

## 澳門特別行政區

## REGIÃO ADMINISTRATIVA ESPECIAL DE MACAU

### 第25/2003號行政命令

行政長官行使《澳門特別行政區基本法》第五十條（四）項規定的職權，並按照八月七日第36/95/M號法令第九條第三款的規定，發佈本行政命令。

#### 第一條

##### 核准

核准《澳門空中航行規章》（下稱《航空規章》），該規章的英文文本附於本行政命令公佈。

#### 第二條

##### 定期更新

一、民航局基於航空運輸的安全理由，對《航空規章》進行必要的技術性更新。

二、上款所指的技術性更新內容必須遵守，且應在兩年內載入《航空規章》，並將該規章公佈。

#### 第三條

##### 推廣

民航局應採取必要措施，將《航空規章》及其技術性更新內容向《航空規章》所規範的對象，尤其是可能使用澳門國際機場者作適當及長期推廣。

#### 第四條

##### 以正式語文公佈

《航空規章》的文本，須於兩年內以澳門特別行政區的正式語文公佈。

#### 第五條

##### 廢止

廢止：

（一）八月七日第227/95/M號訓令核准的《澳門空中航行規章》，該規章的中、葡文文本按一九九九年八月三日第115/GM/99號批示的命令公佈於一九九九年八月十六日第三十三期《政府公報》第一組；

### Ordem Executiva n.º 25/2003

Usando da faculdade conferida pela alínea 4) do artigo 50.º da Lei Básica da Região Administrativa Especial de Macau, e nos termos do n.º 3 do artigo 9.º do Decreto-Lei n.º 36/95/M, de 7 de Agosto, o Chefe do Executivo manda publicar a presente ordem executiva:

#### Artigo 1.º

##### Aprovação

É aprovado o Regulamento de Navegação Aérea de Macau, adiante designado por RNAM, cuja versão em língua inglesa é publicada em anexo à presente ordem executiva.

#### Artigo 2.º

##### Actualização periódica

1. A Autoridade de Aviação Civil (AACM), procede às actualizações técnicas do RNAM que, por razões de segurança do transporte aéreo, se revelarem necessárias.

2. As actualizações referidas no número anterior são de cumprimento obrigatório, devendo ser incorporadas na publicação do RNAM com a periodicidade máxima de dois anos.

#### Artigo 3.º

##### Divulgação

A AACM deve promover as medidas necessárias a uma adequada e permanente divulgação do RNAM e das suas actualizações técnicas pelos destinatários, designadamente pelos potenciais utilizadores do Aeroporto Internacional de Macau.

#### Artigo 4.º

##### Publicação nas línguas oficiais

No prazo máximo de dois anos são publicadas as versões do RNAM nas línguas oficiais da Região Administrativa Especial de Macau.

#### Artigo 5.º

##### Revogações

São revogados:

1) O Regulamento de Navegação Aérea de Macau, aprovado pela Portaria n.º 227/95/M, de 7 de Agosto, cujas versões nas línguas chinesa e portuguesa foram publicadas no *Boletim Oficial* n.º 33, I Série, de 16 de Agosto de 1999, por determinação do Despacho n.º 115/GM/99, de 3 de Agosto de 1999;

(二)十二月二十六日第 327/95/M 號訓令。

2) A Portaria n.º 327/95/M, de 26 de Dezembro.

第六條  
生效Artigo 6.º  
Entrada em vigor

本行政命令自公佈翌日起生效。

A presente ordem executiva entra em vigor no dia seguinte  
ao da sua publicação.

二零零三年七月二日。

2 de Julho de 2003.

命令公佈。

Publique-se.

行政長官 何厚鐘

O Chefe do Executivo, *Ho Hau Wah*.**TABLE OF CONTENTS****PART**

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## Part I

### PRELIMINARY

#### Citation

1. This Regulation may be cited as the *Air Navigation Regulation of Macao (ANRM)*.

#### Definition

2. (1) In this Regulation unless the context otherwise requires:

***Aerial work*** means any purpose (other than commercial air transport) for which an aircraft is flown if hire or reward is given or promised in respect of the flight or for the purpose of the flight;

***Aerial work aircraft*** means an aircraft (other than a commercial air transport aircraft) flying, or intended by the operator to fly, for the purpose of aerial work;

***Aerial work undertaking*** means an undertaking whose business includes the performance of aerial work;

***Aerobatic manoeuvres***, includes loops, spins, rolls, bunts, stall turns, inverted flying and any other similar manoeuvre;

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

***Aerodrome traffic zone***, in relation to any aerodrome, means defined airspace, which is notified, around an aerodrome for the protection of aerodrome traffic;

***Aeronautical light*** means any light established for the purpose of aiding air navigation;

***Aeronautical radio station*** means a radio station on the surface which transmits or receives signals for the purpose of assisting aircraft;

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

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

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

***Aircraft operating manual*** means a manual, acceptable to the Civil Aviation Authority, containing normal, abnormal and emergency procedures, checklists, limitations, performance information, details of the aircraft systems and other material relevant to the operation of the aircraft. The aircraft operating manual is part of the operations manual;

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

***Air traffic control unit*** means an entity appointed by the Civil Aviation Authority, or by any entity maintaining an aerodrome, to give instructions or advice or both by means of radio and visual signals to aircraft in the interests of safety, and "air traffic control service" shall be construed accordingly;

***Air transport undertaking*** means an undertaking whose business includes the carriage by air of passengers or cargo for hire or reward;

***Appropriate aeronautical radio station*** means, in relation to an aircraft, an aeronautical radio station serving the area in which the aircraft is for the time being;

***Appropriate air traffic control unit*** means, in relation to the aircraft, the air traffic control unit serving the area in which the aircraft is for the time being;

***Approved training*** means the training carried out under special curricula and supervision approved by the Civil Aviation Authority and shall provide a level of competency at least equal to that provided by the minimum experience requirements for personnel not receiving such approved training;

***Authorised entity*** means any entity authorised by the Civil Aviation Authority either generally or in relation to a particular case or class of cases, and references to an authorised entity include references to the holder for the time being of any office designated by the Civil Aviation Authority;

***Beneficial interests*** means interests arising under contract and other legal interests;

***Cabin crew member*** means a crew member who performs, in the interest of safety of passengers, duties assigned by the operator or the commander of the aircraft, but who shall not act as a flight crew member;

***Cargo*** includes mail and animals;

***Certificate of airworthiness*** includes any validation thereof and any *Aircraft flight manual* or performance schedule relating to the *Certificate of airworthiness*;

***Certificate of approval*** means a certificate of approval issued under paragraph 8 (1) of this Regulation;

***Certificate of maintenance review*** means a *Certificate of maintenance review* issued under paragraph 9 of this Regulation;

***Certificate of registration*** means a certificate of registration issued under paragraph 4 (8) and (9) of this Regulation;

***Certificate of release to service*** means a *Certificate of release to service* issued under paragraph 10 of this Regulation;

***Civil Aviation Authority*** means *Civil Aviation Authority, Macao - China*

***Commander***, in relation to an aircraft, means the member of the flight crew designated as commander of that aircraft by the operator thereof, or, failing such a person, the person who is for the time being the commander of the aircraft;

**Commercial air transport** has the meaning assigned to it by sub-paragraph (4) hereunder;

**Commercial air transport aircraft** means an aircraft flying or intended by the operator of the aircraft to fly, for the purpose of commercial air transport;

**Commercial air transport of passengers** means transport of passengers which is commercial air transport by virtue of sub-paragraph (4) (a) (i) or (ii) hereunder;

**Competent authority** means, in relation to Macao, the Civil Aviation Authority, and, in relation to any other State or Territory, the authority responsible under the law of that State or Territory for promoting the safety of civil aviation;

**Congested area**, in relation to a city, town or settlement, means any area which is substantially used for residential, industrial, commercial or recreational purposes;

**Contracting State** means any State which is a signatory of the Convention on International Civil Aviation, known as the Chicago Convention;

**Controlled airspace** means control areas and control zones;

**Control area** means air space which has been notified as such and which extends upwards from a notified altitude;

**Control zone** means air space which has been notified as such and which extends upwards from the surface;

**Co-pilot**, in relation to an aircraft, means a pilot who in performing his duties as such is subject to the direction of another pilot carried in the aircraft;

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

**Extended range operation** means any flight by an aeroplane with two turbine power-units where the flight time at the one power-unit inoperative cruise speed (in ISA and still air conditions), from a point on the route to an adequate alternate aerodrome, is greater than the threshold time of 60 minutes approved by the Civil Aviation Authority;

**Flight** and **To fly** have the meanings respectively assigned to them by sub-paragraph (2);

**Flight crew member** means a licenced crew member charged with duties essential to the operation of an aircraft during a flight duty period;

**Flight level** means one of a series of levels of equal atmospheric pressure, separated by notified intervals and each expressed as the number of hundred of feet which would be indicated at that level on a pressure altimeter calibrated in accordance with the International Standard Atmosphere and set to 1013.2 millibars;

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

**Flight recording system** means a system comprising either a flight data recorder or a cockpit voice recorder or both;



**Flight visibility** means the visibility forward from the flight deck of an aircraft in flight;

**Helicopter** means a heavier-than-air aircraft supported in flight chiefly by the reactions of the air on one or more power-driven rotors on substantially vertical axes;

**Heliport** means an aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters;

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

**ICAO** means International Civil Aviation Organization;

**Instrument Flight Rules** means Instrument Flight Rules (IFR) contained in Part VI of the Eleventh Schedule;

**Instrument Meteorological Conditions** means weather precluding flight in compliance with the Visual Flight Rules (VFR);

**To land** in relation to aircraft includes alighting on water;

**Legal personal representative** means an executor, administrator or other representative of a deceased person;

**Licence** includes any certificate of competency or certificate of validity issued with the licence or required to be held in connection with the licence by the law of the State or Territory in which the licence is granted;

**Licence for public use** has the meaning assigned to it by paragraph 69 (1) of this Regulation;

**Licence of aerodrome** means an aerodrome licence delivered under this Regulation;

**Life jacket** includes any device designed to support a person individually in or on water;

**Log book**, in the case of an aircraft log book, engine log book or variable pitch propeller log book, or personal flying log book, includes a record kept either in a book or by any other means approved by the Civil Aviation Authority in any particular case;

**Macao** means the Macao Special Administrative Region of People's Republic of China;

**Macao registered aircraft** means an aircraft which is registered in Macao;

**Maximum certificated take-off mass**, in relation to an aircraft, means the maximum total mass of the aircraft and its contents at which the aircraft may take-off anywhere in the world in the most favourable circumstances in accordance with the certificate of airworthiness in force in respect of the aircraft;

**Maintenance** means the performance of tasks required to ensure the continue airworthiness of an aircraft or aircraft component, including any one or combination of overhaul, inspection, replacement, defect rectification and the embodiment of a modification or repair;

**Military aircraft** includes the naval, military or air force aircraft of any State;

**Nautical mile** means the International Nautical Mile which is a distance of 1,852 metres;

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

**Notified** means shown in publications issued in Macao entitled Notams (Notices to Airmen), Aeronautical Information Circulars (AIC), Aeronautical Information Publications (AIP), Macao Air Safety Publications (MASP) and Macao Aviation Requirements (MAR) or any other official publication so issued for the purpose of enabling any of the provisions of this Regulation to be complied with;

**Operating staff** means the employees and agents employed by the operator, whether or not acting as crew members, who ensure that all flights are conducted in a safe and efficient manner;

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

**Operational flight plan** means the operator's plan for the safe conduct of the flight based on considerations of aircraft performance, other operating limitations and relevant expected conditions on the route to be followed and at the aerodromes concerned;

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

**Operator** means a person, organization or enterprise engaged in or offering to engage in an aircraft operation as it is referred in sub-paragraph (3) hereunder;

**Operator's maintenance management exposition** means a document which describes the operator's procedures necessary to ensure that all scheduled and unscheduled maintenance is performed on the operator's aircraft or aircraft component on time and a controlled and satisfactory manner;

**Prescribed** means prescribed by regulations made by the Civil Aviation Authority under this Regulation;

**Pressurised aircraft** means an aircraft provided with means of maintaining in any compartment thereof a pressure greater than that of the surrounding atmosphere;

**Psychoactive substances** means alcohol, opioids, cannabinoids, sedatives and hypnotics, cocaine, other psychostimulants, hallucinogens, and volatile solvents, whereas coffee and tobacco are excluded;

**Rendering (a Certificate of airworthiness) valid** means the action taken by the Civil Aviation Authority, as an alternative to issuing its own *Certificate of airworthiness*, in accepting a *Certificate of airworthiness* issued by any other Contracting State as the equivalent of its own *Certificate of airworthiness*;

**Rendering (a licence) valid** means the action taken by the Civil Aviation Authority, as an alternative to issuing its own licence, in accepting a licence issued by any other Contracting State as the equivalent of its own licence;

**Repair** means 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;

**Replacement**, in relation to any part of any aircraft or its equipment, includes the removal and replacement of that part whether or not by the same part, and whether or not any work is done on it, but does not include the removal and replacement of a part which is designed to be removable solely for the purpose of enabling another part to be inspected, repaired, removed or replaced or cargo to be loaded;

**Rules of the Air and Air Traffic Control** means the Rules of the Air and Air Traffic Control contained in the Eleventh Schedule;

**Runway visual range (RVR)** means 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;

**Scheduled journey** means one of a series of journeys which are undertaken between the same two places and together amount to a systematic service;

**Special VFR flight** means a flight which is a special VFR flight for the purposes of the rules prescribed under paragraph 61 (1);

**State aircraft** means an aircraft used in military, customs and police services;

**Synthetic flight trainer** means any one of the following three types of apparatus in which flight conditions are simulated on the ground:

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

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

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

**Type Certificate** means a document issued by a Contracting State to define the design of an aircraft type and to certify that this design meets the appropriate airworthiness requirements of that State;

**Visual flight rules** means the visual flight rules (VFR) contained in Part V of the Eleventh Schedule; and

**Visual meteorological conditions** mean weather permitting flight in accordance with the visual meteorological conditions (VMC).

- (2) An aircraft shall be deemed to be in flight:

- (a) in the case of a piloted aeroplane, from the moment when, after the embarkation of its crew, it first moves for the purpose of taking off until the moment it finally comes to rest at the end of the flight; and
  - (b) An helicopter shall be deemed to be in flight in the case of a piloted helicopter from the moment when, after the embarkation of its crew, the helicopter's rotor blades start turning until the moment the helicopter finally comes to rest at the end of the flight, and the rotor blades are stopped;
- (3) References in this Regulation to the operator of an aircraft are, for the purposes of the application of any provision of this Regulation in relation to any particular aircraft, references to the person who at the relevant time has the management of that aircraft:

Provided that, for the purposes of the application of any provision in Part III when by virtue of any charter or other agreement for the hire or loan of an aircraft, a person, other than an air transport undertaking or an aerial work undertaking, has the management of that aircraft for a period not exceeding 14 days, sub-paragraphs (1) and (2) shall have effect as if that agreement had not been entered into.

- (4) (a) Subject to this paragraph, an aircraft in flight shall for the purposes of this Regulation be deemed to fly for the purpose of commercial air transport:
- (i) if hire or reward is given or promised for the carriage of passengers or cargo in the aircraft on that flight; or
  - (ii) if any passengers or cargo are carried gratuitously in the aircraft on that flight by an air transport undertaking, not being persons in the employment of the undertaking (including its directors in the case of a body corporate), persons with the authority of the Civil Aviation Authority either making any inspection or witnessing any training, practice or test for the purposes of this Regulation, or a cargo intended to be used by any such passengers as aforesaid, or by the undertaking; or
  - (iii) for the purposes of Part III if hire or reward is given or promised for the right to fly the aircraft on that flight otherwise than under a hire purchase agreement.
- (b) Where under a transaction effected by or on behalf of a member of an unincorporated association of persons on the one hand and the association of persons or any member thereof on the other hand, a person is carried in, or is given the right to fly, an aircraft in such circumstances that hire or reward would be deemed to be given or promised if the transaction were effected otherwise than as aforesaid, hire or reward, shall, for the purposes of this Regulation, be deemed to be given.
- (5) The expressions appearing in the *Table of general classification of aircraft* set out in Part A of the First Schedule shall have the meanings thereby assigned to them.
- (6) The Air Navigation Regulation of Macao applies to all aircraft, as defined in this Part, registered in Macao or aircraft registered in other States or Territories, flying over or operating into or from Macao. However, when a requirement or provision contained in the Air Navigation Regulation of Macao refers to an aeroplane or a helicopter, the requirement or provision applies only to an aeroplane or a helicopter, as defined in this Part.

