necessary to ensure compliance with these rules in, or in relation to, the aircraft.

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APPENDIX 1

ORGANIZATION AND CONTENTS OF AN OPERATIONS MANUAL

1. Organization

An operations manual, which may be issued in separate parts corresponding to specific aspects of operations, provided in accordance with Chapter 4, 4.2.3.1 shall be organized with the following structure:

- Part A - General;
- Part B - Aircraft operating information;
- Part C - Areas, routes and aerodromes; and
- Part D - Training.

2. Contents

The operations manual referred to above in ‘1. Organization’ shall contain at the least the following:

2.1 PART A - GENERAL

2.1.1 Instructions outlining the **responsibilities** of operations personnel pertaining to the conduct of flight operations and including:

- a) administration and control of Operations Manual including system of amendment and revision
- b) organisational structure
- c) names of nominated post holders as defined by AOCR Appendix 4

2.1.2 Information and policy relating to **fatigue management** including:

- a) rules pertaining to flight time, flight duty period, duty period limitations and rest requirements for flight and cabin crew members in accordance with Chapter 4, 4.10.2 a); and
- b) policy and documentation pertaining to the operator’s FRMS in accordance with Appendix 15.

2.1.3 A list of the navigational equipment to be carried including any requirements relating to operations where **Performance-Based Navigation** is prescribed.

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- 2.1.4 Where relevant to the operations, the long-range navigation procedures, engine failure procedure for **EDTO** and the nomination and utilization of diversion aerodromes.
- 2.1.5 The circumstances in which a **radio listening watch** is to be maintained.
- 2.1.6 The method for determining **minimum flight altitudes**.
- 2.1.7 The methods for determining **aerodrome operating minima**.
- 2.1.8 Safety precautions during **refueling** with passengers on board.
- 2.1.9 **Ground handling** arrangements and procedures.
- 2.1.10 Procedures, as prescribed in ICAO Annex 12, for pilots-in-command observing an accident.
- 2.1.11 The **flight crew** for each type of operation including the designation of the succession of command.
- 2.1.12 Specific instructions for the computation of the **quantities of fuel and oil** to be carried, taking into account all circumstances of the operation including the possibility of loss of pressurization and the failure of one or more engines while en-route.
- 2.1.13 The conditions under which **oxygen** shall be used and the amount of oxygen determined in accordance with Chapter 4, 4.3.9.2.
- 2.1.14 Instructions for **mass and balance** control.
- 2.1.15 Instructions for the conduct and control of **ground de-icing/anti-icing** operations.
- 2.1.16 The specifications for the **operational flight plan**.
- 2.1.17 **Standard operating procedures (SOP)** for each phase of flight.
 - 2.1.17.1 In the case of single-engined aeroplane operations, the SOP must include locations of emergency landing sites along every route in case of engine failure.
- 2.1.18 Instructions on the use of normal **checklists** and the timing of their use.
- 2.1.19 Departure contingency procedures.
- 2.1.20 Instructions on the maintenance of **altitude awareness** and the use of automated or flight crew altitude call-out.

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2.1.21 Instructions on the use of autopilots and auto throttles in IMC.

Note.— Instructions on the use of autopilots and autothrottles, together with 2.1.26 and 2.1.30, are essential for avoidance of approach and landing accidents and controlled flight into terrain accidents.

2.1.22 Instructions on the clarification and acceptance of ATC clearances, particularly where terrain clearance is involved.

2.1.23 Departure and approach briefings.

2.1.24 Procedures for familiarization with areas, routes and aerodromes.

2.1.25 Stabilized approach procedure.

2.1.26 Limitation on **high rates of descent** near the surface.

2.1.27 Conditions required to commence or to continue an instrument approach.

2.1.28 Instructions for the conduct of precision and non-precision instrument approach procedures.

2.1.29 Allocation of flight crew duties and procedures for the management of crew workload during **night and IMC** instrument approach and landing operations.

2.1.30 Instructions and training requirements for the avoidance of controlled flight into terrain and policy for the use of the **ground proximity warning system (GPWS)**.

2.1.31 Policy, instructions, procedures and training requirements for the avoidance of collisions and the use of the **airborne collision avoidance system (ACAS)**.

Note.— Procedures for the operation of ACAS are contained in Appendix 7 of this FOR, PANS-OPS (Doc 8168), Volume I, and in PANS-ATM (Doc 4444), Chapters 12 and 15.

2.1.32 Information and instructions relating to the **interception of civil aircraft** including:

- a) procedures, as prescribed in Attachment A, for pilots-in-command of intercepted aircraft; and
- b) visual signals for use by intercepting and intercepted aircraft, as contained in Attachment A.

2.1.33 For aeroplanes intended to be operated above 15 000 m (49 000 ft):

- a) information which will enable the pilot to determine the best course of action to take in the event of exposure to **solar cosmic radiation**; and

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- b) procedures in the event that a decision to descend is taken, covering:
- 1) the necessity of giving the appropriate ATS unit prior warning of the situation and of obtaining a provisional descent clearance; and
 - 2) the action to be taken in the event that communication with the ATS unit cannot be established or is interrupted.

Note.— Guidance material on the information to be provided is contained in Circular 126 — Guidance Material on SST Aircraft Operations.

- 2.1.34 Details of the **safety management system** (SMS) provided in accordance with Chapter 3 and 4 of ICAO Annex 19.
- 2.1.35 Information and instructions on the carriage of **dangerous goods**, in accordance with CAAN Dangerous Goods Handling Requirements, including action to be taken in the event of an emergency.

Note.— Guidance material on the development of policies and procedures for dealing with dangerous goods incidents onboard aircraft is contained in Emergency Response Guidance for Aircraft Incidents involving Dangerous Goods (Doc 9481).

- 2.1.36 **Security** instructions and guidance.
- 2.1.37 The **search procedure checklist** provided in accordance with Chapter 13, 13.3.
- 2.1.38 Instructions and training requirements for the use of head-up displays (HUD) and enhanced vision systems (EVS) equipment as applicable.
- 2.1.39 Instructions and training requirements for the use of the EFB, as applicable.

2.2 PART B - AIRCRAFT OPERATING INFORMATION

- 2.2.1 Certification limitations and operating limitations.
- 2.2.2 The **normal, abnormal and emergency procedures** to be used by the flight crew and the checklists relating thereto as required by Chapter 6, 6.1.4.
- 2.2.3 Operating instructions and information on climb performance with all engines operating, in accordance with Chapter 4, 4.2.4.3.
- 2.2.4 Flight planning data for pre-flight and in-flight planning with different thrust/power and speed settings.

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- 2.2.5 The **maximum crosswind and tailwind components** for each aeroplane type operated and the reductions to be applied to these values having regard to gusts, low visibility, runway surface conditions, crew experience, use of autopilot, abnormal or emergency circumstances, or any other relevant operational factors.
- 2.2.6 Instructions and data for mass and balance calculations.
- 2.2.7 Instructions for **aircraft loading** and securing of load. Company to develop and implement the Regulated Take-off and Landing weight for all airfields to which they operate for every type. The chart to be prepared as per the Template in APPENDIX 10 for STOL Operators.
- 2.2.8 **Aircraft systems**, associated controls and instructions for their use, as required by Chapter 6, 6.1.4.
- 2.2.9 The Operator shall develop as part of its Operations Manual, a **Minimum Equipment List** and **Configuration Deviation List** (as required) for the aeroplane types operated and specific operations authorized, including any requirements relating to operations where performance-based navigation is prescribed.
- 2.2.10 **Checklist of emergency and safety equipment** and instructions for its use.
- 2.2.11 **Emergency evacuation procedures**, including type specific procedures, crew coordination, assignment of crew's emergency positions and the emergency duties assigned to each crew member.
- 2.2.12 The normal, abnormal and emergency procedures to be used by the **cabin crew**, the checklists relating thereto and aircraft systems information as required, including a statement related to the necessary procedures for the coordination between flight and cabin crew.
- 2.2.13 **Survival and emergency equipment** for different routes and the necessary procedures to verify its normal functioning before take-off, including procedures to determine the required amount of oxygen and the quantity available.
- 2.2.14 The **ground-air visual signal code** for use by survivors, as contained in ICAO Annex 12.

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2.3 PART C - ROUTES AND AERODROMES

- 2.3.1 A **route guide** to ensure that the flight crew will have, for each flight, information relating to communication facilities, navigation aids, aerodromes, instrument approaches, instrument arrivals and instrument departures as applicable for the operation, and such other information as the operator may deem necessary for the proper conduct of flight operations.
- 2.3.2 The **minimum flight altitudes** for each route to be flown.
- 2.3.3 **Aerodrome operating minima** for each of the aerodromes that are likely to be used as aerodromes of intended landing or as alternate aerodromes.
- 2.3.4 The **increase of aerodrome operating minima** in case of degradation of approach or aerodrome facilities.
- 2.3.5 Instructions for determining aerodrome operating minima for instrument approaches using HUD and EVS.
- 2.3.6 The **necessary information** for compliance with all flight profiles required by regulations, including but not limited to, the determination of:
- a) take-off runway length requirements for dry, wet and contaminated conditions, including those dictated by system failures which affect the take-off distance;
 - b) take-off climb limitations;
 - c) en-route climb limitations;
 - d) approach climb limitations and landing climb limitations;
 - e) landing runway length requirements for dry, wet and contaminated conditions, including systems failures which affect the landing distance; and
 - f) supplementary information, such as tire speed limitations.

2.4 TRAINING

- 2.4.1 Details of the **Flight Crew Training Programme**, as required by Chapter 9, 9.3.
- 2.4.2 Details of the **Cabin Crew Duties Training Programme** as required by Chapter 12, 12.4.

Note - Details of the Cabin Crew Training Program is available in the Personnel Licensing Requirements (PELR).

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2.4.3 Details of the **Flight Operations Officer/Flight Dispatcher Training Programme** when employed in conjunction with a method of flight supervision in accordance with Chapter 4, 4.2.1.

Note. — Details of the Flight Operations Officer/Flight Dispatcher Training Programme are contained in PELR.

APPENDIX 2

PILOT PROFICIENCY CHECK (AEROPLANE)

1. GENERAL

1.1 The maneuvers and procedures required for pilot proficiency checks are set in this appendix and must be performed in-flight except to the extent that certain maneuvers and procedures may be performed in an aeroplane simulator.

1.2 Throughout the maneuvers prescribed in this Appendix, good judgment commensurate with a high level of safety must be demonstrated. In determining whether such judgment has been shown, the person conducting the check considers adherence to approved procedures, actions based on analysis of situations for which there is no prescribed procedure or recommended practice, and qualities of prudence and care in selecting a course of action.

2. MANEUVERS/PROCEDURES

2.1 The procedures and maneuvers set forth in this appendix must be performed in a manner that satisfactorily demonstrates knowledge and skill with respect to:

- (1) the aeroplane, its systems and components;
- (2) proper control of airspeed, configuration, direction, altitude, and attitude in accordance with procedures and limitations contained in the approved Aeroplane Flight Manual, the certificate holder's operations manual, check lists, or other approved material appropriate to the aeroplane type; and
- (3) compliance with approach, ATC, or other applicable procedures.

2.2 The Air Operator shall develop a Pilot Proficiency Check program based on the complexity of the aircraft operated. While Operators of light and simple aircraft may develop a PPC program that covers all items in one PPC session, Operators of large and complex aircraft may choose to divide items of a PPC into two or three separate stages. The Air Operator shall identify those items of the PPC that are to be performed in every PPC session and those items that may be performed once in every second or third PPC session. Such a phase-wise implementation shall ensure that all items in the PPC form are completed in a two or three stage cycle. In such a case, the PPC form must be suitably modified and clearly elaborated in the Operations Manual-Part D Training.



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COLUMN I PHASE	COLUMN II PROFICIENCY CHECK ITEMS	COLUMN III PROCEDURES
A. Pre-flight	1. Equipment examination (oral or written)	Equipment examination (oral or written) as part of the practical test the equipment examination must be closely coordinated with, and related to the flight maneuvers portion but may not be given during the flight maneuvers portion. The equipment examination must cover : i) Subjects requiring a practical knowledge of the airplane, its engines, systems, components, operational, and performance factors; ii) Normal, abnormal and emergency procedures and the operations and limitations relating thereto; and iii) The appropriate provisions of the approved Airplane Flight Manual. The person conducting the check may accept, as equal to this equipment test, an equipment test given to the pilot in the certificate holder's ground school within the preceding 6 calendar months.
	2. Pre-flight inspection.	The pilot must : i) conduct an actual visual inspection of the exterior and interior of the airplane, locating each item and explaining briefly the purpose for inspecting it; and ii) demonstrate the use of the pre-start check list, appropriate control system checks, starting procedures, radio and electronic equipment checks, and the selection of proper navigation and communications radio facilities and frequencies prior to flight. Except for flight checks, an approved pictorial means that realistically portrays the location and detail of preflight inspection items and



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		provides for the portrayal of abnormal conditions may be substituted for the preflight inspection. If a flight engineer is a required flight crewmember for the particular type airplane, the visual inspection may be waived.
	3. Taxiing.	This maneuver includes taxiing (in the case of a second in command proficiency check to the extent practical from the second in command crew position), taxiing procedures in compliance with instructions issued by the appropriate traffic control authority or by the person conducting the checks.
	4. Engine checks	As appropriate to the airplane type.
B. Take-Off	1. Normal Take-Off	One normal takeoff which, for the purpose of this maneuver, begins when the airplane is taxied into position on the runway to be used.
	2. Instrument Take-Off	One takeoff with instrument conditions simulated at or before reaching an altitude of 100 feet above the airport elevation.
	3. Crosswind Take-Off	One crosswind takeoff, if practicable, under the existing meteorological, airport, and traffic conditions, requirements (a) and (c) may be combined, and requirements (a), (b) and (c) may be combined if (b) is performed inflight.
	4. Take-Off with Engine failure	One takeoff with a simulated failure of the most critical engine: i) at a point after V₁ and before V₂ that in the judgement of the person conducting the check is appropriate to the airplane type under the prevailing conditions. ii) at a point as close as possible after V₁ when V₁ and V₂ or V₁ and V_r are identical; or iii) at the appropriate speed for non-transport category airplanes. In an airplane group with aft. fuselage-mounted engines this maneuver may be performed in a non-visual simulator.



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	Rejected Take-Off	A rejected takeoff may be performed in an airplane during a normal takeoff run after reaching a reasonable speed determined by giving due consideration to aircraft characteristics, runway length, surface conditions, wind direction and velocity, brake heat energy and any other pertinent factors that may adversely affect safety of the airplane.
C. Instrument Procedure	1. Area departure and area arrival	During each of these maneuvers the applicant must : i) adhere to actual or simulated ATC clearances (including assigned radials); and ii) properly use available navigation facilities.
	2. Holding	This maneuver includes entering, maintaining, and leaving holding patterns. It may be performed in connection with either area departure or area arrival.
	3. ILS and/or other instrument approaches	There must be the following : i) at least one normal ILS approach. ii) at least one manually controlled ILS approach with a simulated failure of one engine. The simulated failure should occur before initiating the final approach course and must continue to touchdown or through the missed approach procedure. iii) Approach on ILS may be conducted at approved flight simulator or flight (Instrument) procedure trainer. iv) At least one non-precision approach procedure that is representative of the non-precision approach procedures that the certificate holder is likely to use.



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		v) Demonstration of at least one non-precision approach procedure on a letdown air other than the approach procedure performed under subparagraph (iii) of this paragraph that the certificate holder is approved to use. If performed in a training device, the procedures must be observed by a check pilot or an approved instructor. Each instrument approach must be performed according to any procedures and limitations approved for the approach facility used. The instrument approach begins when the airplane is over the initial approach fix for the approach procedure being used (or turned over to the final approach controller in the case of GCA approach) and ends when the airplane touches down on the runway or when transition to a missed approach configuration is completed. Instrument conditions need not be simulated below 100° above touchdown zone elevation.
	4. Circling approaches	If the certificate holder is approved for circling minimums below 1000-3, at least one circling approach must be made under the following conditions : i) the portion of the approach to the authorized minimum circling approach altitude must be made under simulated instrument conditions. ii) the approach must be made to the authorized minimum circling approach altitude followed by a change in heading and the necessary maneuvering (by visual reference) to maintain a flight path that permits a normal landing on a flight path that permits a normal landing on a runway at least 90° from the final approach course of the simulated instrument portion of the approach.



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

APP 2-6

		iii) the circling approach must be performed without excessive maneuvering, and without exceeding the normal operating limits of the airplane. The angle of bank should not exceed 30°.
	5. Missed Approach	i) Each pilot must perform at least one missed approach from an ILS approach. ii) Each pilot in command must perform at least one additional missed approach. A complete approved missed approach procedure should be accomplished unless the instructor advises other maneuver. At the discretion of the person conducting the check a simulated engine failure may be required during any of the missed approaches. These maneuvers may be performed either independently or in conjunction with maneuvers required under Section (C) or section (E) of this appendix. At least one missed approach must be performed in flight.
	6. In-Flight Maneuvers with reference to instruments a. Tracking Radials/Bearing b. Unusual attitude control c. Partial panel flying	Tracking desired radials and bearings. Control of airplane's unusual attitude at selected configuration. Covering panels and maneuvering through timing in reference from other instruments.



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

APP 2-7

D. Inflight Maneuvers	1. Steep turns	At least one steep turn in each direction must be performed. Each steep turn must involve a bank angle of 45° with a heading change of at least 180° but not more than 360°.
	2. Approaches to stalls	For the purpose of this maneuver the required approach to a stall is reached when there is a perceptible buffet or other response to the initial stall entry. Except as provided below there must be at least three approaches to stalls as follows : i) One must be in the take-off configuration (except where the airplane uses only a zero-flap take-off configuration) ii) One in a clean configuration. iii) One in a landing configuration. At the discretion of the person conducting the check, one approach to a stall must be performed in one of the above configuration while in a turn with the bank angle between 15° and 30°. One out of three approaches required by this paragraph may be waived. If the certificate holder is authorized to dispatch or flight release the airplane with a stall warning device inoperative the device may not be used during this maneuver.
	3. Maneuver Specific flight characteristics	Recovery from specific flight characteristics that are peculiar to the type of airplane such as high rate of descent.
	4. Slow Flight	Flying maneuver at selected configuration and speed.
	5. VMC Demonstration	Demonstration of control of airplane in minimum controllable airspeed.
	6. Engine failures	In addition to specific requirements for maneuvers with simulated powerplane failures, the person conducting the check may require a simulated engine failure at any time during the check



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

APP 2-8

E. Landings and Approaches to Landings	Notwithstanding the authorizations for combining and waiving maneuvers and for the use of a simulator, at least two actual landings (one to a full stop) must be made for all pilot-in-command and second-in-command proficiency checks. Landings and approaches to landings must include the following, but more than one type may be combined where appropriate. Landing and approaches to landings must include the types listed below, but more than one type may be combined where appropriate :	
	1. Normal Landing	
	2. Landing from a precision or non precision approach	Landing in sequence from an ILS instrument approach or NDB/VOR DME approach except that if circumstances beyond the control of the pilot prevent an actual landing, the person conducting the check may accept an approach to a point where in his judgment a landing to a full stop could have been made.
	3. Crosswind landing	if practical under existing meteorological, airport, and traffic conditions.
	4. Maneuvering to a landing with simulated engine failure	i) in the case of 3-engine airplanes, maneuvering to a landing with an approved procedure that approximates the loss of two engines (centre and one outboard engine); or ii) in the case of other multiengine airplane, maneuvering to a landing with a simulated failure of 50 percent of available engines, with the simulated loss of power on one side of the airplane. Notwithstanding the requirements of subparagraphs 4 (i) and (ii) of this paragraph, in a proficiency check for other than a pilot-in-command, the simulated loss of power may be only the most critical engine. However, if a pilot satisfies the requirements of subparagraphs 4 (i) or (ii) of this paragraph in a visual simulator, he also must maneuver in flight to a landing with a simulated failure of the most critical engine. In addition, a pilot-in-command may omit the maneuver required by subparagraph 4 (i) of (ii)



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

APP 2-9

		of this paragraph during a required proficiency check or simulator course of training if he satisfactorily performed that maneuver during the preceding proficiency check, or during the preceding approved simulator course of training under the observation of a check airman, whichever was completed later.
	5. Circling Approach and Landing	Except as provided in paragraph (f) of this section, if the certificate holder is approved for circling minimums below 1000-3 a landing under simulated circling approach condition. However, when performed in an airplane, if circumstances beyond the control of the pilot prevent a landing, the person conducting the check may accept an approach to a point where, in his judgment, a landing to a full stop could have been made.
	6. Rejected landing	Including a normal missed approach procedure, that is rejected approximately 50 over the runway and approximately over the runway threshold. This maneuver may be combined with instrument, circling, or missed approach procedures, but instrument conditions need not be simulated below 100 feet above the runway.
F. Emergency	1. Normal and Abnormal Procedures	Each applicant must demonstrate the proper use of as many of the systems and devices listed below as the person conducting the check finds are necessary to determine that the person being checked has a practical knowledge of the use of the systems and devices appropriate to the airplane type : (a) Anti-icing and de-icing systems. (b) Auto-pilot system (c) Automatic or other approach aid systems. (d) Stall warning devices, stall avoidance devices, stall avoidance devices, and stability augmentation devices.



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		(e) Airborne radar devices. (f) Any other systems, devices, or aids available. (g) Hydraulic and electrical system failures and malfunctions. (h) Landing gear and flap systems failure or malfunction. (i) Failure of navigation or communications equipment.
	2. Pilot's Knowledge of Emergency Procedures Appropriate to the Type of Airplane	Each applicant must demonstrate the proper emergency procedures for as many of the emergency situations listed below as the person conducting the check finds are necessary to determine that the person being checked has an adequate knowledge of, and ability to perform, such procedure; (a) Fire in flight / in ground. (b) Smoke control. (c) Rapid decompression. (d) Emergency descent. (e) Any other emergency procedures outlined in the appropriate approved Airplane Flight Manual.

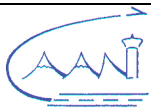


APPENDIX 3

MINIMUM EQUIPMENT LIST (MEL)

Supplementary to Chapter 6, 6.1.3

1. If deviations from the requirements of CAAN in the certification of aircraft were not permitted, an aircraft could not be flown unless all systems and equipment were operable. Experience has proved that some unserviceability can be accepted in the short term when the remaining operative systems and equipment provide for continued safe operations.
2. The CAAN shall 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 DG, CAAN, 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 DG, CAAN requires the operator to prepare a minimum equipment list designed to allow the operation of an aircraft with certain systems or equipment inoperative provided an acceptable level of safety is maintained.
5. The minimum equipment list is not intended to provide for operation of the aircraft for an indefinite period with inoperative systems or equipment. The basic purpose of the minimum equipment list is to permit the safe operation of an aircraft with inoperative systems or equipment within the framework of a controlled and sound programme of repairs and parts replacement.
6. Operators are to ensure that no flight is commenced with multiple minimum equipment list items inoperative without determining that any interrelationship between inoperative systems or components will not result in an unacceptable degradation in the level of safety and/or undue increase in the flight crew workload.
7. The exposure to additional failures during continued operation with inoperative systems or equipment must also be considered in determining that an acceptable level of safety is being maintained. The minimum equipment list may not deviate from requirements of the flight manual limitations section, emergency procedures or other airworthiness requirements of the State of Registry or of the CAAN (when the aircraft is registered and operated in Nepal) unless the appropriate airworthiness authority or the flight manual provides otherwise.



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APP 3-2

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 Chapter 4, 4.3.1.



APPENDIX 4

MEDICAL SUPPLIES

Supplementary to Chapter 6, 6.2.2 a)

TYPES, NUMBER, LOCATION AND CONTENTS OF MEDICAL SUPPLIES

1. Types

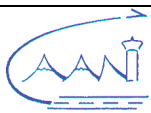
- 1.1 The different types of medical supplies should be provided as follows: first-aid kit(s) for carriage on all aeroplanes, universal precaution kit(s) for carriage on all aeroplanes that require a cabin crew member, and a medical kit for carriage where the aeroplane is authorized to carry more than 100 passengers on a sector length of more than two hours. Where national regulations allow it, operators may elect to carry the recommended medication in the first-aid kit.
- 1.2 Based on the limited available evidence, only a very small number of passengers are likely to benefit from the carriage of automated external defibrillators (AED) on aeroplanes. However, many operators carry them because they offer the only effective treatment for cardiac fibrillation. The likelihood of use, and therefore of potential benefit to a passenger, is greatest in aircraft carrying a large number of passengers, over long duration sector lengths. The carriage of AEDs should be determined by operators on the basis of a risk assessment taking into account the particular needs of the operation.

2. Number of first-aid and universal precaution kits

2.1 First-aid kits

The number of first-aid kits should be appropriate to the number of passengers which the aeroplane is authorized to carry:

<i>Passenger</i>	<i>First-aid kits</i>
0 – 100	1
101 – 200	2
201 – 300	3
301 – 400	4
401 – 500	5
More than 500	6



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

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2.2 Universal precaution kits

For routine operations, one or two universal precaution kits should be carried on aircraft that are required to operate with at least one cabin crew member. Additional kit(s) should be made available at times of increased public health risk, such as during an outbreak of a serious communicable disease having pandemic potential. Such kits may be used to clean up any potentially infectious body contents such as blood, urine, vomit and faeces and to protect the cabin crew members who are assisting potentially infectious cases of suspected communicable disease.

3. Location

3.1 First-aid and universal precaution kits should be distributed as evenly as practicable throughout the passenger cabins. They should be readily accessible to cabin crew members.

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

4. Contents

4.1 The following provides guidance on typical contents of first-aid, universal precaution and medical kits.

4.1.1 *First-aid kit:*

- List of contents
- Antiseptic swabs (10/pack)
- Bandage: adhesive strips
- Bandage: gauze 7.5 cm × 4.5 m
- Bandage: triangular; safety pins
- Dressing: burn 10 cm × 10 cm
- Dressing: compress, sterile 7.5 cm × 12 cm
- Dressing: gauze, sterile 10.4 cm × 10.4 cm
- Tape: adhesive 2.5 cm (roll)
- Steri-strips (or equivalent adhesive strip)
- Hand cleanser or cleansing towelettes
- Pad with shield, or tape, for eye
- Scissors: 10 cm (if allowed by national regulations)
- Tape: Adhesive, surgical 1.2 cm × 4.6 m
- Tweezers: splinter
- Disposable gloves (multiple pairs)
- Thermometers (non-mercury)
- Mouth-to-mouth resuscitation mask with one-way valve
- First-aid manual, current edition
- Incident record form



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

APP 4-3

The following suggested medications can be included in the first-aid kits where permitted by CAAN medical board:

- Mild to moderate analgesic
- Antiemetic
- Nasal decongestant
- Antacid
- Antihistamine

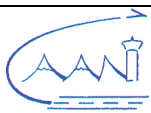
4.1.2 *Universal precaution kit:*

- Dry powder that can convert small liquid spill into a sterile granulated gel
- Germicidal disinfectant for surface cleaning
- Skin wipes
- Face/eye mask (separate or combined)
- Gloves (disposable)
- Protective apron
- Large absorbent towel
- Pick-up scoop with scraper
- Bio-hazard disposal waste bag
- Instructions

4.1.3 *Medical kit:*

Equipment

- List of contents
- Stethoscope
- Sphygmomanometer (electronic preferred)
- Airways, oropharyngeal (three sizes)
- Syringes (appropriate range of sizes)
- Needles (appropriate range of sizes)
- Intravenous catheters (appropriate range of sizes)
 - Antiseptic wipes
 - Gloves (disposable)
 - Needle disposal box
 - Urinary catheter
 - System for delivering intravenous fluids
 - Venous tourniquet
 - Sponge gauze
 - Tape – adhesive
 - Surgical mask
 - Emergency tracheal catheter (or large gauge intravenous cannula)
 - Umbilical cord clamp
 - Thermometers (non-mercury)



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

APP 4-4

- Basic life support cards
- Bag-valve mask
- Flashlight and batteries

Medication

- Epinephrine 1:1 000
- Antihistamine – injectable
- Dextrose 50% (or equivalent) – injectable: 50 ml
- Nitroglycerin tablets, or spray
- Major analgesic
- Sedative anticonvulsant – injectable
- Antiemetic – injectable
- Bronchial dilator – inhaler
- Atropine – injectable
- Adrenocortical steroid – injectable
- Diuretic – injectable
- Medication for postpartum bleeding
- Sodium chloride 0.9% (minimum 250 ml)
- Acetyl salicylic acid (aspirin) for oral use
- Oral beta blocker

If a cardiac monitor is available (with or without an AED) add to the above list:

- Epinephrine 1:10 000 (can be a dilution of epinephrine 1:1 000)

Note.— The United Nations Conference for Adoption of a Single Convention on Narcotic Drugs in March 1961 adopted such a Convention, Article 32 of which contains special provisions concerning the carriage of drugs in medical kits of aircraft engaged in international flight.

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APPENDIX 5

FSTD USER APPROVAL FORM

APPLICATION FOR APPROVAL TO USE A QUALIFIED FLIGHT
SIMULATOR TRAINING DEVICE (FSTD) - AEROPLANES
(FOR-A Chapter 15, 15.22.2, 15.22.3)

Print in block letters clearly with black ink (hand written or printed).

USER APPROVAL NUMBER (for CAAN)

1. APPLICANT TYPE

AOC Holder.....complete section 2 a

Ministry of Defense...complete section 2 b

Individual.....complete section 2 c

2. APPLICANT DETAILS (The Applicant is the person responsible for payment of the fees)

2a) AOC Holder

Registered Company Name in full

Registered Company Number

AOC Number

AOC issued by:

Office Address including phone, fax, email and website address

	FLIGHT OPERATIONS REQUIREMENTS AEROPLANE	APP 5-2

2a continued

Authorized Representative of Company

This application to be signed by a Director or a person so authorized by the Company.

Title/Designation.....

First and Middle Names.....

Surname.....

Telephone numbers (office and cell).....

2b Ministry of Defense or other non-AOC holder organization

Name of Organization.....

Address including telephone, fax, email and website address

Authorized Representative

This application to be signed by a person authorized by the organization named above to act on behalf of the same.

Title/Designation

First and Middle names

Last Name

2c Individuals

Title/Designation

First and Middle Names

Surname

Address including telephone, fax, email and website address

A copy of Flight Crew License must accompany the application.

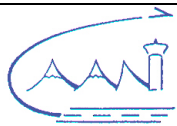
5TH EDITION 12 JANUARY 2011	CIVIL AVIATION AUTHORITY NEPAL	Amendment no. 02 18/06/2013

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3. APPROVAL DETAILS (Tick as applicable)	
Type of Approval requested	Initial ☐ Renewal ☐

4. FSTD DETAILS (Tick or complete as applicable)	
Current FSTD Qualification	UK CAA Qualified ☐ EASA Qualified ☐ FAA Qualified ☐ Any other Local Authority Qualified ☐ Name of local authority.....
FSTD Type	FFS ☐ FTD ☐
FSTD Identification Code and Qualification Level	FSTD code FSTD Qualification Level..... Other FSTD code..... Other FSTD Qualification Level.....
Aircraft Type (If device is qualified for dual type, then mention the particular type or types requested; type includes all series within that type unless otherwise indicated)	
FSTD Location (indicate city and country)	
FSTD Operator (the FSTD Operator is the organization to whom the FSTD Qualification Certificate has been issued)	

5. SCOPE OF USER APPROVAL (Tick or complete the appropriate scope of the proposed approval)
A User Approval will remain valid till the date of expiry of the Qualification Certificate and will be dependent upon the continued qualification of the FSTD to the qualification level specified and on the currency of the navigation database.
5.1 Requested start date of User Approval
5.2 CAAN FOI shall conduct an inspection of the FSTD as mentioned in FOR-A Chapter 15.2.



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APP 5-4

5.3 What is the purpose of your application for a User Approval Certificate?

- a) Initial type training and check for issuance of a flight crew license ☐
- b) Initial or recurrent training and check for the issuance of an Instrument Rating ☐
- c) Recurrent training for renewal or revalidation of a flight crew license ☐
- d) Pilot Proficiency Check for renewal or revalidation of a flight crew license ☐
- e) Pilot Proficiency Check for issuance or renewal of ratings or DCP privilege ☐
- f) 90 days currency of a particular type ☐
- g) LOFT checks (includes Route Check) ☐
- h) Low Visibility Operations (LVO) training and testing (tick as applicable)
CAT I ☐ CAT II ☐ CAT IIIA ☐ CAT IIIB ☐ CAT IIIC ☐

5.4 List the parts of a PPC that may be conducted in the FSTD and for which approval can be granted.

5.5 Regarding an Initial application, are there any differences between the FSTD configuration and your aircraft which affect training delivery? YES ☐ NO ☐

Regarding an application for renewal of a User Approval, has there been any change(s) to the FSTD or associated user's aircraft since the last renewal that would affect an existing differences list? YES ☐ NO ☐

5.6 Where differences/changes have been identified in paragraph 5.5, the list of said differences/changes must be provided with this application form along with any identified / associated mitigation.

6. In the event that this application is withdrawn by the applicant, a cancellation charge may be levied.

7. All expenses for the FOI pursuant to the processing of the approval shall be borne by the applicant.

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8. DECLARATION

I have read the above mentioned clauses and hereby declare to the best of my knowledge the particulars entered on this application are accurate. I understand that a User Approval may be granted in accordance with the requirements of FOR-A Chapter 15 para 15.22.2 and the relevant elements of FOR, PELR, DCP Manual for the purpose of training or checking of flight crew only. I hereby enclose the charges payable.

Name of applicant.....

Signature of applicant and date.....

Or

Signature of authorized representative and date.....

Company or Organization name.....



APPENDIX 6

**OPERATOR AUTHORIZATION FOR ILS CAT-II/IIIA
OPERATIONS**

1. INTRODUCTION

1.1 This procedure has been developed to permit operators to perform Cat-II and Cat-III A level low-visibility approaches in poor weather conditions. For conducting Cat-II or Cat-III A operations, the operators are required to take necessary measures to meet the requirements and obtain authorization from CAAN.

1.2 Authorization for Cat-II and Cat-III A operations is dependent on the following four elements in order to maintain the required level of safety:

- a) The aircraft;
- b) The flight crew;
- c) The airport; and
- d) The operator

All of these elements must comply with the regulations stipulated by DG, CAAN. An aircraft type must be approved for Cat-II/Cat-III A operations with an Automatic Landing System, which provides automatic control of the aircraft during approach and landing. The flight crew should be trained for such operations and have authorization for the same from DG, CAAN. Similarly, the airport must be equipped and approved for Cat-II/Cat-III A operations.

1.3 This Appendix lays down the requirements to be met by the operators in respect of equipment, organization, staffing, training and other matters affecting the operations of aircraft for grant of authorization for ILS Cat-II and Cat-III A operations. Authorization for Cat-II/III A operations is through issuance of, or amendments to the Operations Specifications of the operator.

2. APPLICABILITY

The requirements contained in this Appendix are applicable to all Nepalese Operators intending to carry out Cat-II and Cat-III A operations. Before operating flights to foreign airports, the operators shall file their operating minima and other relevant documents required by the Aviation Authority of that country and seek their approval for commencing Cat-II and Cat-III A operations after obtaining approval from DG, CAAN for the same.



3. DEFINITIONS

a) Categories of precision approach and landing operations

- i) **Category-II (Cat-II) Operation:** A precision instrument approach and landing with Decision Height lower than 60m (200 ft) but not lower than 30m (100 ft), and a Runway Visual Range not less than 350m.
- ii) **Category-IIIA (Cat-IIIA) Operation:** A precision instrument approach and landing with :
 - a) a Decision Height lower than 30m (100 ft), but not lower than 15m (50 ft); and
 - b) a Runway Visual Range not less than 200 m.

Note: Where the Decision Height and Runway Visual Range do not fall within the same Category, either the Decision Height or the RVR may determine in which Category the operation is to be considered. The operation will be in the Category with the lower minima.

- b) **Alert Height (AH):** An Alert Height is a height above the runway based on the characteristics of the aeroplane and its fail-operational Automatic Landing System, above which a Category-III approach would be discontinued and a missed approach initiated if a failure occurred in one of the redundant parts of the Automatic Landing System, or in the relevant ground equipment.
- c) **Decision Altitude/Height (DA/H):** A specified altitude or height in the precision approach at which a missed approach must be initiated if the required visual reference to continue the approach has not been established.

Note

- i) *Decision Altitude (DA) is referenced to Mean Sea Level (MSL) and Decision Height (DH) is referenced to the threshold elevation.*
- ii) *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.*
- d) **Low Visibility Procedures (LVP):** Procedures applied at an aerodrome for the purpose of ensuring safe operations during Category II and IIIA approaches and Low Visibility Take-offs.
- e) **Fail-passive Automatic Landing System:** An Automatic Landing System is fail-passive if, in the event of a failure, there is no significant deviation of aeroplane trim, flight path or attitude but the landing will not be completed automatically.



- f) **Fail-operational Automatic Landing System:** An Automatic Landing System is fail-operational if, in the event of a failure, the approach, flare and landing can be completed by the remaining part of the automatic system.

4. PROCEDURE FOR GRANT OF AUTHORISATION

- 4.1 An operator applying for Cat-II or Cat-III A operations shall adhere to the rigid structure of the regulations to get the operational authorization. An operator, who applies for Cat-II or Cat-III A authorization, shall submit a detailed proposal to the DG, CAAN defining clearly the plans and policies on all aspects of the operations. The proposal shall include information on, amongst other aspects, the following items:

a) Aircraft Type

Details of the aircraft intended to be used, its certification status with respect to Cat-II or Cat-III A operations, list of required equipment for the intended mode of operations, the operating limitations, the procedures to be followed following various failures, etc.

b) Maintenance Programme

A description of the maintenance programme, which is mandatory to ensure that the airborne equipment will remain at the required level of airworthiness standard, reliability and performance. It shall include training of Aircraft Maintenance Engineers, maintenance of test equipment and standards, maintenance procedures, engineering modifications and periodic checks of auto-land system.

c) Flight Crew Procedure

A description of the operational procedures covering in particular crew task sharing, approach monitoring, decision-making, handling of failures and go-around. Detailed requirements in this regard are given in succeeding para 5.

d) Flight Crew Training

Syllabii for ground training, simulator training, flight training, recurrent training and upgrade training shall be furnished in order to get the Cat-II or Cat-III A authorisation for the flight crew.

e) Airfield Equipment

A description of the airfield equipment in accordance with ICAO standards for Cat-II/Cat-III A, including visual and non-visual aids, runway characteristics, obstacle clearance area, RVR measurements, ATC procedures, low visibility procedures, etc.



f) Airfield Operating Minima

A proposal for airfield operating minima for each airfield intended to be used by the operator for such operations.

- 4.2 After receiving the proposal, concerned CAAN shall examine the information and hold discussions with the operator to ensure that the operator establishes a well laid down system and procedures for conducting and monitoring Cat-II/Cat-III A operations.
- 4.3 On completion of the necessary actions, the operator shall submit a consolidated statement showing item-wise compliance to these requirements satisfactorily meeting the requirements, the DG, CAAN will grant necessary authorization by issuing relevant initial Operations Specifications for Cat-II operations and specifying:
 - i) Minima (RVR, AH and DH) to be used;
 - ii) Aeroplanes (indicated by registration numbers) which can be used;
 - iii) Aerodromes to be used; and
 - iv) Any limitation that may be imposed by the DG, CAAN.
- 4.4 The operator shall be required to demonstrate his ability to perform Cat-II operations with an appropriate approach success rate and level of safety. On satisfactory completion of this, the operator shall be granted standard Operations Specifications for Cat-II operations.
- 4.5 For grant of Cat-III A authorization, same procedure shall be followed i.e. grant of initial Operations Specifications, successful operational demonstration and grant of standard Operations Specifications through gradual reduction in meteorological minima.
- 4.6 The Operations Specifications shall form part of the operator's permit.

5. OPERATING REQUIREMENTS

- 5.1 Operators shall develop procedures and operational instructions to be used by their flight crew for Cat II/III A operations and Low Visibility Takeoff to ensure safe conduct of the operations. These procedures and instructions shall be included in the Operations Manual. All the instructions shall be compatible with limitations and mandatory procedures contained in the approved Flight Manual and the Nepalese Civil Aviation Rules, Regulations and any other instructions issued by the DG, CAAN from time to time.



5.2 The procedures and the operational instructions shall cover normal and abnormal situations which can be encountered in actual operations which shall include at least the following items:

- i) Checks for satisfactory functioning of the aircraft equipment, both before departure and in flight;
- ii) Effect on minima caused by changes in the status of the ground installations and airborne equipment;
- iii) Procedure for take off, approach, flare, landing, roll out and missed approach;
- iv) Procedure to be followed in the event of failures, warnings and other abnormal situations;
- v) The minimum visual reference required;
- vi) The importance of correct seating and eye position; and
- vii) Action which may be necessary arising from deterioration of the visual reference.

5.3 Crew Coordination :

Appropriate procedures for crew co-ordination shall be established so that each flight crew member can carry out their assigned responsibilities. Briefings prior to the applicable takeoff or approach shall be specified to assure appropriate and necessary crew communications. Responsibilities and assignment of tasks shall be clearly understood by crew members.

5.4 Monitoring :

The operator shall establish procedures and instructions for Low Visibility Take Off and Cat-II/IIIA operations. These procedures shall be included in the Operations Manual and contain the duties of flight crew members during taxiing, take off, approach, flare, landing, roll out and missed approach as appropriate. Procedures shall assure that adequate crew attention can be devoted to control of aircraft flight path, displacements from intended path, mode annunciations, failure annunciations and warnings, and adherence to minima requirements associated with DH and AH. Procedures for calling out failure conditions shall be pre-established, and responsibility for alerting other crew members to a failure condition shall be clearly identified.

5.5 Use of the Decision Height or Alert Height:

Procedure for setting various reference bugs in the cockpit shall be laid down, responsibilities for Decision Height call-outs shall be clearly defined, and visual reference requirements necessary at Decision Height shall be specified so that flight crew are aware



of the necessary visual references that shall be established by, and maintained after passing Decision Height.

5.6 The operator shall assure that at each runway intended for Category II/IIIA operations, the Radio Altimeter systems used to define Alert Height or Decision Height provides consistent, reliable, and appropriate readings for determination of Decision Height or Alert Height over the terrain underlying the approach path. Any adjustments to approach minima or procedures made on final approach shall be completed prior to Alert Height and applicable annunciation (e.g. LAND2) for fail passive operations.

5.7 **Call-outs:** Altitude/Height call-outs shall be used for Category II/IIIA. Callouts shall be accomplished by the flight crew or shall be automatic (e.g., using synthetic voice call-outs). Call-outs shall be specified to address any non-normal configurations, mode switches, failed modes, or other failures that could affect safe flight, continuation of the landing, or the accomplishment of a safe missed approach.

5.8 **Aircraft Configurations:** Operational procedures shall include any authorized aircraft configurations that might be required for low visibility takeoff or Category-II/IIIA approaches or missed approaches. Examples of configurations that operational procedures which need to be included are:

- (i) Alternate Flap Settings approved for Category-II/IIIA;
- (ii) Use of alternate AFCS modes or configurations (e.g., Single Land, LAND2);
- (iii) Inoperative equipment provisions related to the Minimum Equipment List, such as a non-availability of certain electrical system components, inoperative Radio Altimeter, air data computers, hydraulic systems or instrument switching system components; and
- (iv) Availability and use of alternate electrical power sources (e.g., APU) if required as a standby source.

Procedures required to accommodate various aircraft configurations shall be readily available to the flight crew and the aircraft dispatcher to preclude the inadvertent use of an incorrect procedure or configuration. Acceptable configurations and aircraft type shall be clearly identified so that the crew can easily determine whether the aircraft is or is not in a configuration to initiate a low visibility takeoff or Category-II/IIIA Approach.

5.9 Airport Surface Depiction for Category II/IIIA Operations:

A suitable airport surface depiction (e.g., airport diagrams) shall be available to flight crews to assure appropriate identification of visual landmarks or lighting to safely accomplish taxing in Cat-II/IIIA conditions from the gate to the runway and from the runway to the gate. The Airport depiction shall use an appropriate scale with suitable detailed information on gate locations, parking locations, holding locations, critical areas, obstacle free zones, taxi way identifications, runway identifications, and any applicable taxi way markings for designated holding spots or holding areas.



5.10 The operator shall lay down procedure in their operations manual to ensure that the Commander satisfies himself that :

- i) the status of the visual and non-visual facilities is sufficient prior to commencing a Low Visibility Take Off or a Cat-II or Cat-III A approach;
- ii) appropriate LVPs are in force according to information received from Air Traffic Services before commencing a low visibility take off or a Cat-II or Cat-III A approach.

5.11 The operator shall include in the Operations Manual the minimum equipment that has to be serviceable prior to departure for the commencement of Low Visibility Take Off or a Cat-II or Cat-III A approach in accordance with the Aeroplane Flight Manual or approved document and the Commander shall satisfy himself that the status of aeroplane and the relevant airborne system is appropriate for the specific operation to be conducted.

5.12 The operator shall lay down dispatch procedures which shall include appropriate consideration of reported and forecast weather, field conditions, facilities status, NOTAM information, alternate airport designation, missed approach performance, crew qualifications, airborne system status (provisions of MEL and CDL) and fuel planning.

5.13 All the flight crew members of a flight shall hold appropriate authorization for the particular type of operations to be conducted.

5.14 Clearance to carry out Cat-II and Cat-III A approach shall be requested from ATC, who shall activate the low visibility procedures i.e. prepare the airfield and assure appropriate aircraft separation. Such an approach shall not be undertaken until the clearance has been received. ATC shall be informed when an automatic landing is intended to be performed, so that the ATC may initiate action to provide the same protection even in Cat-I or better conditions.

6. AIRCRAFT AND MAINTENANCE REQUIREMENTS

The detailed airworthiness and maintenance requirements for Cat-II and Cat-III A operations are contained in Nepalese Civil Airworthiness Requirements (NCAR). Some of the salient aspects are as given hereunder:

- i) For Cat-II/III A operations, only multi-engine aircraft duly certified for such operations shall be used. The aircraft type shall be equipped with an Automatic Landing System, which provides automatic control of the aircraft during approach and landing. In order to perform the Cat-II/III A approach and automatic landing, the equipment listed in aeroplane flight manual shall be required to be operative. If one of these equipment or systems is listed in the MEL with associated dispatch conditions, the MEL must clearly indicate that Cat-II or Cat-III A operations are not authorized.



- ii) Every operator shall establish a specific maintenance programme in order to be able to check and demonstrate the full capability of the aircraft to perform Cat-II/Cat-III A operations. A reliability programme shall be developed/extended to monitor, track and control the operational status of the aircraft to achieve successful Cat-II/Cat-III A landings.
- iii) Every operator shall establish a specific procedure to govern the capability of the aircraft to conduct Cat-II/Cat-III A operations in the following conditions:
 - a) Confirmed defect with corrective action carried out;
 - b) Unconfirmed defect but with corrective action;
 - c) Aircraft dispatch under MEL conditions;
 - d) Unable to correct defect and not under MEL conditions; and
 - e) Unable to perform the required test;
- iv) Upgrading/down-grading capability procedure shall be defined so as to assist the dispatch of aircraft. The dispatch policy shall be based on the Minimum Equipment List as it governs the basic criteria for operation. The dispatch criteria and status of aircraft shall be recorded in the aircraft log book with reference to the MEL. A prominent placard shall be displayed in the aircraft and in the flight operations office to inform the crew of the current status of each aircraft.
- v) If an aircraft has not performed Cat-II/Cat-III A operations including practice approaches for a period of one month, a specific check shall be carried out for which a proper schedule shall be prepared by the operator.

7. FLIGHT CREW TRAINING REQUIREMENTS

- 7.1 Flight crew shall be trained and equipped in all aspects of all weather operations. Detailed requirements for the ground and flight training are contained in the Attachment 12-2 of this Appendix and ICAO Manual of All Weather Operations Doc No.9365.
- 7.2 The operators shall lay down detailed training programme for initial authorization, recurrent training and for obtaining authorization for an additional aircraft type. The operators are encouraged to have their training programmes higher than the minimum stipulated by DG, CAAN, keeping in view the general level of experience of the flight crew employed by them.



8. AIRPORT REQUIREMENTS

Requirements contained in ICAO Annex 14, Manual of All Weather Operations Doc 9365 (Cat-II and Cat-III A) and those stipulated by DG, CAAN shall be complied with. Some of the salient requirements concerning airports are given below :

- a) An operator shall not use an airport for Cat-II or Cat-III A operations unless it is approved for such operations.
- b) Due to very low visibility in Cat-II and Cat-III A operations, each airfield shall meet stringent criteria concerning obstacle clearance to avoid any aircraft on approach, landing or go-around touching obstacles on the ground. The basis of these criteria is included in ICAO Annex 14 and PANS-OPS Doc-8168.
- c) The ILS installation shall conform to the appropriate specifications contained in ICAO Annex 10, Volume 1, Part (i), Chapters 2 & 3 and be designed and operated in accordance with the guidance material contained in attachment 'C' to Part (i) of Annex 10.
- d) During Cat-II and Cat-III A approaches, the ILS beams shall be protected from unacceptable disturbances in the critical area and sensitive area.
- e) The RVR reports shall be given in increments of not more than 50m when the RVR is less than 800m and not more than 25m when the RVR is less than 150m.
- f) A system of maintenance of visual aids shall be established to ensure both lighting and marking system reliability. A system of maintenance for ILS installations shall also be established with regular ground and flight checks as stipulated in the ICAO Annex 10. Users shall be advised as soon as possible of any degradation in ILS performance.
- g) A secondary power supply for visual aids shall be required with maximum switch-over time as indicated in ICAO Annex 14.
- h) Cat-II and Cat-III A operations shall required special procedures for the ATC and all services in the aerodrome i.e. Low Visibility Procedures. The aerodrome authority shall develop the procedure in accordance with the ICAO Manual of All Weather Operations. Mainly, the procedures to be established are :
 - i) procedures for ATC to be quickly informed of all degradations in ILS performance and to inform the pilot, if necessary;
 - ii) procedures for ATC to be quickly informed of all degradations in visual aids and to inform the pilot, if necessary;
 - iii) procedures for the protection of the Obstacle Free Zone by the control of ground movements;



- iv) procedures for the protection of the ILS critical area and the ILS sensitive area by control of ground movements and adequate separation between two aircraft on approach or one aircraft on approach and another taking-off;
- v) procedures for meteorological services particularly for ATC to quickly inform the crew changes in RVR;
- vi) procedures for maintenance; and
- vii) procedures for security.

9. OPERATIONAL DEMONSTRATION AND ISSUANCE OF OPERATIONS SPECIFICATIONS

The implementation of all weather operations shall be achieved in stages through gradual reduction in meteorological criteria commensurate with the confidence and experience gained by the operator as stipulated hereunder:

9.1 Issuance of Initial Cat-II Operations Specifications

- (i) The operator shall have gained experience of at least one year in Cat-I operations for issuance of initial Operations Specifications for Cat-II operations.
- (ii) Operator shall be issued initial Operations Specifications authorizing to carry out Cat-II operations with Decision Height of 150 feet and RVR of 500 metres after ensuring that an operator has prepared all the required documents, procedures, maintenance and training programmes and the flight crew have been trained and obtained necessary authorization for conducting Cat-II operations.

9.2 Operational Demonstration for Cat-II Operations

9.2.1 The operator shall carry out operational demonstration, in order to establish that an appropriate level of safety can be met in such operations. The operator shall prove that he can perform Cat-II operations with the appropriate success rate and level of safety. For this purpose, operator shall carry out in-service proving for a period of at least six months. Particular attention shall be given to the flight and maintenance procedures as established by the operator. During this period, the operator shall successfully complete the following operations, demonstrations and data collection programme in line service as part of the approval process to ensure continued performance and reliability of the system before operations down to the next succeeding lower minima are authorized:

- (i) For operational demonstration of airborne system, one hundred successful landings are to be accomplished in line operations, including training flights,



using Cat-II system. The system should demonstrate reliability and performance in line operations consistent with the operational concepts.

- (ii) For collection of data during airborne system demonstration, the applicant shall provide crew flight reports and automatic flight recording data giving approach and landing performance whenever an approach and landing is attempted utilizing the Cat-II system, regardless of whether the approach is abandoned or concluded successfully. The completed forms and a summary of the demonstration results will be made available to DG, CAAN. Entry must also be made in the Techlog/Flight Report Book after the flight.
- (iii) Approaches where the pilot was assured that the critical area protection was provided which do not result in a successful landing, are to be fully documented giving factors which result in unsuccessful approaches e.g. due to ATC factors, faulty ground station signals or other factors.

9.2.2 The operator shall provide crew flight reports and automatic flight recording data during all the operational demonstrations. The flight crew reports should provide at least the following data:

- i) Airfield and runway used;
- ii) Weather conditions;
- iii) Time;
- iv) Adequacy of speed control;
- v) Any out-of-trim condition at time of Automatic Flight Control System disengagement;
- vi) Compatibility of Automatic Flight Control Systems, Flight Director and raw data;
- vii) Indication of the position of the aircraft relative to the ILS 11 centerline when descending through 100 ft (30m);
- viii) Touchdown position;
- ix) Reason for failure leading to aborted approach, give height above runway at which approach, was discontinued; and
- x) Quality of overall system performance.

The automatic flight recordings shall provide at least the following:

- i) Deviation from localizer at touchdown;



- ii) Flare time;
- iii) Rate of descent at touchdown;
- iv) Pitch and bank angles at touchdown;
- v) Speed loss in flare; and
- vi) Maximum deviation during ground roll-out (for aircraft with automatic ground roll control or guidance intended for operations with no DH).

9.2.3 The operator shall develop a form for use by the flight crew to record the data listed above. A sample proforma for crew reports is given as Attachment-12-1. This form shall be completed whenever an approach is attempted utilizing the airborne low visibility approach system regardless of whether it is initiated, abandoned or concluded successfully. A successful approach is one in which at 100 feet point :

- i) The airplane is in trim so as to allow for continuation of normal approach and landing.
- ii) The indicated airspeed and heading are satisfactory for a normal flare and landing. With auto throttle control system, the speed must be + 5 knots of programmed airspeed but may not be less than computed threshold speed.
- iii) The airplane is positioned so that the cockpit is within, and tracking so as to remain within, the lateral confines of the runway extended.
- iv) Deviation from glideslope does not exceed + 75 microamps as displayed on the ILS indicator. The Operator may specify the equivalent scale deviation for their type of aircraft in consultation with the aircraft manufacturer.
- v) No unusual roughness or excessive attitude changes occur after leaving middle marker.
- vi) No unusual deviation in the touchdown or touchdown and roll out performance.

9.2.4 During the six months period following the issuance of initial Operations Specifications to conduct Cat-II operations (as mentioned in para 9.1), the operator, when practicable, shall use the Cat-II airborne system using the operator's operating and maintenance procedures. During this period, pilot reports shall be obtained for each approach with the data described above. These reports shall be analysed and a summary report prepared and submitted to DG, CAAN. This report shall show that, at least 95% of approaches made during this period were successful.



9.3 Issuance of Standard Cat-II Operations Specifications

After successful completion of six months of operations under initial Operations Specifications and at least twenty five approaches as indicated in para 9.2.1 above, the operator shall be issued revised Standard Operations Specifications authorizing him to carry out Cat-II operations with a Decision Height of 100 feet and RVR of 350 m.

9.4 Issuance of Initial Cat-III A Operations Specifications

Operator shall be issued an initial Operations Specifications to carry out Cat-III A operations with Decision Height of 100 feet and RVR of 300 metres after ensuring that operator has prepared all the required documents, procedures, maintenance and training programmes and the flight crew have been trained and the operator has also successfully acquired six months experience of Cat-II operations and issued standard Operations Specifications for such operations.

9.5 Operational Demonstration for Cat-III A Operations

9.5.1 The operator shall then carry out operational demonstration, in order to establish that an appropriate level of safety can be met in such operations. The operator shall prove that he can perform Cat-III A operations with the appropriate success rate and level of safety. For this purpose, he must carry out in-service proving for a period of six months. Particular attention shall be given to the flight and maintenance procedures as established by the operator. During this period, the operator shall successfully complete the following operations demonstrations and data collection programme in line service as part of the approval process to ensure continued performance and reliability of the system before operations down to the next succeeding lower minima are authorized:

- (i) For operational demonstration of airborne system, one hundred successful landings are to be accomplished in line operations, including training flights, using Cat-III A system. The system should demonstrate reliability and performance in line operations consistent with the operational concepts.
- (ii) For collection of data during airborne system demonstration, the applicant shall provide crew flight reports and automatic flight recording data in accordance with the proforma given at Annexure-I giving approach and landing performance whenever an approach and landing is attempted utilizing the Cat-III A system, regardless of whether the approach is abandoned or concluded successfully. The completed forms and a summary of the demonstration results will be made available to DGCA.
- (iii) Approaches where the pilot was assured that the critical area protection was provided which do not result in a successful landing, are to be fully documented giving factors which result in unsuccessful approaches e.g. due to ATC factors, faulty ground station signals or other factors.