## Part II

### REGISTRATION AND MARKING OF AIRCRAFT

#### Aircraft to be registered

3. (1) An aircraft shall not fly in Macao unless it is registered in:
- (a) Macao; or
  - (b) a Contracting State; or
  - (c) some other State or Territory in relation to which there is in force an agreement between the Government of Macao and the government of that State or Territory which makes provision for the flight in Macao of aircraft registered in that State or Territory.
- (2) Any aircraft may fly unregistered on any flight which:
- (a) begins and ends in Macao; and
  - (b) is in accordance with the “*B*” *Conditions* set out in the Second Schedule;
- (3) The Civil Aviation Authority may, in such special circumstances and subject to such conditions or limitations as it may think fit, exempt temporarily from sub-paragraph (1) an aircraft registered elsewhere.
- (4) If an aircraft flies in Macao in contravention of sub-paragraph (1) in such manner or circumstances that if the aircraft had been registered in Macao an offence against this Regulation or against other legislation or regulation would have been committed, the like offence shall be deemed to have been committed in respect of that aircraft.

#### Registration of aircraft in Macao

4. (1) The Civil Aviation Authority shall be the authority for the registration of aircraft in Macao.
- (2) Subject to this paragraph, an aircraft shall not be registered or continue to be registered in Macao if it appears to the Civil Aviation Authority that:
- (a) the aircraft is registered outside Macao and that such registration does not cease by operation of law upon the aircraft being registered in Macao;
  - (b) an unqualified person is entitled as owner to any legal or beneficial interest in the aircraft or any share therein; or
  - (c) it would be inexpedient in the public interest for the aircraft to be or to continue to be registered in Macao.
- (3) The following persons and no other shall be qualified to be the owner of a legal or beneficial interest in an aircraft registered in Macao or a share therein:
- (a) the Government of Macao;

- (b) residents of Macao; and
  - (c) companies incorporated in Macao.
- (4) (a) If an unqualified person residing or having its principal place of business, in Macao is entitled as owner to a legal or beneficial interest in an aircraft, or a share therein, the Civil Aviation Authority, upon being satisfied that the aircraft may otherwise be properly so registered, may register the aircraft in Macao.
- (b) The person aforesaid shall not cause or permit the aircraft, while it is registered in pursuance of this sub-paragraph, to be used for the purpose of commercial air transport or aerial work.
- (5) If an aircraft is chartered by demise to a person qualified as aforesaid the Civil Aviation Authority may, whether or not an unqualified person is entitled as owner to a legal or beneficial interest therein, register the aircraft in Macao in the name of the charter upon being satisfied that the aircraft may otherwise be properly so registered, and subject to this paragraph the aircraft may remain so registered during the continuation of the charter.
- (6) Application for the registration of an aircraft in Macao shall be made in writing to the Civil Aviation Authority, and shall include or be accompanied by such particulars and evidence relating to the aircraft and the ownership and chartering thereof as he/she may require to enable him/her to determine whether the aircraft may properly be registered in Macao and to issue the *Certificate of registration* referred to in sub-paragraph (9). In particular, the application shall include the proper description of the aircraft according to the *Table of general classification of aircraft* set out in Part A of the First Schedule.
- (7) Upon receiving an application for the registration of an aircraft in Macao and being satisfied that the aircraft may properly be so registered, the Civil Aviation Authority shall register the aircraft, wherever it may be, and shall include in the register the following particulars:
- (a) the number of the certificate;
  - (b) the mark of origin of the aircraft, and the registration mark assigned to it by the Civil Aviation Authority;
  - (c) the name of the constructor of the aircraft and its designation;
  - (d) the serial number of the aircraft;
  - (e) photographs of the aircraft;
  - (f) (i) the name and address of every person who is entitled as owner to a legal interest in the aircraft or a share therein and in the case of an aircraft which is the subject of a hire-purchase agreement the name and address of the hirer; or
  - (ii) in the case of an aircraft registered in pursuance of sub-paragraph (4) or (5) above an indication that it is so registered.
- (8) For the initial grant, change or renewal of *Certificates of registration* regarding the registration of aircraft in Macao, the payment of a fee is due to the Civil Aviation Authority, according to the Twelfth Schedule of this Regulation.

- (9) The Civil Aviation Authority shall furnish to the person or persons in whose name the aircraft is registered (referred to in this Regulation as the registered owner) a *Certificate of registration*, which shall include the foregoing particulars and the date on which the certificate was issued:

Provided that the Civil Aviation Authority shall not be required to furnish a *Certificate of registration* if the registered owner:

- (a) is the holder of an aircraft dealer's certificate granted under sub-paragraph (10);
  - (b) has made to the Civil Aviation Authority and has not withdrawn a statement of his/her intention that the aircraft is to fly only in accordance with the "**C**" *Conditions* set out in the Second Schedule; and
  - (c) shall use the aircraft only in accordance with the "**C**" *Conditions* set out in the Second Schedule.
- (10) The Civil Aviation Authority may grant to any person an aircraft dealer's certificate if it is satisfied that he/she is a person carrying on in Macao the business of buying and selling aircraft.
- (11) Subject to sub-paragraphs (4) and (5), if at any time after an aircraft has been registered in Macao an unqualified person becomes entitled as owner to a legal or beneficial interest in the aircraft or a share therein, the registration of the aircraft shall thereupon become void and the *Certificate of registration* shall forthwith be returned by the registered owner to the Civil Aviation Authority for cancellation.
- (12) Any person who is registered as the owner of an aircraft registered in Macao shall forthwith inform the Civil Aviation Authority in writing of:
- (a) any change in the particulars which were furnished to the Civil Aviation Authority upon application being made for the registration of the aircraft;
  - (b) the destruction of the aircraft, or its permanent withdrawal from use, or its exportation; or
  - (c) in the case of an aircraft registered in pursuance of sub-paragraph (5) the termination of the demise charter.
- (13) Any person or entity who becomes the owner of an aircraft registered in Macao shall forthwith inform the Civil Aviation Authority in writing to that effect.
- (14) The Civil Aviation Authority may, whenever it appears necessary or appropriate to do so for giving effect to this Regulation or for bringing up to date or otherwise correcting the particulars entered in the register, amend the register or, if it thinks fit, may cancel the registration of the aircraft, and shall cancel that registration if it is satisfied that there has been a change in the ownership of the aircraft.
- (15) The Civil Aviation Authority may, by regulations, adapt or modify sub-paragraphs (1) to (14) as it considers necessary or expedient for the purpose of providing for the temporary transfer of aircraft to or from the Macao register, either generally or in relation to a particular case or class of cases.
- (16) In this paragraph references to an interest in an aircraft do not include references to an interest in an aircraft to which a person is entitled only by virtue of his/her membership of a flying club, and the reference in sub-paragraph (12) to the registered owner of an aircraft includes, in the case of a deceased person, his/her personal representative, and in the case of a body corporate which has been dissolved, its successor.

- (17) Nothing in this paragraph shall prevent the Civil Aviation Authority to cancel, revoke or suspend the *Certificate of registration* of an aircraft if in its opinion it would be inexpedient in the public interest to do so.

#### Nationality and registration marks

5. (1) An aircraft (other than an aircraft permitted by or under this Regulation to fly without being registered) shall not fly unless it bears painted thereon or affixed thereto, in the manner required by the law of the State or Territory in which it is registered, the origin and registration marks required by that law.
- (2) The marks to be borne by aircraft registered in Macao shall comply with Part B of the First Schedule.
- (3) An aircraft shall not bear any marks which purport to indicate:
- (a) that the aircraft is registered in a State in which it is not in fact registered; or
  - (b) that the aircraft is a *state aircraft* of a particular State if it is not in fact such an aircraft, unless the appropriate authority of that State has sanctioned the bearing of such marks.



## Part III

### AIRWORTHINESS AND EQUIPMENT OF AIRCRAFT

#### Certificate of airworthiness to be in force

6. (1) An aircraft shall not fly unless there is in force in respect thereof a *Certificate of airworthiness* duly issued or rendered valid under the law of the State or Territory in which the aircraft is registered, and any conditions subject to which the *Certificate of airworthiness* was issued or rendered valid are complied with:

Provided that the foregoing prohibition shall not apply to flights beginning and ending in Macao, of:

- (a) an aircraft flying in accordance with the “A” *Conditions* or the “B” *Conditions* set out in the Second Schedule; and
  - (b) an aircraft flying in accordance with the conditions of a permit to fly issued by the Civil Aviation Authority in respect of that aircraft.
- (2) In the case of a Macao registered aircraft the *Certificate of airworthiness* referred to in subparagraph (1) shall be a *Certificate of airworthiness* issued or rendered valid in accordance with paragraph 7.

#### Issue, renewal, etc., of certificates of airworthiness

7. (1) The Civil Aviation Authority may issue in respect of any aircraft a *Certificate of airworthiness* if satisfied that the aircraft is fit to fly having regard to:
- (a) the design, construction, workmanship and materials of the aircraft (including in particular any engines fitted therein), and of any equipment carried in the aircraft which it is considered necessary for the airworthiness of the aircraft; and
  - (b) the results of flying trials, and such other tests of the aircraft as it may require:
- (2) Provided that, if the Civil Aviation Authority has issued a *Certificate of airworthiness* in respect of an aircraft which, in its opinion, is a prototype aircraft or a modification of a prototype aircraft, it may dispense with flying trials in the case of any other aircraft is satisfied that it conforms to such prototype or modification.
- (3) Every *Certificate of airworthiness* shall specify such categories as are, in the opinion of the Civil Aviation Authority, appropriate to the aircraft in accordance with the Third Schedule and the *Certificate of airworthiness* shall be issued subject to the condition that the aircraft shall be flown only for the purpose indicated in the said Schedule in relation to those categories.
- (4) Where an aircraft is classified in its *Certificate of airworthiness* as being under the *Special category*, the purpose for which the aircraft is used shall also be specified in its *Certificate of airworthiness*.
- (5) The Civil Aviation Authority may issue the *Certificate of airworthiness* subject to such other conditions relating to the airworthiness of the aircraft as it thinks fit.

- (6) The *Certificate of airworthiness* may designate the performance group to which the aircraft belongs for the purposes of the requirements referred to in paragraph 28 (1).
- (7) The Civil Aviation Authority may, subject to such conditions as it thinks fit, issue a *Certificate of validation* rendering valid for the purposes of this Regulation a *Certificate of airworthiness* issued in respect of any aircraft under the law of any State or Territory.
- (8) Subject to this paragraph and paragraph 59, a *Certificate of airworthiness* or a *Certificate of validation* issued under this paragraph shall remain in force for such period as may be specified therein, and may be renewed from time to time by the Civil Aviation Authority for such further period as it thinks fit.
- (9) A *Certificate of airworthiness* or a *Certificate of validation* issued in respect of an aircraft shall cease to be in force when:
  - (a) the aircraft, or such of its equipment as is necessary for the airworthiness of the aircraft is overhauled, repaired or modified, or if any part of the aircraft or of such equipment is removed or is replaced, otherwise than in a manner and with material of a type approved by the Civil Aviation Authority either generally or in relation to a class of aircraft or to the particular aircraft;
  - (b) the aircraft has suffered an accident which has affected its airworthy condition;
  - (c) by some reason, the aircraft or any of its components are released to service on a condition different from the one which led to the issue of a *Certificate of airworthiness* by the Civil Aviation Authority;
  - (d) are not fully complied the restrictions and conditions explicitly mentioned in *Certificate of airworthiness* of the aircraft;
  - (e) from the time an inspection is required by the Civil Aviation Authority to be made for the purpose of ascertaining whether the aircraft remains airworthy until the completion of that inspection of the aircraft or of any such equipment; or
  - (f) from the time a modification is required by the Civil Aviation Authority for the purpose of ensuring that the aircraft remains airworthy until the completion to the satisfaction of the Civil Aviation Authority of that modification of the aircraft or of any such equipment.
- (10) Without prejudice to any other provision of this Regulation, the Civil Aviation Authority may, for the purpose of this paragraph, accept reports furnished to the Civil Aviation Authority by a person whom it may approve either absolutely or subject to such conditions as it thinks fit as qualified to furnish such reports.
- (11) The Civil Aviation Authority shall cause to be prepared and preserved in relation to each Macao registered aircraft a record enabling the aircraft (including in particular its engines) and such of its equipment as it may have considered necessary for the airworthiness of the aircraft in issuing, varying or rendering valid a *Certificate of airworthiness*, to be identified with the drawings and other documents on the basis of which the *Certificate of airworthiness* was issued, varied or rendered valid as the case may be. All equipment so identified shall for the purpose of this Regulation be deemed to be equipment necessary for the airworthiness of the aircraft. The Civil Aviation Authority shall cause such record to be produced for examination upon request being made therefore at any reasonable time by any person having, in the opinion of the Civil Aviation Authority, reasonable grounds for requiring examining it.

- (12) Nothing in this paragraph shall prevent the Civil Aviation Authority to cancel, suspend, revoke or not revalidate the *Certificate of airworthiness* of an aircraft registered in Macao if, in its opinion, it would be in the public interest to do so.
- (13) When the Civil Aviation Authority first enters on its register an aircraft of a particular type in accordance with paragraph 4 of this Regulation and issues or validates a *Certificate of airworthiness* in accordance with paragraph 7 (1) above, resulting information that the aircraft has been entered in the Macao register shall be provided to the State of Design and consequently the State of Design of that aircraft is indebted to transmit any *mandatory continuing airworthiness information* to the Civil Aviation Authority, which it has found to be necessary for the continuing airworthiness of the aircraft and its safe operation.
- Note.** — The term *mandatory continuing airworthiness information* is intended to include mandatory requirements for modification, replacement of parts or inspection of aircraft and amendment of operating limitations and procedures, and airworthiness information, which includes airworthiness directives.
- (14) The Civil Aviation Authority, upon receipt of *mandatory continuing airworthiness information* from the State of Design in relation to a Macao registered aircraft, will adopt the mandatory information directly or will assess the information received and take appropriate action on the basis of its own requirements. Any *mandatory continuing airworthiness information*, which has been originated in respect of a Macao registered aircraft provided by an operator and/or a maintenance organization, will be transmitted by the Civil Aviation Authority to the State of Design.
- (15) The operator shall monitor and assess maintenance and operational experience with respect to continuing airworthiness and provide the information as prescribed by the Civil Aviation Authority and report through the system according to paragraph 88.
- (16) The operator shall obtain and assess continuing airworthiness information and recommendations available from the organization responsible for the type design and shall implement resulting actions considered necessary in accordance with a procedure acceptable to the Civil Aviation Authority.
- (17) The Civil Aviation Authority will, in respect of aeroplanes of over 5,700 kg and helicopters over 3,180 kg maximum certificated take-off mass, make available to the organization responsible for the type design of that aircraft, such information on faults, malfunctions, defects and other occurrences which cause or might cause adverse effects on the continuing airworthiness of a Macao registered aircraft.