9.5.2 During operational demonstrations of Cat-III A operations, the operator shall provide crew flight reports and automatic flight data recording in accordance with para 9.2.2 and 9.2.3.

9.5.3 During the six month period following the issuance of initial Operations Specifications to conduct Cat-III A operations, the operator, when practicable, shall use the Cat-III A airborne system using the operator's operating and maintenance procedures. During this period, pilot reports shall be obtained for each approach with the data described above. These reports shall be analyzed and a summary report prepared and submitted to DGCA. This report shall show that, 95% of approaches made during this period were successful.

9.6 Issuance of Standard Cat-III A Operations Specifications

After successful completion of six months of operations under initial Cat-III A Operations Specifications and at least twenty five approaches as indicated in para 9.5.1, the operator shall be issued a final Operations Specifications authorizing him Cat-III A operations with a Decision Height of 50 feet and RVR of 200m.

9.7 Introduction of New Type of Aircraft for Experienced Operators

Whenever an operator introduces a new type of aircraft into service for Cat-II or Cat-III A operations, a complete operational demonstration as stipulated in above paragraphs shall be carried out. This demonstration process will follow the same basic sequence. It consists of a progressive introduction of lower minima with periodic reports of the approaches made during actual in-line service leading to amendment of Operations Specifications.

10. CONTINUOUS MONITORING

After obtaining the authorization, the operator must continue to provide quarterly reports of in-line service. These reports must include the following information:

- i) The total number of approaches, by aircraft type, where the airborne Cat-II or Cat-III A equipment was utilized to make satisfactory, actual or practice, approaches to the applicable Cat-II or Cat-III A minima.
- ii) The total number of unsatisfactory approaches by aerodrome and aircraft registration-wise in the following categories.
 - a) Airborne equipment faults;
 - b) Ground facility difficulties;
 - c) Missed approaches because of ATC instructions; and
 - d) Other reasons.
- iii) The operator shall establish a procedure to monitor the performance of the Automatic Landing System of each aircraft. The continuous monitoring shall permit the detection of any decrease in the level of safety before it becomes



hazardous. The operator shall continue to check his results and to take adequate actions by modifying the operating or maintenance procedures, if necessary. The monitoring shall also permit problems to be detected on a specified airfield (ILS, ATC procedures, etc.). The monitoring shall be continuous and data shall be retained for a period of at least 1 year.

11. GENERAL REQUIREMENTS

- (i) No operator shall carry out Cat-II or Cat-III A operations without specific approval of DG, CAAN and unless each aircraft concerned is equipped and certified for operations with decision height below 60m (200 ft).
- (ii) Every operator shall file with the DG, CAAN, minima for every airport for Cat-II and Cat-III A operations keeping in view the requirements contained in ICAO Manual of All Weather Operations and the operator's experience and policy.
- (iii) An operator shall verify that Low Visibility Procedure (LVP) have been established and are enforced at those aerodromes where low visibility operations are to be conducted.
- (iv) Every operator shall establish and maintain a suitable system for recording success and failure of approach and automatic landing to monitor the overall safety of the operation.
- (v) Each operator must have sufficient qualified personnel to continuously monitor and ensure the highest degree of safety in Cat-II and Cat-III A operations. The operator should provide necessary training to the ground staff directly involved with flight operations.
- (vi) The authorization granted to an operator for conducting Cat-II/III A operations shall be valid only if the requirements contained in this Appendix are complied with and the capability of the operator, its flight crew and aircraft does not degrade below the required level.
- (vii) The authorization is liable to be cancelled/suspended/withdrawn/modified at any time in the event of any of the above conditions not being complied with and/or violated by the operator and for reasons affecting safety of aircraft operations.

- End -



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

APP 6-16

SAMPLE FORM FLIGHT CREW REPORT ON AUTO-APPROACH AND AUTO-LAND PERFORMANCE

OPERATOR

1. SECTION I – Complete all items

Aircraft Type	Aircraft Registration No.	Captain	Flight No.	Date
Airport	Runway	Conditions Cat I+ ☐ Cat II ☐ Cat IIIA ☐	Wind Direction & Speed	ATC Runway Protection Provided ☐ Unknown or None ☐ Cat II

The Auto-Approach Auto-Land was:
☐ Satisfactory ☐ Unsatisfactory

If Unsatisfactory you must complete Section II

Auto-Land Touchdown Zone is 900 feet to 2400 feet down the runway and within 27 feet of centerline.

2. SECTION II – Complete ONLY if Auto-Approach or Auto-Land was UN-SATISFACTORY

If the Approach was discontinued, it was due to:

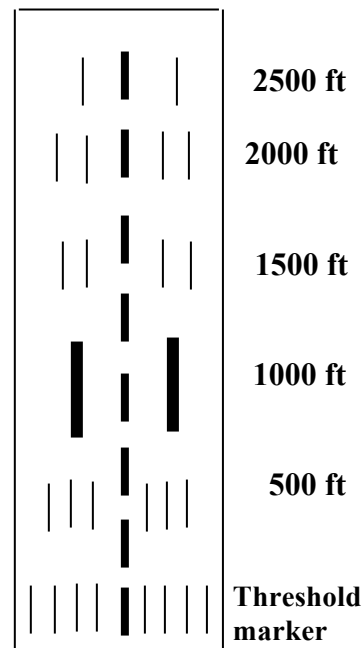
- ☐ Airborne Equipment failure
- ☐ Ground Facilities Difficulties
- ☐ ATC Instructions
- ☐ Other (Specify)

LOCALIZER (Left/Right) GLIDESLOPE (High/Low)

OUTER		MIDDLE		INNER	
L ☐	H ☐	L ☐	H ☐	L ☐	H ☐
R ☐	L ☐	R ☐	L ☐	R ☐	L ☐

If the autopilot was disconnected the altitude was _____ ft MSL.

Other Comments





PILOT AUTHORISATION FOR ILS CATEGORY-II AND CATEGORY-III OPERATIONS

1. INTRODUCTION

With the modernization of airport facilities in the country, Instrument Landing System (ILS) capability is being upgraded to Category-II and Category-III levels at some of the airports to permit operations even in lower visibility conditions. The operations in such weather conditions shall, however, be possible only when all other requirements relating to aircraft, pilots, operator etc. are also complied with. This Attachment lays down the minimum requirements for training and grant of authorization to pilots for ILS Category-II and Category-III operations

2. DEFINITIONS

CATEGORIES OF PRECISION APPROACH AND LANDING OPERATIONS

Category-II (Cat-II) Operation : A precision instrument approach and landing with:

- a) Decision Height lower than 200 ft (60m) but not lower than 100 ft (30m);
and
- b) a Runway Visual Range not less than 350m.

Category-IIIA (Cat-IIIA) Operation : A precision instrument approach and landing with:

- a) a Decision Height lower than 100 ft (30m), but not lower than 50 ft (15m);
and
- b) a Runway Visual Range not less than 200 m.

Category-IIIB (Cat-IIIB) Operation: A precision instrument approach and landing with:

- a) No Decision Height or a Decision Height lower than 50 ft (15 m).
- b) Runway Visual Range less than 200 m but not less than 50 m.

Note: Where the decision height and Runway Visual Range (RVR) do not fall within the same Category, either the Decision Height or the RVR may determine in which Category the operation is to be considered. The operation will be in the Category with the lower minima.

Alert Height: An Alert Height is a height above the runway based on the characteristics of the aeroplane and its fail operational Automatic Landing System, above which a Category-III approach would be discontinued and a missed approach initiated if a failure occurred in one of the redundant parts of the Automatic Landing System, or in the relevant ground equipment.

Decision Altitude/Height (DA/H): A specified altitude or height (A/H) in the precision approach 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 (MSL) and Decision Height (DH) is referenced to the threshold elevation.



Note 2 The required visual reference means that section of the visual aids or of the approach area which shall have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path.

Fail-passive Automatic Landing System: An Automatic Landing System is fail-passive if, in the event of a failure, there is no significant deviation of aeroplane trim, flight path or attitude but the landing will not be completed automatically.

Fail-operational Automatic Landing System: An Automatic Landing System is fail-operational if, in the event of a failure, the approach, flare and landing can be completed by the remaining part of the automatic system.

FOR SCHEDULED OPERATORS

3. QUALIFICATIONS AND FLYING EXPERIENCE REQUIREMENTS

The pilot seeking authorization for ILS Cat-II or Cat-III operations shall meet the following qualifications and experience requirements:

a) License and Ratings

- i. Current CPL or higher license.
- ii. Instrument Rating

b) Flying Experience for PIC

- i) Total flying experience 2500 hrs
- ii) PIC experience on type 500 hrs. (for initial authorization).
200 hrs (for additional aircraft type authorization).
- iii) Night Flying on type 100 hrs.
- iv) Instrument Flying 100 hrs (including not more than 50 hrs. on Full Flight Simulator of the type).

c) Flying Experience for Co-Pilot

- i) Total flying experience 500 hrs
- ii) On type experience 300 hrs (for initial authorization).
200 hrs. (for additional aircraft type authorization).
- iii) Instrument Flying 100 hrs. (including not more than 50 hrs. on Full Flight Simulator of the type)



4. Ground Training for PIC, Co-Pilot and Flight Engineers for Cat-II and Cat- III Authorization

Details of the ground training are given in Annexure-I. The ground training shall lay specific emphasis on the following:

- i) All the technical aspects required for ILS Cat-II and Cat-III operations, the aircraft equipment required for carrying out ILS Cat-II and Cat-III approaches and associated weather phenomenon, with special emphasis on poor visibility in fog, rain, meteorological minima etc. This training shall be given by Ground Instructor/Flight Instructor/ Synthetic Flight Instructor.
- ii) The techniques for ILS Cat-II and Cat-III operations, effects on operations due failures in the airborne and ground equipment and their indications, and action required to be taken on various failures. This training shall be given by Flight Instructor/Synthetic Flight Instructor.

5. SIMULATOR TRAINING AND LINE FLYING FOR ILS CAT-II/CAT-III AUTHORIZATION

The training exercises stipulated hereunder shall be the minimum to be carried out on an approved simulator. The Instructor and the Examiner shall ensure that the pilot acquires the required proficiency and if necessary additional training be given. In case of a gap between ground classes/ simulator training of more than six months the pilot shall undergo a simulator training session of at least one hour

5.1 TRAINING FOR PIC/CO-PILOT

SIMULATOR TRAINING

- (a) Training session(s) of minimum of 3 hours consisting of a minimum of 15 ILS Cat-II approaches in which at least 4 landings and 4 go-around shall be accomplished. Auto-landings shall also be practised, if the aircraft is equipped and certified for auto-landings. The exercise shall also include approaches with one engine inoperative for landing and go-around. Low visibility takeoffs and reject take-offs due to engine failure at low speeds and high speeds shall be carried out. Handling of failures and taking necessary corrective action shall also be part of the training. Detailed syllabus is at Annexure-II.
- (b) One session of 1 hour by an Examiner to check the proficiency for ILS Cat-II operations including engine failure on approach and go-around and recognition of aircraft and ground equipment failures and to take necessary corrective action. Performa given at Annexure-III shall be used to check the proficiency.
- (c) Only on successful completion of simulator training for Cat-II Operations, Pilot shall undergo one session of 2 hours consisting of at least six ILS Cat-III approaches including auto-landings and go-around with all engines operating, critical engine failure and also with equipment failures and to demonstrate ability to take necessary corrective actions to handle the failures. Detailed syllabus is at Annexure-IV.
- (d) One evaluation session by an Examiner to check the proficiency for ILS Cat-III operations consisting of a minimum of 2 approaches. Performa at Annexure-V shall be used to check the proficiency.



Note: The Co-pilot shall be part of flight crew composition when simulator training and evaluation session by Examiner is being conducted for PIC as stipulated above.

INCAPACITATION EXERCISE FOR P2

AIRCRAFT LINE FLYING

For PIC

- i) One ILS Cat-II/ Cat-III approach in weather conditions at or above the Cat-I minima under the supervision of Flight Instructor/Examiner.
- ii) Thereafter a minimum of 2 ILS Cat-II/ Cat-III practice approaches including auto-landings, if applicable, at or above the Cat-I weather minima of which 1 can be on simulator of Category D.
- iii) Final release check at or above Cat-I weather minima by an Instructor/Examiner or CAAN Flight Operations Inspector.

Note: All the above practice approaches on the aircraft can be carried out at any Category-I ILS runway where auto land is permissible and which has been approved, after flight trials, by the operator. All Operators must maintain a periodically updated list of approved airports/ runways where practice CAT II/ III approaches/ auto-land may be carried out.

AIRCRAFT LINE FLYING UNDER SUPERVISION

The pilot meeting the qualification and experience requirements and training stipulated in paras 3, 4 and 5 shall be a Co-pilot on at least 3 ILS Cat-II/ Cat-III approaches while the PIC is carrying out ILS Cat-II/ Cat-III practice approaches.

Note: Pilots cleared for Cat-II/ Cat-III operations shall carry out applicable Cat-II/ Cat-III practice approaches respectively.

5.2 TRAINING FOR FLIGHT ENGINEER (WHEREVER REQUIRED)

Flight Engineer, wherever required as a part of the crew complement, shall be a part of the flight crew composition when the simulator training is being conducted for PIC. He shall also have been a Flight Engineer on at least 4 ILS Cat-II/ Cat-III approaches while the PIC is carrying out ILS Cat-II/ Cat-III practice approaches on aircraft at or above Cat-I minima conditions.

6. RECURRENT TRAINING AND CHECK

- a) **Recurrent Ground Training** Recurrent ground training shall provide any remedial review of topics specified in initial Cat-II & Cat-III ground training, to ensure continued familiarity with those topics. Emphasis shall be placed on any programme modifications, changes to aircraft equipment or procedures, review of any occurrences or incidents that may be pertinent, and finally emphasis may be placed on re-familiarization with topics such as flight mode annunciation for failure conditions or other information which the pilots may not routinely see during normal line operations. Topics to be addressed for each Pilot-in-Command and Copilot are those topics, necessary for the performance of the assigned duties for each respective crew member in the current assignment. This training may be complete during annual refresher training.



b) Recurrent Simulator Training

- i) **For Pilot-in-Command:** Pilot's knowledge and ability to perform the tasks associated with the particular category of operation for which he is authorized, is to be demonstrated during normal proficiency/IR checks. This shall include a minimum of three Cat-II or Cat-III approaches as applicable and a minimum of one go-around. A pilot shall also demonstrate the low visibility take off manoeuvres as prescribed for LVO.
- ii) **For Co-Pilot:** The Co-Pilot must be a part of the flight crew composition when simulator recurrent training are being conducted for PIC.
- iii) **For Flight Engineer:** Flight Engineer, wherever required as a part of the crew complement, shall be a part of the flight crew composition when the simulator training is being conducted for PIC.

7. ADDITION OF AIRCRAFT TYPE TO PILOT'S AUTHORIZATION

A pilot seeking addition of another type of aircraft to the current Category-II or Category -III authorization must comply with the following requirements:

- (i) Shall undergo adequate ground training on technical and operational aspects of aircraft and its equipment in relation to Cat-II and Cat-III operations, effects on operations, of failures in airborne equipment and actions required to be taken on various failures.
- (ii) Simulator practice session(s) consisting of Cat-II/Cat-III approaches in which applicable exercises as for initial authorization shall be carried out.
- (iii) One simulator session of 1 hr. by an examiner to check proficiency of PIC on the type of aircraft for Cat- II/ Cat-III operations.
- (iv) A PIC shall carry out a minimum of 3 ILS Cat-II/ Cat-III practice approaches.
- (v) A co-pilot shall have been part of the flight crew composition on at least 3 ILS Cat-II/ Cat-III approaches on aircraft.
- (vi) Release check of PIC on aircraft by an Examiner or a CAAN Flight Operations Inspector.

8. GENERAL REQUIREMENTS

- i) To exercise the privileges of ILS Cat-II or Cat-III authorization, a PIC shall have carried out a minimum of six approaches (either actual or practice) of the applicable category including at least 1 on the aircraft within the preceding 6 months, and a Co-pilot shall have been a crew member on at least 3 ILS Cat-II or Cat-III approaches as applicable, within the preceding 6 months.
- ii) Scheduled Operators shall be granted authorization for Cat-II Operations and Cat-IIIA/ Cat-IIIB Operations as per the provisions of Appendix 12.



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For NON-SCHEDULED/ PRIVATE/ GENERAL AVIATION/ OTHER OPERATORS:

- i) For all such operators where pilots have done the prescribed training AND are current within one year on a Full Flight/ ZFTT (Level D) simulator of type, Cat-I state minima shall apply for ILS approaches.
- ii) For aircraft where appropriate ZFTT Simulator is not available or does not apply, and the aircraft is capable/ certified for Cat II/ III, after the ground training applicable for Cat II/ III and a check flight with Flight Operations Inspector, the pilot will be permitted to fly down to Cat I / other approaches state minimas.
- iii) The pilots shall maintain proper record of Cat-II and Cat-III approaches, which shall be duly certified by the pilot in charge of operations or Flight Instructor/Examiner carrying out the proficiency checks as per Annexure-VI.
- iv) Authorization of the pilot for Cat-II or Cat-III operations shall be valid for the duration of validity of his license, provided the pilot continues to regularly fly the type of aircraft on which the authorization has been granted and meet all the applicable requirements of this Appendix, unless revoked/suspended by the DG, CAAN. The pilot shall furnish necessary information and documents while seeking renewal of his license to show continued compliance of necessary recurrent training and checks and the other requirements of this Appendix.
- v) In case a pilot does not meet the recency requirements, he shall undergo simulator practice of at least one session and a check by an Examiner or CAAN Flight Operations Inspector before he resumes Cat-II or Cat-III operations.
- vi) The DG, CAAN may grant authorization for a specified period to any pilot of equivalent status approved as such by any Contracting State for carrying out Cat-II or Cat-III operations.



ANNEXURE I

GROUND TRAINING OF FLIGHT CREW FOR CAT-II/ CAT-III OPERATIONS

Flight Crew must be able to make full use of ground and airborne equipment intended for use during Cat-II and Cat-III operations. They must, therefore, be instructed in how to obtain maximum benefit from redundancy provided in the airborne equipment and to understand fully the limitations of the total system including both ground and airborne elements. The ground instruction shall cover at least the following:

1. Ground System and NAVAIDs.

Ground systems and NAVAIDs are considered to include characteristics of the airport, electronic navigation aids, lighting, marking and other systems (e.g., RVR) and any other relevant information necessary for safe Cat-II/ Cat-III landing or low visibility takeoff operations.

The training and qualification program shall appropriately address the operational characteristics, capabilities and limitations of at least each of the following:

- i) **NAV AIDs.** The navigation systems to be used, such as the instrument landing system with its associated critical area protection criteria, marker beacons, distance measuring equipment, locators or other relevant systems shall be addressed to the extent necessary for safe operations, limitations of the ILS, including the effect on aeroplane system performance of interference to the ILS signal caused by other landing, taking off or overflying aeroplanes.
- ii) **Visual Aids.** Visual aids include approach lighting system, touch down zone, centerline lighting, runway edge lighting, taxiway lighting, standby power for lighting and any other lighting systems that might be relevant to a Cat-II/ Cat-III environment, such as the coding of the center line lighting for distance remaining, and lighting for displaced thresholds, stop ways, or other relevant configurations shall be addressed. Limitations on their use as visual cues in reduced RVRs with various glide path angles and cockpit cut-off angles, and the heights at which various visual aids may be expected to become visible in actual operations.
- iii) **Runway and Taxiways.** The runway and taxiway characteristics concerning width, safety areas, obstacle free zones, markings, hold lines (including Cat-II/Cat-III holding points), signs, holding spots, or taxi way position markings, runway distance remaining markings and runway distance remaining signs shall be addressed.
- iv) **Weather Reporting.** Weather reporting and transmissiometers systems, including RVR locations, readout increments, sensitivity to lighting levels set for the runway edge lights, variation in the significance of reported values, controlling and advisory status of readouts, and requirements when transmissiometers become inoperative, different methods of measuring the assessing RVR and the limitations associated with each method.



- v) **Facility Status.** Facility status, proper interpretation of outage reports for lighting components, standby power, or other factors and proper application of NOTAMS regarding the initiation of Cat-II/ Cat-III approaches or initiation of a low visibility takeoff.

2. The Airborne System.

The training and qualification program shall address the characteristics, capabilities, limitations, and proper use of each appropriate airborne system element applicable to Cat-II/ Cat-III landing or low visibility takeoff including the following:

- i) **Flight Guidance.** The flight control system, flight guidance system, instruments and displays and annunciation systems including any associated flight director, landing system and roll out system, or takeoff systems, if applicable. For automatic or manual systems which require crew input for parameters such as inbound course or automatic or manually tuned navigation frequencies, the crew shall be aware of the importance of checking that proper selections have been made to assure appropriate system performance.
- ii) **Speed Management.** The automatic throttle, FMC or other speed management system, if applicable.
- iii) **Instruments.** Situation information displays, as applicable.
- iv) **Supporting Systems.** Other associated instrumentation and displays, as applicable, including any monitoring displays, status displays, mode annunciation displays, failure or warning annunciations and associated system status displays that may be relevant.
- v) **Aircraft Characteristics.** Any aircraft characteristics that may be relevant to Cat-II/ Cat-III, such as cockpit visibility cutoff angles and the effect on cockpit visibility, of proper eye height, seat position or instrument lighting intensities related to transition through areas of varying brightness, visual conditions change. Crew shall be aware of the effects on flight visibility related to use of different flap settings, approach speeds, use of various landing or taxi lights and proper procedures for use of windshield wipers and rain repellent. If windshield defog, anti-ice, or de-icing systems affect forward visibility, crew shall be aware of those effects and be familiar with proper settings for use of that equipment related to low visibility landing.

3. Weather Phenomenon

- i) Characteristics of Fog
- ii) Usage of Strobe Lights
- iii) Usage of Landing Lights
- iv) Effect of Low Level Wind Shear, Turbulence, Precipitation
- v) Runway surface conditions i.e. slippery, slush, contamination etc.



4. Flight Procedures and Associated Information.

- i) **Operations Specification.** Crew shall be familiar with, and properly able to apply, operations specifications applicable to Category-II/ Cat-III landing.
- ii) **Normal and Non-normal Procedures.** Crew shall be familiar with appropriate normal and non-normal procedures including crew duties, monitoring assignments. Appropriate automatic or crew initiated call-outs to be used, proper use of standard instrument approach procedures, special instrument approach procedures, applicable minima for normal configurations or for alternate or failure configurations and down grading/reversion to higher minima in the event of failures. Effects of specific aeroplane malfunctions (e.g. engine failure) on auto-throttle, auto-pilot, performance, etc.
- iii) **Weather and RVR.** Crew and aircraft dispatchers shall be familiar with weather associated with Cat-II/ Cat-III and proper application of Runway Visual Range, including its use and limitations, the determination of controlling RVR and advisory RVR, required transmission meters, appropriate light settings for correct RVR readouts and proper determination of RVR values reported at foreign facilities.
- iv) **Use of DA(H) and Alert Height.** Crew shall be familiar with the proper application of Decision Height and Alert Height, as applicable, including proper use and setting of Radar Altimeter bugs, use of the inner marker where authorized or required due to irregular underlying terrain and appropriate altimeter setting procedures for the Barometric Altimeter consistent with the operator's practice of using either QNH or QFE. Pilot tasks at DH, procedures and techniques for transition from instrument to visual flight in low RVR conditions, including the geometry of eye, wheel and antenna positions with reference to ILS reference datum height.
- v) **Use of Visual Reference.** Crew shall be familiar with the availability and limitations of visual references encountered, both on approach before and after Decision Height, if a Decision Height is applicable. Crew shall be familiar with the expected visual references likely to be encountered if an Alert Height is used even though a visual reference requirement is not established. Crew shall be familiar with procedures for an unexpected deterioration of conditions to less than the minimum visibility specified for the procedure during an approach, flare or roll out including the proper response to a loss of visual reference or a reduction of visual reference below the specified values when using a Decision Height and prior to the time that the aircraft touches down. The operator shall provide some means of demonstrating the expected visual references where the weather is at acceptable minimum conditions and the expected sequence of visual cues during an approach in which the visibility is at or above the specified landing minima. This may be done using simulation, video presentation of simulated landings or actual landings, slides showing expected visual references, computer based reproductions of expected visual references.



- vi) **Transition to Visual Flight:** Transition from non-visual to visual flight for the pilot in command during the approach. For systems, which include electronic monitoring displays, procedures for transition from those monitoring displays to external visual references shall be addressed.
- vii) **Acceptable Flight Path Deviations.** Pilots shall be familiar with the recognition of the limits of acceptable aircraft position and flight path tracking during approach, flare and if applicable roll out. This shall be addressed using appropriate displays or annunciations for either Automatic Landing Systems or for Manual Landing Systems or when using electronic monitoring systems such as an Independent Landing Monitor.
- viii) **Wind Limitations.** Environmental effects shall be addressed. Environmental effects include appropriate constraints for head winds, tail winds, cross winds, and the effect of vertical and horizontal wind shear on automatic systems, flight directors, or other system (e.g., synthetic vision) performance.
- ix) **Contaminated Runways.** Crew shall be familiar with the operator's policies and procedures concerning constraints applicable to Cat-II/ Cat-III landings or low visibility takeoffs, on contaminated or cluttered runways. Limits shall be noted for use of slippery or icy runways as far as directional control and stopping performance is concerned, and crew shall be familiar with appropriate constraints related to braking friction reports. Crew shall be familiar with the method of providing braking friction reports applicable to each airport having Cat-II/ Cat-III landing operations or low visibility takeoff operations.
- x) **Airborne System Failures.** Crew shall be familiar with the recognition and proper reaction to significant airborne system failures experienced prior to and after reaching the final approach fix and experienced prior to and after reaching Alert Height or Decision Height, as applicable. Expected crew response to failure after touch down shall be addressed, particularly for Cat-II/ Cat-III operations.
- xi) **Go-around Provisions.** Pilots are expected to appropriately recognize and react to ground or navigation system faults, failures or abnormalities at any point during the approach, before and after passing Alert Height or Decision Height and in the event an abnormality or failure which occurs after touch down. Crew shall be familiar with appropriate go-around techniques, systems to be used either automatically or manually, consequences of failures on go-around systems which may be used, the expected height loss during a manual or automatic go around considering various initiation altitudes, and appropriate consideration for obstacle clearance in the event that a missed approach must be initiated below Alert Height or Decision Height.



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- xii) **Reporting Anomalies.** Pilots shall be familiar with the need to report navigation system anomalies or discrepancies, or failures of approach lights, runway lights, touch down zone lights, center line lights or any other discrepancies which could be pertinent to subsequent Cat-II/ Cat-III operations.
- xiii) **Usage of Strobe Lights and Landing Lights** during Cat-II/ Cat-III approaches and their limitations.
- xiv) **MEL** Considerations/requirements like thrust reversers, wiper system, antiskid systems, auto-brakes etc.
- xv) **Recognition of and action to be taken** in the event of failure of ground equipment. Action to be taken in the event of failure of approach and landing equipment above and below Decision Height.
- xvi) Allocation of crew duties in carrying out the procedure.
- xvii) Procedure and precautions to be followed while taxiing during limited visibility conditions.
- xviii) Importance of correct seating and eye position.
- xix) Briefing procedure/tests prior to commencement of Cat-II/ Cat-III approaches.
- xx) Limitations of auto-flight system.
- xxi) Any other relevant item considered necessary by the operator.

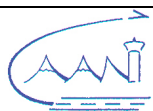
**ANNEXURE II****SIMULATOR TRAINING MANOEUVRES FOR CATEGORY- II LANDINGS**

Manoeuvres may be addressed individually as Category-II manoeuvre, or an appropriate sample of Category-II manoeuvres may be carried out and evaluated, if crew are to be Category-II qualified. Simulator training for Category-II landing shall address at least the following manoeuvres:

1. **Normal landings.** Normal landings at the lowest applicable Category-II minima, using representative auto-flight configurations or combinations of configurations authorized for use (e.g., flight director, autopilot, auto-throttles),
2. **Missed approach.** A missed approach from the lowest applicable DA (H), (may be combined with other manoeuvres),
3. **Balked landing.** A balked landing or missed approach from a low altitude that could result in a touchdown during go-around (balked landing or rejected landing - may be combined with other manoeuvres),
4. **System or NAVAID Failures.** Appropriate aircraft and ground system, NAVAID failures (may be combined with other manoeuvres),
5. **Engine Failures.** Engine failure (i) prior to approach, (ii) during approach, and (iii) during missed approach. (if specific flight characteristics of the aircraft or operational authorizations require this manoeuvre),
6. **Low Visibility Rollout.** Manual roll out with low visibility at applicable minima (may be combined),
7. **Realistic Environmental Conditions.** Landings (in simulation) with environmental conditions at a representative sample of limiting values authorized for applicable Category-II minima (e.g., regarding wind magnitude, headwind and crosswind components, turbulence, and runway surface friction characteristics (wet, snow, slippery - may be combined), and
8. **Non-normal configuration approaches and landings.** Representative non-normal configuration approaches and landings in instrument conditions shall be carried out. For these approaches, the simulated weather minima may be above, or well above, the lowest Category-II minima authorized. Minima shall be at levels that might typically be experienced in line operations, for a landing with the non-normal condition used. During these approaches, representative auto-flight, instrument, and aircraft system configurations or combinations of configurations shall be carried out (e.g., flight director, auto-pilot, auto-throttles, raw data, inoperative electrical or hydraulic components).



9. **Basic Airmanship Skills.** In accomplishing items 1 through 8 above, each pilot shall demonstrate competence, or be judged to have the necessary competence in "basic airmanship skills" to adequately address:
- a) **Manual Control.** Manual control, or reversion to manual control of the aircraft, if necessary, (for FBW aircraft, normal law or configuration is acceptable)
 - b) **Automation.** Proper use of automation
 - c) **Situation Awareness.** Appropriate planning and situation awareness, including terrain awareness,
 - d) **Detection and coping with adverse environmental factors.** Ability to detect and cope with adverse environmental conditions (e.g., applicable crosswinds, turbulence, windshear, convective weather, or adverse airport conditions (e.g., slippery runways),
 - e) **Detection and coping with adverse NAVAID factors.** Detection ability to detect and cope with adverse ground system, space system, or NAVAID failures or anomalies, and
 - f) **Crew coordination and CRM.** Proper crew co-ordination, and Crew Resource Management.
10. **Simulator Training Manoeuvres for Takeoffs.** For low visibility takeoff, the following manoeuvres and procedures shall be addressed (may be combined):
- a) **Normal takeoff,**
 - b) **Rejected takeoff** from a point prior to V₁ (including an engine failure) at low and high speed.
 - c) **Continued takeoff** following failures including engine failure, and any critical failures for the aircraft type which could lead to lateral asymmetry during the takeoff, or
 - d) **Limiting conditions.** The conditions under which these normal and rejected takeoffs shall be demonstrated include appropriate limiting cross winds, winds, gusts and runway surface friction levels authorized.



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ANNEXURE III

CAT-II PRECISION APPROACHES EVALUATION

Airline _____ Simulator Type/Category _____
Capt. _____ Co-Pilot _____ Flt. Engg. _____
Examiner _____
Date _____ From _____ To _____ Time _____

Sl.No.	Exercises	Satisfactory	Unsatisfactory
	INIT T/O		
1.	Cockpit Prepared by Instructor Engine Running, Fuel Freeze		
2.	Take-Off - Holding Cat-II Briefing		
3.	Approach-2/3 AP-DH100 FT-No Visual Contact Go-around – Radar Vectors – Down wind		
4.	Approach-2/3 AP- DH 100 Ft RVR 350 mts. Auto-land		
5.	Take-Off Fog Patches Engine Failure Before 100 kts – Reject Take-off		
6.	Take-off – Fog Patches – Continue Take-off		
7.	Approach – 2/3 AP – DH 100 Ft. – 1 Auto- throttle only Remaining auto-throttle fail at 500 ft. - - auto-land (if applicable)		
8.	Approach – 2/3 AP – DH 100 ft. Loss of Loc Transmitter at 200 ft. – auto-land warning (if applicable) – Go-around		
9. .	Approach – 2/3 AP – DH 100 ft. Engine failure above 100 ft. – Go-around		
10.	Approach – 2/3 AP – DH 100 ft. Engine Failure below 100 ft. – Land or take action specific to the aircraft		
11.	Approach – 2 AP (or 1 AP with dual channels) DH 100 ft. Auto-pilot disconnect at 80 ft. – Manual Landing		
12.	Down grading to Cat-I from Cat-II approach		

Remarks, if any.

Pilot's Signature Examiner/Instructor Signature.....
Licence No. Licence No.

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ANNEXURE IV

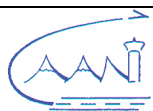
Simulator Training for Category–III Operations

Simulator training shall address at least the following manoeuvres and procedures for Category-III operations. During each of the specified manoeuvres or procedures, crew members are expected to perform their respective assignments or duties as applicable.

1. Normal landings at the lowest applicable Category-III minima.
2. A missed approach from the Alert Height or Decision Height (may be combined with other manoeuvres).
3. A missed approach from a low altitude that could result in a touch down during go-around (rejected landing).
4. Appropriate aircraft and ground system failures (may be combined with other manoeuvres).
5. Engine failure prior to or during approach.
6. Except for aircraft using an automatic Fail Operational roll out system, manual roll out in low visibility at applicable minima (may be combined).
7. Landings at the limiting environmental conditions for Category-III with respect to wind, cross wind components, and runway surface friction characteristics.

For Low Visibility Takeoff where a flight guidance system is required, the following manoeuvres and procedures shall be addressed:

1. Normal takeoff,
2. Rejected takeoff from a point prior to V₁ (including an engine failure), at low speed and high speed.
3. Continued takeoff following failures including engine failure after V₁, and any critical failures for the aircraft type which could lead to lateral asymmetry during the takeoff or the conditions under which these normal and rejected takeoffs shall be demonstrated include appropriate limiting cross winds, winds, gusts and runway surface friction levels authorized. A demonstration shall be done at weights or on runways that represent a critical field length.



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ANNEXURE V

CAT-III PRECISION APPROACHES EVALUATION

Airline _____ Simulator Type/Category _____
Capt. _____ Co-Pilot _____ Flt. Engg. _____
Examiner _____ Licence No. _____
Date _____ From _____ To _____ Time _____

Sl.No.	Exercises	Satisfactory	Unsatisfactory
	INIT T/O		
1.	Cockpit Prepared by Instructor Engine Running		
2.	Take-Off - Holding Cat-III Briefing		
3.	Approach-3/2 AP-DH50 FT*-NO Visual Contact Go-around – Radar Vectors		
4.	Approach-3/2 AP- DH 50 Ft *RVR 200/ 100 mts. Auto-land		
5.	Take-Off Fog Patches – Continue Take-Off –		
6.	Approach-3/2 AP-DH50FT* RVR 200/ 100 mts. Go-around or Auto-land		
7.	Approach-3/2 AP-DH 50 FT* Visual Contact – Auto-Land Roll Out Fault		
8.	Take-off Fog Patches Engine Failure before 100 kts - Reject Take Off		
9. .	Take-off RVR Reducing -- Visual cues lost Engine Failure at High Speed (Before V1) – Reject Take-off		
10.	App. Cat-III – 3/2 AP DH 50 Ft* Loss of LOC Transmitter at 200 ft. – Auto Level Warning Go- Around		
11.	App.Cat-III Both A/P Disconnect at 50 Ft*.– Go- around		
12.	App. Cat-III - 3/2 AP DH 50 Ft.* Engine Failure below 100 Ft. – Autoland		
13.	Down grading to Cat-II or Cat-I from Cat-III		

Remarks, if any.

Pilot's Signature Examiner/Instructor Signature.....

Licence No. Licence No.

Note* DH 50 FT for Cat-III A operations or as approved to operator for Cat-III B operations.



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ANNEXURE VI

RECORD OF CATEGORY-II AND CATEGORY-III APPROACHES

Name _____ Licence No. _____
Rank _____
Aircraft Type _____
Airline _____

CERTIFICATION

Category-II _____ Name of Examiner _____
Signature of Examiner _____ Licence No. _____
Category-III _____ Name of Examiner _____
Signature of Examiner _____ Licence No. _____

Date	Airport Rwy	A/c Regn	Category-II Category- III	Practice/ Actual	Remarks	Signatures



APPENDIX 7

OPERATION OF AIRBORNE COLLISION AVOIDANCE SYSTEM (ACAS) EQUIPMENT

(DOC 8168 PANS-OPS VOL I flight procedures)

7.1 ACAS OVERVIEW

7.1.1 The information provided by an ACAS is intended to assist pilots in the safe operation of aircraft by providing advice on appropriate action to reduce the risk of collision. This is achieved through resolution advisories (RAs), which propose manoeuvres, and through traffic advisories (TAs), which are intended to prompt visual acquisition and to act as a warning that an RA may follow. TAs indicate the approximate positions of intruding aircraft that may later cause resolution advisories. RAs propose vertical manoeuvres that are predicted to increase or maintain separation from threatening aircraft. ACAS I equipment is only capable of providing TAs, while ACAS II is capable of providing both TAs and RAs. In this chapter, reference to ACAS means ACAS II.

7.1.2 ACAS indications shall be used by pilots in the avoidance of potential collisions, the enhancement of situational awareness, and the active search for, and visual acquisition of, conflicting traffic.

7.1.3 Nothing in the procedures specified in 7.2 hereunder shall prevent pilots-in-command from exercising their best judgement and full authority in the choice of the best course of action to resolve a traffic conflict or avert a potential collision.

Note 1.— The ability of ACAS to fulfil its role of assisting pilots in the avoidance of potential collisions is dependent on the correct and timely response by pilots to ACAS indications. Operational experience has shown that the correct response by pilots is dependent on the effectiveness of the initial and recurrent training in ACAS procedures.

Note 2.— The normal operating mode of ACAS is TA/RA. The TA-only mode of operation is used in certain aircraft performance limiting conditions caused by in-flight failures or as otherwise promulgated by the appropriate authority.

Note 3.— ACAS Training Guidelines for Pilots are provided in the Attachment, “ACAS Training Guidelines for Pilots”.

7.2 USE OF ACAS INDICATORS

The indications generated by ACAS shall be used by pilots in conformity with the following safety considerations:

- a) pilots shall not manoeuvre their aircraft in response to traffic advisories (TAs) only;



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

APP 7-2

Note 1.— TAs are intended to alert pilots to the possibility of a resolution advisory (RA), to enhance situational awareness, and to assist in visual acquisition of conflicting traffic. However, visually acquired traffic may not be the same traffic causing a TA. Visual perception of an encounter may be misleading, particularly at night.

Note 2.— The above restriction in the use of TAs is due to the limited bearing accuracy and to the difficulty in interpreting altitude rate from displayed traffic information.

b) on receipt of a TA, pilots shall use all available information to prepare for appropriate action if an RA occurs; and

c) in the event of an RA, pilots shall:

- 1) respond immediately by following the RA as indicated, unless doing so would jeopardize the safety of the aeroplane;

Note 1.— Stall warning, wind shear, and ground proximity warning system alerts have precedence over ACAS.

Note 2.— Visually acquired traffic may not be the same traffic causing an RA. Visual perception of an encounter may be misleading, particularly at night.

- 2) follow the RA even if there is a conflict between the RA and an air traffic control (ATC) instruction to manoeuvre;

- 3) not manoeuvre in the opposite sense to an RA;

Note.— In the case of an ACAS-ACAS coordinated encounter, the RAs complement each other in order to reduce the potential for collision. Manoeuvres, or lack of manoeuvres, that result in vertical rates opposite to the sense of an RA could result in a collision with the intruder aircraft.

- 4) as soon as possible, as permitted by flight crew workload, notify the appropriate ATC unit of any RA which requires a deviation from the current ATC instruction or clearance;

Note.— Unless informed by the pilot, ATC does not know when ACAS issues RAs. It is possible for ATC to issue instructions that are unknowingly contrary to ACAS RA indications. Therefore, it is important that ATC be notified when an ATC instruction or clearance is not being followed because it conflicts with an RA.

- 5) promptly comply with any modified RAs;
- 6) limit the alterations of the flight path to the minimum extent necessary to comply with the RAs;
- 7) promptly return to the terms of the ATC instruction or clearance when the conflict is resolved; and
- 8) notify ATC when returning to the current clearance.



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APP 7-3

Note.— Procedures in regard to ACAS-equipped aircraft and the phraseology to be used for the notification of manoeuvres in response to a resolution advisory are contained in the PANS-ATM (Doc 4444), Chapters 15.7.3 and 12.3.1.2 respectively.

7.3 HIGH VERTICAL RATE (HVR) ENCOUNTERS

Pilots should use appropriate procedures by which an aeroplane climbing or descending to an assigned altitude or flight level, especially with an autopilot engaged, may do so at a rate less than 8 m/s (or 1 500 ft/min) throughout the last 300 m (or 1 000 ft) of climb or descent to the assigned altitude or flight level when the pilot is made aware of another aircraft at or approaching an adjacent altitude or flight level, unless otherwise instructed by ATC. These procedures are intended to avoid unnecessary ACAS II resolution advisories in aircraft at or approaching adjacent altitudes or flight levels. For commercial operations, these procedures should be specified by the operator. Detailed information on HVR encounters and guidance material concerning the development of appropriate procedures is contained in Attachment B to this part.



Attachment A to Appendix 7

ACAS TRAINING GUIDELINES FOR PILOTS

Note.— The acronym “ACAS” is used in this attachment to indicate “ACAS II”.

1. INTRODUCTION

- 1.1 During the implementation of ACAS and the operational evaluations conducted by States, several operational issues were identified that were attributed to deficiencies in pilot training programmes. To address these deficiencies, a set of performance-based training objectives for ACAS pilot training was developed.

The training objectives cover:

- theory of operation;
- pre-flight operations;
- general in-flight operations;
- response to traffic advisories (TAs); and
- response to resolution advisories (RAs).

The training objectives are further divided into the areas of:

- ACAS academic training;
- ACAS manoeuvre training;
- ACAS initial evaluation; and
- ACAS recurrent qualification.

- 1.2 ACAS academic training material has been divided into items that are considered essential training and those that are considered desirable. Those items that are deemed to be essential are a requirement for each ACAS operator. In each area, a list of objectives and acceptable performance criteria is defined. All manoeuvre training is considered essential.

- 1.3 In developing this material, no attempt was made to define how the training programme should be implemented. Instead, objectives were established that define the knowledge a pilot operating ACAS is expected to possess and the performance expected from a pilot who has completed ACAS training. Therefore, all pilots who operate ACAS equipment should receive the ACAS training described below.

2. ACAS ACADEMIC TRAINING

2.1 General

This training is typically conducted in a classroom environment. The knowledge demonstrations specified in this section may be achieved through the successful completion of written tests or providing correct responses to non-realtime computer-based training (CBT) questions.



2.2 Essential items

2.2.1 *Theory of operation.* The pilot must demonstrate an understanding of ACAS operation and the criteria used for issuing TAs and RAs. This training should address the following topics:

2.2.1.1 System operation

OBJECTIVE: Demonstrate knowledge of how ACAS functions.

CRITERIA: The pilot must demonstrate an understanding of the following functions:

a) Surveillance:

- 1) ACAS interrogates other transponder-equipped aircraft within a nominal range of 26 km (14 NM); and
- 2) ACAS surveillance range can be reduced in geographic areas with a large number of ground interrogators and/or ACAS-equipped aircraft. A minimum surveillance range of 8.5 km (4.5 NM) is guaranteed for ACAS aircraft that are airborne.

Note.— If the operator's ACAS installation provides for the use of the Mode S extended squitter, the normal surveillance range may be increased beyond the nominal 14 NM. However, this information is not used for collision avoidance purposes.

b) Collision avoidance:

- 1) TAs can be issued against any transponder-equipped aircraft that responds to the ICAO Mode C interrogations, even if the aircraft does not have altitude-reporting capability;

Note.— SSR transponders having only Mode A capability do not generate TAs. ACAS does not use Mode A interrogations; therefore, the Mode A transponder codes of nearby aircraft are not known to ACAS. In ICAO SARPs, Mode C minus the altitude is not considered Mode A because of the difference in the pulse intervals. ACAS uses the framing pulses of replies to Mode C interrogations and will track and may display aircraft equipped with an operating Mode A/C transponder whether or not the altitude-reporting function has been enabled.

- 2) RAs can be issued only against aircraft that are reporting altitude and in the vertical plane only;
- 3) RAs issued against an ACAS-equipped intruder are coordinated to ensure that complementary RAs are issued;
- 4) failure to respond to an RA deprives the aircraft of the collision protection provided by its ACAS. Additionally, in ACAS-ACAS encounters, it also restricts the choices available to the other aircraft's ACAS and thus renders the other aircraft's ACAS less effective than if the first aircraft were not ACAS-equipped; and



- 5) manoeuvring in a direction opposite to that indicated by an RA is likely to result in further reduction in separation. This is particularly true in the case of an ACAS-ACAS coordinated encounter.

2.2.1.2 Advisory thresholds

OBJECTIVE: Demonstrate knowledge of the criteria for issuing TAs and RAs.

CRITERIA: The pilot must be able to demonstrate an understanding of the methodology used by ACAS to issue TAs and RAs and the general criteria for the issuance of these advisories to include:

- a) ACAS advisories are based on time to closest point of approach (CPA) rather than distance. The time must be short and vertical separation must be small, or projected to be small, before an advisory can be issued. The separation standards provided by air traffic services are different from those against which ACAS issues alerts;
- b) thresholds for issuing a TA or RA vary with altitude. The thresholds are larger at higher altitudes;
- c) TAs generally occur from 20 to 48 seconds prior to CPA. When ACAS is operated in TA-only mode, RAs will be inhibited;
- d) RAs occur from 15 to 35 seconds before the projected CPA; and
- e) RAs are chosen to provide the desired vertical separation at CPA. As a result, RAs can instruct a climb or descent through the intruder aircraft's altitude.

2.2.1.3 ACAS limitations

OBJECTIVE: To verify that the pilot is aware of the limitations of ACAS.

CRITERIA: The pilot must demonstrate a knowledge and understanding of the ACAS limitations including:

- a) ACAS will neither track nor display non-transponder-equipped aircraft, nor aircraft with an inoperable transponder, nor aircraft with a Mode A transponder;
- b) ACAS will automatically fail if the input from the aircraft's barometric altimeter, radio altimeter, or transponder is lost;

Note.- In some installations, the loss of information from other on-board systems such as an inertial reference system (IRS) or attitude and heading reference system (AHRS) may result in an ACAS failure. Individual operators should ensure that their pilots are aware of what types of aircraft system failures will result in an ACAS failure.

- c) some aircraft within 116 m (380 ft) above ground level (AGL) (nominal value) will not be displayed. If ACAS is able to determine that an aircraft below this altitude is airborne, it will be displayed;



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- d) ACAS may not display all proximate transponder-equipped aircraft in areas of high-density traffic; however, it will still issue RAs as necessary;
- e) because of design limitations, the bearing displayed by ACAS is not sufficiently accurate to support the initiation of horizontal manoeuvres based solely on the traffic display;
- f) because of design limitations, ACAS will neither display nor give alerts against intruders with a vertical speed in excess of 3 048 m/min (10 000 ft/min). In addition, the design implementation may result in some short-term errors in the tracked vertical speed of an intruder during periods of high vertical acceleration by the intruder; and
- g) stall warnings, ground proximity warning system (GPWS)/enhanced ground proximity warning system (EGPWS) warnings, and wind shear warnings take precedence over ACAS advisories. When either a GPWS/EGPWS or wind shear warning is active, ACAS will automatically switch to the TA-only mode of operation except that ACAS aural annunciations will be inhibited. ACAS will remain in TA-only mode for 10 seconds after the GPWS/EGPWS or wind shear warning is removed.

2.2.1.4 ACAS inhibits

OBJECTIVE: To verify that the pilot is aware of the conditions under which certain functions of ACAS are inhibited.

CRITERIA: The pilot must demonstrate a knowledge and understanding of the various ACAS inhibits including:

- a) increase descent RAs are inhibited below 442 ("30) m (1 450 ("100) ft) AGL;
- b) descend RAs are inhibited below 335 ("30) m (1 100 ("100) ft) AGL;
- c) all RAs are inhibited below 305 ("30) m (1 000 ("100) ft) AGL;
- d) all ACAS aural annunciations are inhibited below 152 ("30) m (500 ("100) ft) AGL. This includes the aural annunciation for TAs; and
- e) altitude and configuration under which climb and increase climb RAs are inhibited. ACAS can still issue climb and increase climb RAs when operating at the aircraft's maximum altitude or certified ceiling. However, if aeroplane performance at maximum altitude is not sufficient to enable compliance with the climb rate required by a climb RA, the response should still be in the required sense but not beyond the extent permitted by aeroplane performance limitations.

Note.- In some aircraft types, climb or increase climb RAs are never inhibited.

2.2.2 Operating procedures. The pilot must demonstrate the knowledge required to operate ACAS and interpret the information presented by ACAS. This training should address the following topics:



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2.2.2.1 Use of controls

OBJECTIVE: To verify that the pilot can properly operate all ACAS and display controls.

CRITERIA: Demonstrate the proper use of controls including:

- a) aircraft configuration required to initiate a self-test;
- b) steps required to initiate a self-test;
- c) recognizing when the self-test is successful and when it is unsuccessful. When the self-test is unsuccessful, recognizing the reason for the failure, and, if possible, correcting the problem;
- d) recommended usage of traffic display range selection. Low ranges are used in the terminal area, and the higher display ranges are used in the en-route environment and in the transition between the terminal and en-route environment;
- e) if available, recommended usage of the AAbove/Below@ mode selector. AAbove@ mode should be used during climb, and ABelow@ mode should be used during descent;
- f) recognition that the configuration of the traffic display, i.e. range and AAbove/Below@ selection, does not affect the ACAS surveillance volume;
- g) selection of lower ranges on the traffic display to increase display resolution when an advisory is issued;
- h) if available, proper selection of the display of absolute or relative altitude and the limitations of using the absolute display option if a barometric correction is not provided to ACAS; and
- i) proper configuration to display the appropriate ACAS information without eliminating the display of other needed information.

Note.- The wide variety of display implementations makes it difficult to establish more definitive criteria. When the training programme is developed, these general criteria should be expanded to cover specific details for an operator's specific display implementation.

2.2.2.2 Display interpretation

OBJECTIVE: To verify that a pilot understands the meaning of all information that can be displayed by ACAS.

CRITERIA: The pilot must demonstrate the ability to properly interpret information displayed by ACAS including:

- a) other traffic, i.e. traffic within the selected display range that is not proximate traffic, or causing a TA or RA to be issued;



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- b) proximate traffic, i.e. traffic that is within 11 km (6 NM) and "366 m (1 200 ft);
- c) non-altitude reporting traffic;
- d) no bearing TAs and RAs;
- e) off-scale TAs and RAs. The selected range should be changed to ensure that all available information on the intruder is displayed;
- f) traffic advisories. The minimum available display range that allows the traffic to be displayed should be selected to provide the maximum display resolution;
- g) resolution advisories (traffic display). The minimum available display range of the traffic display that allows the traffic to be displayed should be selected to provide the maximum display resolution;
- h) resolution advisories (RA display). Pilots should demonstrate knowledge of the meaning of the red and green areas or the meaning of pitch or flight path angle cues displayed on the RA display. For displays using red and green areas, pilots should demonstrate knowledge of when the green areas will and will not be displayed. Pilots should also demonstrate an understanding of the RA display limitations, i.e. if a vertical speed tape is used and the range of the tape is less than 762 m/min (2,500 ft/min), how an increase rate RA will be displayed; and
- i) if appropriate, awareness that navigation displays oriented ATrack-Up@ may require a pilot to make a mental adjustment for drift angle when assessing the bearing of proximate traffic.

Note.- The wide variety of display implementations will require the tailoring of some criteria. When the training programme is developed, these criteria should be expanded to cover details for an operator's specific display implementation.

2.2.2.3 Use of the TA-only mode

OBJECTIVE: To verify that a pilot understands the appropriate times to select the TA-only mode of operation and the limitations associated with using this mode.

CRITERIA: The pilot must demonstrate the following:

- a) knowledge of the operator's guidance for the use of TA-only mode;
- b) reasons for using this mode and situations in which its use may be desirable. These include operating in known close proximity to other aircraft such as when visual approaches are being used to closely spaced parallel runways or taking off towards aircraft operating in a VFR corridor. If TA-only mode is not selected when an airport is conducting simultaneous operations from parallel runways separated by less than 366 m (1 200 ft), and to some intersecting runways, RAs can be expected. If an RA is received in these situations, the response should comply with the operator's approved procedures; and



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- c) the TA aural annunciation is inhibited below 152 m ("30) m (500 ft ("100 ft)) AGL. As a result, TAs issued below 152 m (500 ft) AGL may not be noticed unless the TA display is included in the routine instrument scan.

2.2.2.4 Crew coordination

OBJECTIVE: To verify that pilots adequately brief other crew members on how ACAS advisories will be handled.

CRITERIA: Pilots must demonstrate that their pre-flight briefing addresses the procedures that will be used in responding to TAs and RAs including:

- a) division of duties between the pilot flying and the pilot not flying, including a clear definition of whether the pilot flying or the pilot-in-command will fly the aircraft during a response to an RA;
- b) expected call-outs;
- c) communications with ATC; and
- d) conditions under which an RA may not be followed and who will make this decision.

Note 1.- Different operators have different procedures for conducting pre-flight briefings and for responding to ACAS advisories. These factors should be taken into consideration when implementing the training programme.

Note 2.- The operator must specify the conditions under which an RA need not be followed, reflecting advice published by States' Civil Aviation Authorities. This should not be an item left to the discretion of a crew.

Note 3.- This portion of the training may be combined with other training such as crew resource management (CRM).

2.2.2.5 Reporting requirements

OBJECTIVE: To verify that the pilot is aware of the requirements for reporting RAs to the controller and other authorities.

CRITERIA: The pilot must demonstrate the following:

- a) the use of the phraseology contained in the *Procedures for Air Navigation Services - Air Traffic Management* (PANS-ATM, Doc 4444); and
- b) where information can be obtained regarding the need for making written reports to various States when an RA is issued. Various States have different reporting requirements and the material available to the pilot should be tailored to the airline's operating environment.



2.3 Desirable items

2.3.1 *Advisory thresholds*

OBJECTIVE: Demonstrate knowledge of the criteria for issuing TAs and RAs.

CRITERIA: The pilot must be able to demonstrate an understanding of the methodology used by ACAS to issue TAs and RAs and the general criteria for the issuance of these advisories to include:

- a) the TA altitude threshold is 259 m (850 ft) below FL 420 and 366 m (1 200 ft) above FL 420;
- b) when the vertical separation at CPA is projected to be less than the ACAS-desired separation, an RA requiring a change to the existing vertical speed will be issued. The ACAS-desired separation varies from 91 m (300 ft) at low altitude to a maximum of 213 m (700 ft) above FL 300;
- c) when the vertical separation at CPA is projected to be greater than the ACAS-desired separation, an RA that does not require a change to the existing vertical speed will be issued. This separation varies from 183 to 244 m (600 to 800 ft); and
- d) RA fixed-range thresholds vary between 0.4 km (0.2 NM) at low altitude and 2 km (1.1 NM) at high altitude. These fixed-range thresholds are used to issue RAs in encounters with slow closure rates.

3. ACAS MANOEUVRE TRAINING

- 3.1 When training pilots to properly respond to ACAS-displayed information, TAs and RAs are most effective when accomplished in a flight simulator equipped with an ACAS display and controls similar in appearance and operation to those in the aircraft. If a simulator is utilized, CRM aspects of responding to TAs and RAs should be practised during this training.
- 3.2 If an operator does not have access to an ACAS-equipped simulator, the initial ACAS evaluation should be conducted by means of an interactive CBT with an ACAS display and controls similar in appearance and operation to those in the aircraft the pilot will fly. This interactive CBT should depict scenarios in which real-time responses must be made. The pilot should be informed whether or not the responses made were correct. If the response was incorrect or inappropriate, the CBT should show what the correct response should be.
- 3.3 The scenarios in the manoeuvre training should include initial RAs that require a change in vertical speed; initial RAs not requiring a change in vertical speed; maintain rate RAs; altitude crossing RAs; increase rate RAs; RA reversals; weakening RAs; RAs issued while the aircraft is at a maximum altitude, and multi-aircraft encounters. In all scenarios, excursions should be limited to the extent required by the RA. The scenarios should be concluded with a return to the original flight profile. The scenarios should also include



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demonstrations of the consequences of not responding to RAs, slow or late responses, and manoeuvring opposite to the direction called for by the displayed RA as follows:

3.3.1 *TA responses*

OBJECTIVE: To verify that the pilot properly interprets and responds to TAs.