#### **Certificate of approval**

8. (1) An entity engaged, or intending to engage, in any stage of the design, manufacture, maintenance or distribution of aircraft, aircraft components or aircraft materials in Macao, may apply to the Civil Aviation Authority for a *Certificate of approval* in respect of those activities.
- (2) Where an applicant under this paragraph:
- (a) furnishes to the Civil Aviation Authority such evidence as the Civil Aviation Authority may require, however, not less than:
- (i) the qualifications and competence of the applicant and the qualifications and competence of the employees of the applicant;
- (ii) a statement designating an accountable manager;
- (iii) the intended scope of work;

- (iv) the clear definition of the various management roles, duties and responsibilities, as well as an organisational chart;
- (v) the facilities at the disposal of the applicant;
- (vi) the work procedures proposed by the applicant; and
- (vii) all the necessary means and conditions to enable the applicant to exercise its duties and privileges,

to carry out all activities to which the application relates;

- (b) satisfies the Civil Aviation Authority that, having regard to the evidence so furnished, the applicant is, or will be, able to carry on the activities to which the application relates in a satisfactory manner; and
- (c) pays the appropriate fees mentioned in the Twelfth Schedule,

the Civil Aviation Authority may, subject to such conditions as it thinks fit, issue to the applicant a *Certificate of approval* with respect to those activities.

- (3) An authorised entity may, at any time, for the purpose of ascertaining whether the activities to which a *Certificate of approval* relates are being carried on in a satisfactory manner or for any other purpose:

- (a) inspect any aircraft, aircraft component, aircraft material, facilities, licences, personnel or records;
- (b) inspect any process or system carried on by, any records maintained by or any documents in the possession of, the holder of the certificate of approval in connection with the activities to which the *Certificate of approval* relates;
- (c) conduct inquiries regarding any member of the organisation;
- (d) conduct any test or investigation that the authorised entity considers necessary; and
- (e) require the holder of the *Certificate of approval* to furnish to the authorised entity such evidence as the authorised entity may require:
  - (i) of the qualifications and competence of the holder or of the qualification and competence of the employees of the holder;
  - (ii) of the facilities at the disposal of the holder;
  - (iii) of the acceptable means available to carry out its duties; and
  - (iv) of the procedures followed.

- (4) Any expense incurred by reason of anything done during, in or incidental to the investigation mentioned in sub-paragraph (3) shall be paid by and be recoverable from the holder of the *Certificate of approval*.

- (5) For the purposes of this paragraph:

**Aircraft component** means any part or equipment for an aircraft, being a part of equipment that, when fitted to, or provided in, an aircraft, may, if it is not sound or not functioning correctly, affect the safety of the aircraft or cause the aircraft to become a danger to person or property, but does not include a part or equipment of a kind that the Civil Aviation Authority directs shall not be an aircraft component for the purpose of this paragraph.

**Aircraft material** means a material (including a fluid) for use in the manufacture, maintenance, servicing or operation of an aircraft or of an aircraft component, but does not include an aircraft component.

#### Maintenance programme and Certificate of maintenance review

9. (1) A Macao registered aircraft shall not fly unless:

- (a) the aircraft (including in particular its power plants and components), together with its equipment and radio station, is maintained in accordance with a *Maintenance programme* and all the procedures and requirements approved by the Civil Aviation Authority in relation to that aircraft; and
- (b) there is in force a *Certificate of maintenance review* issued in accordance with this paragraph and such certificate shall certify the date on which the maintenance review was carried out and the date thereafter when the next review is due:

Provided that an aircraft may, notwithstanding that sub-paragraphs (1) (a) and (b) have not been complied with in relation to the radio station therein, fly for the sole purpose of enabling persons to be trained to perform duties in aircraft.

- (2) The approved *Maintenance programme* referred to in sub-paragraph (1) (a) shall specify for the use and guidance of maintenance and operational personnel concerned, the occasions on which a review must be carried out for the purpose of issuing a *Certificate of maintenance review*. The design and application of the operator's *Maintenance programme* shall observe human factors principles and copies of all amendments to the *Maintenance programme* shall be furnished promptly to all organizations or persons to whom the *Maintenance programme* has been issued. The requirement for the content of a maintenance programme is detailed in Nineteenth Schedule.
- (3) A *Certificate of maintenance review* may be issued for the purposes of this paragraph only by:
  - (a) the holder of a licence granted under this Regulation as an aircraft maintenance engineer being a licence of a category appropriate in accordance with paragraph 11 and the Fourth Schedule;
  - (b) the holder of a licence as such an aircraft maintenance engineer granted under the law of a Contracting State and rendered valid under this Regulation, in accordance with the privileges endorsed on the licence;
  - (c) the holder of a licence as such an aircraft maintenance engineer granted under the law of any such Contracting State as may be prescribed in accordance with the privileges endorsed on the licence and subject to any conditions as may be prescribed;
  - (d) a person or entity whom the Civil Aviation Authority has authorised to issue a *Certificate of maintenance review* in a particular case, and in accordance with that authority; or
  - (e) a person or entity approved by the Civil Aviation Authority as being competent to issue such *Certificates of maintenance review*, and in accordance with that approval:

Provided that, upon approving a *Maintenance programme*, the Civil Aviation Authority may direct that *Certificates of maintenance review* relating to that *Maintenance programme*, or to any part thereof specified in its direction, may be issued only by the holder of such a licence as is so specified.

- (4) A person or entity referred to in sub-paragraph (3) shall not issue a *Certificate of maintenance review* unless it has first been verified that:
  - (a) maintenance has been carried out on the aircraft in accordance with the *Maintenance programme* approved for that aircraft;
  - (b) inspections and modifications required by the Civil Aviation Authority as provided in paragraph 7 of this Regulation have been completed as certified in the relevant *Certificate of release to service*;
  - (c) defects entered in the *Technical log* of the aircraft in accordance with sub-paragraphs (7) and (8) have been rectified or the rectification thereof has been deferred in accordance with procedures approved by the Civil Aviation Authority; and
  - (d) *Certificates of release to service* have been issued in accordance with paragraph 10.
- (5) For the purpose of sub-paragraph (4), the operator of the aircraft shall furnish all such information relating to all such matters as may be necessary for the person referred to in that sub-paragraph.
- (6) *Certificates of maintenance review* shall be issued in duplicate. One of the duplicates shall, during the period of validity of the certificate, be carried in the aircraft when paragraph 55 of this Regulation so requires, and the other shall be kept by the operator elsewhere than in the aircraft
- (7) On the termination of every flight by a Macao registered aircraft for any of the purposes specified in sub-paragraph (1) above, the commander of the aircraft shall enter in a *Technical log*:
  - (a) the times when the aircraft took off and landed;
  - (b) the particulars of any defect which are known or suspected to him/her and which affects the airworthiness or safe operation of the aircraft or if no defect is known to him/her, an entry to that effect; and
  - (c) such other particulars in respect of the airworthiness or operation of the aircraft as the Civil Aviation Authority may require.
- (8) Notwithstanding sub-paragraph (7) above, in the case of a number of consecutive flights each of which begins and ends:
  - (a) on the same day;
  - (b) at the same aerodrome; and
  - (c) with the same person as the commander of the aircraft,

the commander of the aircraft may, except where he/she becomes aware of a defect during an earlier flight, make the entries referred to in sub-paragraph (7) above in a technical log at the end of the last of such consecutive flights.

- (9) Upon the rectification of any defect which has been entered in a *Technical log* in accordance with sub-paragraphs (7) and (8) above, a copy of the *Certificate of release to service* required by paragraph 10 of this Regulation in respect of the work done for the rectification of the defect shall be entered in the *Technical log* in such a position or manner as to be readily identifiable with the entry of the defect to which it relates.
- (10) The *Technical log* referred to in sub-paragraphs (7), (8) and (9) above shall be carried in the aircraft when paragraph 55 of this Regulation so requires and copies of the entries referred to in those sub-paragraphs shall be kept on the ground.
- (11) Subject to paragraph 58 of this Regulation, every *Certificate of maintenance review* shall be preserved by the operator of the aircraft for a period of two years following the expiry of the period of validity of the certificate and for such further period as the Civil Aviation Authority may require in any particular case.

### Inspection, overhaul, repair, replacement and modification

10. (1) A Macao registered aircraft, being an aircraft in respect of which a *Certificate of airworthiness* issued or rendered valid under this Regulation is in force, shall not fly if any part of the aircraft or of such of its equipment as is necessary for the airworthiness of the aircraft, has been overhauled, repaired, replaced, modified or maintained, or has been inspected as provided in paragraph 7 (9) (b) above, unless there is in force a *Certificate of release to service* issued in accordance with this paragraph and relating to the overhaul, repair, replacement, modification, maintenance or inspection, as the case may be:

Provided that if a repair or replacement of a part of an aircraft or its equipment is carried out when the aircraft is at such a place that it is not reasonably practicable:

(a) for the repair or replacement to be carried out in such a manner that a *Certificate of release to service* can be issued under this paragraph in respect thereof; or

(b) for such *Certificate of release to service* to be issued while the aircraft is at that place,

the aircraft may fly to a place at which such *Certificate of release to service* can be issued, being the nearest place:

(i) to which the aircraft can, in the reasonable opinion of the commander thereof, safely fly by a route for which it is properly equipped; and

(ii) to which it is reasonable to fly having regard to any hazard to the liberty or health of any person on board,

and in such case the commander of the aircraft shall cause written particulars of the flight, and the reasons for making it, to be given to the Civil Aviation Authority within 10 days thereafter.

(2) Neither:

(a) equipment provided in compliance with the Fifth Schedule (except paragraph 3 of the Fifth Schedule); nor

(b) in the case of a commercial air transport aircraft, radio equipment provided for use therein or in any survival craft carried therein, whether or not such equipment is provided in compliance with this Regulation or any regulations made or any requirements notified there under;

shall be installed, or placed on board for use, in an aircraft after being overhauled, repaired, modified or inspected, unless there is in force in respect thereof at the time when it is installed or placed on board a *Certificate of release to service* issued in accordance with this paragraph and relating to the overhaul, repair, modification or inspection, as the case may be.

- (3) For the purposes of this Regulation, *Certificate of release to service* means a certificate that the part of the aircraft or its equipment has been overhauled, repaired, replaced, modified or maintained, as the case may be, in a manner and with material of a type approved by the Civil Aviation Authority either generally or in relation to a class of aircraft or the particular aircraft and which identifies the overhaul, repair, replacement, modification or maintenance to which it relates and includes particulars of the work done; and in relation to an inspection required by the Civil Aviation Authority that the inspection has been made in accordance with the requirements of the Civil Aviation Authority and that any consequential repair, replacement or modification has been carried out as aforesaid.
- (4) A *Certificate of release to service* may be issued for the purposes of this paragraph only by:
  - (a) the holder of a licence granted under this Regulation as an aircraft maintenance engineer being a licence of a category appropriate in accordance with Part A of the Fourth Schedule;
  - (b) the holder of a licence as such an aircraft maintenance engineer granted under the law of a Contracting State and rendered valid under this Regulation in accordance with the privileges endorsed on the licence;
  - (c) the holder of a licence as such an aircraft maintenance engineer granted under the law of any such Contracting State as may be prescribed in accordance with the privileges endorsed on the licence and subject to any condition which may be prescribed;
  - (d) a person or entity approved by the Civil Aviation Authority as being competent to issue such certificates;
  - (e) a person or entity whom the Civil Aviation Authority has authorised to issue the certificate in a particular case; or
  - (f) in relation only to the adjustment and compensation of direct reading magnetic compasses, the holder of an airline transport pilot licence – aeroplane or a flight navigator licence.
- (5) Subject to paragraph 58 of this Regulation, if the aircraft to which a *Certificate of release to service* relates, is a commercial air transport aircraft or an aerial work aircraft, the *Certificate of release to service* shall be preserved by the operator of the aircraft for the period of time for which the operator is required to preserve the *Log Book* relating to the same part of the aircraft or to the same equipment or apparatus as the case may be. In the case of any other aircraft the *Certificate of release to service* shall be preserved by the operator of the aircraft for a period of two years.
- (6) A *Certificate of release to service* shall contain a certification including:
  - (a) basic details of the maintenance carried out including detailed reference of the approved data used;
  - (b) date such maintenance was completed;
  - (c) when applicable, the identity of the approved maintenance organization; and
  - (d) the identity of the person or persons signing the Certificate of release to service.



### Licensing of maintenance engineers

11. (1) The Civil Aviation Authority may grant to any person a licence to act, for the purposes of this Regulation, as a non-flight crew member, in one of the categories specified in the Fourth Schedule upon the Civil Aviation Authority being satisfied that the applicant is a fit and proper person to hold the licence and is qualified by his/her knowledge and experience to do so, and for that purpose the applicant shall furnish such evidence and undergo such examinations and tests as the Civil Aviation Authority may require. The Civil Aviation Authority may include a rating in the licence, limiting the privileges of that licence to particular types of aircraft or equipment.
- (2) A licence granted by the Civil Aviation Authority to a person who suppose to engage in duties other than those attributed to flight crew members, entitles the holder to exercise the duties and privileges of the respective aeronautical licence.
- (3) In the specific case of licensed aircraft maintenance engineers, a licence shall, subject to any rating as aforesaid, entitle the holder to issue *Certificates of maintenance review*, *Certificates of release to service* or *Certificates of fitness for flight* in accordance with the duties and privileges highlighted in the Fourth Schedule.
- (4) A licence granted to aeronautical personnel other than flight crew members and the respective rating(s) shall, subject to paragraph 59 of this Regulation, remain in force for the period specified therein, but may be renewed by the Civil Aviation Authority, from time to time, upon being satisfied that the applicant is a fit and proper person and is qualified as aforesaid.
- (5) The Civil Aviation Authority may, on a discretionary basis, issue a certificate rendering valid, for the purpose of this Regulation, any licence of an aeronautical technician other than a flight crew member granted under the law of any Contracting State. The certificate may be issued subject to such conditions and for such period as the Civil Aviation Authority thinks fit.
- (6) Upon receiving a licence granted under this paragraph, the holder shall forthwith sign his/her name thereon in ink with his/her ordinary signature.

### Equipment of aircraft

12. (1) An aircraft shall not fly unless it is so equipped as to comply with the law of the State or Territory in which it is registered, and to enable lights and markings to be displayed, and signals to be made, in accordance with this Regulation and any regulations made and requirements notified there under.
- (2) In the case of a Macao registered aircraft the equipment (including radio and navigation equipment) required to be provided (in addition to any other equipment required by or under this Regulation) shall be that specified in such parts of the Fifth Schedule as are applicable in the circumstances and shall comply with the provisions of that Schedule. The equipment, except that specified in paragraph 3 of the Fifth Schedule, shall be of a type approved by the Civil Aviation Authority either generally or in relation to a class of aircraft or in relation to that aircraft and shall be installed in a manner so approved.
- (3) In any particular case the Civil Aviation Authority may direct that a Macao registered aircraft shall carry such additional or special equipment or supplies as it may specify for the purpose of facilitating the navigation of the aircraft, the carrying out of search and rescue operations, or the survival of the persons carried in the aircraft.

- (4) The equipment carried in compliance with this paragraph shall be so installed or stowed and kept stowed, and so maintained and adjusted, as to be readily accessible and capable of being used by the person for whose use it is intended.
- (5) The position of equipment provided for emergency use shall be indicated by clear markings in or on the aircraft. In particular in every commercial air transport aircraft registered in Macao there shall be:
  - (a) provided individually for each passenger; or
  - (b) if the Civil Aviation Authority so permits in writing, exhibited in a prominent position in every passenger compartment, a notice relevant to the aircraft in question containing pictorial:
    - (i) instructions on the brace position to be adopted in the event of an emergency landing;
    - (ii) instructions on the method of use of the safety belts and safety harnesses as appropriate;
    - (iii) information as to where emergency exits are to be found and instructions as to how they are to be used; and
    - (iv) information provided in passenger emergency briefing cards as to where the life-jackets, escape slides, life-rafts and oxygen masks, if required to be provided by sub-paragraph (2) above, are to be found and instructions as to how they are to be used, including any special instructions for passengers seated near a window or door emergency exit.
- (6) All equipment installed or carried in an aircraft, whether or not in compliance with this paragraph, shall be so installed or stowed and kept stowed and so maintained and adjusted as not to be a source of danger in itself or to impair the airworthiness of the aircraft or the proper functioning of any equipment or services necessary for the safety of the aircraft.
- (7) Without prejudice to sub-paragraph (2) above, all navigational equipment (other than radio equipment) of any of the following types:
  - (a) equipment capable of establishing the aircraft's position in relation to its position at some earlier time by computing and applying the resultant of the acceleration and gravitational forces acting upon it; and
  - (b) equipment capable of establishing automatically the altitude and relative bearing of selected celestial bodies,
 

when carried in a Macao registered aircraft (whether or not in compliance with this Regulation or any of the regulations made there under) shall be of a type approved by the Civil Aviation Authority either generally or in relation to a class of aircraft or in relation to that aircraft and shall be so installed in a manner so approved.
- (8) This paragraph shall not apply in relation to radio equipment except that specified in the Fifth Schedule.