CRITERIA: The pilot must demonstrate:

- a) proper division of responsibilities between the pilot flying and the pilot not flying. The pilot flying should continue to fly the aeroplane and be prepared to respond to any RA that might follow. The pilot not flying should provide updates on the traffic location shown on the ACAS traffic display and use this information to help visually acquire the intruder;
- b) proper interpretation of the displayed information. Visually search for the traffic causing the TA at a location shown on the traffic display. Use should be made of all information shown on the display, note being taken of the bearing and range of the intruder (amber circle), whether it is above or below (data tag), and its vertical speed direction (trend arrow);
- c) other available information is used to assist in visual acquisition. This includes ATC Aparty-line@ information, traffic flow in use, etc.;
- d) because of the limitations described in 2.2.1.3 e), that no manoeuvres are made based solely on the information shown on the ACAS display; and
- e) when visual acquisition is attained, right of way rules are used to maintain or attain safe separation. No unnecessary manoeuvres are initiated. The limitations of making manoeuvres based solely on visual acquisition are understood.

3.3.2 *RA responses*

OBJECTIVE: To verify THAT the pilot properly interprets and responds to RAs.

CRITERIA: The pilot **MUST** demonstrate:

- a) proper division of responsibilities between the pilot flying and the pilot not flying. The pilot flying should respond to the RA with positive control inputs, when required, while the pilot not flying is providing updates on the traffic location, checking the traffic display and monitoring the response to the RA. Proper CRM should be used. If the operator's procedures require the pilot-in-command to fly all RAs, transfer of aircraft control should be demonstrated;
- b) proper interpretation of the displayed information. The pilot recognizes the intruder causing the RA to be issued (red square on display). The pilot responds appropriately;
- c) for RAs requiring a change in vertical speed, initiation of a response in the proper direction within five seconds of the RA being displayed. Pilot actions must focus on



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tasks related to manoeuvring the aeroplane in response to the RA and flight crew coordination, avoiding distractions that may interfere with a correct and timely response. After initiating the manoeuvre, and as soon as possible, as permitted by flight workload, ATC is notified using the standard phraseology if the manoeuvre requires a deviation from the current ATC instruction or clearance;

Note.— Appendix 7 para 3.2 c) 1), states that in the event of an RA, pilots should respond immediately and manoeuvre as indicated, unless doing so would jeopardize the safety of the aeroplane.

- d) for RAs not requiring a change in vertical speed, focus on tasks associated with following the RA, including preparedness for a modification to the initially displayed RA where a change in vertical speed may be required. Distractions that may interfere with a correct and timely response must be avoided;
- e) recognition of and the proper response to modifications to the initially displayed RA:
 - 1) for increase rate RAs, the vertical speed is increased within 2 1/2 seconds of the RA being displayed;
 - 2) for RA reversals, the manoeuvre is initiated within 2 1/2 seconds of the RA being displayed;
 - 3) for RA weakenings, the vertical speed is modified to initiate a return towards level flight within 2 ½ seconds of the RA being displayed; and
 - 4) for RAs that strengthen, the manoeuvre to comply with the revised RA is initiated within 2 1/2 seconds of the RA being displayed;
- f) recognition of altitude crossing encounters and the proper response to these RAs;
- g) for RAs that do not require a change in vertical speed, the vertical speed needle or pitch angle remains outside the red area on the RA display;
- h) for maintain rate RAs, the vertical speed is not reduced. Pilots should recognize that a maintain rate RA may result in crossing through the intruder's altitude;
- i) that if a justified decision is made to not follow an RA, the resulting vertical rate is not in a direction opposite to the sense of the displayed RA;
- j) that the deviation from the current clearance is minimized by levelling the aircraft when the RA weakens and when "Clear of Conflict" is annunciated, executing a prompt return to the current clearance; and notifying ATC as soon as possible, as permitted by flight crew workload;
- k) that when possible, an ATC clearance is complied with while responding to an RA. For example, if the aircraft can level at the assigned altitude while responding to a reduce climb or reduce descent RA, it should be done;



- l) that when simultaneous conflicting instructions to manoeuvre are received from ATC and an RA, the RA is followed and, as soon as possible, as permitted by flight crew workload, ATC is notified using the standard phraseology;
- m) a knowledge of the ACAS multi-aircraft logic and its limitations, and that ACAS can optimize separation from two aircraft by climbing or descending towards one of them. For example, ACAS considers as intruders only aircraft that it finds to be a threat when selecting an RA. As such, it is possible for ACAS to issue an RA against one intruder, which results in a manoeuvre towards another intruder that is not classified as a threat. If the second intruder becomes a threat, the RA will be modified to provide separation from that intruder;
- n) a knowledge of the consequences of not responding to an RA and manoeuvring in the direction opposite to the RA; and
- o) that a prompt response is made when a climb RA is issued while the aircraft is at the maximum altitude.

4. ACAS INITIAL EVALUATION

- 4.1 The pilot's understanding of the academic training items should be assessed by means of a written test or interactive CBT that records correct and incorrect responses to questions.
- 4.2 The pilot's understanding of the manoeuvre training items should be assessed in a flight simulator equipped with an ACAS display and controls similar in appearance and operation to those in the aircraft the pilot will fly, and the results assessed by a qualified instructor, inspector, or check pilot. The range of scenarios should include: initial RAs requiring a change in vertical speed; initial RAs that do not require a change in vertical speed; maintain rate RAs; altitude crossing RAs; increase rate RAs; RA reversals; weakening RAs; RAs issued while the aircraft is at the maximum altitude, and multi-aircraft encounters. In all scenarios, excursions should be limited to the extent required by the RA. The scenarios should be concluded with a return to the original flight profile. The scenarios should also include demonstrations of the consequences of not responding to RAs, slow or late responses, and manoeuvring opposite to the direction called for by the displayed RA.
- 4.3 If an operator does not have access to an ACAS-equipped simulator, the initial ACAS evaluation should be conducted by means of an interactive CBT with an ACAS display and controls similar in appearance and operation to those in the aircraft the pilot will fly. This interactive CBT should depict scenarios in which real-time responses must be made, and a record should be made of whether or not each response was correct. The CBT should include all types of RAs described in 4.2.

5. ACAS RECURRENT TRAINING

- 5.1 ACAS recurrent training ensures that pilots maintain the appropriate ACAS knowledge and skills. ACAS recurrent training should be integrated into and/or conducted in conjunction with other established recurrent training programmes. An essential item of



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recurrent training is the discussion of any significant issues and operational concerns that have been identified by the operator.

- 5.2 ACAS monitoring programmes periodically publish findings from their analyses of ACAS events. The results of these analyses typically discuss technical and operational issues related to the use and operation of ACAS. This information is available from ICAO or directly from the monitoring programmes. ACAS recurrent training programmes should address the results of monitoring programmes in both the academic and simulator portions of recurrent training visits.

Note.- ACAS monitoring programmes are carried out by some States and international organizations including the United States' Federal Aviation Administration (FAA) and the European Organisation for the Safety of Air Navigation (EUROCONTROL).

- 5.3 Recurrent training should include both academic and manoeuvre training and address any significant issues identified by line operating experience, system changes, procedural changes, or unique characteristics such as the introduction of new aircraft/ display systems or operations in airspace where high numbers of TAs and RAs have been reported.

- 5.4 Pilots should fly all scenarios once every four years.

- 5.5 Pilots should complete all scenarios once every two years if CBT is used.



Attachment B to Appendix 7

ACAS HIGH VERTICAL RATE (HVR) ENCOUNTERS

1. ACAS PERFORMANCE DURING HIGH VERTICAL RATE (HVR) ENCOUNTERS

- 1.1 As of 2006, data collected by ACAS monitoring programmes continue to show that a large percentage of ACAS RAs 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 SARPs and guidance material (see Annex 10, Volume I) that have been effective in reducing the frequency of occurrence for these types of RAs, but these types of RAs 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 autothrottles) 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 descent 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 (or 3 000 ft/min) until they are within 150 m (or 500 ft) of the aircraft's assigned altitude. When a climbing or descending aircraft maintains a vertical speed in excess of 15 m/s (or 3 000 ft/min) until it is within 150 m (or 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 (or 1 500 ft/min). Depending on the altitude of the level aircraft, this RA will typically be issued when the intruder aircraft is approximately 150 m (or 500 ft) below its assigned altitude and the vertical speed of the intruder is in excess of 15 m/s (or 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 manoeuvre to increase vertical separation from the intruder aircraft.

2. OPERATIONAL IMPACTS OF RAs RESULTING FROM HVR ENCOUNTERS

- 2.1 Shortly after ACAS issues the RA (climb RA for the encounter geometry shown in Figure 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 RAs issued in this encounter geometry are unwelcome. The RAs 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 RAs decrease their confidence in the performance of ACAS. These RAs typically occur repeatedly in the same geographic area, and repeated RAs 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 airspace is structured and managed. Data collected during 2001 indicate that up to 70 per cent of the RAs 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 RAs issued within one hour, although airspace containing a lower density of traffic will have relatively few RAs 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 RAs, but these types of RAs continue to occur with a high degree of regularity in airspace throughout the world.
- 3.2 HVR RAs 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 RAs of this type have been observed above FL 290 in the past. With the current



reduced separation, it is possible that HVR RAs may occur more frequently above FL 290 in RVSM airspace. Many HVR RAs 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 RAs occur in geographic areas where there is a concentration of climbing and descending aircraft.

4. ACAS FEATURES THAT REDUCE THE LIKELIHOOD OF RAs BEING ISSUED IN THESE SITUATIONS

- 4.1 ACAS recognizes HVR encounters, such as that shown in Figure 1. When this encounter geometry is detected, the issuance of RAs 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 (or 3 000 ft/min) until it is within 150 m (or 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. However, this is not considered to be a viable approach to reducing these types of RAs 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 RAs.

5. OPERATOR-SPECIFIED PROCEDURES

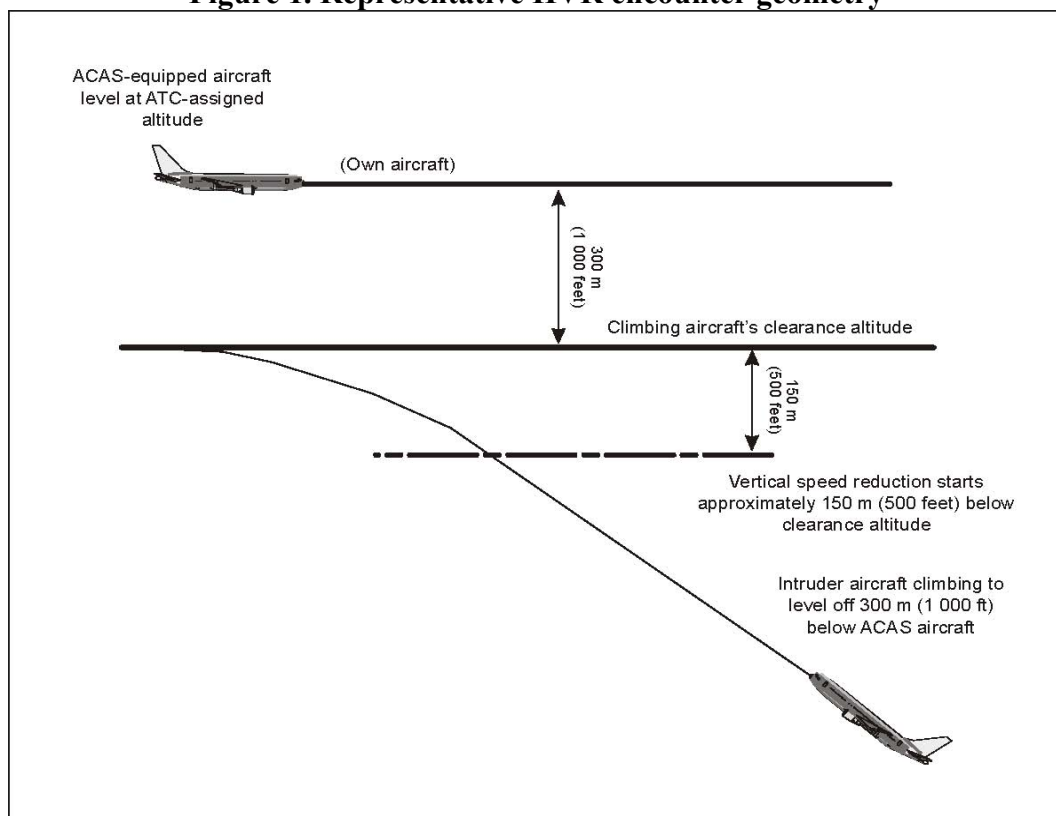
- 5.1 Due to the operational impacts on pilots and controllers caused by these types of RAs, and the continued existence of these RAs and the constraints on further modifications to ACAS, operators should specify procedures by which an aeroplane climbing or descending to an assigned altitude or flight level with an autopilot engaged may do so at a rate less than 8 m/sec (or 1 500 ft/min) within 300 m (or 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 RAs.
- 5.2 The implementation of such procedures will not completely eliminate these RAs, but in the absence of other solutions, such as the redesign of airspace, their implementation will reduce the frequency of these undesirable RAs until a technical solution can be developed. Options that operators should consider include flying the entire climb or descent at a preselected 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 or flight level, *and* when the pilot is aware that there is an aircraft at or approaching an adjacent altitude or flight level. The crew can be made aware of the presence of that aircraft by several means, including information provided by an air traffic controller, an ACAS TA or by visual acquisition. When a crew of an intruder aircraft becomes aware that another aircraft is at or approaching an adjacent altitude or flight level, it is recommended that the vertical speed

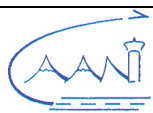
of the intruder aircraft be reduced to less than 8 m/s (or 1 500 ft/min) when approaching an altitude that is 300 m (or 1 000 ft) above or below the assigned altitude or flight level.

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 When the autopilot is in the altitude capture mode, subsequent vertical mode changes such as the selection of a vertical speed mode may cause some autopilots either to cancel the altitude capture or to not properly capture the selected altitude. 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 manoeuvres. 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.

Figure 1. Representative HVR encounter geometry





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Attachment C to Appendix 7

PILOT/OBSERVER RA REPORT

GENERAL				
AIR OPERATOR				
PILOT				
OBSERVER				
Contact Phone Number				
RADAR				
FLIGHT No.				
AIRCRAFT REGN No.				
AIRCRAFT TYPE				
Point of Departure				
Destination				
Date and Time of event in UTC				
Own aircraft altitude				
Own aircraft position	FIR:	VOR:	Radial:	DME:
	<i>OR</i>			
	Latitude:		Longitude:	
PHASE OF FLIGHT				
<i>Check appropriate box</i>	Take off	Climb	Cruise	Descent
	Hold	Final	Missed Approach	
Clearance (<i>indicate in feet or Flight Level</i>)				
TA INFORMATION				
TA issued ?	Yes:		No:	
Visual contact prior to RA?	Yes:		No:	
ATS advisory?	Yes:		No:	
RA INFORMATION				
Intruder Bearing	o'clock			
Intruder Range	Nautical miles			
Relative altitude	Feet			
Type of RA	(<i>"climb", "crossing climb", "VSL 500", "descend", etc.</i>)			



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

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Did you follow the RA?	Yes:	No:		
If applicable, did ATS instruction conflict with the RA?	Yes:	No:		
Was RA necessary?	Yes:	No:		
GENERAL INFORMATION				
Flight Conditions (check appropriate box)	IMC	VMC	DAY	NIGHT
Visibility	kilometres			
Air Traffic Service provided				
Aerodrome/Approach control				
Flight Information				

REMARKS

The report should be forwarded to

- (i) the DG, CAAN, Babar Mahal, Kathmandu, phone 01-426326
- (ii) the concerned Tower (copy)



APPENDIX 8.

FLIGHT RECORDERS

The material in this Appendix concerns flight recorders intended for installation in aeroplanes engaged in international air navigation. Crash protected flight recorders comprise one or more of the following systems: a flight data recorder (FDR), a cockpit voice recorder (CVR), an airborne image recorder (AIR) and/or a data link recorder (DLR). 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).

1. General requirements

1.1 Non-deployable flight recorder containers shall:

- a) be painted a distinctive orange or yellow colour;
- b) carry reflective material to facilitate their location; and
- c) have securely attached an automatically activated underwater locating device operating at a frequency of 37.5 kHz. At the earliest practicable date, but not later than 1 January 2018, this device shall operate for a minimum of 90 days.

Note.— Current industry practice is to phase out yellow flight recorder containers at the end of the service life of the flight recorder.

1.2 Automatic deployable flight recorder containers shall:

- a) be painted a distinctive orange colour, however the surface visible from outside the aircraft may be of another colour;
- b) carry reflective material to facilitate their location; and
- c) have an integrated automatically activated ELT.

1.3 The flight recorder systems shall be installed so that:

- a) the probability of damage to the recordings is minimized;
- b) they receive electrical power from a bus that provides the maximum reliability for operation of the flight recorder systems without jeopardizing service to essential or emergency loads;



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

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c) there is an aural or visual means for pre-flight checking that the flight recorder systems are operating properly; and

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.

1.4 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.

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

1.6 The manufacturer shall provide the appropriate certificating authority with the following information in respect of the flight recording systems:

- a) manufacturer's operating instructions, equipment limitations and installation procedures;
- b) parameter origin or source and equations which relate counts to units of measurement; and
- c) 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 Flight data recorders shall be classified as Type I, Type IA, Type II and Type IIA depending upon the number of parameters to be recorded and the duration required for retention of the recorded information.

2.2.2 The parameters that satisfy the requirements for FDRs are listed in the paragraphs below. The number of parameters to be recorded shall depend on aeroplane complexity. The parameters without an asterisk (*) are mandatory parameters which shall be recorded regardless of aeroplane complexity. In addition, the parameters designated by an asterisk (*) shall be recorded if an information data source for the parameter is used by aeroplane systems or the flight crew to operate the aeroplane. However, other parameters may be substituted with due regard to the aeroplane type and the characteristics of the recording equipment.



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

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2.2.2.1 The following parameters shall satisfy the requirements for flight path and speed:

- Pressure altitude
- Indicated airspeed or calibrated airspeed
- Air-ground status and each landing gear air-ground sensor when practicable
- Total or outside air temperature
- Heading (primary flight crew reference)
- Normal acceleration
- Lateral acceleration
- Longitudinal acceleration (body axis)
- Time or relative time count
- Navigation data*: drift angle, wind speed, wind direction, latitude/longitude
- Groundspeed*
- Radio altitude*

2.2.2.2 The following parameters shall satisfy the requirements for attitude:

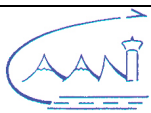
- Pitch attitude
- Roll attitude
- Yaw or sideslip angle*
- Angle of attack*

2.2.2.3 The following parameters shall satisfy the requirements for engine power:

- Engine thrust/power: propulsive thrust/power on each engine, cockpit thrust/power lever position
- Thrust reverse status*
- Engine thrust command*
- Engine thrust target*
- Engine bleed valve position*
- Additional engine parameters*: EPR, N1, indicated vibration level, N2, EGT, TLA, fuel flow, fuel cut-off lever position, N3

2.2.2.4 The following parameters shall satisfy the requirements for configuration:

- Pitch trim surface position
- Flaps*: trailing edge flap position, cockpit control selection
- Slats*: leading edge flap (slat) position, cockpit control selection
- Landing gear*: landing gear, gear selector position
- Yaw trim surface position*
- Roll trim surface position*
- Cockpit trim control input position pitch*
- Cockpit trim control input position roll*
- Cockpit trim control input position yaw*



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

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- Ground spoiler and speed brake*: Ground spoiler position, ground spoiler selection, speed brake position, speed brake selection
- De-icing and/or anti-icing systems selection*
- Hydraulic pressure (each system)*
- Fuel quantity in CG trim tank *
- AC electrical bus status*
- DC electrical bus status*
- APU bleed valve position*
- Computed centre of gravity*

2.2.2.5 The following parameters shall satisfy the requirements for operation:

- Warnings
- Primary flight control surface and primary flight control pilot input: pitch axis, roll axis, yaw axis
- Marker beacon passage
- Each navigation receiver frequency selection
- Manual radio transmission keying and CVR/FDR synchronization reference
- Autopilot/autothrottle/AFCS mode and engagement status*
- Selected barometric setting*: pilot, first officer
- Selected altitude (all pilot selectable modes of operation)*
- Selected speed (all pilot selectable modes of operation)*
- Selected Mach (all pilot selectable modes of operation)*
- Selected vertical speed (all pilot selectable modes of operation)*
- Selected heading (all pilot selectable modes of operation)*
- Selected flight path (all pilot selectable modes of operation)*: course/DSTRK, path angle
- Selected decision height*
- EFIS display format*: pilot, first officer
- Multi-function/engine/alerts display format*
- GPWS/TAWS/GCAS status*: selection of terrain display mode including pop-up display status, terrain alerts, both cautions and warnings, and advisories, on/off switch position
- Low pressure warning*: hydraulic pressure, pneumatic pressure
- Computer failure*
- Loss of cabin pressure*
- TCAS/ACAS (traffic alert and collision avoidance system/airborne collision avoidance system)*
- Ice detection*
- Engine warning each engine vibration*
- Engine warning each engine over temperature*
- Engine warning each engine oil pressure low*
- Engine warning each engine over speed*
- Wind shear warning*
- Operational stall protection, stick shaker and pusher activation*
- All cockpit flight control input forces*: control wheel, control column, rudder pedal cockpit input forces



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

APP 8-5

- Vertical deviation*: ILS glide path, MLS elevation, GNSS approach path
- Horizontal deviation*: ILS localizer, MLS azimuth, GNSS approach path
- DME 1 and 2 distances*
- Primary navigation system reference*: GNSS, INS, VOR/DME, MLS, Loran C, ILS
- Brakes*: left and right brake pressure, left and right brake pedal position
- Date*
- Event marker*
- Head up display in use*
- Para visual display on*

Note.— It is not intended that aeroplanes issued with an individual certificate of airworthiness before 1 January 2016 be modified to meet the range, sampling, accuracy or resolution guidance detailed in this Appendix.

2.2.2.6 Type IA FDR. This FDR shall be capable of recording, as appropriate to the aeroplane, at least the 78 parameters in ICAO Annex 6, Part I, Appendix 8, Table A8-1.

2.2.2.7 Type I FDR. This FDR shall be capable of recording, as appropriate to the aeroplane, at least the first 32 parameters in ICAO Annex 6, Part I, Appendix 8, Table A8-1.

2.2.2.8 Types II and IIA FDRs. These FDRs shall be capable of recording, as appropriate to the aeroplane, at least the first 16 parameters in ICAO Annex 6, Part I, Appendix 8, Table A8-1.

2.2.2.9 The parameters that satisfy the requirements for flight path and speed as displayed to the pilot(s) are listed below.

The parameters without an (*) are mandatory parameters which shall be recorded. In addition, the parameters designated by an (*) shall be recorded if an information source for the parameter is displayed to the pilot and is practicable to record:

- Pressure altitude
- Indicated airspeed or calibrated airspeed
- Heading (primary flight crew reference)
- Pitch attitude
- Roll attitude
- Engine thrust/power
- Landing-gear status*
- Total or outside air temperature*
- Time*
- Navigation data*: drift angle, wind speed, wind direction, latitude/longitude
- Radio altitude*



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

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2.3 Additional information

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

2.3.2 The measurement range, recording interval and accuracy of parameters on installed equipment shall be verified by methods approved by the appropriate certificating authority.

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

3. Cockpit voice recorder (CVR) and cockpit audio recording system (CARS)

3.1 Signals to be recorded

The CVR and CARS shall start to record prior to the aeroplane moving under its own power and record continuously until the termination of the flight when the aeroplane is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the CVR and CARS shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

3.1.1 The CVR shall record on four separate channels, or more, at least the following:

- a) voice communication transmitted from or received in the aeroplane by radio;
- b) aural environment on the flight deck;
- c) voice communication of flight crew members on the flight deck using the aeroplane's interphone system, if installed;
- d) voice or audio signals identifying navigation or approach aids introduced in the headset or speaker; and
- e) voice communication of flight crew members using the passenger address system, if installed

3.1.2 The CARS shall record on two separate channels, or more, at least the following:

- a) voice communication transmitted from or received in the aeroplane by radio;
- b) aural environment on the flight deck; and
- c) voice communication of flight crew members on the flight deck using the aeroplane's interphone system, if installed.



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

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3.1.3 The CVR shall be capable of recording on at least four channels simultaneously. On a tape-based CVR, to ensure accurate time correlation between channels, the CVR is to record in an in-line format. If a bi-directional configuration is used, the in-line format and channel allocation shall be retained in both directions.

3.1.4 The preferred channel allocation shall be as follows:

Channel 1 — co-pilot headphones and live boom microphone

Channel 2 — pilot headphones and live boom microphone

Channel 3 — area microphone

Channel 4 — time reference plus the third and fourth crew members' headphone and live microphone, if applicable.

Note 1.— Channel 1 is located closest to the base of the recording head.

Note 2.— The preferred channel 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.

4. Airborne image recorder (AIR) and airborne image recording system (AIRS)

4.1 Classes

4.1.1 A Class A AIR or AIRS captures the general cockpit area in order to provide data supplemental to conventional flight recorders.

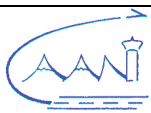
Note 1.— To respect crew privacy, the cockpit area view may be designed as far as practical to exclude the head and shoulders of crew members whilst seated in their normal operating position.

Note 2.— There are no provisions for Class A AIR or AIRS in this document.

4.1.2 A Class B AIR or AIRS captures data link message displays.

4.1.3 A Class C AIR or AIRS captures instruments and control panels.

Note.— A Class C AIR or AIRS may be considered as a means for recording flight data where it is not practical or is prohibitively expensive to record on an FDR or an ADRS, or where an FDR is not required.



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

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4.2 Operation

The AIR or AIRS must start to record prior to the aeroplane moving under its own power and record continuously until the termination of the flight when the aeroplane is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the AIR or AIRS must start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

5. Data link recorder (DLR)

5.1 Applications to be recorded

5.1.1 Where the aircraft flight path is authorized or controlled through the use of data link messages, all data link messages, both uplinks (to the aircraft) and downlinks (from the aircraft), shall be recorded on the aircraft. As far as practicable, the time the messages were displayed to the flight crew and the time of the responses shall be recorded.

Note.— Sufficient information to derive the content of the data link communications message and the time the messages were displayed to the flight crew is needed to determine an accurate sequence of events on board the aircraft.

5.1.2 Messages applying to the applications listed below shall be recorded. Applications without the asterisk (*) are mandatory applications which shall be recorded regardless of the system complexity. Applications with an (*) shall be recorded only as far as is practicable given the architecture of the system.

- Data link initiation capability
- Controller-pilot data link communications
- Data link flight information services
- Automatic dependent surveillance — contract
- Automatic dependent surveillance — broadcast*
- Aeronautical operational control*.

Note.— Descriptions of the applications are contained in ICAO Annex 6, Part I, Appendix 8, Table A8-2.

6. Aircraft data recording systems (ADRS)

6.1 Parameters to be recorded

ADRS shall be capable of recording, as appropriate to the aeroplane, at least the essential (E) parameters in ICAO Annex 6, Part I, Appendix 8, Table A8-3.



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

APP 8-9

6.2 Additional information

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

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

7. Inspections of flight recorder systems

7.1 Prior to the first flight of the day, the built-in test features for the flight recorders and flight data acquisition unit (FDAU), when installed, shall be monitored by manual and/or automatic checks.

7.2 FDR systems or ADRS, CVR systems or CARS, and AIR systems or AIRS shall have recording system inspection intervals of one year; subject to the approval from the appropriate regulatory authority, this period may be extended to two years provided these systems have demonstrated a high integrity of serviceability and self-monitoring. DLR systems or DLRS shall have recording system inspection intervals of two years; subject to the approval from the appropriate regulatory authority, this period may be extended to four years provided these systems have demonstrated high integrity of serviceability and self-monitoring.

7.3 Recording system inspections shall be carried out as follows:

- a) an analysis of the recorded data from the flight recorders shall ensure that the recorder operates correctly for the nominal duration of the recording;
- b) the analysis of the FDR or ADRS shall evaluate the quality of the recorded data to determine if the bit error rate (including those errors introduced by recorder, the acquisition unit, the source of the data on the aeroplane and by the tools used to extract the data from the recorder) is within acceptable limits and to determine the nature and distribution of the errors;
- c) a complete flight recording from the FDR or ADRS shall be examined in engineering units to evaluate the validity of all recorded parameters. Particular attention shall be given to parameters from sensors dedicated to the FDR or ADRS. Parameters taken from the aircraft's electrical bus system need not be checked if their serviceability can be detected by other aircraft systems;



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d) the readout facility shall have the necessary software to accurately convert the recorded values to engineering units and to determine the status of discrete signals;

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

f) where practicable, during the examination, a sample of in-flight recordings of the CVR or CARS shall be examined for evidence that the intelligibility of the signal is acceptable; and

g) an examination of the recorded images on the AIR or AIRS shall be carried out by replay of the AIR or AIRS recording. While installed in the aircraft, the AIR or AIRS shall record test images from each aircraft source and from relevant external sources to ensure that all required images meet recording quality standards.