#### Radio equipment of aircraft

13. (1) An aircraft shall not fly unless it is so equipped with radio equipment as to comply with the law of the State or Territory in which the aircraft is registered and to enable communications to be made, and the aircraft to be navigated, in accordance with the provisions of this Regulation and any regulations made there under.

- (2) In the case of a Macao registered aircraft, the aircraft shall be equipped with radio equipment in accordance with the Sixth Schedule.
- (3) In any particular case the Civil Aviation Authority may direct that a Macao registered aircraft shall carry such additional or special radio equipment as it may specify for the purpose of facilitating the navigation of the aircraft, the carrying out of search and rescue operations or the survival of the persons carried in the aircraft.
- (4) The radio equipment provided in compliance with this paragraph shall always be maintained in serviceable condition.
- (5) All radio equipment installed in a Macao registered aircraft, whether or not in compliance with this Regulation or any regulations made or requirements notified hereunder, shall be of a type approved by the Civil Aviation Authority as suitable for the purpose for which it is to be used, and shall be installed in a manner approved by the Civil Aviation Authority. Neither the equipment nor the manner in which it is installed shall be modified except with the approval of the Civil Aviation Authority.

#### Minimum equipment requirements

14. (1) When a registered Macao aircraft has sustained damage, the Civil Aviation Authority shall judge whether the damage is of a nature such that the aircraft is no longer airworthy as established by the Regulation and the appropriate airworthiness requirements issued by the Civil Aviation Authority and subject to such conditions as it thinks fit. The following is applicable:
  - (a) If the damage is sustained or ascertained when the aircraft is on the territory of another State or Territory, the authorities of the other State or Territory shall be entitled to prevent the aircraft from resuming its flight on the condition that the Civil Aviation Authority be advised, through a communication by the commander of the aircraft or by the authority of the State or Territory of all details necessary to formulate its own judgement;
  - (b) When the Civil Aviation Authority considers that the damage sustained is of a nature such that the aircraft is no longer airworthy, it shall prohibit the aircraft from resuming flight until it is restored to an airworthy condition;
  - (c) The Civil Aviation Authority may, however, in exceptional circumstances, prescribe particular limiting conditions to permit the aircraft to fly without fare-paying passengers to an aerodrome (or heliport) at which it will be restored to an airworthy condition, with the permission of the State or Territory that had originally prevented the aircraft from resuming flights;
  - (d) When the Civil Aviation Authority considers that the damage sustained is of a nature such that the aircraft is still airworthy, the aircraft shall be allowed to resume its flight, subject to such conditions as it thinks fit, granting an authorization permitting such aircraft to commence a flight in specified circumstances notwithstanding that any specified item of equipment (including radio and navigation equipment) required by or under this Regulation to be carried in the circumstances of the intended flight is not carried or is not in a fit condition for use;
  - (e) Any failure to maintain an aircraft in an airworthy condition as defined by the appropriate airworthiness requirements issued by the Civil Aviation Authority shall render the aircraft ineligible for operation until the aircraft is restored to an airworthy condition.
- (2) An aircraft registered in Macao shall not commence a flight if any of the equipment (including radio and navigation equipment) required by or under this Regulation to be carried in the circumstances of the intended flight is not carried or is not in a fit condition for use:

- (a) otherwise than under and in accordance with the terms of an authorization under this paragraph which has been granted to the operator; and
- (b) unless in the case of an aircraft to which paragraph 24 of this Regulation applies, the *Operations manual* required thereby contains the particulars specified in Part F of the Ninth Schedule.

#### Aircraft, engine and propeller log books

15. (1) In addition to any other *log* book required by or under this Regulation, the following *Log* books shall be kept in respect of every commercial air transport aircraft and aerial work aircraft registered in Macao:

- (a) an aircraft *Log* book; and
- (b) a separate *Log* book in respect of each power plant fitted in the aircraft; and
- (c) a separate *Log* book in respect of each variable pitch propeller fitted to the aircraft.

The *Log* books shall include the particulars respectively specified in the Seventh Schedule.

- (2) Each entry in the *Log* book shall be made as soon as it is practicable after the occurrence to which it relates, but in no event more than 7 days after the expiration of the *Certificate of maintenance review* (if any) in force in respect of the aircraft at the time of the occurrence.
- (3) Entries in a *Log* book may refer to other documents, which shall be clearly identified, and any other document so referred to shall be deemed, for the purposes of this Regulation, to be part of the *Log* book.
- (4) It shall be the duty of the operator of every aircraft in respect of which *Log* books are required to be kept to keep them or cause them to be kept in accordance with sub-paragraphs (1) to (3) above.
- (5) Subject to paragraph 58 of this Regulation every *Log* book shall be preserved by the operator of the aircraft until a date two years after the aircraft, the power plant or the variable pitch propeller, as the case may be, has been destroyed or has been permanently withdrawn from use.

#### Aircraft weight schedule

16. (1) Every aircraft in respect of which a *Certificate of airworthiness* issued or rendered valid under this Regulation is in force shall be weighed, and the position of its centre of gravity determined, at such times and in such manner as the Civil Aviation Authority may require in the case of that aircraft.
- (2) Upon the aircraft being weighed as mentioned in sub-paragraph (1) above, the operator of the aircraft shall prepare a *Weight schedule* showing:
- (a) either the basic weight of the aircraft, that is to say, the weight of the aircraft empty together with the weight of the unusable fuel and unusable oil in the aircraft and of such items of equipment as are indicated in the *Weight schedule* or such other weight as may be approved by the Civil Aviation Authority in the case of that aircraft; and
  - (b) either the position of the centre of gravity of the aircraft when the aircraft contains only the items included in the basic weight or such other position of the centre of gravity as may be approved by the Civil Aviation Authority in the case of that aircraft.

- (3) Subject to paragraph 58 of this Regulation the *Weight schedule* shall be preserved by the operator of the aircraft until the expiry of a period of 6 months following the next occasion on which the aircraft is weighed for the purposes of this paragraph.

**Access and inspection of airworthiness purposes**

17. The Civil Aviation Authority may cause such inspections, audits, investigations, tests, experiments and flight trials to be made as it thinks necessary to enable the Civil Aviation Authority to perform the functions vested in it by this Regulation and any person authorised in writing by the Civil Aviation Authority shall at all reasonable times have the right of access to any place in any establishment to which access is necessary for the purpose of inspecting the manufacture of, or assembly of any part of the aircraft or its equipment or any drawing or other documents relating to any part of the aircraft.

## Part IV

### AIRCRAFT CREW AND LICENSING

#### Composition of crew of aircraft

18. (1) An aircraft shall not fly unless it carries a flight crew of the number and description required by the law of the State or Territory in which it is registered.
- (2) A Macao registered aircraft shall carry the number and composition of the flight crew not less than that specified in the *Aircraft flight manual* or the *Operations manual*. The flight crews shall include flight crew members, when necessitated by considerations related to the type of aircraft used, the type of operation involved and the duration of flight between points where flight crews are changed, in addition to the minimum numbers specified in the *Aircraft flight manual* or other documents associated with the *Certificate of airworthiness* issued or rendered valid under this Regulation or, if no *Certificate of airworthiness* is required under this Regulation to be in force, the *Certificate of airworthiness*, if any, last in force under this Regulation, in respect of that aircraft.
- (3) A Macao registered aircraft flying for the purpose of commercial air transport having a maximum certificated take-off mass of more than 5,700 kg, shall carry not less than two pilots as members of the flight crew thereof.
- (4) A Macao registered aircraft engaged on a flight for the purpose of commercial air transport shall carry:
- (a) a flight navigator as a member of the flight crew; or
  - (b) navigational equipment approved by the Civil Aviation Authority and used in accordance with any conditions subject to which that approval may have been given,
- if on the route or any diversion wherefrom, being a route or diversion planned before take-off, the aircraft is intended to be more than 500 nautical miles from the point of take-off measured along the route to be flown, and to pass over part of an area specified in the Fifteenth Schedule.
- (5) The flight navigator referred to in sub-paragraph (4) above shall be carried in addition to any person who is carried in accordance with this paragraph to perform other duties.
- (6) A Macao registered aircraft which is required by paragraph 13 of this Regulation to be equipped with radio communication equipment, shall carry a flight radiotelephony operator as a member of the flight crew, who, if he/she is required to operate radiotelegraph apparatus, shall be carried in addition to any other person who is carried in accordance with this paragraph to perform other duties.
- (7) If it appears to be expedient to do so in the interests of safety, the Civil Aviation Authority may direct any particular operator of any Macao registered aircraft that the aircraft operated by the operator or any such aircraft shall not fly in such circumstances as the Civil Aviation Authority may specify unless they carry in addition to the flight crew required to be carried therein by sub-paragraphs (1) to (6) above such additional persons as members of the flight crew as it may specify in the direction.
- (8) (a) This paragraph shall apply to any flight for the purpose of commercial air transport by a Macao registered aircraft.

- (i) on which is carried 20 or more passengers; or
  - (ii) which may, in accordance with its *Certificate of airworthiness*, carry more than 35 passengers and on which at least one passenger is carried.
- (b) The crew of an aircraft on a flight to which this paragraph applies shall include cabin crew carried for the purposes of performing in the interests of the safety of passengers, duties to be assigned by the operator or the commander of the aircraft but who shall not act as members of the flight crew.
- (c) On a flight to which this paragraph applies, there shall be carried not less than one cabin crew for every 50, or fraction of 50 passenger seats installed in the aircraft except that the number of cabin crew calculated in accordance with this sub-paragraph need not be carried where the Civil Aviation Authority has granted written authorization to the operator to carry a lesser number on that flight and the operator carries the number specified in that authorization and complies with any other terms and conditions subject to which such authorization is granted.
- (9) The Civil Aviation Authority may, if it appears to be expedient to do so in the interests of safety, direct any particular operator of any Macao registered aircraft that the aircraft operated by the operator or any such aircraft shall not fly in such circumstances as the Civil Aviation Authority may specify unless those aircraft carry in addition to the cabin crew required to be carried therein by sub-paragraph (8) above such additional cabin crew as it may specify in the direction.
- (10) When a separate flight engineer's station is incorporated in the design of an aircraft, the flight crew shall include at least one flight engineer especially assigned to that station, unless the duties associated with that station can be satisfactorily performed by another flight crew member, holding a flight engineer licence, without interference with regular duties.
- (11) The flight crew shall include at least one member who holds a flight navigator licence in all operations where, as determined by the Civil Aviation Authority, navigation necessary for the safe conduct of the flight cannot be adequately accomplished by the pilots from the pilot station.

#### Members of flight crew – requirement for license

19. (1) Subject to this paragraph, a person shall not act as a flight crew member of a Macao registered aircraft unless a licence granted or rendered valid by the Civil Aviation Authority is held showing compliance with the specifications of this Regulation and appropriate to the duties to be performed by that person:

Provided that a person may, within Macao, act as a flight radiotelephony operator without being the holder of such a licence if:

- (a) he/she does so as a person being trained in a Macao registered aircraft to perform duties as a member of the flight crew of an aircraft;
- (b) he/she is authorised to operate the radiotelephony station by the holder of the licence granted in respect of that station by the Civil Aviation Authority;
- (c) messages can only be transmitted for the purpose of instruction, or of the safety or navigation of the aircraft;
- (d) messages can only be transmitted on a frequency assigned by the Civil Aviation Authority;
- (e) the transmitter is pre-set to one or more of the frequencies so assigned and cannot be adjusted in flight to any other frequency;

- (f) to the operation of the transmitter requires the use only of external switches; and
  - (g) the stability of the frequency radiated is maintained automatically by the transmitter.
- (2) Subject to this paragraph, a person shall not act as a flight crew member of an aircraft unless a valid licence is held showing compliance with this Regulation and appropriate to the duties to be performed by that person in an aircraft registered outside Macao unless:
- (a) in the case of an aircraft flying for the purpose of commercial air transport or aerial work, he/she is the holder of an appropriate licence granted or rendered valid under the law of the Contracting State in which the aircraft is registered; and
  - (b) in the case of any other aircraft, he/she is the holder of an appropriate licence granted or rendered valid under the law of the Contracting State in which the aircraft is registered or under this Regulation, and the Civil Aviation Authority does not in the particular case give a direction to the contrary.
- (3) For the purposes of this paragraph, a granted licence purporting to authorise the holder thereof to act as a member of the flight crew of an aircraft, not being a licence purporting to authorise him/her to act as a student pilot only, shall, unless the Civil Aviation Authority in the particular case gives a direction to the contrary, be deemed to be a licence rendered valid under this Regulation but shall not entitle the holder to act as a member of the flight crew of any aircraft flying for the purpose of commercial air transport or aerial work or on any flight in respect of which he/she receives remuneration for services rendered as a member of the flight crew on that flight.
- (4) Notwithstanding sub-paragraph (1) above, a person may, unless the *Certificate of airworthiness* in force in respect of the aircraft otherwise requires, act as pilot of a Macao registered aircraft for the purpose of undergoing training or tests for the grant or renewal of a pilot licence or for the inclusion, renewal or extension of a rating thereon without being the holder of an appropriate licence, if the following condition is complied with:
- (a) no other person shall be carried in the aircraft or in an aircraft being towed thereby except:
    - (i) a person carried as a member of the flight crew in compliance with this Regulation;
    - (ii) a person authorised by the Civil Aviation Authority to witness the aforesaid training or tests, or to conduct the aforesaid tests; or
    - (iii) if the commander of the aircraft is the holder of an appropriate licence, a person carried for the purpose of being trained or tested as a member of the flight crew of an aircraft.

#### **Grant, renewal and effect of flight crew licenses**

20. (1) The Civil Aviation Authority is the sole entity which may grant, validate or revalidate licences and ratings to flight crew members that operate or wish to operate aircraft registered in Macao. Those who are acting or intend to act as flight crew members of aircraft registered in Macao shall follow the various requirements prescribed by the Civil Aviation Authority in the Eighth Schedule. The Civil Aviation Authority may grant, validate or revalidate such licences:
- (a) upon being satisfied that the applicant is a fit and proper person to hold the licence and is qualified by reason of his/her knowledge, experience, competence, skill and physical fitness to act in the capacity to which the licence relates, and for that purpose the applicant may be



required to undergo the appropriate medical examinations set out in the Fourteenth Schedule and any other examinations and tests or furnish any other evidence as the Civil Aviation Authority may determine;

- (b) provided that a licence or rating of any class shall not be granted to any person who is under the minimum age specified for that class of licence or rating as specified in the Eighth Schedule; and
  - (c) provided that a licence of the class referred to in paragraph 1 of the Eighth Schedule shall not be renewed or granted to any person who has attained the age of 60 years.
- (2) Subject to any conditions of the licence, the licence's privileges of any class shall entitle the holder to perform the functions specified in respect of that licence in Part D of the Eighth Schedule:

Provided that:

- (a) subject to sub-paragraphs (10) and (11) hereunder and to paragraph 19 (4) of this Regulation, a person shall not be entitled to perform any of the functions specified in Part C of the Eighth Schedule in respect of a rating unless his/her licence includes that rating;
  - (b) a person shall not be entitled to perform any of the functions to which his/her licence relates if he/she knows or has reason to believe that his/her physical condition renders him/her temporarily or permanently unfit to perform such function; and
  - (c) a person shall not be entitled to perform the functions to which an instrument rating – aeroplane or/and – helicopter or flight instructor rating unless his/her licence bears a certificate signed by a person authorised by the Civil Aviation Authority to sign such certificate, indicating that the holder of the licence has, within the period of 6 months in the case of an instrument rating – aeroplane and 24 months in the case of a flight instructor rating preceding the day on which he/she performs those functions, passed a test of his/her ability to perform the functions to which the rating relates, being a test carried out in flight in the case of the flight instructor rating and in the case of the instrument rating, either in flight or by means of a synthetic flight trainer approved by the Civil Aviation Authority in which flight conditions are simulated on the ground.
- (3) The Civil Aviation Authority may, if it is satisfied that the applicant is qualified as aforesaid to act in the capacity to which the rating relates, include in a licence a rating of any of the classes specified in Part C of the Eighth Schedule and such rating shall be deemed to form part of the licence and shall entitle the holder to perform such functions as are specified in Part D of that Schedule in respect of that rating. An instrument rating (referred to in that Schedule) may be renewed by any person appointed by the Civil Aviation Authority for that purpose, if that person is satisfied by a test that the applicant continues to be competent to perform the functions to which the rating relates. The test shall be carried out either in flight or by means of a synthetic flight trainer approved by the Civil Aviation Authority in which flight conditions are simulated on the ground.
- (4) A licence and a rating shall, subject to paragraph 59 of this Regulation remain in force for the periods indicated in the licence, not exceeding those respectively specified in the Eighth Schedule, and may be renewed by the Civil Aviation Authority from time to time upon being satisfied that the applicant is a fit and proper person and is qualified as aforesaid.
- (5) Upon receiving a licence granted under this paragraph the holder shall forthwith sign his/her name thereon in ink with his/her ordinary signature.

- (6) Every holder of a flight crew member licence granted under this paragraph and the requirements of the Eight Schedule shall, upon applying for the renewal of the licence and upon such other occasions as the Civil Aviation Authority may require, submit himself/herself to medical examination by an accredited medical examiner approved by the Civil Aviation Authority either generally or in a particular case, who shall make a report to the Civil Aviation Authority in such form as the Civil Aviation Authority may require.
- (7) Every holder of a licence granted under this paragraph or rendered valid under paragraph 21 of this Regulation who:
- (a) suffers any personal injury involving incapacity to undertake the functions to which his/her licence relates;
  - (b) suffers any illness involving incapacity to undertake those functions throughout a period of 20 days or more; or
  - (c) in the case of a woman, has reason to believe that she is pregnant,

shall inform the Civil Aviation Authority in writing of such injury, illness, or pregnancy, as soon as possible in the case of the injury or pregnancy, and as soon as the period of 20 days has elapsed in the case of the illness.

- (8) A licence for a flight crew member granted under the terms of the Eighth Schedule of this Regulation shall be deemed to be suspended upon the occurrence of such an injury, or the elapse of such period of illness as is referred to in sub-paragraph (7) above.

The suspension of the licence shall cease:

- (a) upon the holder being medically examined under arrangements made by the Civil Aviation Authority and pronounced fit to resume his/her functions under the licence; or
  - (b) upon the Civil Aviation Authority exempting the holder from the requirement of a medical examination, subject to such conditions as the Civil Aviation Authority may think fit.
- (9) A licence granted under this paragraph shall be deemed to be suspended upon the pregnancy of the holder being diagnosed and shall remain suspended until the holder has been medically examined after the termination of the pregnancy and pronounced fit to resume her duties under the licence.
- (10) Nothing in this Regulation shall be taken to prohibit the holder of a commercial pilot or airline transport pilot licence – aeroplane, or – helicopter from acting as commander of an aircraft carrying passengers by night by reason of the lack of a night rating in his/her licence.
- (11) Nothing in this Regulation shall prohibit the holder of a pilot licence from acting as pilot of an aircraft not exceeding 5,700 kg maximum certificated take-off mass when with the authority of the Civil Aviation Authority he/she is testing any person in pursuance of sub-paragraph (1) or (3) above, notwithstanding that the type of aircraft in which the test is conducted is not specified in the aircraft rating included in his/her licence.
- (12) Where any provision of Part B of the Ninth Schedule permits a test to be conducted in a synthetic flight trainer approved by the Civil Aviation Authority, that approval may be granted subject to such conditions as the Civil Aviation Authority thinks fit.
- (13) Without prejudice to any other provision of this Regulation, the Civil Aviation Authority may, for the purpose of this paragraph, either absolutely or subject to such conditions as it thinks fit:

- (a) approve any course of training or instruction;
  - (b) authorise a person to conduct such examinations or tests as it may specify; and
  - (c) approve a person to provide any course of training or instruction.
- (14) Personnel licences issued by the Civil Aviation Authority in accordance with the relevant provisions of this Regulation will conform to the following specifications and details which will appear on the granted licence:
- (i) **Macao Special Administrative Region of the People's Republic of China** (in bold type);
  - (ii) Title of licence (in very bold type);
  - (iii) Serial number of the licence, in Arabic numerals, given by the Civil Aviation Authority;
  - (iv) Name of holder in full (in roman alphabet also if script of national language is other than roman);
  - (iv<sup>a</sup>) Date of birth;
  - (v) Address of holder;
  - (vi) Nationality of holder;
  - (vii) Signature of holder;
  - (viii) Authority and, where necessary, conditions under which the licence is issued;
  - (ix) Certification concerning validity and authorization for holder to exercise privileges appropriate to licence;
  - (x) Signature of officer issuing the licence and the date of such issue;
  - (xi) Seal or stamp of the Civil Aviation Authority;
  - (xii) Ratings, e.g. category, class, type of aircraft, airframe, aerodrome control, etc;
  - (xiii) Remarks, i.e. special endorsements relating to limitations and endorsements for privileges; and
  - (xiv) Any other details established by the Civil Aviation Authority.

#### Validation of licenses

21. The Civil Aviation Authority may, on a discretionary basis, issue a *Certificate of validation* rendering valid for the purposes of this Regulation any licence or rating as a member of the flight crew of aircraft granted under the law of any Contracting State. A *Certificate of validation* may be issued according with the terms of paragraph 4 of the Eighth Schedule and subject to such conditions and for such period as the Civil Aviation Authority thinks fit.

#### Personal flying log book

22. Every member of the flight crew of a Macao registered aircraft, and every person who engages in flying for the purpose of qualifying for the grant or renewal of a licence under this Regulation shall keep a personal flying *log book* in which the following particulars shall be recorded:

- (a) the name and address of the holder of the flying *log book*;
- (b) particulars of the holder's licence (if any) to act as a member of the flight crew of an aircraft;
- (c) the name and address of his/her employer (if any);
- (d) particulars of all flights made by him/her as a member of the flight crew of an aircraft or while flying for the purpose of qualifying for the grant or renewal of a licence under this Regulation including:
  - (i) the date, time, duration and places of arrival and departure of each flight;
  - (ii) the type and registration marks of the aircraft;
  - (iii) the capacity in which he/she acted in flight;
  - (iv) particulars of any special conditions under which the flight was conducted, including night flight and instrument flight; and
  - (v) particulars of any test or examination undertaken whilst in flight; and
- (e) particulars of any test or examination taken whilst in a synthetic flight trainer, including:
  - (i) the date of the test or examination;
  - (ii) the type of synthetic flight trainer;
  - (iii) the capacity in which he/she acted; and
  - (iv) the nature of the test or examination.

#### Instruction in flying

23. (1) A person shall not give any instruction in-flight to any person flying or about to fly an aircraft for the purpose of becoming qualified for:
- (a) the grant of a pilot licence;
  - (b) the inclusion in a pilot licence of an aircraft rating entitling the holder of the licence to act as pilot of:
    - (i) a multi-engined aircraft; or
    - (ii) an aircraft of any class appearing in the Table of Part A of the First Schedule, if he/she has not been previously entitled under the law to act as pilot of a multi-engined aircraft, or of an aircraft of that class as the case may be; or
  - (c) the inclusion or variation of any rating, other than an aircraft rating, in a pilot licence, unless:

- (i) the person giving the instruction holds a licence, granted or rendered valid under this Regulation, entitling him/her to act as commander of the aircraft for the purpose and in the circumstances under which instruction is to be given;
- (ii) such licence includes a flight instructor rating entitling the holder, in accordance with the privileges specified in the Eighth Schedule in respect of that rating, to give the instruction; and
- (iii) if payment is made for the instruction, such licence entitles the holder to act as commander of an aircraft flying for the purpose of commercial air transport:

Provided that sub-paragraph (1) (c) (iii) above shall not apply if the aircraft is owned, or is operated under arrangements entered into by a flying club of which both the person giving and the person receiving the instruction are members.

- (2) For the purpose of this paragraph payment shall be deemed to be made for instruction if any reward is given or promised by any person to any other person in consideration of the flight being made or of the instruction being given or if the instruction is given by a person employed for reward primarily for the purpose of giving such instruction.

## Part V

### OPERATION OF AIRCRAFT

#### Operations manual

24. (1) This paragraph shall apply to commercial air transport aircraft registered in Macao except aircraft used for the time being solely for flights not intended to exceed 60 minutes in duration, which are either:
- (a) flights solely for training persons to perform duties in an aircraft; or
  - (b) flights intended to begin and end at the same aerodrome.
- (2) (a) The operator of every aircraft to which this paragraph applies shall:
- (i) make available for the use and guidance to each member of its *Operating staff* an *Operations manual*;
  - (ii) ensure that each copy of the *Operations manual* is kept up to date; and
  - (iii) ensure that on each flight every member of the crew has access to a copy of every part of the *Operations manual* which is relevant to his/her duties on the flight.
- (b) Each *Operations manual* shall contain all such information and operating instructions as may be necessary to enable the *Operating staff* to perform their duties and responsibilities and the relationship of such duties to the operation as a whole including, in particular, information and instructions relating to the matters specified in Part A of the Ninth Schedule:
- Provided that the *Operations manual* shall not be required to contain any information or instructions available in an *Aircraft flight manual* accessible to the persons by whom the information or instructions may be required.
- (c) The operator of every aircraft to which this paragraph applies shall provide its *Operating staff* with an *Aircraft operating manual*, as part of the *Operations manual*, for each aircraft type operated, containing the normal, abnormal and emergency procedures relating to the operation of the aircraft. The manual shall also include details of the aircraft systems and of the checklists to be used. The design of the manual shall observe human factors principles.
- (3) The operator of every aircraft to which this paragraph applies shall:
- (a) make available to the authorities or any authorised entity, an *Operator's maintenance management exposition* approved by the Civil Aviation Authority;
  - (b) ensure that each copy of the *Operator's maintenance management exposition* is kept up to date and copies of all amendments are provided promptly to all organizations or persons to whom the manual has been issued; and
  - (c) make sure that each *Operator's maintenance management exposition* must contain all such information and instructions as may be necessary to enable the continuous airworthiness of the

aircraft including, in particular, the information and instructions relating to the matters specified in Part E of the Ninth Schedule.

- (d) Each *Operator's maintenance management exposition* shall contain all such information and instructions as may be necessary to enable the operating staff to perform their duties and responsibilities.
- (4) The operator of the aircraft shall furnish the Civil Aviation Authority with a copy of the whole of the *Operations manual* and the *Operator's maintenance management exposition* for the time being in effect together with all amendments and/or revisions, for review and acceptance and, where required, approval. The operator shall make such amendments or additions to the referred manuals, as well as to incorporate any such mandatory material as the Civil Aviation Authority may require for the purpose of ensuring the safety of the aircraft or of any persons or property carried therein or the safety, efficiency or regularity of air navigation.
- (5) For the purposes of this paragraph and the Ninth Schedule, *Operating staff* means the employees and agents employed by the operator, whether or not as members of the crew of the aircraft, to ensure that the flights of the aircraft are conducted in a safe manner, and includes an operator who performs those functions. The operator shall ensure that the operating staff when abroad knows that they must comply with the laws, regulations and procedures of those States or Territories in which operations are conducted.
- (6) The operator of the aircraft 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 aircraft.
- (7) If in the course of a flight, the equipment, which is specified in Scale O in paragraph 5 of the Fifth Schedule, is required to be provided in an aircraft and the said equipment becomes unserviceable, the aircraft shall be operated for the remainder of the flight in accordance with any relevant instructions in the operator's *Operations manual*.
- (8) The operator of the aircraft shall ensure that, in accordance with procedures approved by the Civil Aviation Authority or acceptable to the State of Registry if it is not a Macao registered aircraft, that:
- (a) each aircraft they operate is maintained in an airworthy condition;
  - (b) the operational and emergency equipment necessary for an intended flight is serviceable; and
  - (c) the *Certificate of Airworthiness* of each aircraft they operate remains valid.
- (9) The operator shall not operate an aircraft unless it is maintained and released to service by a maintenance organization approved by the Civil Aviation Authority in accordance with the applicable provisions or acceptable to the State of Registry if it is not a Macao registered aircraft.
- (10) The operator shall employ a person or group of persons to ensure that all maintenance is carried out in accordance with the *Operator's maintenance management exposition*.

**Training manual**

25. (1) The operator of every aircraft registered in Macao and flying for the purpose of commercial air transport shall:
- (a) make a *Training manual* available to every person appointed by the operator to give or to supervise the training, experience, practice or periodical test required under paragraph 26 (2) of this Regulation; and
  - (b) ensure that each copy of that training manual is kept up to date.
- (2) Each *Training manual* shall contain all such information and instructions as may be necessary to enable a person appointed by the operator to give or to supervise the training, experience, practice and periodical tests required under paragraph 26 (2) of this Regulation to perform his/her duties as such including in particular information and instructions relating to the matters specified in Part C of the Ninth Schedule.
- (3) (a) An aircraft to which this paragraph applies shall not fly unless not less than 30 days prior to such flight the operator of the aircraft has furnished to the Civil Aviation Authority a copy of its *Training manual* relating to the crew of that aircraft.
- (b) Subject to sub-paragraph (3) (c) hereunder, any amendment or addition to the *Training manual* shall be furnished to the Civil Aviation Authority by the operator before they come into effect.
- (c) An amendment or addition relating to training, experience, practice or periodical tests on an aircraft shall not take effect until the amendment or addition has been furnished to the Civil Aviation Authority.
- (d) Without prejudice to sub-paragraphs (1) and (2) above the operator shall make such amendments or additions to the *Training manual* as the Civil Aviation Authority may require for the purpose of ensuring the safety of the aircraft or of persons or property carried therein or the safety, efficiency or regularity of air navigation.

**Commercial air transport – operator’s responsibilities**

26. (1) The operator of a Macao registered aircraft shall not permit the aircraft to fly for the purpose of commercial air transport without first:
- (a) designating from among the flight crew a pilot to be the commander of the aircraft for the flight;
  - (b) satisfying itself by every reasonable means that the aeronautical radio stations and navigation aids serving the intended route or any planned diversion wherefrom are adequate for the safe navigation of the aircraft;
  - (c) satisfying itself by every reasonable means that the aerodrome (or heliport) and their facilities at which it is intended to take off or land, and any alternate aerodrome (or heliport) and their facilities at which a landing may be made, shall be kept continuously available for flight operations during their published hours of operations, irrespective of weather conditions, and are suitable for the purpose and in particular are adequately manned and equipped including such manning and equipment as may be notified to ensure the safety of the aircraft and its passengers:



Provided that the operator of the aircraft shall not be required to satisfy itself as to the adequacy of fire fighting, search, rescue or other services which are required only after the occurrence of an accident.