7.4 A flight recorder system shall be considered unserviceable if there is a significant period of poor quality data, unintelligible signals, or if one or more of the mandatory parameters is not recorded correctly.

7.5 A report of the recording system inspection shall be made available on request to regulatory authorities for monitoring purposes.

7.6 Calibration of the FDR system:

a) for those parameters which have sensors dedicated only to the FDR and are not checked by other means, recalibration shall be carried out at least every five years or in accordance with the recommendations of the sensor manufacturer to determine any discrepancies in the engineering conversion routines for the mandatory parameters and to ensure that parameters are being recorded within the calibration tolerances; and

b) when the parameters of altitude and airspeed are provided by sensors that are dedicated to the FDR system, there shall be a recalibration performed as recommended by the sensor manufacturer, or at least every two years.



APPENDIX 9

STOL FIELDs CLEARANCE REQUIREMENTS

“.....This manual provides guidance for the planning and establishment of STOLPORTS, unique airports designed to serve aeroplanes that have exceptional short-field performance capabilities. While "stolport" and "STOL aircraft" have not been precisely defined by ICAO, it is recognized that the capability of certain aeroplanes to operate safely in areas constrained by limited space, restricted terrain or both, offers economic and social advantages provided there are dedicated airports available.

A **STOLPORT** is “an airport whose physical characteristics, visual and non-visual aids and total infrastructure are created to support safe and effective public air transport in and out of densely populated urban areas as well as to and from rural areas with difficult terrain.”

As no Standards or Recommended Practices for stolports exist in any of the ICAO Annexes, this manual covers all the aircraft operating aspects of stolports except non-visual navigation aids. The airport terminal building and groundside operations are not addressed. The material in this manual is based on adaptations of conventional airport practices and on the experience of States that have operated stolports or complete STOL systems. It should, however, be noted that Stolport specifications included herein are *not* applicable to **ALTIPOINTS** which are constructed in mountainous regions, though some of the STOL aircraft in use today are designed to operate from altiports.

An **ALTIPOINT** may be defined as “a small airport in a mountainous area with a steep gradient runway, used for landing up the slope and for take-off down the slope, thereby making use of only one approach/departure area.”

On the other hand, the longitudinal slope of a STOL runway is flatter than even that prescribed for a runway designed for the operation of conventional aircraft and generally has approach/departure areas at both ends of the runway. Contemporary "short-field" aeroplanes fall into a rather narrow range with respect to size and performance. The guidance in this manual caters to that fact. The future of civil STOL aircraft development is uncertain, but should progress in this area lead to larger aeroplanes, a revision of some of the material in this manual will be required.....” **Foreword, STOLPORT Manual, Doc 9150-AN/899, Second Edition – 1991 (ICAO)**

1. INTRODUCTION

- 1.1 What has generally been accepted commonly in Nepal as “STOL fields”, do not necessarily fall under the definition of ICAO DOC 9150 as STOLports. Airfields like Lukla, Syangboche, Dolpa, Rara, Simikot clearly reflect the definition of ALTIPOINTS as defined by Doc 9150, as all these fields are located in mountainous regions, have a steep gradient runway and only one approach/departure path is used. Surprisingly however, Manang does not fit this definition of ALTIPOINT, despite being located at approximately 11000 ft above mean sea level as it does not have a steep gradient runway and departure/approaches are possible (with caution) from both ends of the runway.

Some STOL airfields located on a lower altitude, seem to partially fit the definition of an ALTIPOINT where the runway has a somewhat steep gradient and normally only one end of the runway is used for both arrival and departure eg. Salley and Bhojpur.



However, they cannot be classified as Altiports because of their low elevation. Kangelanda and Lamidanda both have fairly flat runways and both runway ends can be used for departure or arrival. Phaplu and Rumjatar, on the other hand, have steep runway gradients and although normally only one runway end is used for departure and arrival, it is possible to use both. Taplejung on the other hand is located on a mountain slope but has a fairly flat runway gradient, except for the arrival end but only one arrival and departure path. Most of Nepal's STOL airfields are much more demanding and present a much higher risk factor than the STOLPORT concept described by DOC 9150.

- 1.2 The different and unique challenges presented by the STOL fields of Nepal make it difficult to determine a universal STOL field clearance procedure for every class and type of aeroplane or for every operator. What have been provided in this Appendix after three decades of study and experience, are the minimum requirements to be met by an operator and it is strongly recommended by CAAN for operators to opt for a more stringent clearance procedure to ensure that the flight crew will have sufficient experience and skill prior to being released for normal STOL operations.

1.3 SMS and SOP

While operators now are required to have a Safety Management System in place, particular attention must be paid by operators using STOL fields in their systems focusing particularly on this issue. The SOP too must have a section devoted entirely to the standard procedures to be followed by a flight crew for every STOL field to which it operates.

1.4 Flight Crew utilization

Operators should ensure that the flight crew maintain their proficiency and familiarization for the airfields and routes to which they operate. Consideration should be particularly given to crew who were previously operating to STOL fields but have not been engaged in STOL field operations for a number of years or even months.

The utilization of expatriate and foreign flight crew members who have never flown to STOL fields abroad or who have never flown in Nepal requires particular attention. Despite having a great many hours in type, their inexperience in flying in Nepal's extreme flying environment presents a serious challenge to all concerned. Instructor-on-type does **not** automatically qualify a pilot for release for solo or with a copilot to any of Nepal's STOL fields. This is of particular concern in the case of single-engined aeroplanes. The utilization of CRM and Human Factors principles in the rostering of crew as well as their implementation in flight must be emphasized.

1.5 Aircraft

Previous clearance requirements focused primarily on twin engined aeroplanes. The recent change of policy of permitting the continuation of operation of single-engined aeroplanes to and from STOL fields has yet presented even greater challenges. Every operator who operates such class of aeroplanes to Nepal's STOL fields must identify and include in their SOP, an emergency landing field or strip along the route in case



of engine failure, to which the aeroplane can safely glide and land. STOL field clearance for crew involved in such operations will naturally be more stringent than for crew flying multi-engined STOL aeroplanes. Operators that operate "tail-dragger" or tail-wheel type aeroplanes should as far as practicable refrain their flight crew from operating another type of aeroplane.

Certain airfields situated at a low elevation and categorized as STOL fields (eg. Ramechhap, Chaurjhari etc.) for multi-engined aeroplanes may not necessarily be STOL fields for certain aeroplanes like the PC-6 Pilatus Porter which has an exceptional short-field performance capability and for which a so-called "STOL" field is really a normal field.

1.6 Airfields

Each and every STOL field in Nepal is unique and has its own peculiar characteristics. A STOL pilot should be well acquainted with these characteristics before being released for solo or flights with copilots. STOL fields in Nepal range from the shortest field length of 1400 feet (Doti) to the longest at 2200 feet (Jumla, Jomsom and Phaplu). They range from the lowest elevation at 1,555 feet MSL (Ramechhap) to the highest at 12,297 feet MSL (Syangboche). They range from flat airfields to the steepest at 12% (Lukla). Rapidly changing weather and wind conditions in mountainous regions are both highly critical influential factors in the safe operations in these airfields. Narrow and busy routes through a particular mountain pass during peak travel season to some of these airfields provide further hazards to pilots operating to and from these airfields particularly if their aircraft are not equipped with ACAS equipment or flying solo.

1.6.1 Categories of STOL airfields.

In the case of single-engine aeroplanes, since it is assumed that pilots will initially fly as First Officers with Instructors and Line Captains for a number of years acquiring the required flight hours prior to being promoted to Captain, they will normally be first cleared to the STOL fields for two-pilot operations. Only after having gained considerable flight experience over a number of years in all seasons, should an operator consider releasing a pilot for solo operations to STOL fields. It is therefore assumed that by the time a pilot is released for solo, he will have already cleared the required STOL fields during his multi-pilot operational period.

Pilots shall be cleared to the following airfields with copilots categorically through Categories A, B and C; however, where an operator does not operate to any airfields in Category A, his pilots may commence clearing Category B airfields after having completed the preliminary requirements of Category B. Similarly where an operator does not operate to any Category B airfields, his pilots may, after having cleared Category A airfields, commence clearance of Category C airfields.



DEFINITIONS

Aerodrome Traffic Density

- a) *Light.* Where the number of movements in the mean busy hour is not greater than 15 per runway or typically less than 20 total aerodrome movements.
- b) *Medium.* Where the number of movements in the mean busy hour is of the order of 16 to 25 per runway or typically between 20 to 35 total aerodrome movements.
- c) *Heavy.* Where the number of movements in the mean busy hour is of the order or 26 or more per runway or typically more than 35 total aerodrome movements.

Note 1. The number of movements in the mean busy hour is the arithmetic mean over the year of the number of movements in the daily busiest hour.

Note 2. Either a take-off or a landing constitutes a movement.

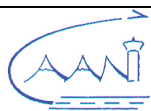
Aeroplane reference field length. The minimum field length required for take-off at maximum certificated take-off mass, sea level, standard atmospheric conditions, still air and zero runway slope, as shown in the appropriate aeroplane flight manual prescribed by the certifying authority or equivalent data from the aeroplane manufacturer. Field length means balanced field length for aeroplanes, if applicable, or take-off distance in other cases.

Slush. Water-saturated snow which with a heel-and-toe slap-down motion against the ground will be displaced with a splatter, specific gravity: 0.5 upto 0.8.

Note.-Combinations of ice, snow and/or standing water may, especially when rain, rain and snow, or snow is falling, produce substances with specific gravities in excess of 0.8. These substances, due to their high water/ice content, will have a transparent rather than a cloudy appearance and, at the higher specific gravities, will be readily distinguishable from slush.

Snow (on the ground).

- a) *Dry snow.* Snow which can be blown if loose or, if compacted by hand, will fall apart again upon release; specific gravity: up to but not including 0.35.
- b) *Wet snow.* Snow which, if compacted by hand, will stick together and tend to or form a snowball; specific gravity: 0.35 up to but not including 0.5.
- c) *Compacted snow.* Snow which has been compressed into a solid mass that resists further compression and will hold together or break up into lumps if picked up; specific gravity: 0.5 and over.



FLIGHT OPERATIONS REQUIREMENTS AEROPLANE

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(I) Category A airfields:

For Category A airfields,

- the first airfield of this category should be cleared after completing five missions* with an Instructor Pilot and checked by another Instructor Pilot in the sixth mission.
- The remaining airfields of this category may be cleared by an Instructor Pilot as per the approved Company Manuals.

1	Ramecchap	4	Baitadi	7	Darchula
2	Chaurjhari	5	Sanfebagar	8	Salley
3	Doti	6	Baglung	9	Bajhang

(II) Category B airfields:

For Category B airfields,

- a Pilot must have accomplished additional 50 STOL missions* to any Cat B airfield and every STOL field of this category should be cleared after completing at least five missions with an Instructor Pilot in each airfield and checked by another Instructor Pilot in the sixth mission.

1	Bhojpur	6	Bajura	11	Rumjatar
2	Taplejung	7	Rolpa	12	Khanidanda
3	Phaplu	8	Kangeldanda	13	Dhorpatan**
4	Jomsom (for multi-engine operations)	9	Thamkharka		
5	Jumla	10	Lamidanda		

(III) Category C airfields (ALTIPOrts):

For Category C airfields,

- a Pilot must have accomplished additional 100 missions* in Cat C airfields.
- For multi-engine aeroplanes, after receiving the ATPL license, two years must be completed prior to beginning the clearance of CAT C airfields; and for single-engine aeroplanes, a minimum of three years for multi-pilot operations and four years for single-pilot operations after receiving the CPL license,
- Each airfield of this category should be cleared after accomplishing ten missions in each airfield and checked by an Instructor Pilot in the eleventh mission.

1	Lukla	4	Simikot	7	Langtang**
2	Manang	5	Rara	8	Jomsom (for single-engine operations)
3	Jufal (Dolpa)	6	Syangboche**	9	Masinechour (Upper Dolpa)



Note- In certain instances where an operator does not operate to a particular aerodrome in Category C on a regular basis and it is not possible to clear his pilots with the required number of missions due to various constraints, clearances to such airfields is permitted as per the following procedure, provided that the pilots have already been cleared for at least two Cat C airfields:

- i) Company must notify CAAN for every pilot adopting this procedure stating the reason for the diversion from the normal procedure.*
- ii) The pilot shall perform a minimum of twelve Takeoffs and landings at that particular airfield within no less than three missions. He shall then be cleared by another IP in the next mission.*

*mission = For use of this document, a mission is defined as one complete sector commencing from the aerodrome of origin to the intended destination aerodrome culminating in a full stop landing. Such a completed sector shall fulfill one mission.

** single engine STOL operations

1. P-I-C CLEARANCE TO STOL FIELDS (AEROPLANE)

- 2.1 PIC clearances to STOL fields have been segregated in three parts viz; two-pilot operations in single-engined aeroplanes; single-pilot operations in single-engined aeroplanes and two-pilot operations in multi-engined aeroplanes.
- 2.2 A pilot will not be designated as Pilot-In-Command, for the destination to STOL airfields unless he has completed the experience in flight as specified below;

A) Aeroplane with multi-pilot operations (single-engined aeroplanes)

- 1) Upon obtaining P1 license from CAAN, a new pilot (designated as a copilot) shall fly a minimum of 100 flying hours logged as P1 with Instructor Pilot.
- 2) A pilot should have a minimum of total 2500 hours of experience in aeroplane category in which the minimum of experience mentioned below should be included and a clearance from the Instructor Pilot:
 - i) should have minimum of 300 hours logged as P1 airfields in Nepal to fly with colleagues; and minimum of 700 hours as P1 in STOL to fly with new copilots. The minimum number of landings required in STOL airfields to be mentioned in the Company Operations Manual. In the case of STOL airfields with Line Captains, accumulations of P1 hours only on return leg to base is allowed, while both ways may be logged as P1 when flying with an Instructor.
 - ii) should have minimum of 100 hours of flying experience in STOL airfield as P1 with Instructor Pilot.
- 3) Clearance to STOL airfields may be commenced categorically as mentioned in 1.6.1.



- 4) In the case of foreign Instructor Pilots on type, he must first fly a minimum of 400 hours and one year of flying experience in Nepal with Nepalese Instructor Pilots, Senior Line Captains or Senior Copilots (with more than 1000 flight hours in Nepal) before he is released with a new copilot. He must then receive a Clearance from the local Instructor Pilot or an authorized Senior Line Captain of the company before being released with new co-pilots. Such a clearance shall be required for every airfield to which the operator operates.
- 5) In the case where the operator does not have a local Instructor Pilot but only Line Captains and the foreign Instructor is required to fly with a copilot to clear his (copilot's) IP hours, the foreign Instructor shall fly to the destination STOL field with the Line Captain and on the return leg to base, he shall fly with the copilot to clear the copilot's IP hours. However, foreign Instructor Pilots who have accumulated a minimum of 400 hours of STOL flying experience in Nepal shall be exempted from this requirement.
- 6) Captains and copilots of multi-engine aeroplanes who already have previous STOL flying experience in Nepal need to fly a minimum of 50 hours with Instructor Pilots of single-engine STOL aeroplanes for type conversion. However, those with non-STOL experience or who have not flown STOL operations during the last five years must fly a minimum of 100 hours with Instructors prior to being released for normal flights.
- 7) Pilots who already have an Instructor Pilot rating in multi-engine aeroplanes and acceptable to the Director General, CAAN, shall be eligible to be endorsed with an IP rating in a single-engine aeroplane after acquiring a rating on type; accumulating a minimum of 100 hours of flight experience on type and successfully completing a checkride to the Check Pilot's satisfaction. However, in the case of tail-wheel type aeroplanes, he shall fly a minimum of 200 hours prior to applying for an IP rating.

B) Aeroplane with single-pilot operations (single-engined aeroplanes)

- 1) should have a minimum of total 5000 hours of experience in aeroplane category in which the minimum of experience mentioned below should be included:
 - i) should have a minimum of 2000 hours logged as P1 in Nepal in STOL airfields. In the case of STOL airfields with Line Captains, accumulations of P1 hours only on return leg to base is allowed, while both ways may be logged as P1 when flying with an Instructor.
 - ii) should have minimum of 100 hours of flying experience in STOL airfield as P1 with Instructor Pilot.
- 2) must have previously cleared as PIC, the particular STOL field in multi-pilot operations to which he intends to fly solo.
- 3) foreign pilots are prohibited to fly solo to and from Nepal's STOL fields until fulfilling the requirements of B 1).



C) Aeroplane with multi-pilot operations (multi-engined aeroplanes)

- 1) Upon obtaining P1 license from CAAN, the person shall fly a minimum of 50 flying hours logged as P1 with Instructor Pilot.
 - 2) Should have a minimum of total 2500 hours of experience in aeroplane category in which the minimum of experience mentioned below should be included:
 - i) should have minimum of 500 hours logged as P1 in Nepal in STOL airfields. In the case of STOL airfields with Line Captains, accumulations of P1 hours only on return leg to base is allowed, while both ways may be logged as P1 when flying with an Instructor.
 - ii) should have minimum of 100 hours of flying experience in STOL airfield as P1 with Instructor Pilot.
 - iii) one year of STOL experience in Nepal and has accomplished 100 missions on STOL airfields (for pilots who convert from non-STOL flying and have no previous STOL flying experience).
 - 3) Clearance to STOL airfields may be commenced categorically as mentioned in 1.6.1.
 - 4) In the case of pilots converting from single engine aeroplanes to multi-engine aeroplanes, the following shall apply:
 - a) pilots without previous multi-engine experience shall require a minimum of 1000 hours in multi-engine aeroplanes and an ATPL prior to commencing STOL clearance procedures;
 - b) pilots who already have more than 1000 hours in multi-engine aeroplanes but are flying in single-engine aeroplanes and who have already cleared certain STOL airfields in single-engine aeroplanes may commence STOL field clearances in multi-engine aeroplanes after obtaining an ATPL, completing the required IP hours, and performing at least ten missions to that STOL field and checkout by another IP or DCP.
- 2.3
- a) In the case of foreign Instructor Pilots, he must first fly a minimum of 400 hours with Nepalese Instructor Pilots and/or Line Captains. He must then receive a Clearance from the local Instructor Pilot or a company authorized Senior Line Captain of the company before being released with co-pilots. Such a clearance shall be required for every airfield to which the operator operates.
 - b) In the case of foreign Line Captains with or without type rating, he must fulfill the requirements of C 1), 2) and 3).
 - c) In the case where the operator does not have a local Instructor Pilot but only a Line Captain and the foreign Instructor is required to fly with a copilot to clear

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his (copilot's) IP hours, the foreign Instructor shall fly to the destination STOL field with the Line Captain and on the return leg to base, he shall fly with the copilot to clear the copilot's IP hours.

1. REFERENCES

- STOLPORT Manual, Doc 9150-AN/899, Second Edition – 1991 (ICAO)
- UNDP/ICAO PROJECT : NEP/82/009 - HIGH ALTITUDE STOL PERFORMANCE CRITERIA STUDY (DHC-6/300 Series Twin Otter Aircraft) - His Majesty's Government of Nepal – February 1998
- ANNEX 14 VOLUME I - AERODROMES

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APPENDIX 10

Regulated Take-off and Landing Mass

1. GENERAL

- 1.1 The Regulated Takeoff and Landing Mass for each airfield to which the operator operates shall be calculated from the Airplane Flight Manual for a given temperature and wind condition.
- 1.2 For STOL operations, take-off and landing mass must be provided for wind calm, 5 knots head/tail wind and 10 knots head/tailwind conditions.
- 1.3 Guidance material on the use of the templates must be included for the flight crew and other operations personnel using the templates and must be a part of the initial and recurrent trainings. All operators to use the following Templates as standard. The fields indicated are the minimum information required, any other information required may be made to suit individual aircraft or Type needs.
- 1.4 Reference material must be quoted when providing the data for the required fields eg. Airplane Flight Manual, Chapter no. etc.
- 1.5 When a particular aeroplane is fitted with special equipment or is configured separately in comparison to other aeroplanes of the same type in the fleet that significantly impacts the take-off and landing weights, the Regn. No. of this aeroplane and its associated data must be provided separately.
- 1.6 When providing the data, all the necessary corrections demanded by the Performance Charts or the Tables of the AFM must be performed and only the net sum is to be provided.
- 1.7 Taking 70 percent of the given Runway field length for the ground roll should ensure reaching 50 feet above the end of the runway for take-off in most STOL fields under optimum conditions.

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TEMPLATE (for STOL operations)

Aircraft Type/Series	Regn. No.	Acft. configuration: (for Takeoff/Landing)				
Runway Designation	Runway slope	Runway length = 2/3 of runway length =				
Name of Aerodrome;elevation						
Temperature OAT °C	Runway surface : mention Clay, Gravel or Bitumen					
	Wind : calm		Wind : 5 knots Headwind		Wind : 5 knots Tailwind	
	Regulated Take-off Weight	Regulated Landing Weight	Regulated Take-off Weight	Regulated Landing Weight	Regulated Take-off Weight	Regulated Landing Weight
	lbs or kgs	lbs or kgs	lbs or kgs	lbs or kgs	lbs or kgs	lbs or kgs
-5						
0						
+5						
+10						
+15						
+20						
+25						
+30						
+35						
+40						



APPENDIX 11

TEST LANDING

1. GENERAL

1.1 Conditions for a TEST LANDING.

- a) Test Landings to a particular airfield shall be done by an operator when it introduces a new type or a variant of the type of aeroplane into the country that results in a significant change of performance or when that particular type although previously operated in the country, has previously never been tested in a particular airfield. Only concerned CAAN and Operator's personnel shall be onboard.
- b) In the case of STOL fields, for single-engined aeroplanes:
 - (i) where an operator performs an initial Test Landing first to a CAT A or CAT B STOL field, then to a CAT C STOL field, a CAAN observer must be onboard for every Test Landing.
 - (ii) where an operator first conducts Test Landings first to CAT C STOL fields, then applies for normal flights to CAT A or B STOL fields, a CAAN observer must be present for every CAT C airfield and further Test Landings are not required for CAT A or B STOL fields provided that the operator has demonstrated successful Test Landings at a minimum of two CAT C STOL fields. Normal flights to CAT A and B airfields may be permitted provided the Regulated Take-off and Landing Weights and the SOP to such airfields submitted to the DG, CAAN is approved.
- c) In the case of STOL fields, for multi-engined aeroplanes, a CAAN observer shall be onboard for every Test Landing to every STOL field.

1.2 Test Landings shall be conducted using the attached Test Landing Form.



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TEST LANDING REPORT

1. DATE : TIME:

2. AERODROME INFORMATION

Name of aerodrome:	
ICAO designator:	
Three-letter code (if available):	
District:	
Zone:	

Runway length:	
Runway designation:	
Elevation:	
Coordinates:	

3. AIRCRAFT INFORMATION

Operator:	
Type of aircraft:	
Registration Number:	
Take-off weight:	
Landing weight:	

4. WEATHER INFORMATION

Wind information (direction and speed):	
Weather condition:	
QNH:	
Temperature in degrees Celsius:	



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5. CREW

PIC	
SIC	
Any other crew	

6. COMPANY PERSONNEL OTHER THAN FLIGHT CREW

Name	Designation & Department

7. CAAN PERSONNEL

Name	Designation & Department

8. CAAN TEAM OBSERVATIONS:

A. Obstructions/obstacles:

B. Runway conditions:



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9. RECOMMENDATIONS:

Signature of all concerned



APPENDIX 12.

**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.



APPENDIX 13

AEROPLANE PERFORMANCE OPERATING LIMITATIONS

1. Purpose and scope

The purpose of this APPENDIX is to provide guidance as to the level of performance intended by the provisions of Chapter 5 as applicable to turbine-powered subsonic transport type aeroplanes over 5 700 kg maximum certificated take-off mass having two or more engines. However, where relevant, it can be applied to all subsonic turbine-powered or piston-engine aeroplanes having two, three or four engines

Note.— This Appendix is not intended for application to aeroplanes having short take-off and landing (STOL) or vertical take-off and landing (VTOL) capabilities.

2. Definitions

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

CAS (calibrated airspeed). The calibrated airspeed is equal to the airspeed indicator reading corrected for position and instrument error. (As a result of the sea level adiabatic compressible flow correction to the airspeed instrument dial, CAS is equal to the true airspeed (TAS) in Standard Atmosphere at sea level.)

Declared temperature. A temperature selected in such a way that when used for performance purposes, over a series of operations, the average level of safety is not less than would be obtained by using official forecast temperatures.

Expected. Used in relation to various aspects of performance (e.g. rate or gradient of climb), this term means the standard performance for the type, in the relevant conditions (e.g. mass, altitude and temperature).

Grooved or porous friction course runway. A paved runway that has been prepared with lateral grooving or a porous friction course (PFC) surface to improve braking characteristics when wet.

Height. The vertical distance of a level, a point, or an object considered as a point, measured from a specified datum.

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Note.— For the purposes of this example, the point referred to above is the lowest part of the aeroplane and the specified datum is the take-off or landing surface, whichever is applicable.

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

Landing surface. That part of the surface of an aerodrome which the aerodrome authority has declared available for the normal ground or water run of aircraft landing in a particular direction.

Net gradient. The net gradient of climb throughout these requirements is the expected gradient of climb diminished by the manoeuvre performance (i.e. that gradient of climb necessary to provide power to manoeuvre) and by the margin (i.e. that gradient of climb necessary to provide for those variations in performance which are not expected to be taken explicit account of operationally).

Reference humidity. The relationship between temperature and reference humidity is defined as follows:

- at temperatures at and below ISA, 80 per cent relative humidity,
- at temperatures at and above ISA + 28° C, 34 per cent relative humidity,
- at temperatures between ISA and ISA + 28° C, the relative humidity varies linearly between the humidity specified for those temperatures.

Runway surface condition. The state of the surface of the runway: either dry, wet, or contaminated:

- a) **Contaminated runway.** A runway is contaminated when more than 25 per cent of the runway surface area (whether in isolated areas or not) within the required length and width being used is covered by:
 - water, or slush more than 3 mm (0.125 in) deep;
 - loose snow more than 20 mm (0.75 in) deep; or
 - compacted snow or ice, including wet ice.
- b) **Dry runway.** A dry runway is one which is clear of contaminants and visible moisture within the required length and the width being used.
- c) **Wet runway.** A runway that is neither dry nor contaminated.

Note 1.— In certain situations, it may be appropriate to consider the runway contaminated even when it does not meet the above definition. For example, if less than 25 per cent of the runway surface area is covered with water, slush, snow or ice, but it is located where

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rotation or lift-off will occur, or during the high speed part of the take-off roll, the effect will be far more significant than if it were encountered early in take-off while at low speed. In this situation, the runway should be considered to be contaminated.

Note 2.— Similarly, a runway that is dry in the area where braking would occur during a high speed rejected take-off, but damp or wet (without measurable water depth) in the area where acceleration would occur, may be considered to be dry for computing take-off performance. For example, if the first 25 per cent of the runway was damp, but the remaining runway length was dry, the runway would be wet using the definitions above. However, since a wet runway does not affect acceleration, and the braking portion of a rejected take-off would take place on a dry surface, it would be appropriate to use dry runway take-off performance.

Take-off distance available (TODA). The length of the take-off run available plus the length of the clearway, if provided.

Take-off run available (TORA). The length of runway declared available and suitable for the ground run of an aeroplane taking off.

Take-off surface. That part of the surface of an aerodrome which the aerodrome authority has declared available for the normal ground or water run of aircraft taking off in a particular direction.

TAS (True airspeed). The speed of the aeroplane relative to undisturbed air.

V_{so}. A stalling speed or minimum steady flight speed in the landing configuration.

V_{s1}. A stalling speed or minimum steady flight speed.

Note 1.— See Chapter 1 and Annexes 8 and 14, Volume I, for other definitions.

Note 2.— The terms “accelerate-stop distance”, “take-off distance”, “V₁”, “take-off run”, “net take-off flight path”, “one engine inoperative en-route net flight path”, and “two engines inoperative en-route net flight path”, as relating to the aeroplane, have their meanings defined in the airworthiness requirements under which the aeroplane was certificated.