(d) selecting a take-off alternate aerodrome to be specified in the *Operational flight plan* if the weather conditions at the aerodrome of departure are at or below the applicable *Aerodrome operating minima* or it would not be possible to return to the aerodrome of departure for other reasons. The take-off alternate aerodrome shall be located within the following distance from the aerodrome of departure:

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

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

Provided that the aerodrome to be selected as a take-off alternate the available information shall indicate that, at the estimated time of use, the conditions will be at or above the *Aerodrome operating minima* for that operation.

(e) selecting at least one destination alternate aerodrome to be specified in the *Operational flight plan* and ATS flight plan, unless:

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

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

(f) selecting en-route alternate aerodromes, required for extended range operations by aeroplanes with two turbine power-units (ETOPS), which shall be specified in the *Operational flight plan* and ATS flight plan.

(g) complying with the aeroplane performance operating limitations as referred in the Seventeenth Schedule of this Regulation or with the helicopter performance operating limitations as referred in the Eighteenth Schedule of this Regulation.

(h) selecting alternate heliports for a flight to be conducted in accordance with the instrument flight rules (IFR), at least one suitable alternate shall be specified in the *Operational flight plan* and ATS the flight plan, unless:

(i) the duration of the flight and the meteorological conditions prevailing are such that there is reasonable certainty that, at the estimated time of arrival at the heliport of intended landing, and for a reasonable period before and after such time, the approach and landing may be made under visual meteorological conditions as prescribed by the Civil Aviation Authority; or

b) the heliport of intended landing is isolated and no suitable alternate is available. A point of no return (PNR) shall be determined.

(i) selecting suitable off-shore alternates may be specified subject to the following:

(i) the offshore alternates shall be used only after a point of no return (PNR). Prior to PNR on-shore alternates shall be used;

- (ii) mechanical reliability of critical control systems and critical components shall be considered and taken into account when determining the suitability of the alternates;
- (iii) one engine inoperative performance capability shall be attainable prior to arrival at the alternate;
- (iv) deck availability shall be guaranteed;
- (v) weather information must be reliable and accurate.

**Note.** - The landing technique specified in the *Aircraft flight manual* following control system failure may preclude the nomination of certain helidecks as alternate heliports.

- (vi) off-shore alternates should not be used when it is possible to carry enough fuel to have an on-shore alternate. Such circumstances should be exceptional and should not include payload enhancement in adverse weather conditions.
- (2) The operator of a Macao registered aircraft shall not permit any person to be a member of the crew thereof during any flight for the purpose of commercial air transport (except a flight for the sole purpose of training persons to perform duties in aircraft) unless such person has had the training, experience, practice and periodical tests specified in Part B of the Ninth Schedule in respect of the duties which he/she is to perform and unless the operator is satisfied that such person is competent to perform his/her duties, and in particular to use the equipment provided in the aircraft for that purpose. The operator shall maintain, preserve, produce and furnish information respecting records relating to the foregoing matters in accordance with paragraph 2 (1) of Part B of the Ninth Schedule.
- (3) The operator of a Macao registered aircraft shall not permit any member of the flight crew thereof, during any flight for the purpose of the commercial air transport of passengers or cargo to simulate emergency or abnormal situations which will adversely affect the flight characteristics of the aircraft.
- (4) The operator of a Macao registered aircraft for the purpose of the commercial air transport of passengers shall adopt a security programme, compatible with any aerodrome security programme, to ensure that all the following elements will be taken into account:

(a) *Security of the flight crew compartment*

- (i) 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.
- (ii) All aeroplanes of a maximum total weight in excess of 45500 kg or authorized to carry more than 60 passengers 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.
- (iii) In all aeroplanes which are equipped with a flight crew compartment door in accordance with (4)(a)(ii):
  - (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.

(iv) The installation mentioned in (4)(a)(ii) and (4)(a)(iii)(B) above shall be approved by the State of *Design of the aeroplane*.

(b) *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 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.

(c) *Security Training Programme*

(i) 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 and it shall include the following elements:

(A) determination of the seriousness of any occurrence;

(B) crew communication and coordination;

(C) appropriate self-defense responses;

(D) understanding of behaviour of terrorists so as to facilitate the ability of crew members to cope with hijacker behaviour and passenger responses;

(E) live situational training exercises regarding various threat conditions;

(F) flight deck procedures to protect the aeroplane; and aeroplane search procedures and guidance on least-risk bomb locations where practicable.

(ii) 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 aircraft so that they contribute to the prevention of acts of sabotage or other forms of unlawful interference.

(d) *Reporting acts of unlawful interference*

An operator shall ensure that following an act of unlawful interference the commander shall submit, without delay, a report of such an act to the Civil Aviation Authority and when applicable to the designated local authority of other State or Territory;

(5) The operator of a Macao registered aircraft, or a designated representative, has the responsibility for *Operational control*.

(6) The operator of a Macao registered aircraft shall ensure that the commander has available on board the aircraft all the essential information concerning the search and rescue services in the area over which the aircraft will be flown.

- (7) The operator of a Macao registered aircraft shall establish and maintain an accident prevention and flight safety programme. Details of the programme, including a statement of safety policy and the responsibilities of management and personnel, shall be included in the *Operations manual*. A flight data analysis programme as part as of the operator's accident prevention and flight safety programme shall comply with the requirements of Scale EE of the Fifth Schedule.
- (8) The operator of a Macao registered aeroplane shall not permit its aeroplanes to 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 satisfactory 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 signals and instructions, phraseology and procedures, and is able to conform to the operational standards required for safe aircraft movement at the aerodrome.
- (9) The operator of a Macao registered helicopter shall not permit its helicopters to be turned under power without a qualified pilot at the controls.
- (10) The operator shall issue operating instructions and provide information on aircraft climb performance with all engines operating to enable the commander to determine the climb gradient that can be achieved during the departure phase for the existing take-off conditions, intended take-off technique and performance operating limitations as referred in the Seventeenth Schedule for aeroplanes and Eighteenth Schedule for helicopters for the purpose of commercial air transport. The information on take-off conditions, intended take-off technique and performance operating limitations shall be included in the *Operations manual*.
- (11) The operator shall establish a fuel policy for the purpose of flight planning and in-flight replanning to ensure that every flight carries sufficient fuel for the planned operation and reserves to cover deviations from the planned operation.
- (12) The operator shall ensure that the planning of flights is only based upon:
- (a) Procedures and data contained in or derived from the Operations Manual or current aircraft specific data; and
  - (b) The operating conditions under which the flight is to be conducted including:
    - (i) Realistic aircraft fuel consumption data;
    - (ii) Anticipated masses;
    - (iii) Expected meteorological conditions; and
    - (iv) Air Traffic Services procedures and restrictions.
- (13) An operator shall ensure that the pre-flight calculation of usable fuel required for a flight includes:
- (a) Taxi fuel;
  - (b) Trip fuel;
  - (c) Reserve fuel consisting of:

- (i) Contingency fuel to compensate for items such as:
    - (A) Deviations of an individual aircraft from the expected fuel consumption data;
    - (B) Deviations from forecast meteorological conditions; and
    - (C) Deviations from planned routings and/or cruising levels/altitudes;
  - (ii) Alternate fuel, if a destination alternate is required;
  - (iii) Final reserve fuel; and
  - (iv) Additional fuel, if required by the type of operation; and
  - (d) Extra fuel if required by the commander.
- (14) An operator shall ensure that in-flight replanning procedures for calculating usable fuel required when a flight has to proceed along a route or to a destination other than originally planned includes:
- (a) Trip fuel for the remainder of the flight;
  - (b) Reserve fuel consisting of:
    - (i) Contingency fuel;
    - (ii) Alternate fuel, if a destination alternate is required.
    - (iii) Final reserve fuel; and
    - (iv) Additional fuel, if required by the type of operation; and
  - (c) Extra fuel if required by the commander.
- (15) An operator shall maintain fuel and oil records to enable Civil Aviation Authority to ascertain that, for each flight, the requirements of this provision have been complied with. Fuel and oil records shall be retained by the operator for a period of three months.

#### **Loading – commercial air transport aircraft and suspended loads**

27. (1) The operator of a Macao registered aircraft shall not cause or permit it to be loaded or any load to be suspended wherefrom for a flight for the purpose of commercial air transport except under the supervision of a person whom he/she has caused to be furnished with written instructions as to the distribution and securing of the load so as to ensure that:
- (a) the load may safely be carried on the flight; and
  - (b) any conditions subject to which the *Certificate of airworthiness* in force in respect of the aircraft was issued or rendered valid, being conditions relating to the loading of the aircraft, are complied with.
- (2) The instructions shall indicate the weight of the aircraft prepared for service, that is to say the aggregate of the basic weight (shown in the *Weight schedule* referred to in paragraph 16 of this Regulation) and the weight of such additional items in or on the aircraft as the operator thinks fit to include; and the instructions shall indicate the additional items included in the weight of the aircraft prepared for service, and shall show the position of the centre of gravity of the aircraft at that weight:

Provided that this sub-paragraph shall not apply in relation to a flight if:

- (a) the aircraft's maximum certificated take-off mass does not exceed 1,150 kg; or

- (b) the aircraft's maximum certificated take-off mass does not exceed 2,730 kg and the flight is intended not to exceed 60 minutes in duration and is either:
  - (i) a flight solely for training persons to perform duties in an aircraft; or
  - (ii) a flight intended to begin and end at the same aerodrome.
- (3) The operator of an aircraft shall not cause or permit it to be loaded in contravention of the instructions referred to in sub-paragraph (1) above.
- (4) The person supervising the loading of the aircraft shall, before the commencement of any such flight, prepare and sign a load sheet in duplicate conforming to the requirements specified in sub-paragraph (6) hereunder and shall (unless he/she is the commander of the aircraft) submit the load sheet for examination by the commander of the aircraft who shall upon being satisfied that the aircraft is loaded in the manner required by sub-paragraph (1) above, sign his/her name thereon:

Provided that the foregoing requirements of this paragraph shall not apply if:

- (a) the load and the distributing and securing thereof upon the next intended flight are to be unchanged from the previous flight and the commander of the aircraft makes and signs an endorsement to that effect upon the load sheet for the previous flight, indicating the date of the endorsement, the place of departure upon the next intended flight and the next intended place of destination; or
  - (b) sub-paragraph (2) does not apply in relation to the flight.
- (5) One copy of the load sheet shall be carried in the aircraft when paragraph 55 of this Regulation so requires until the flights to which it relates have been completed and one copy of that load sheet and of the instructions referred to in this paragraph shall be preserved by the operator until the expiration of a period of 6 months thereafter and shall not be carried in the aircraft.
  - (6) Every load sheet required by sub-paragraph (4) above shall contain the following particulars:
    - (a) the mark of origin of the aircraft to which the load sheet relates, and the registration mark assigned to that aircraft by the Civil Aviation Authority;
    - (b) particulars of the flight to which the load sheet relates;
    - (c) the total weight of the aircraft as loaded for that flight;
    - (d) the weight of the several items from which the total weight of the aircraft, as so loaded, has been calculated including in particular the weight of the aircraft prepared for service and the respective total weights of the passengers, crew, baggage and cargo intended to be carried on the flight;
    - (e) the manner in which the load is distributed and the resulting position of the centre of gravity of the aircraft which may be given approximately if and to the extent that the relevant *Certificate of airworthiness* so permits; and
    - (f) the signature of the person referred to in sub-paragraph (1) above as responsible for the loading of the aircraft, that the aircraft has been loaded in accordance with the written instructions furnished to him/her by the operator of the aircraft pursuant to that sub-paragraph.

- (7) For the purpose of calculating the total weight of the aircraft the respective total weights of the passengers and crew entered in the load sheet shall be computed from the actual weight of each person and for that purpose each person shall be separately weighed:

Provided that in the case of an aircraft with a total seating capacity of 12 or more persons and subject to sub-paragraph (8), the weights may be calculated according to the included table and the load sheet shall bear a notation to that effect.

TABLE

(a) Males	75 kg
(b) Females	65 kg
(c) Children aged two and above but not exceeding 12 years of age	40 kg
(d) Infants under two years of age	10 kg

- (8) The commander of the aircraft shall, if in his/her opinion it is necessary to do so in the interests of the safety of the aircraft, require any or all of the passengers and crew to be actually weighed for the purpose of the entry to be made in the load sheet.
- (9) The operator of an aircraft registered in Macao and flying for the purpose of the commercial air transport of passengers shall not cause or permit baggage to be carried in the passenger compartment of the aircraft unless such baggage can be properly secured and, in the case of an aircraft capable of seating more than 30 passengers, such baggage shall not exceed the capacity of the spaces in the passenger compartment approved by the Civil Aviation Authority for the purpose of stowing baggage.

#### Commercial air transport – operating conditions

28. (1) No Macao registered aircraft shall be flown for the purpose of commercial air transport, unless such requirements as are prescribed in respect of its weight and balance, and related performance and flight in specified meteorological conditions or at night have been complied with.
- (2) The assessment of the ability of an aircraft to comply with sub-paragraph (1) above shall be based on the information as to its performance contained in the *Certificate of airworthiness* relating to the aircraft. In the event of the information given therein being insufficient for that purpose such assessment shall be based on the best information available to the commander of the aircraft.
- (3) The requirements specified in Part D of the Ninth Schedule in respect of the *Aerodrome (or heliport) operating minima* and weather conditions required for take-off, approach to landing and landing shall be complied with in respect of every aircraft to which paragraph 24 of this Regulation applies.

- (4) An aircraft registered in Macao when flying over water for the purpose of commercial air transport shall fly, except as may be necessary for the purpose of take-off or landing, at such an altitude as would enable the aircraft
- (a) if it has one engine only, in the event of the failure of that engine; and
  - (b) if it has more than one engine, in the event of the failure of one of those engines and with the remaining engine or engines operating within the maximum continuous power conditions specified in the *Aircraft flight manual*,
- to reach a place at which it can safely land at a height sufficient to enable it to do so.
- (5) Except under and in accordance with the terms of a written authorization granted by the Civil Aviation Authority to the operator, a Macao aeroplane having two turbine power-units shall not fly in extended range operation for the purpose of commercial air transport unless it will, in the meteorological conditions expected for the flight, at any point along the route or any planned diversion wherefrom, not be more than 60 minutes flying time at single engine cruise speed to an adequate aerodrome.
- (6) In granting the written authorization above-mentioned for this type of operation, the Civil Aviation Authority shall ensure that:
- (a) the airworthiness certification of the aeroplane type;
  - (b) the reliability of the propulsion system; and
  - (c) the operator's maintenance procedures, operating practices, flight dispatch procedures and crew training programmes;

provide the over-all level of safety intended by this Regulation. In making this assessment, account shall be taken of the route to be flown, the anticipated operating conditions and the location of adequate en-route alternate aerodromes.

- (7) A flight to be conducted in accordance with sub-paragraph (5) above shall not be commenced unless, during the possible period of arrival, the required en-route alternate aerodrome(s) will be available and the available information indicates that conditions at those aerodromes will be at or above the *Aerodrome operating minima* approved for the operation by the Civil Aviation Authority.

#### **Aerodrome (Heliport) Operating Minima**

29. (1) A commercial air transport aircraft not registered in Macao shall not fly in or over Macao unless the operator thereof shall have furnished to the Civil Aviation Authority such particulars as it may from time to time require relating to the *Aerodrome (or heliport) operating minima* specified by the operator in relation to a Macao aerodrome (or heliport) for the purpose of limiting their use by the aircraft for take-off or landing, including any instruction given by the operator in relation to such weather conditions. The aircraft shall not fly in or over Macao unless the operator shall have made such amendments of or additions to the *Aerodrome (or heliport) operating minima* so specified and shall comply with any instruction given by the Civil Aviation Authority for the purpose of ensuring the safety of the aircraft or the safety, efficiency or regularity of air navigation.
- (2) A commercial air transport aircraft not registered in Macao shall not begin or end a flight at a Macao aerodrome (or heliport) in *Aerodrome (or heliport) operating minima* less favourable than those so specified in the Ninth Schedule in relation to that aerodrome (or heliport), or in contravention of the instructions referred to in sub-paragraph (1) above.



- (3) Without prejudice to sub-paragraph (2) above, a commercial air transport aircraft not registered in Macao shall not commence or continue an approach to landing at a Macao aerodrome if the *Runway visual range* at that aerodrome is at that time less than the relevant minimum for landing established in accordance with sub-paragraph (1) above.
- (4) For the purposes of this paragraph, *Runway visual range*, in relation to a runway or landing strip, means the range over which the pilot of an aircraft on the centreline of a runway can see runway surface markings or the lights delineating the runway or identifying its centreline or, in the case of a Macao aerodrome, the distance, if any, communicated to the commander of the aircraft by or on behalf of the person in charge of the aerodrome as being the *Runway visual range*.
- (5) The operator of a commercial air transport aircraft registered in Macao shall establish *Aerodrome (or heliport) operating minima* for each aerodrome (or heliport) to be used in operations, and the Civil Aviation Authority shall approve the method of determination of such minima. Such minima shall not be lower than any that may be established for such aerodromes (or heliports) by the State or Territory in which the aerodrome is located, except when specifically approved by that State or Territory.
- (6) The *Aerodrome (or heliport) operating minima* which will apply to any particular operation of a commercial air transport aircraft registered in Macao shall be established in accordance with Part D of the Ninth Schedule and approved by the Civil Aviation Authority.

#### **Preflight action by commander of aircraft**

30. The commander of a Macao registered aircraft shall satisfy himself/herself before the aircraft takes off:

- (a) that the flight can safely be made, taking into account the latest information available as to the route and aerodromes (or heliport) to be used, the weather reports and forecasts available, and any alternative course of action which can be adopted in case the flight cannot be completed as planned, particularly having regard to the following:
  - (i) a flight to be conducted in accordance with the visual flight rules (VFR) shall not be commenced unless current meteorological reports or a combination of current reports and forecasts indicate that the meteorological conditions along the route or that part of the route to be flown under the visual flight rules will, at the appropriate time, be such as to render compliance with these rules possible;
  - (ii) a flight to be conducted in accordance with instrument flight rules (IFR) shall not be commenced unless information is available which indicates that conditions at the aerodrome (or heliport) of intended landing or, where a destination alternate is required, at least one destination alternate aerodrome (or heliport) will, at the estimated time of arrival, be at or above the *Aerodrome (or heliport) operating minima*.
- (b) (i) that the equipment, including radio and navigation equipment, required by or under this Regulation to be carried in the circumstances of the intended flight is carried and is in a fit, sufficient and legal condition for use in accordance with the Ninth Schedule, Part F; or
  - (ii) that the flight may commence under and in accordance with the terms of an authorization granted to the operator pursuant to paragraph 14 of this Regulation;
  - (iii) the checklists referred in sub-paragraph 1 (b) of Part A of the Ninth Schedule are complied with in detail;

- (c) that the aircraft is in every way fit for the intended flight and holds a *Certificate of release to service* as required by paragraph 10 of this Regulation, and where a *Certificate of maintenance review* is required by paragraph 9 (1) of this Regulation to be in force, it is in force and will not cease to be in force during the intended flight;
- (d) the mass of the aircraft and the centre of gravity location are such that the flight can be conducted safely, and the load carried by the aircraft is of such weight, and is so distributed and secured, and it may safely be carried on the intended flight;
- (e) in the case of a power-driven aircraft or airship, that sufficient fuel, oil and engine coolant (if required) are carried for the intended flight, and that a safe margin has been allowed for contingencies, and in the case of a flight for the purpose of commercial air transport, that the instructions in the *Operations manual* relating to fuel, oil and engine coolant have been complied with in accordance with sub-paragraph 30 (i) hereunder;
- (f) in the case of an aircraft, that having regard to the performance (for an aircraft engaged in commercial air transport, the aeroplane operating limitations as referred to in the Seventeenth Schedule or the helicopter operating limitations as referred to in the Eighteenth Schedule, as applicable) in the conditions to be expected on the intended flight, and to any obstructions at the places of departure and intended destination and on the intended route, it is capable of safely taking off, reaching and maintaining a safe altitude thereafter, and making a safe landing at the place of intended destination;
- (g) that any pre-flight check system established by the operator and set forth in the *Operations manual* or elsewhere has been complied with by each member of the crew of the aircraft;
- (h) for an aircraft engaged in commercial air transport the operator shall complete an *Operational flight plan*, which contents and use shall be described in the *Operations manual*;
- (i) that the flight shall not be commenced unless, taking into account both the meteorological conditions and any delays that are expected in flight, the aircraft carries sufficient fuel and oil to ensure that it can safely complete the flight. In addition, a reserve shall be carried to provide for contingencies;

#### **Responsibility of commander and Passenger briefing**

31. The commander of a Macao registered aircraft shall be responsible for the safety of all crew members, passengers and cargo on board when the doors are closed. The commander shall also be responsible for the operation and safety of the aircraft from the moment the aircraft 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 power plant(s) used as primary propulsion units are shut down (or the rotor blades stopped for helicopters) and shall take all reasonable steps to ensure:
- (a) before the aircraft takes off on any flight, that all passengers are made familiar with the position and method of use of emergency exits, safety belts (with diagonal shoulder strap, where required to be carried), safety harnesses and (where required to be carried) oxygen equipment and life-jackets and all emergency equipment, including passenger emergency briefing cards, required by or under this Regulation and intended for use by passengers individually in the case of an emergency occurring to the aircraft;
  - (b) before the aircraft takes off on any flight, that all passengers are given specific warnings and take the appropriate actions to ensure that during certain stages of the flight no use can be

made of certain electronic devices or any other personal belongings used by passengers individually which can possibly endanger the safety of the flight or its occupants; and

- (c) in an emergency, that all passengers are instructed in the emergency action which they should take.

#### **Pilots to remain at control**

32. (1) The commander of a Macao registered aircraft, being an aircraft shall cause one pilot to remain at the controls at all times while the aircraft is in flight. If the aircraft is required by or under this Regulation to carry two pilots, the commander shall cause both pilots to remain at the controls during take-off and landing and during flight, except when their absence is necessary for the performance of duties in connexion with the operation of the aircraft or for physiological needs. If the aircraft carries two or more pilots (whether or not it is required to do so) and is engaged on a flight for the purpose of the commercial air transport of passengers the commander shall remain at the controls during take off and landing.
- (2) Each pilot at the controls shall be secured in his/her seat by either a safety belt with or without one diagonal shoulder strap.
- (3) Any flight crew member occupying a pilot's seat of a Macao registered aircraft for the purpose of commercial air transport 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.

#### **Commercial air transport of passengers – additional duties of commander**

33. (1) This paragraph shall apply to flights for the purpose of the commercial air transport of passengers by a Macao registered aircraft.
- (2) In relation to every flight to which this paragraph applies, the commander of the aircraft shall:
- (a) (i) if the aircraft is not a seaplane but is intended in the course of the flight to reach a point more than 30 minutes flying time (while flying in still air at the speed specified in the relevant *Certificate of airworthiness* as the speed for compliance with regulations governing flights over water) from the nearest land, take all reasonable steps to ensure that before take-off all passengers are given a demonstration of the method of use of the life-jackets required by or under this Regulation for the use of passengers;
- (ii) if the aircraft is not a seaplane but is required by paragraph 18 (8) of this Regulation to carry cabin crew, take all reasonable steps to ensure that, before the aircraft takes off on a flight:
- (A) which is intended to proceed beyond gliding distance from land; or
- (B) on which in the event of any emergency occurring during the take-off or during the landing at the intended destination or any likely alternate destination it is reasonably possible that the aircraft would be forced to land onto water,

all passengers are given a demonstration of the method of use of the life-jackets required by or under this Regulation for the use of passengers except that where the only requirement to give such a demonstration arises because it is reasonably possible that the aircraft would be forced to land

onto water at one or more of the likely alternate destinations the demonstration need not be given until after the decision has been taken to divert to such a destination;

- (b) if the aircraft is a seaplane, take all reasonable steps to ensure that before the aircraft takes off all passengers are given a demonstration of the method of use of the equipment referred to in sub-paragraph (2) (a) above;
  - (c) before the aircraft takes off, and before it lands, and whenever it is required for safety reasons, take all reasonable steps to ensure that the cabin crew of the aircraft is properly seated with seat belt or, when provided, safety harness fastened, and that all persons carried in compliance with paragraph 18 (8) of this Regulation are properly secured in seats which shall be in a passenger compartment and which shall be so situated that those persons can readily assist passengers;
  - (d) before the aircraft takes off, and before it lands, and whenever by reason of turbulent air or any emergency occurring during flight he/she considers the precaution necessary:
    - (i) take all reasonable steps to ensure that all passengers of two years of age or more are properly secured in their seats by safety belts (with diagonal shoulder strap, where required to be carried) or safety harnesses and that all passengers under the age of two years are properly secured by means of a child restraint device; and
    - (ii) take all reasonable steps to ensure that those items of baggage in the passenger compartment which he reasonably considers ought by virtue of their size, weight and nature to be properly secured are properly secured and, in the case of an aircraft capable of seating more than 30 passengers, that such baggage is stowed in the passenger compartment stowage spaces approved by the Civil Aviation Authority for the purpose;
  - (e) except in a case where a pressure greater than 700 millibars is maintained in all passenger and crew compartments throughout the flight, take all reasonable steps to ensure that:
    - (i) before the aircraft reaches flight level 100 the method of use of the oxygen provided in the aircraft in compliance with the requirements of paragraph 12 of this Regulation is demonstrated to all passengers;
    - (ii) when flying above flight level 130 all passengers and cabin crew are recommended to use oxygen;
    - (iii) during any period when the aircraft is flying above flight level 100 oxygen is used by all the flight crew of the aircraft; and
    - (iv) the cabin crew should be safeguarded so as to ensure reasonable probability of their retaining consciousness during any emergency descent which may be necessary in the event of loss of pressurization and, in addition, they should have such means of protection as will enable them to administer first aid to passengers during stabilized flight following the emergency. Passengers should be safeguarded by such devices or operational procedures as will ensure reasonable probability of their surviving the effects of hypoxia in the event of loss of pressurization.
- (3) All helicopters on flights over water shall be certified for ditching on the conditions approved by the Civil Aviation Authority, for compliance with the following requirements:
- (a) to be fitted with a permanent or rapidly deployable means of floatation so as to ensure a safe ditching of the helicopter when:

- (i) flying over water at a distance from land corresponding to more than 10 minutes at normal cruise speed in the case of performance Class 1 or 2 helicopters; or
  - (ii) flying over water beyond autorotational or safe forced landing distance from land in the case of performance Class 3 helicopters; and
- (b) sea state shall be an integral part of ditching information.

#### Flight dispatch and flight operations officers

34. (1) Subject to the provisions of this paragraph, the operator of a Macao registered aircraft which may require an approved method of flight supervision must do so by using the service of holders of licensed flight operations officers. A flight operations officer when employed in conjunction with an approved method of flight supervision shall:
- (a) assist the commander in flight preparation and provide the relevant information required;
  - (b) assist the commander in preparing the *Operational flight plan* and the ATS flight plan, sign when applicable and file the ATS flight plan with the appropriate ATS unit;
  - (c) furnish the commander while in flight, by appropriate means, with information which may be necessary for the safe conduct of the flight; and
  - (d) in the event of an emergency, initiate such procedures as may be outlined in the *Operations manual*;
  - (e) avoid taking any action that would conflict with the procedures established by:
    - (i) air traffic control;
    - (ii) the meteorological service; or
    - (iii) the communications service.
- (2) The Civil Aviation Authority may grant a licence subject to such conditions as it thinks fit to any person to act as a flight operations officers, upon it being satisfied that the applicant is a fit person, of an adequate age, knowledge, experience, competence and skills so to act, and for that purpose the applicant shall furnish such evidence and undergo such examinations and tests as the Civil Aviation Authority may require of him/her:
- (a) Provided that the Civil Aviation Authority will not grant a flight operations officers licence to a person under the age of 21 years;
  - (b) Provided that the applicant meets the requirements laid down in the Fourth Schedule of this Regulation.
- (3) Every licence issued by the Civil Aviation Authority which authorizes a person to act as a Flight operations officer shall be valid for the sole purpose of entitling the respective holder to accomplish flight operations dispatch and flight supervision tasks.
- (4) After an applicant has successfully completed an approved training course or met any other requirements regarding the necessary experience mentioned in the Fourth Schedule of this Regulation, he/she has to serve under the supervision of a licensed flight operations officers for a probation period not less than 90 days within the six months immediately preceding the application.

- (5) Subject to the provisions of paragraph 59 of this Regulation, a licence to act as a flight operations officers shall remain in force for the period indicated in the licence and may be renewed by the Civil Aviation Authority according to the revalidation period put forward in the Fourth Schedule of this Regulation, upon being satisfied that the applicant is a capable person and is qualified aforesaid.
- (6) An *Operational flight plan* shall be completed for every intended flight for the purpose of commercial air transport. The operational flight plan shall be approved and signed by the commander and signed by the Flight operations officer, 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 (or heliport) authority or on record in a suitable place at the point of departure. The *Operations manual* shall describe the content and use of the *Operational flight plan*.
- (7) Operational instructions involving a change in the ATS flight plan shall, when practicable, be co-ordinated with the appropriate ATS unit before transmission to the aircraft. When the above co-ordination has not been possible, operational instructions do not relieve the commander of the responsibility for obtaining an appropriate clearance from an ATS unit, if applicable, before making a change in flight plan.

#### Operation of radio in aircraft

35. (1) The radio station in an aircraft shall not be operated, whether or not the aircraft is in flight, except in accordance with the conditions of the licence issued in respect of that station under the law of the State or Territory in which the aircraft is registered, and by a person duly licensed or otherwise permitted to operate the radio station under the law.
- (2) Whenever an aircraft is in flight in such circumstances that it is required by this Regulation to be equipped with radio communication equipment, a continuous radio watch shall be maintained by a member of the flight crew listening to the signals transmitted upon the frequency notified, or designated by a message received from an appropriate or aeronautical radio station, for use by that aircraft:

Provided that:

- (a) the radio watch may be discontinued or continued on another frequency to the extent that a message as aforesaid so permits or for reasons of safety; and
  - (b) the watch may be kept by a device installed in the aircraft if:
    - (i) the appropriate aeronautical radio station has been informed to that effect and has raised no objection; and
    - (ii) that the station is notified or in the case of a station not situated in Macao otherwise designated as transmitting a signal suitable for that purpose.
- (3) The radio station in an aircraft shall not be operated so as to cause interference which would impair the efficiency of aeronautical telecommunications or navigational services, and in particular emissions shall not be made except as follows:
- (a) emissions of the class and frequency for the time being in use, in accordance with general international aeronautical practice, in the airspace in which the aircraft is flying;
  - (b) distress, urgency and safety messages and signals, in accordance with general international aeronautical practice;

- (c) messages and signals relating to the flight of the aircraft, in accordance with general international aeronautical practice;
  - (d) such public correspondence messages as may be permitted by or under the aircraft radio station licence referred to in sub-paragraph (1) above.
- (4) In any Macao registered aircraft which is engaged on a flight for the purpose of commercial air transport, an intercommunication system for use by all members of the flight crew and including boom or throat microphones, not of a hand-held type for use by pilots and flight engineer (if any) shall be provided. Below the transition level/altitude, all flight crew members required to be on flight deck duty shall communicate through boom or throat microphones.