3. General

3.1 The provisions of 4 to 7 should be complied with, unless deviations therefrom are specifically authorized by the DG, CAAN on the grounds that the special circumstances of a particular case make a literal observance of these provisions unnecessary for safety.

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3.2 Compliance with 4 to 7 should be established using performance data in the flight manual and in accordance with other applicable operating requirements. In no case should the limitations in the flight manual be exceeded. However, additional limitations may be applied when operational conditions not included in the flight manual are encountered. The performance data contained in the flight manual may be supplemented with other data acceptable to the DG, CAAN if necessary to show compliance with 4 to 7. When applying the factors prescribed in this Appendix, account may be taken of any operational factors already incorporated in the flight manual data to avoid double application of factors.

3.3 The procedures scheduled in the flight manual should be followed except where operational circumstances require the use of modified procedures in order to maintain the intended level of safety.

Note.— See the Airworthiness Manual (Doc 9760) for the related airworthiness performance guidance material.

4. Aeroplane take-off performance limitations

4.1 No aeroplane should commence a take-off at a mass which exceeds the take-off mass specified in the flight manual for the altitude of the aerodrome and for the ambient temperature existing at the time of the take-off.

4.2 No aeroplane should commence a take-off at a mass such that, allowing for normal consumption of fuel and oil in flight to the aerodrome of destination and to the destination alternate aerodromes, the mass on arrival will exceed the landing mass specified in the flight manual for the altitude of each of the aerodromes involved and for the ambient temperatures anticipated at the time of landing.

4.3 No aeroplane should commence a take-off at a mass which exceeds the mass at which, in accordance with the minimum distances for take-off scheduled in the flight manual, compliance with 4.3.1 to 4.3.3 inclusive is shown.

4.3.1 The take-off run required should not exceed the take-off run available.

4.3.2 The accelerate-stop distance required should not exceed the accelerate-stop distance available.

4.3.3 The take-off distance required should not exceed the takeoff distance available.

4.3.4 When showing compliance with 4.3 the same value of V_1 for the continued and discontinued take-off phases should be used.

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4.4 When showing compliance with 4.3 the following parameters should be taken into account:

- a) the pressure altitude at the aerodrome;
- b) the ambient temperature at the aerodrome;
- c) the runway surface condition and the type of the runway surface;
- d) the runway slope in the direction of the take-off;
- e) the runway slope;
- f) not more than 50 per cent of the reported headwind component or not less than 150 per cent of the reported tailwind component; and
- g) the loss, if any, of runway length due to alignment of the aeroplane prior to take-off.

4.5 Credit is not taken for the length of the stopway or the length of the clearway unless they comply with the relevant specifications in Annex 14, Volume I.

5. Take-off obstacle clearance limitations

5.1 No aeroplane should commence a take-off at a mass in excess of that shown in the flight manual to correspond with a net take-off flight path which clears all obstacles either by at least a height of 10.7 m (35 ft) vertically or at least 90 m (300 ft) plus $0.125D$ laterally, where D is the horizontal distance the aeroplane has travelled from the end of take-off distance available, except as provided in 5.1.1 to 5.1.3 inclusive. For aeroplanes with a wingspan of less than 60 m (200 ft) a horizontal obstacle clearance of half the aeroplane wingspan plus 60 m (200 ft), plus $0.125D$ may be used. In determining the allowable deviation of the net take-off flight path in order to avoid obstacles by at least the distances specified, it is assumed that the aeroplane is not banked before the clearance of the net take-off flight path above obstacles is at least one half of the wingspan but not less than 15.2 m (50 ft) height and that the bank thereafter does not exceed 15° , except as provided in 5.1.4. The net take-off flight path considered is for the altitude of the aerodrome and for the ambient temperature and not more than 50 per cent of the reported headwind component or not less than 150 per cent of the reported tailwind component existing at the time of take-off. The take-off obstacle accountability area defined above is considered to include the effect of crosswinds.

5.1.1 Where the intended track does not include any change of heading greater than 15° ,

- a) for operations conducted in VMC by day, or
- b) for operations conducted with navigation aids such that the pilot can maintain the aeroplane on the intended track with the same precision as for operations specified in 5.1.1 a), obstacles at a distance greater than 300 m (1 000 ft) on either side of the intended track need not be cleared.

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- 5.1.2 Where the intended track does not include any change of heading greater than 15° for operations conducted in IMC, or in VMC by night, except as provided in 5.1.1 b); and where the intended track includes changes of heading greater than 15° for operations conducted in VMC by day, obstacles at a distance greater than 600 m (2 000 ft) on either side of the intended track need not be cleared.
- 5.1.3 Where the intended track includes changes of heading greater than 15° for operations conducted in IMC, or in VMC by night, obstacles at a distance greater than 900 m (3 000 ft) on either side of the intended track need not be cleared.
- 5.1.4 An aeroplane may be operated with bank angles of more than 15° below 120 m (400 ft) above the elevation of the end of the take-off run available, provided special procedures are used that allow the pilot to fly the desired bank angles safely under all circumstances. Bank angles should be limited to not more than 20° between 30 m (100 ft) and 120 m (400 ft), and not more than 25° above 120 m (400 ft). Methods approved by the DG, CAAN should be used to account for the effect of bank angle on operating speeds and flight path including the distance increments resulting from increased operating speeds. The net take-off flight path in which the aeroplane is banked by more than 15° should clear all obstacles by a vertical distance of at least 10.7 m (35 ft) relative to the lowest part of the banked aeroplane within the horizontal distance specified in 5.1. The use of bank angles greater than those mentioned above should be subject to the approval from the DG, CAAN.

6. En-route limitations

6.1 General

At no point along the intended track is an aeroplane having three or more engines to be more than 90 minutes at normal cruising speed away from an aerodrome at which the distance specifications for alternate aerodromes (see 7.3) are complied with and where it is expected that a safe landing can be made, unless it complies with 6.3.1.1.

6.2 One engine inoperative

- 6.2.1 No aeroplane should commence a take-off at a mass in excess of that which, in accordance with the one-engine-inoperative en-route net flight path data shown in the flight manual, permits compliance either with 6.2.1.1 or 6.2.1.2 at all points along the route. The net flight path has a positive slope at 450 m (1 500 ft) above the aerodrome where the landing is assumed to be made after engine failure. The net flight path used is for the ambient temperatures anticipated along the route. In meteorological conditions where icing protection systems are to be operable, the effect of their use on the net flight path data is taken into account.



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- 6.2.1.1 The slope of the net flight path is positive at an altitude of at least 300 m (1 000 ft) above all terrain and obstructions along the route within 9.3 km (5 NM) on either side of the intended track.
- 6.2.1.2 The net flight path is such as to permit the aeroplane to continue flight from the cruising altitude to an aerodrome where a landing can be made in accordance with 7.3, the net flight path clearing vertically, by at least 600 m (2 000 ft), all terrain and obstructions along the route within 9.3 km (5 NM) on either side of the intended track. The provisions of 6.2.1.2.1 to 6.2.1.2.5 inclusive are applied.
- 6.2.1.2.1 The engine is assumed to fail at the most critical point along the route, allowance being made for indecision and navigational error.
- 6.2.1.2.2 Account is taken of the effects of winds on the flight path.
- 6.2.1.2.3 Fuel jettisoning is permitted to an extent consistent with reaching the aerodrome with satisfactory fuel reserves, if a safe procedure is used.
- 6.2.1.2.4 The aerodrome, where the aeroplane is assumed to land after engine failure, is specified in the operational flight plan, and it meets the appropriate aerodrome operating minima at the expected time of use.
- 6.2.1.2.5 The consumption of fuel and oil after the engine becomes inoperative is that which is accounted for in the net flight path data shown in the flight manual.

6.3 Two engines inoperative — aeroplanes with three or more engines

6.3.1 Aeroplanes which do not comply with 6.1 should comply with 6.3.1.1.

- 6.3.1.1 No aeroplane should commence a take-off at a mass in excess of that which, according to the two-engine inoperative en-route net flight path data shown in the flight manual, permits the aeroplane to continue the flight from the point where two engines are assumed to fail simultaneously, to an aerodrome at which the landing distance specification for alternate aerodromes (see 7.3) is complied with and where it is expected that a safe landing can be made. The net flight path clears vertically, by at least 600 m (2 000 ft) all terrain and obstructions along the route within 9.3 km (5 NM) on either side of the intended track. The net flight path considered is for the ambient temperatures anticipated along the route. In altitudes and meteorological conditions where icing protection systems are to be operable, the effect of their use on the net flight path data is taken into account. The provisions of 6.3.1.1.1 to 6.3.1.1.5 inclusive apply.

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6.3.1.1.1 The two engines are assumed to fail at the most critical point of that portion of the route where the aeroplane is at more than 90 minutes at normal cruising speed away from an aerodrome at which the landing distance specification for alternate aerodromes (see 7.3) is complied with and where it is expected that a safe landing can be made.

6.3.1.1.2 The net flight path has a positive slope at 450 m (1 500 ft) above the aerodrome where the landing is assumed to be made after the failure of two engines.

6.3.1.1.3 Fuel jettisoning is permitted to an extent consistent with 6.3.1.1.4, if a safe procedure is used.

6.3.1.1.4 The aeroplane mass at the point where the two engines are assumed to fail is considered to be not less than that which would include sufficient fuel to proceed to the aerodrome and to arrive there at an altitude of at least 450 m (1 500 ft) directly over the landing area and thereafter to fly for 15 minutes at cruise power and/or thrust.

6.3.1.1.5 The consumption of fuel and oil after the engines become inoperative is that which is accounted for in the net flight path data shown in the flight manual.

7. Landing limitations

7.1 Aerodrome of destination — dry runways

7.1.1 No aeroplane should commence a take-off at a mass in excess of that which permits the aeroplane to be brought to a full stop landing at the aerodrome of intended destination from 15.2 m (50 ft) above the threshold:

- a) for turbo jet powered aeroplanes, within 60 per cent of the landing distance available; and
- b) for turbo-propeller aeroplanes, within 70 per cent of the landing distance available.

The mass of the aeroplane is assumed to be reduced by the mass of the fuel and oil expected to be consumed in flight to the aerodrome of intended destination. Compliance is shown with 7.1.1.1 and with either 7.1.1.2 or 7.1.1.3.

7.1.1.1 It is assumed that the aeroplane is landed on the most favourable runway and in the most favourable direction in still air.



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7.1.1.2 It is assumed that the aeroplane is landed on the runway which is the most suitable for the wind conditions anticipated at the aerodrome at the time of landing, taking due account of the probable wind speed and direction, of the ground handling characteristics of the aeroplane, and of other conditions (i.e. landing aids, terrain).

7.1.1.3 If full compliance with 7.1.1.2 is not shown, the aeroplane may be taken off if a destination alternate aerodrome is designated which permits compliance with 7.3.

7.1.1.4 When showing compliance with 7.1.1 at least the following factors should be taken into account:

- a) the pressure altitude of the aerodrome;
- b) the runway slope in the direction of the landing if greater than ± 2.0 per cent; and
- c) not more than 50 per cent of the headwind component or not less than 150 per cent of the tailwind component.

7.2 Aerodrome of destination — wet or contaminated runways

7.2.1 When the appropriate weather reports or forecasts or a combination thereof indicate that the runway at the estimated time of arrival may be wet, the landing distance available should be at least 115 per cent of the required landing distance determined in accordance with 7.1.

7.2.2 A landing distance on a wet runway shorter than that required by 7.2.1 but not less than that required by 7.1 may be used if the flight manual includes specific additional information about landing distance on wet runways.

7.2.3 When the appropriate weather reports or forecasts or a combination thereof indicate that the runway at the estimated time of arrival may be contaminated, the landing distance available should be the greater of:

- a) the landing distance determined in accordance with 7.2.1; or
- b) the landing distance determined in accordance with contaminated landing distance data with a safety margin acceptable to the DG, CAAN.

7.2.4 If compliance with 7.2.3 is not shown, the aeroplane may take off if a destination alternate aerodrome is designated for which compliance is shown with 7.2.3 and 7.3.

7.2.5 When showing compliance with 7.2.2 and 7.2.3, the criteria of 7.1 should be applied accordingly. However, 7.1.1 a) and b) need not be applied to the wet and contaminated runway landing distance determination required by 7.2.2 and 7.2.3.

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7.3 Destination alternate aerodrome

No aerodrome should be designated as a destination alternate aerodrome unless the aeroplane, at the mass anticipated at the time of arrival at such aerodrome, can comply with 7.1 and either 7.2.1 or 7.2.2, in accordance with the landing distance required for the altitude of the alternate aerodrome and in accordance with other applicable operating requirements for the alternate aerodrome.

7.4 Performance considerations before landing

The operator should provide the flight crew with a method to ensure that a full stop landing, with a safety margin acceptable to the DG, CAAN, that is at least the minimum specified in the Type Certificate holder's aircraft flight manual (AFM), or equivalent, can be made on the runway to be used in the conditions existing at the time of landing and with the deceleration means that will be used.



APPENDIX 14.

LIGHTS TO BE DISPLAYED BY AEROPLANES

(Note.—Reference Chapter 6, Para 6.10)

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 manoeuvres 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.



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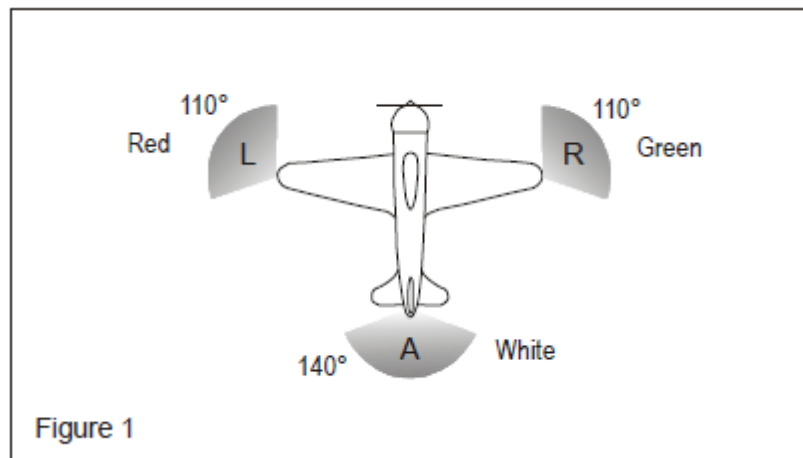
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2. Navigation lights to be displayed in the air

Note.— The lights specified herein are intended to meet the requirements of ICAO Annex 2 for navigation lights.

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

- a) a red light projected above and below the horizontal plane through angle of coverage L;
- b) a green light projected above and below the horizontal plane through angle of coverage R;
- c) a white light projected above and below the horizontal plane rearward through angle of coverage A.



3. Lights to be displayed on the water

3.1 General

Note.— The lights specified herein are intended to meet the requirements of ICAO 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;



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- c) when being towed;
- d) when not under command and not making way;
- e) when making way but not under command;
- f) when at anchor;
- g) when aground.

The lights required by aeroplanes in each case are described below.

3.2 When under way

As illustrated in Figure 2, the following appearing as steady unobstructed lights:

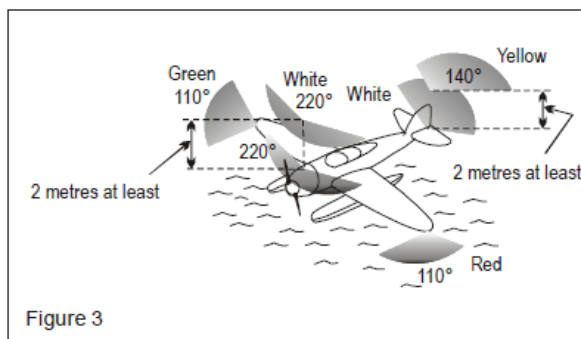
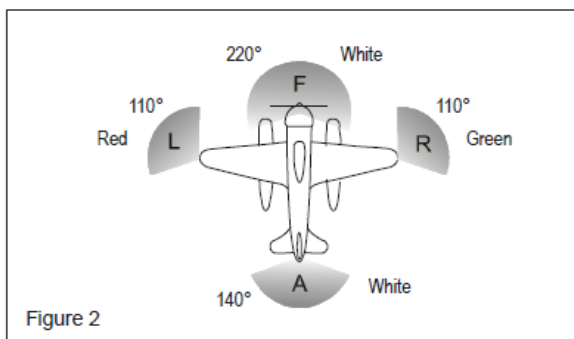
- a) a red light projected above and below the horizontal through angle of coverage L;
- b) a green light projected above and below the horizontal through angle of coverage R;
- c) a white light projected above and below the horizontal through angle of coverage A; and
- d) a white light projected through angle of coverage F.

The lights described in 3.2 a), b) and c) should be visible at a distance of at least 3.7 km (2 NM). The light described in 3.2 d) should be visible at a distance of 9.3 km (5 NM) when fitted to an aeroplane of 20 m or more in length or visible at a distance of 5.6 km (3 NM) when fitted to an aeroplane of less than 20 m in length.

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.





3.4 When being towed

The lights described in 3.2 a), b) and c) appearing as steady, unobstructed lights.m above it.

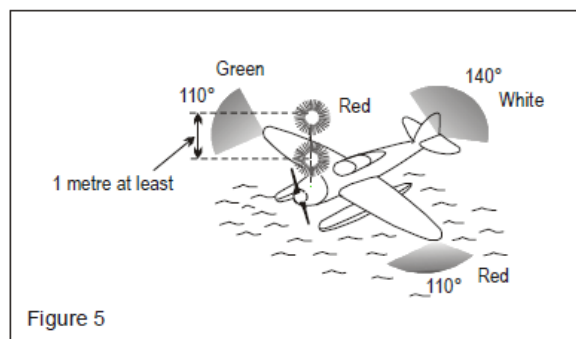
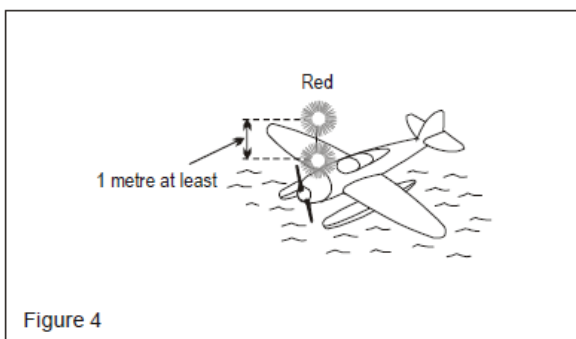
3.5 When not under command and not making way

As illustrated in Figure 4, two steady red lights placed where they can best be seen, one vertically over the other and not less than 1 m apart, and of such a character as to be visible all around the horizon at a distance of at least 3.7 km (2 NM).

3.6 When making way but not under command

As illustrated in Figure 5, the lights described in 3.5 plus the lights described in 3.2 a), b) and c).

Note.— The display of lights prescribed in 3.5 and 3.6 is to be taken by other aircraft as signals that the aeroplane showing them is not under command and cannot therefore get out of the way. They are not signals of aeroplanes in distress and requiring assistance.



3.7 When at anchor

- If less than 50 m in length, where it can best be seen, a steady white light (Figure 6), visible all around the horizon ata distance of at least 3.7 km (2 NM).
- 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).
- 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

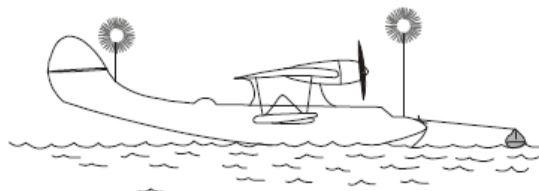
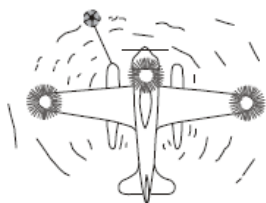


Figure 7

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.



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

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APPENDIX 15

FATIGUE RISK MANAGEMENT SYSTEM REQUIREMENTS

Note.— Guidance on the development, implementation, approval and monitoring of an FRMS is contained in the Fatigue Risk Management Systems Manual for Regulators (Doc 9966).

A Fatigue Risk Management System (FRMS) established in accordance with Chapter 4, 4.10.6, shall contain, at a minimum:

1. FRMS policy and documentation

1.1 FRMS policy

1.1.1 The operator shall define its FRMS policy, with all elements of the FRMS clearly identified.

1.1.2 The policy shall require that the scope of FRMS operations be clearly defined in the operations manual.

1.1.3 The policy shall:

- a) reflect the shared responsibility of management, flight and cabin crews, and other involved personnel;
- b) clearly state the safety objectives of the FRMS;
- c) be signed by the accountable executive of the organization;
- d) be communicated, with visible endorsement, to all the relevant areas and levels of the organization;
- e) declare management commitment to effective safety reporting;
- f) declare management commitment to the provision of adequate resources for the FRMS;
- g) declare management commitment to continuous improvement of the FRMS;
- h) require that clear lines of accountability for management, flight and cabin crews, and all other involved personnel are identified; and
- i) require periodic reviews to ensure it remains relevant and appropriate.

Note.— Effective safety reporting is described in the Safety Management Manual (SMM) (Doc 9859).

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1.2 FRMS documentation

An operator shall develop and keep current FRMS documentation that describes and records:

- a) FRMS policy and objectives;
- b) FRMS processes and procedures;
- c) accountabilities, responsibilities and authorities for these processes and procedures;
- d) mechanisms for ongoing involvement of management, flight and cabin crew members, and all other involved personnel;
- e) FRMS training programmes, training requirements and attendance records;
- f) scheduled and actual flight times, duty periods and rest periods with significant deviations and reasons for deviations noted; and

Note.— Significant deviations are described in the Fatigue Risk Management Systems Manual for Regulators (Doc 9966).

- g) FRMS outputs including findings from collected data, recommendations, and actions taken.

2. Fatigue risk management processes

2.1 Identification of hazards

Note.— Legal guidance for the protection of information from safety data collection and processing systems is contained in Attachment B to Annex 19.

An operator shall develop and maintain three fundamental and documented processes for fatigue hazard identification:

2.1.1 Predictive

The predictive process shall identify fatigue hazards by examining crew scheduling and taking into account factors known to affect sleep and fatigue and their effects on performance. Methods of examination may include but are not limited to:

- a) operator or industry operational experience and data collected on similar types of operations;
- b) evidence-based scheduling practices; and
- c) bio-mathematical models.

2.1.2 Proactive

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The proactive process shall identify fatigue hazards within current flight operations. Methods of examination may include but are not limited to:

- a) self-reporting of fatigue risks;
- b) crew fatigue surveys;
- c) relevant flight and cabin crew performance data;
- d) available safety databases and scientific studies; and
- e) analysis of planned versus actual time worked.

2.1.3 *Reactive*

The reactive process shall identify the contribution of fatigue hazards to reports and events associated with potential negative safety consequences in order to determine how the impact of fatigue could have been minimized. At a minimum, the process may be triggered by any of the following:

- a) fatigue reports;
- b) confidential reports;
- c) audit reports;
- d) incidents; and
- e) flight data analysis events.

2.2 Risk assessment

2.2.1 An operator shall develop and implement risk assessment procedures that determine the probability and potential severity of fatigue-related events and identify when the associated risks require mitigation.

2.2.2 The risk assessment procedures shall review identified hazards and link them to:

- a) operational processes;
- b) their probability;
- c) possible consequences; and
- d) the effectiveness of existing safety barriers and controls.

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2.3 Risk mitigation

An operator shall develop and implement risk mitigation procedures that:

- a) select the appropriate mitigation strategies;
- b) implement the mitigation strategies; and
- c) monitor the strategies' implementation and effectiveness.

3. FRMS safety assurance processes

The operator shall develop and maintain FRMS safety assurance processes to:

a) provide for continuous FRMS performance monitoring, analysis of trends, and measurement to validate the effectiveness of the fatigue safety risk controls. The sources of data may include, but are not limited to:

- 1) hazard reporting and investigations;
- 2) audits and surveys; and
- 3) reviews and fatigue studies;

b) provide a formal process for the management of change which shall include but is not limited to:

- 1) identification of changes in the operational environment that may affect FRMS;
- 2) identification of changes within the organization that may affect FRMS; and
- 3) consideration of available tools which could be used to maintain or improve FRMS performance prior to implementing changes; and

c) provide for the continuous improvement of the FRMS. This shall include but is not limited to:

- 1) the elimination and/or modification of risk controls that have had unintended consequences or that are no longer needed due to changes in the operational or organizational environment;
- 2) routine evaluations of facilities, equipment, documentation and procedures; and
- 3) the determination of the need to introduce new processes and procedures to mitigate emerging fatigue-related risks.

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4. FRMS promotion processes

FRMS promotion processes support the ongoing development of the FRMS, the continuous improvement of its overall performance, and attainment of optimum safety levels. The following shall be established and implemented by the operator as part of its FRMS:

a) training programmes to ensure competency commensurate with the roles and responsibilities of management, flight and cabin crew, and all other involved personnel under the planned FRMS; and

b) an effective FRMS communication plan that:

1) explains FRMS policies, procedures and responsibilities to all relevant stakeholders; and

2) describes communication channels used to gather and disseminate FRMS-related information.

ATTACHMENT

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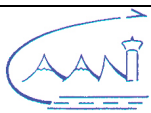
ATTACHMENT A

SIGNALS FOR USE IN THE EVENT OF INTERCEPTION

Reference to Chapter 3, 3.15

1. Signals initiated by intercepting aircraft and responses by intercepted aircraft

Series	INTERCEPTING Aircraft Signals	Meaning	INTERCEPTED Aircraft Responds	Meaning
1.	DAY or NIGHT — Rocking aircraft and flashing navigational lights at irregular intervals (and landing lights in the case of a helicopter) from a position slightly above and ahead of, and normally to the left of, the intercepted aircraft (or to the right if the intercepted aircraft is a helicopter) and, after acknowledgement, a slow level turn, normally to the left (or to the right in the case of a helicopter) on the desired heading. <i>Note 1.— Meteorological conditions or terrain may require the intercepting aircraft to reverse the positions and direction of turn given above in Series 1.</i> <i>Note 2.— If the intercepted aircraft is not able to keep pace with the intercepting aircraft, the latter is expected to fly a series of racetrack patterns and to rock the aircraft each time it passes the intercepted aircraft.</i>	You have been intercepted. Follow me.	DAY or NIGHT — Rocking aircraft, flashing navigational lights at irregular intervals and following.	Understood, will comply.
2.	DAY or NIGHT — An abrupt breakaway manoeuvre from the intercepted aircraft consisting of a climbing turn of 90 degrees or more without	You may proceed.		Understood, will comply.



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ATT - A2

3.	crossing the line of flight of the intercepted aircraft. DAY or NIGHT — Lowering landing gear (if fitted), showing steady landing lights and overflying runway in use or, if the intercepted aircraft is a helicopter, overflying the helicopter landing area. In the case of helicopters, the intercepting helicopter makes a landing approach, coming to hover near to the landing area.	Land at this aerodrome.		Understood, will comply.

2. Signals initiated by intercepted aircraft and responses by intercepting aircraft

Series	INTERCEPTING Aircraft Signals	Meaning	INTERCEPTED Aircraft Responds	Meaning
4.	DAY or NIGHT — Raising landing gear (if fitted) and flashing landing lights while passing over runway in use or helicopter landing area at a height exceeding 300 m (1 000 ft) but not exceeding 600 m (2 000 ft) (in the case of a helicopter, at a height exceeding 50 m (170 ft) but not exceeding 100 m (330 ft)) above the aerodrome level, and continuing to circle runway in use or helicopter landing area. If unable to flash landing lights, flash any other lights available.	Aerodrome you have designated is inadequate.	DAY or NIGHT — If it is desired that the intercepted aircraft follow the intercepting aircraft to an alternate aerodrome, the intercepting aircraft raises its landing gear (if fitted) and uses the Series 1 signals prescribed for intercepting aircraft. If it is decided to release the intercepted aircraft, the intercepting aircraft uses the Series 2 signals prescribed for intercepting aircraft.	Understood, follow me. Understood, you may proceed.
5	DAY or NIGHT — Regular switching on and off of all available lights but in such a manner as to be distinct from flashing lights.	Cannot comply.	DAY or NIGHT — Use Series 2 signals prescribed for intercepting aircraft.	Understood
6..	DAY or NIGHT — Irregular flashing of all available lights.	In distress.	DAY or NIGHT — Use Series 2 signals prescribed for intercepting aircraft.	Understood

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ATTACHMENT B

HEAD-UP DISPLAY (HUD), EQUIVALENT DISPLAYS AND VISION SYSTEMS *Supplementary to Chapter 4, 4.2.8.1.1, and Chapter 6, 6.23*

Introduction

The material in this attachment provides guidance for certified HUD and vision systems intended for operational use in aircraft engaged in international air navigation. A HUD, vision systems and hybrid systems may be installed and operated to provide guidance, enhance situational awareness and/or to obtain an operational credit by establishing minima below the aerodrome operating minima, for approach ban purposes, or reducing the visibility requirements or requiring fewer ground facilities as compensated for by airborne capabilities. HUD and vision systems may be installed separately or together as part of a hybrid system. Any operational credit to be obtained from their use requires approval from the State of the Operator.

Note 1.— “Vision systems” is a generic term referring to the existing systems designed to provide images, i.e. enhanced vision systems (EVS), synthetic vision systems (SVS) and combined vision systems (CVS).

Note 2.— Operational credit can be granted only within the limits of the design approval.

Note 3.— Currently, operational credit has been given only to vision systems containing an image sensor providing areal-time image of the actual external scene on the HUD.

1. HUD and equivalent displays

1.1 General

1.1.1 A HUD presents flight information into the pilot’s forward external field of view without significantly restricting that external view.

1.1.2 A variety of flight information may be presented on a HUD depending on the intended flight operation, flight conditions, systems capabilities and operational approval. A HUD may include, but is not limited to, the following:

- a) airspeed;
- b) altitude;
- c) heading;

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- d) vertical speed;
- e) angle of attack;
- f) flight path or velocity vector;
- g) attitude with bank and pitch references;
- h) course and glide path with deviation indications;
- i) status indications (e.g. navigation sensor, autopilot, flight director); and
- j) alerts and warning displays (e.g. ACAS, wind shear, ground proximity warning).

1.2 Operational applications

1.2.1 Flight operations with a HUD can improve situational awareness by combining flight information located on head-down displays with the external view to provide pilots with more immediate awareness of relevant flight parameters and situation information while they continuously view the external scene. This improved situational awareness can also reduce errors in flight operations and improve the pilot's ability to transition between instrument and visual references as meteorological conditions change. Flight operations applications may include the following:

- a) enhanced situational awareness during all flight operations, but especially during taxi, take-off, approach and landing;
- b) reduced flight technical error during take-off, approach and landing; and
- c) improvements in performance due to precise prediction of touchdown area, tail strike awareness/warning and rapid recognition of and recovery from unusual attitudes.

1.2.2 A HUD may be used for the following purposes:

- a) to supplement conventional flight deck instrumentation in the performance of a particular task or operation. The primary cockpit instruments remain the primary means for manually controlling or manoeuvring the aircraft; and
- b) as a primary flight display:
 - 1) information presented by the HUD may be used by the pilot in lieu of scanning head-down displays. Operational approval of a HUD for such use allows the pilot to control the aircraft by reference to the HUD for approved ground or flight operations; and

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2) information presented by the HUD may be used as a means to achieve additional navigation or control performance. The required information is displayed on the HUD. Operational credit, in the form of lower minima, for a HUD used for this purpose may be approved for a particular aircraft or automatic flight control system.

Additional credit may also be allowed when conducting HUD operations in situations where automated systems are otherwise used. 1.2.3 A HUD, as a stand-alone system, may qualify for operations with reduced visibility or RVR or replace some parts of the ground facilities such as touchdown zone and/or centre line lights. Examples and references to publications in this regard can be found in the *Manual of All-Weather Operations* (Doc 9365).

- 1.2.4 A HUD or equivalent display is one that has at least the following characteristics: it has a head-up presentation not requiring transition of visual attention from head down to head up; it displays sensor-derived imagery conformal to the pilot's external view; it permits simultaneous view of the EVS sensor imagery, required aircraft flight symbology, and the external view; and its display characteristics and dynamics are suitable for manual control of the aircraft. Before such systems can be used, the appropriate airworthiness and operational approvals must be obtained.

1.3 HUD training

- 1.3.1 An operator shall develop and make available to CAAN for approval training program on vision systems. The training program shall include recency of experience for flight crew for the use of HUD.
- 1.3.2 HUD training should address all flight operations for which the HUD is designed and operationally approved. Some training elements may require adjustments based on whether the aeroplane has a single or dual HUD installation. Training should include contingency procedures required in the event of head-up display degradation or failure. HUD training should include the following elements as applicable to the intended use:
- a) an understanding of the HUD, its flight path, energy management concepts and symbology. This should include operations during critical flight events (e.g. ACAS traffic advisory/resolution advisory, upset and wind shear recovery, engine or system failure);
 - b) HUD limitations and normal procedures, including maintenance and operational checks performed to ensure normal system function prior to use. These checks include pilot seat adjustment to attain and maintain appropriate viewing angles and verification of HUD operating modes;
 - c) HUD use during low visibility operations, including taxi, take-off, instrument approach and landing in both day and night conditions. This training should include the transition from head-down to head-up and head-up to head-down operations;

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- d) failure modes of the HUD and the impact of the failure modes or limitations on crew performance;
- e) crew coordination, monitoring and verbal call-out procedures for single HUD installations with head-down monitoring for the pilot not equipped with a HUD and head-up monitoring for the pilot equipped with a HUD;
- f) crew coordination, monitoring and verbal call-out procedures for dual HUD installations with use of a HUD by the pilot flying the aircraft and either head-up or head-down monitoring by the other pilot;
- g) consideration of the potential for loss of situational awareness due to “tunnel vision” (also known as cognitive tunnelling or attention tunnelling);
- h) any effects that weather, such as low ceilings and visibilities, may have on the performance of a HUD; and
- i) HUD airworthiness requirements.

2. Vision systems

2.1 General

- 2.1.1 Vision systems can display electronic real-time images of the actual external scene achieved through the use of image sensors (EVS) or display synthetic images, which are derived from the on-board avionic systems (SVS). Vision systems can also consist of a combination of these two systems or combined vision systems (CVS). Such a system may display electronic real-time images of the external scene using the EVS component of the system. However, the merging of EVS and SVS into a CVS is dependent on the intended function (e.g. whether or not there is intent to achieve operational credit).
- 2.1.2 The information from vision systems may be displayed on a head-up or head-down display. When enhanced vision imagery is displayed on a HUD, it should be presented to the pilot’s forward external field of view without significantly restricting that external view.
- 2.1.3 The enhanced position fixing and guidance provided by SVS may provide additional safety for all phases of flight especially low visibility taxi, take-off, approach and landing operations.
- 2.1.4 Light emitting diode (LED) lights may not be visible to infrared-based vision systems due to the fact that LED lights are not incandescent and they do not have a significant heat signature. Operators of such vision systems will need to acquire information about the LED implementation programmes at aerodromes where they operate.

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2.2 Operational applications

- 2.2.1 Flight operations with enhanced vision image sensors allow the pilot to view an image of the external scene obscured by darkness or other visibility restrictions. When the external scene is partially obscured, enhanced vision imaging may allow the pilot to acquire an image of the external scene earlier than with natural or unaided vision. The improved acquisition of an image of the external scene may improve situational awareness.
- 2.2.2 Vision system imagery may also allow pilots to detect terrain or obstructions on the runway or taxiways. A vision system image can also provide visual cues to enable earlier runway alignment and a more stabilized approach.
- 2.2.3 The combined display of aircraft performance, guidance and imagery may allow the pilot to maintain a more stabilized approach and smoothly transition from enhanced visual references to natural visual references.

2.3 Vision systems training

- 2.3.1 An operator shall develop and make available to CAAN for approval training program on vision systems. The training program shall include recency of experience for flight crew for the use of HUD with or without enhanced vision imagery or conventional head-down instrumentation.
- 2.3.2 Training should address all flight operations for which the vision system is approved. This training should include contingency procedures required in the event of system degradation or failure. Training for situational awareness should not interfere with other required operations. Training for operational credit should also require training on the applicable HUD used to present the enhanced visual imagery. Training should include the following elements as applicable:
 - a) an understanding of the system characteristics and operational constraints;
 - b) normal procedures, controls, modes and system adjustments (e.g. sensor theory including radiant versus thermal energy and resulting images);
 - c) operational constraints, normal procedures, controls, modes and system adjustments;
 - d) limitations;
 - e) airworthiness requirements;
 - f) vision system display during low visibility operations, including taxi, take-off, instrument approach and landing; system use for instrument approach procedures in both day and night conditions;

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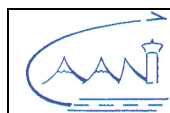
- g) failure modes and the impact of failure modes or limitations upon crew performance, in particular, for two-pilot operations;
- h) crew coordination and monitoring procedures and pilot call-out responsibilities;
- i) transition from enhanced imagery to visual conditions during runway visual acquisition;
- j) rejected landing: with the loss of visual cues of the landing area, touchdown zone or rollout area;
- k) any effects that weather, such as low ceilings and visibilities, may have on the performance of the vision system; and
- l) effects of aerodrome lighting using LED lights.

2.4 Operational concepts

- 2.4.1 Instrument approach operations that involve the use of vision systems include the instrument phase and the visual phase. The instrument phase ends at the published MDA/H or DA/H unless a missed approach is initiated. The continued approach to landing from MDA/H or DA/H will be conducted using visual references. The visual references will be acquired by use of an EVS or CVS, natural vision or a combination of the two.
- 2.4.2 Down to a defined height, typically 30 m (100 ft), the visual references will be acquired by means of the vision system. Below this height the visual references should be solely based on natural vision. In the most advanced applications, the vision system is expected to be able to be used down to touchdown without the requirement for natural vision acquisition of visual references. Using the EVS or CVS does not change the classification of an instrument approach procedure, since the published DA/H remains unchanged and manoeuvring below DA/H is conducted by visual references acquired by means of the EVS or CVS.
- 2.4.3 In addition to the operational credit that EVS/CSV is able to provide, these systems may also provide an operational and safety advantage through improved situational awareness, earlier acquisition of visual references and smoother transition to references by natural vision. These advantages are more pronounced for Type A approach operations than for Type B approach operations.

2.5 Visual references

- 2.5.1 The required visual references do not change due to the use of an EVS or CVS, but those references are allowed to be acquired by means of either vision system until a certain height during the approach (see Figure I-1).



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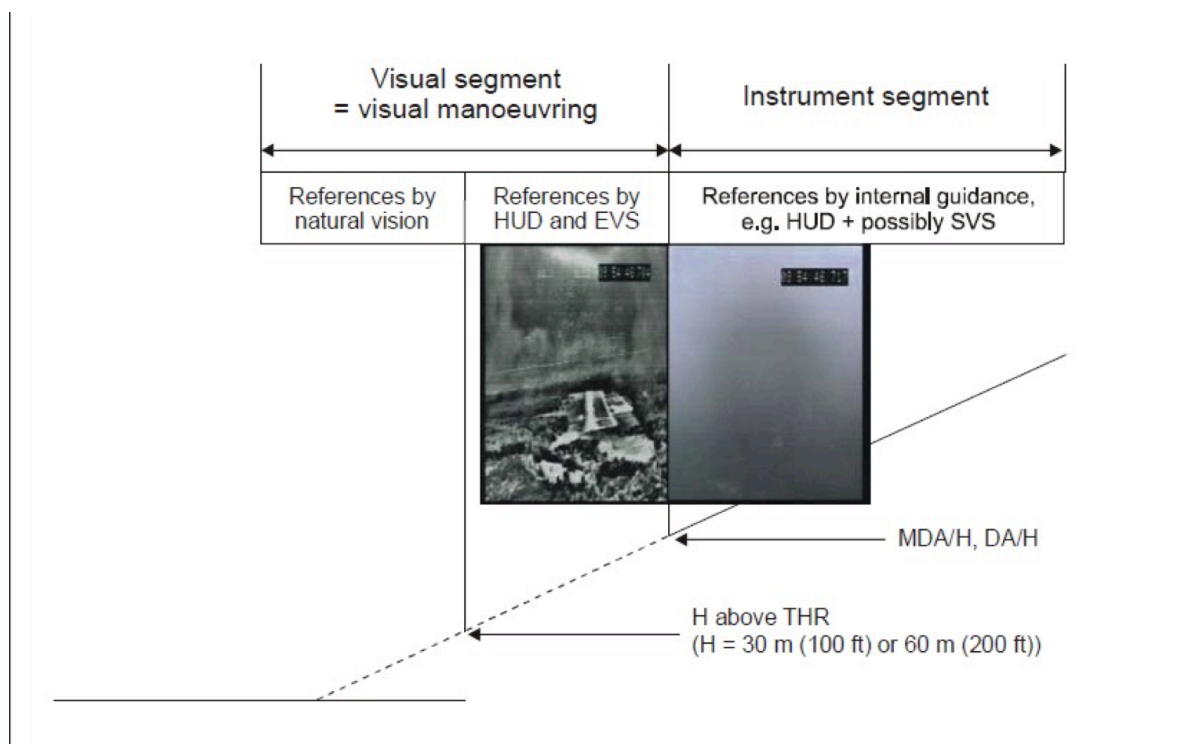
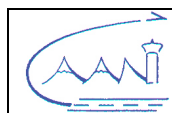


Figure I-1. EVS operations — transition from instrument to visual reference

- 2.5.2 In regions that have developed requirements for operations with vision systems, the visual references are indicated in Table I-1.

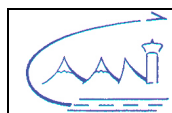


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Table I-1. Examples of operational credits

OPERATIONS BELOW DA/DH OR MDA/MDH	
Example 1	Example 2
For procedures designed to support Type A operations, the following visual references for the intended runway should be distinctly visible and identifiable: • the approach lighting system; or • the runway threshold, identified by at least one of the following: — the beginning of the runway landing surface; — threshold lights; or — runway end identifier lights; and • the touchdown zone, identified by at least one of the following: — the runway touchdown zone landing surface; — touchdown zone lights; — touchdown zone markings; or	For procedures designed to support 3D Type A and Type BCAT I operations, the following visual references should be displayed and identifiable to the pilot on the EVS image: • elements of the approach lighting system; or • the runway threshold, identified by at least one of the following: — the beginning of the runway landing surface; — threshold lights; — threshold identification lights; or — the touchdown zone, identified by at least one of the following: – the runway touchdown zone landing surface; – touchdown zone lights; – touchdown zone markings; or – runway lights.
Operations below 60 m (200 ft) above touchdown zone elevation	Operations below 60 m (200 ft) above threshold elevation
No additional requirements apply at 60 m (200 ft).	For procedures designed to support 3D Type A operations, the visual references are the same as those specified below for Type B CAT I operations
Operations below 30 m (100 ft) above touchdown zone elevation	Operations below 30 m (100 ft) above threshold elevation
The visibility must be sufficient for the following to be distinctly visible and identifiable to the pilot without reliance on the EVS: • the lights or markings of the threshold; or • the lights or markings of the touchdown zone.	For procedures designed to support Type B CAT II operations, at least one of the visual references specified below should be distinctly visible and identifiable to the pilot without reliance on the EVS: • the lights or markings of the threshold; or • the lights or markings of the touchdown zone.



3. Hybrid systems

3.1 A hybrid system generically means that two or more systems are combined. The hybrid system typically has improved performance compared to each of the component systems, which in turn may qualify for operational credit. Vision systems are normally part of a hybrid system, e.g. EVS is typically combined with a HUD. Including more components in the hybrid system normally enhances the performance of the system.

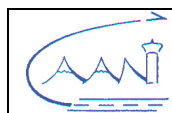
3.2 Table I-2 provides some examples of hybrid system components. Any combination of the listed systems may constitute a hybrid system. The degree of operational credit that may be given to a hybrid system depends on its performance (accuracy, integrity and availability) as assessed and determined by the certification and operational approval processes.

Table I-2. Examples of hybrid system components

Systems based on image sensors	Systems not based on image sensors
EVS • Passive infrared sensors • Active infrared sensors • Passive millimetre wave radiometer • Active millimetre wave radar	SVS
	Autoflight systems, flight control computers, automatic landing systems
	Systems for position fixing
CVS (where the EVS component as above qualifies for operational credit)	CVS (the SVS component)
	HUD, equivalent display
	ILS, GNSS

4. Operational credits

4.1 Aerodrome operating minima are expressed in terms of minimum visibility/RVR and MDA/H or DA/H. With respect to operational credit this means that the visibility/RVR requirements, established in the instrument approach procedure, may be reduced or satisfied for aircraft equipped with appropriately approved vision systems such as EVS. Reasons for granting operational credit may be when aircraft are better equipped than what was originally considered when designing the instrument approach procedure or when runway visual aids considered in the design of the procedure are not available but can be compensated for by on-board equipment.



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- 4.2 Credits related to visibility/RVR can be given using at least three concepts. The first concept is to reduce the required RVR which will allow the aircraft to continue the approach beyond the approach ban point with a reported RVR lower than what was established for the approach procedure. Where a minimum visibility is prescribed, a second concept to grant operational credit may be used. In this case, the required minimum visibility is kept unchanged, but it is satisfied by means of the on-board equipment, typically an EVS. The result of both these concepts is that operations are allowed in meteorological conditions where otherwise they would not be possible. A third concept is to give operational credit by allowing operations in visibility/RVR which are not lower than those established for the approach procedure, but the approach operation is conducted with less facilities on the ground. One example of the latter is to allow Category II operations without touchdown and/or centre line lights, compensated for by additional on-board equipment, e.g. a HUD.
- 4.3 Granting operational credits does not affect the classification of an instrument approach procedure since, as described in Standard 4.2.8.3, instrument approach procedures are designed to support a given instrument approach operation (i.e. type, category). However, the design of those procedures may not take into consideration on-board equipment that may compensate for facilities on the ground.
- 4.4 In order to provide optimum service, the ATS may have to be informed about the capabilities of better-equipped aircraft, e.g. which is the minimum RVR required.
- 4.5 In addition to the operational credit that a HUD, vision systems and hybrid systems are able to provide, these systems will also provide an operational and safety advantage through improved situational awareness, earlier acquisition of visual references and smoother transition to references by natural vision. These advantages are more pronounced for 3D Type A approach operations than for Type B approach operations.

5. Operational procedures

- 5.1 It is not prohibited to use vision systems in connection with circling. However, due to the system layout of a vision system and the nature of a circling procedure, key visual references can be obtained only by natural vision, and operational credit is not feasible for existing vision systems. The vision system may provide additional situational awareness.
- 5.2 The operational procedures associated with the use of a HUD, vision systems and hybrid systems should be included in the operations manual. The instructions in the operations manual should include:
- a) any limitation that is imposed by the airworthiness or operational approvals;

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b) how operational credit affects:

- 1) flight planning with respect to destination and alternate aerodromes;
- 2) ground operations;
- 3) flight execution, e.g. approach ban and minimum visibility;
- 4) crew resource management that takes into account the equipment configuration, e.g. the pilots may have different presentation equipment;
- 5) standard operating procedures, e.g. use of autoflight systems, call-outs that may be particular to the vision system or hybrid system, criteria for stabilized approach;
- 6) ATS flight plans and radio communication.

6. Approvals

6.1 General

- 6.1.1 An operator that wishes to conduct operations with a HUD or equivalent display, vision system or hybrid system will need to obtain certain approvals (i.e. 4.2.8.1.1 and 6.23). The extent of the approvals will depend on the intended operation and the complexity of the equipment.
- 6.1.2 Enhanced vision imagery may be used to improve situational awareness without a specific operational approval. However, the standard operating procedures for these types of operations need to be specified in the operations manual. An example of this type of operation may include an EVS or an SVS on a head-down display that is used only for situational awareness of the surrounding area of the aircraft during ground operations where the display is not in the pilot's primary field of view. For enhanced situational awareness, the installation and operational procedures need to ensure that the operation of the vision system does not interfere with normal procedures or the operation or use of other aircraft systems. In some cases, modifications to these normal procedures for other aircraft systems or equipment may be necessary to ensure compatibility.
- 6.1.3 When a vision system or a hybrid system with vision systems imagery is used for operational credit, operational approvals will typically require that the imagery be combined with flight guidance and presented on a HUD. Operational approvals may require that this information also be presented on a head-down display. Operational credit may be applied for any flight operation, but credit for instrument approach and take-off operations is most common.

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6.1.4 When the application for approval relates to operational credits for systems not including a vision system, the guidance in this attachment may be used to the extent applicable as determined by the State of the Operator or the State of Registry for general aviation.

6.1.5 Operators should be aware that some States may require some information about the operational credit(s) which has been granted by the State of the Operator or the State of Registry for general aviation. Typically the approval from that State will have to be presented, and in some cases the State of the Aerodrome may wish to issue an approval or to validate the original approval.

6.2 Approvals for operational credit

To obtain operational credit the operator will need to specify the desired operational credit and submit a suitable application. The content of a suitable application should include:

a) *Applicant details — required for all approval requests.* The official name and business or trading name(s), address, mailing address, e-mail address and contact telephone/fax numbers of the applicant.

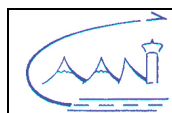
Note.— For AOC holders, the company name, AOC number and e-mail address should be required.

b) *Aircraft details — required for all approval requests.* Aircraft make(s), model(s) and registration mark(s).

c) *Operator's vision system compliance list.* The contents of the compliance list are included in Table I-3. The compliance list should include the information that is relevant to the approval requested and the registration marks of the aircraft involved. If more than one type of aircraft/fleet is included in a single application a completed compliance list should be included for each aircraft/fleet.

d) *Documents to be included with the application.* Copies of all documents referred to in column 4 of the operator's vision system compliance list (Table I-3) should be included when returning the completed application form to the civil aviation authority. There should be no need to send complete manuals; only the relevant sections/pages should be required.

e) *Name, title and signature.*



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Table I-3. Example of an AOC vision system compliance list

MAIN HEADING	EXPANDED AREAS TO BE ADDRESSED BY THE APPLICATION	SUB-REQUIREMENTS	OPERATOR'S OPS.MANUAL REFERENCE OR DOCUMENT REFERENCE
1.0 Reference documents used in compiling the submission	The submission should be based on current up-to-date regulatory material. A compliance statement showing how the criteria of the applicable regulations and requirements have been satisfied		
2.0 Aircraft flight manual (AFM)	A copy of the relevant AFM entry showing the aircraft certification basis for the vision system and any operational conditions.		
3.0 Feedback and reporting of significant problems	An outline of the process for the reporting of failures in the operational use of procedures. <i>Note.— In particular, significant problems with the vision system/HUD system, reporting on circumstances/ locations where the vision system was unsatisfactory.</i>		
4.0 Instrument approach chart provider and operating minima	The name of the provider of the relevant instrument approach charts. Confirmation that all aerodrome operating minima are established in accordance with the method acceptable to the relevant authority.		
5.0 Operations manual entries and standard operating procedures	Manufacturer/operator-developed. Manufacturer's procedures are recommended as a starting point and should include at least the items in the sub-requirements column.	Definitions. Check that crew members are qualified for vision system/ HUD operations. MEL handling. Equipment required for vision system operations. Types of approach where vision systems can be used.	

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		Statement that the autopilot/flight director should be used whenever possible. Minimum visual references for landing. Approach ban and RVR. Stabilized approach criteria. Correct seating and eye position. Crew coordination, e.g. duties of the pilot flying and the pilot not flying: • limitations; • designation of handling and non-handling pilots; • use of automatic flight control system; • checklist handling; • approach briefing; • radio communications handling; • monitoring and cross-checking of instruments and radio aids; and • use of the repeater display by the pilot not flying. Contingency procedures including: • failures above and below decision height; • ILS deviation warnings; • autopilot disconnect; • auto-throttle disconnect; • electrical failures; • engine failure; • failures and loss of visual references at or below decision height; • vision system/HUD failure below normal decision height; • wind shear; • ACAS warnings; • EGPWS warnings.	
6.0 Safety risk assessment		Operator's safety risk assessment.	

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ATTACHMENT C

FLIGHT SAFETY DOCUMENTS SYSTEM

Supplementary to Chapter 3, 3.3.4

1. Introduction

- 1.1 The following material provides guidance on the organization and development of an operator's flight safety documents system. It should be understood that the development of a flight safety documents system is a complete process, and changes to each document comprising the system may affect the entire system. Guidelines applicable to the development of operational documents have been produced by government and industry sources and are available to operators. Nevertheless, it may be difficult for operators to make the best use of these guidelines, since they are distributed across a number of publications.
- 1.2 Furthermore, guidelines applicable to operational documents development tend to focus on a single aspect of documents design, for example, formatting and typography. Guidelines rarely cover the entire process of operational documents development. It is important for operational documents to be consistent with each other, and consistent with regulations, manufacturer requirements and Human Factors principles. It is also necessary to ensure consistency across departments as well as consistency in application. Hence the emphasis on an integrated approach, based on the notion of the operational documents as a complete system.
- 1.3 The guidelines in this Attachment address the major aspects of an operator's flight safety documents system development process, with the aim of ensuring compliance with Chapter 3, 3.3.4. The guidelines are based not only upon scientific research, but also upon current best industry practices, with an emphasis on a high degree of operational relevance.

2. Organization

- 2.1 A flight safety documents system should be organized according to criteria which ensure easy access to information required for flight and ground operations contained in the various operational documents comprising the system and which facilitate management of the distribution and revision of operational documents.
- 2.2 Information contained in a flight safety documents system should be grouped according to the importance and use of the information, as follows:
 - a) time-critical information, e.g., information that can jeopardize the safety of the operation if not immediately available;
 - b) time-sensitive information, e.g., information that can affect the level of safety or delay the operation if not available in a short time period;

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- c) frequently used information;
 - d) reference information, e.g., information that is required for the operation but does not fall under b) or c) above; and
 - e) information that can be grouped based on the phase of operation in which it is used.
- 2.3 Time-critical information should be placed early and prominently in the flight safety documents system.
- 2.4 Time-critical information, time-sensitive information, and frequently used information should be placed in cards and quick-reference guides.

3. Validation

The flight safety documents system should be validated before deployment, under realistic conditions. Validation should involve the critical aspects of the information use, in order to verify its effectiveness. Interactions among all groups that can occur during operations should also be included in the validation process.

4. Design

- 4.1 A flight safety documents system should maintain consistency in terminology and in the use of standard terms for common items and actions.
- 4.2 Operational documents should include a glossary of terms, acronyms and their standard definition, updated on a regular basis to ensure access to the most recent terminology. All significant terms, acronyms and abbreviations included in the flight documents system should be defined.
- 4.3 A flight safety documents system should ensure standardization across document types, including writing style, terminology, use of graphics and symbols, and formatting across documents. This includes a consistent location of specific types of information, consistent use of units of measurement and consistent use of codes.
- 4.4 A flight safety documents system should include a master index to locate, in a timely manner, information included in more than one operational document.

Note.— The master index must be placed in the front of each document and consist of no more than three levels of indexing. Pages containing abnormal and emergency information must be tabbed for direct access.

- 4.5 A flight safety documents system should comply with the requirements of the operator's quality system, if applicable.

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5. Deployment

Operators should monitor deployment of the flight safety documents system, to ensure appropriate and realistic use of the documents, based on the characteristics of the operational environment and in a way which is both operationally relevant and beneficial to operational personnel. This monitoring should include a formal feedback system for obtaining input from operational personnel.

6. Amendment

6.1 Operators should develop an information gathering, review, distribution and revision control system to process information and data obtained from all sources relevant to the type of operation conducted, including, but not limited to, the State of the Operator, State of design, State of Registry, manufacturers and equipment vendors.

Note.— Manufacturers provide information for the operation of specific aircraft that emphasizes the aircraft systems and procedures under conditions that may not fully match the requirements of operators. Operators should ensure that such information meets their specific needs and those of the local authority.

6.2 Operators should develop an information gathering, review and distribution system to process information resulting from changes that originate within the operator, including:

- a) changes resulting from the installation of new equipment;
- b) changes in response to operating experience;
- c) changes in an operator's policies and procedures;
- d) changes in an operator certificate; and
- e) changes for purposes of maintaining cross fleet standardization.

Note.— Operators should ensure that crew coordination philosophy, policies and procedures are specific to their operation.

6.3 A flight safety documents system should be reviewed:

- a) on a regular basis (at least once a year);
- b) after major events (mergers, acquisitions, rapid growth, downsizing, etc.);
- c) after technology changes (introduction of new equipment); and
- d) after changes in safety regulations.

6.4 Operators should develop methods of communicating new information. The specific methods should be responsive to the degree of communication urgency.

Note.— As frequent changes diminish the importance of new or modified procedures, it is desirable to minimize changes to the flight safety documents system.

6.5 New information should be reviewed and validated considering its effects on the entire flight safety documents system.

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- 6.6 The method of communicating new information should be complemented by a tracking system to ensure currency by operational personnel. The tracking system should include a procedure to verify that operational personnel have the most recent updates.

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