#### **Aeronautical station operator**

36. (1) Subject to the provisions of this paragraph, an aeronautical radio station can only be operated by a duly licensed aeronautical station operator.
- (2) The Civil Aviation Authority may grant a licence subject to such conditions as it thinks fit to any person to act as an aeronautical station operator, upon it being satisfied that the applicant is a fit person, with an adequate age, knowledge, experience, competence and skill so to act, and for that purpose the applicant shall furnish such evidence and undergo such examinations and tests as the Civil Aviation Authority may require of him:
- (a) Provided that the Civil Aviation Authority will not grant an aeronautical station operator licence to a person under the age of 18 years;
  - (b) Air traffic controllers duly qualified to act as such by the Civil Aviation Authority may be regarded as having met the necessary requirements, therefore do not need to hold an aeronautical station operator licence.
  - (c) Holders of pilot licences accepted by the Civil Aviation Authority can be regarded as having met the necessary requirements and therefore do not need to hold an aeronautical station operator licence.
- (3) Every person to act as an aeronautical station operator must meet the conditions laid down in the Fourth Schedule to this Regulation, specifying the Macao's requirements to hold an aeronautical station operator licence.

#### **Minimum navigation performance**

37. (1) An aircraft registered in Macao shall not fly in the airspace specified in the Sixteenth Schedule unless:
- (a) it is equipped with navigation systems which enable the aircraft to maintain the navigation performance capability specified in the Sixteenth Schedule;
  - (b) the navigation systems required by sub-paragraph (1) (a) above are approved by the Civil Aviation Authority and installed and maintained in a manner approved by the Civil Aviation Authority;
  - (c) the operating procedures for the navigation systems required by sub-paragraph (1) (a) above are approved by the Civil Aviation Authority; and
  - (d) the equipment is operated in accordance with the approved procedures while the aircraft is flying in the airspace as specified in the Sixth Schedule.

**Use of flight recording system and preservation of records**

38. (1) The operator of the aircraft or the qualified person referred in paragraph 4 (3) of this Regulation shall at all times subject to paragraph 58 of this Regulation, preserve:
- (a) the recording required by paragraph 4 (2) (r), (s), (t) and (u), and Scale P of the Fifth Schedule made by any flight data recorder to be carried in an aeroplane; or
  - (b) the recording required by paragraph 4 (2) (v), (w) and (x), and Scale AA of the Fifth Schedule made by any flight data recorder to be carried in a helicopter.
- (2) The operator of the aircraft shall preserve the records mentioned in sub-paragraph (1) above for such period as the Civil Aviation Authority may in a particular case direct.
- (3) On any flight on which a flight data recorder (FDR) or a cockpit voice recorder (CVR) is required by this Regulation to be carried:
- (a) in an aeroplane, it shall always be in use from the beginning of the take off run to the end of the landing run; and
  - (b) in a helicopter, it shall always be in use from the time the rotors first turn for the purpose of taking off until the rotors are next stopped.
- (4) To preserve flight recorder records, flight recorders (FDR and CVR) shall be de-activated 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 as amended.
- (5) Operational checks and evaluations of recordings from the flight data and cockpit voice recorder systems shall be conducted to ensure the continued serviceability of the recorders.

**Dropping of persons, animals and articles**

39. (1) Articles and animals (whether or not attached to a parachute) shall not be dropped, or permitted to drop, from an aircraft in flight so as to endanger persons or property.
- (2) Articles, animals and persons (whether or not attached to a parachute) shall not be dropped, or permitted to drop, to the surface from an aircraft flying in Macao:

Provided that this sub-paragraph shall not apply to the descent of persons by parachute from an aircraft in an emergency, or to the dropping of articles by or with the authority of the commander of the aircraft in the following circumstances:

- (a) the dropping of articles for the purpose of saving life;
- (b) jettisoning, in case of emergency, of fuel or other articles in the aircraft;
- (c) the dropping of articles solely for the purpose of navigating the aircraft in accordance with ordinary practice or with this Regulation;
- (d) the dropping of articles for the purposes of agriculture, horticulture or public health or as a measure against weather conditions or oil pollution, or for training for the dropping of articles for any such purposes, if the articles are dropped with the permission of the Civil Aviation



Authority and in accordance with any conditions subject to which that permission may have been given.

- (3) For the purposes of this paragraph, dropping includes projecting and lowering.
- (4) Nothing in this paragraph shall prohibit the lowering of any person or animal from a helicopter to the surface, if the *Certificate of airworthiness* issued or rendered valid in respect of the helicopter under the law of the Contracting State in which it is registered includes an express provision that it may be used for that purpose.

#### Carriage of weapons or munitions of war

- 40.
- (1) An aircraft shall not carry any munitions of war.
  - (2) It shall be unlawful for any person to take or cause to be taken on board an aircraft, or to deliver or cause to be delivered for carriage thereon, any goods which he knows or has reason to believe or suspects to be munitions of war.
  - (3) For the purposes of this paragraph, *munitions of war* means such weapons and ammunition designed for use in warfare or against the person, including parts designed for such weapons and ammunition.

#### Carriage of dangerous goods

- 41.
- (1) Dangerous goods shall not be carried in an aircraft except as follows:
    - (a) goods carried in accordance with any regulations which the Civil Aviation Authority may make to permit dangerous goods to be carried either in aircraft generally or in aircraft of any class specified in the regulations;
    - (b) goods carried with the written authorization of the Civil Aviation Authority, and in accordance with any conditions to which such authorization may be subject;
    - (c) goods carried in an aircraft with the consent of the operator thereof for the purpose of ensuring the proper navigation or safety of the aircraft or the well-being of any person on board; and
    - (d) goods permitted to be carried under the law of the State or Territory in which the aircraft is registered, if there is in force in relation to such State or Territory an agreement between the Territory of Macao and the government of the State or Territory permitting the carriage of dangerous goods within Macao in aircraft registered in that State or Territory.
  - (2) Dangerous goods permitted by this Regulation to be carried in an aircraft shall not be loaded as cargo therein unless:
    - (a) the consignor of the goods has furnished the operator of the aircraft with particulars in writing of the nature of the goods and the danger to which they give rise; and
    - (b) the goods have been properly packed and the container in which they are packed is properly and clearly marked and labelled so as to indicate that danger to the person loading the goods in the aircraft.
  - (3) The operator of any aircraft shall:
    - (a) ensure that passengers are warned as to the type of goods that they are prohibited from transporting on board an aircraft as checked baggage or carry on articles;

- (b) ensure that flight crew and other employees including its agents are provided with such information and training as will enable them to carry out their responsibilities with regard to the transport of dangerous goods;
  - (c) before the commencement of any training course relating to the transport of dangerous goods, submit to the Civil Aviation Authority for approval the programmes and syllabus of the training course; and
  - (d) as soon as practicable and before any flight begins, inform the commander of the aircraft in writing of the identity of any dangerous goods on board the aircraft, the danger to which they give rise and the weight or quantity of the goods.
- (4) It shall be unlawful for any person to take or cause to be taken on board any aircraft, or to deliver or cause to be delivered for loading thereon, any goods which he/she knows or ought to know or suspect to be dangerous goods the carriage of which is prohibited by this paragraph.
- (5) The operator of any aircraft shall as soon as practicable notify the Civil Aviation Authority of any dangerous goods accident or incident.
- (6) Where any dangerous goods accident or incident occurs, the Civil Aviation Authority shall cause an investigation to be made in such manner as he thinks necessary.
- (7) For the purposes of any investigation under sub-paragraph (6) above, any person authorised by the Civil Aviation Authority to carry out the investigation may:
- (a) require such persons as it thinks necessary to answer any question or furnish any information or produce any document, paper and article and retain any such document, paper and article until the completion of the investigation;
  - (b) have access to and examine any consignment of goods; and
  - (c) enter and inspect any place the entry or inspection whereof appears to him to be necessary.
- (8) For the purpose of this paragraph:

***Dangerous goods*** mean articles or substances which are capable of posing significant risk to health, safety or property when transported by air;

***Dangerous goods accident*** means an occurrence associated with and related to the transport of dangerous goods by air which results in fatal or serious injury to a person or major property damage;

***Dangerous goods incident*** means an occurrence, other than a dangerous goods accident, associated with and related to the transport of dangerous goods by air, not necessarily occurring on board an aircraft, which results in injury to a person, property damage, fire, breakage, spillage, leakage of fluid or radiation or other evidence that the integrity of the packaging has not been maintained; and includes any occurrence; relating to the transport of dangerous goods, which seriously jeopardises the aircraft or its occupants.

- (9) This paragraph shall be additional to and not in derogation from paragraph 40.

### Method of carriage of persons

42. A person shall not be in or on part of an aircraft in flight which is not a part designed for the accommodation of persons and in particular a person shall not be on the wings or undercarriage of an aircraft.

Provided that a person may have temporary access to:

- (a) any part of an aircraft for the purpose of taking action necessary for the safety of the aircraft or of any person or cargo therein; or
- (b) any part of an aircraft in which cargo or stores are carried, being a part which is designed to enable a person to have access thereto while the aircraft is in flight.

### Exits and break-in markings

43. (1) This paragraph shall apply to commercial air transport aircraft registered in Macao.
- (2) Whenever an aircraft to which this paragraph applies is carrying passengers, every exit wherefrom and every internal door in the aircraft shall be in working order, and during take off and landing and during any emergency every such exit and door shall be kept free of obstruction and shall not be fastened by locking or otherwise so as to prevent, hinder or delay its use by passengers:

Provided that:

- (a) an exit may be obstructed by cargo if it is an exit which, in accordance with arrangements approved by the Civil Aviation Authority either generally or in relation to a class of aircraft or a particular aircraft, is not required for use by passengers;
  - (b) a door between the flight crew compartment and any adjacent compartment to which passengers have access may be locked or bolted if the commander of the aircraft so determines, for the purpose of preventing access by passengers to the flight crew compartment; and
  - (c) nothing in this paragraph shall apply to any internal door which is so placed that it cannot prevent, hinder or delay the exit of passengers from the aircraft in an emergency if it is not in working order.
- (3) Every exit from the aircraft shall be marked with the words **EXIT** or **EMERGENCY EXIT** in English and Chinese.
- (4) (a) Every exit from the aircraft shall be marked with instructions in English and Chinese and with diagrams, to indicate the correct method of opening the exit.
- (b) The markings shall be placed on or near the inside surface of the door or other closure of the exit and, if it is able to be opened from the outside of the aircraft, on or near the exterior surface.
- (5) (a) Every aircraft to which this paragraph applies, being an aircraft of which the maximum certificated take-off mass exceeds 3,600 kg shall be marked upon the exterior surface of its fuselage with marking to show the areas (referred to in this sub-paragraph as break-in areas) which can, for purposes of rescue in an emergency, be most readily and effectively broken into by persons outside the aircraft.

- (b) The break-in areas shall be rectangular in shape and shall be marked by right-angled corner markings, each arm of which shall be 9 cm in length along its outer edge and 3 cm in width.
  - (c) If the corner markings are more than 2 m apart intermediate lines 9 cm x 3 cm shall be inserted so that there is not more than 2 m between adjacent markings.
  - (d) The words **CUT HERE IN EMERGENCY** shall be marked in English and Chinese across the centre of each break-in area.
- (6) On every flight by an aircraft to which this paragraph applies, being an aircraft of which the maximum certificated take-off mass exceeds 5,700 kg, every exit from such an aircraft intended to be used by passengers in an emergency shall be marked upon the exterior of the aircraft by a band not less than 5 cm in width outlining the exit.
- (7) The markings required by this paragraph shall:
- (a) be painted, or affixed by other equally permanent means;
  - (b) except in the case of the markings required by sub-paragraph (6) above, be red in colour and, in any case in which the colour of the adjacent background is such as to render red markings not readily visible, be outlined in white or some other contrasting colour in such a manner as to render them readily visible;
  - (c) in the case of the markings required by sub-paragraph (6) above, be of a colour clearly contrasting with the background on which it appears;
  - (d) be kept at all times clean and un-obscured.
- (8) If one, but not more than one, exit from an aircraft becomes inoperative at a place where it is not reasonably practicable for it to be repaired or replaced, nothing in this paragraph shall prevent that aircraft from carrying passengers until it next lands at a place where the exit can be repaired or replaced:

Provided that:

- (a) the number of passengers carried and the position of the seats which they occupy is in accordance with arrangements approved by the Civil Aviation Authority either in relation to the particular aircraft or to a class of aircraft; and
- (b) in accordance with arrangements so approved, the exit is fastened by locking or otherwise, the words **EXIT** or **EMERGENCY EXIT** are covered and the exit is marked by a red disc at least 23 centimetres in diameter with a horizontal white bar across it bearing the words **NO EXIT** in red letters written in English and Chinese.

#### **Endangering safety of an aircraft**

44. A person shall not wilfully or negligently imperil the safety of an aircraft or any person on board, whether by interference with any member of the flight crew of the aircraft, or by tampering with the aircraft or its equipment or by disorderly conduct or by any other means.

#### **Endangering safety of any person or property**

45. A person shall not wilfully or negligently cause or permit an aircraft to endanger any person or property.

**Drunkenness in aircraft and use of psychoactive substances**

46. (1) A person shall not enter any aircraft when drunk, or be drunk in any aircraft.
- (2) A person under the influence of a drug to such an extent as to impair his senses shall not enter or be in any aircraft.
- (3) A person shall not, when acting as a member of the crew of any aircraft or being carried in any aircraft for the purpose of so acting, be under the influence of drink or a drug.
- (4) Holders of licences provided for in this Regulation shall not engage in any problematic use of psychoactive substances, which might render them unable to safely and properly exercise their licences and related ratings privileges.
- (5) The Civil Aviation Authority will ensure, as far as practicable, that all licence holders who engage in any kind of problematic use of psychoactive substances are identified and removed from their safety-critical functions. Return to the safety-critical functions may be considered after successful treatment or, in cases where no treatment is necessary, after cessation of the problematic use of substances and upon determination that the person's continued performance of the function is unlikely to jeopardize safety.

**Smoking in aircraft**

47. (1) Notices indicating when smoking is prohibited shall be exhibited in every Macao registered aircraft so as to be visible from each passenger seat therein.
- (2) A person shall not smoke in any compartment of a Macao registered aircraft at a time when smoking is prohibited in that compartment by a notice to that effect exhibited by or on behalf of the commander of the aircraft.

**Authority of commander and members of the crew of an aircraft**

48. Every person in a Macao registered aircraft shall obey all lawful commands which the commander of that aircraft may give for the purpose of securing the safety of the aircraft and of persons or property carried therein, or the safety, efficiency or regularity of air navigation.

**Stowaways**

49. A person shall not secrete himself/herself for the purpose of being carried in an aircraft without the consent of either the operator or the commander thereof or of any other person entitled to give consent to his/her being carried in the aircraft.

## Part VI

### AIRCRAFT NOISE

#### Noise certificate

50. (1) In this Part, unless the context otherwise requires:

*Annex* means ICAO Annex 16 – *Environmental protection*, Volume I – *Aircraft noise* and any amendment thereto.

*Noise certificate* means a certificate issued or validated or other document approved to the effect that the aircraft to which the certificate or other document relates complies with the applicable noise certification requirements in force in that State.

- (2) This Part shall apply to every aircraft landing or taking off in Macao except an aircraft flying in accordance with “*A*” *Conditions* or “*B*” *Conditions* set out in the Second Schedule.
- (3) An aircraft to which this Part applies shall not land or take off in Macao unless:
- (a) there is in force in respect of that aircraft a noise certificate which is:
- (i) deemed to be issued by the Civil Aviation Authority under sub-paragraph (4) hereunder;
- (ii) issued or validated by a country which applies standards which, in the opinion of the Civil Aviation Authority, are substantially equivalent to the Annex; or
- (iii) issued or validated in pursuance of the Annex; and
- (b) all conditions subject to which the certificate was issued are complied with.
- (4) Where the manufacturer of an aircraft that engages in air navigation has included in the *Aircraft flight manual* a statement to the effect that the aircraft:
- (a) conforms with the relevant standards in respect of noise contained in the *Annex*; or
- (b) complies with the standard requirements relating to the control of aircraft noise, the requirements of which, in the opinion of the Civil Aviation Authority, are substantially equivalent to the *Annex*,
- there shall be deemed to have been issued under this sub-paragraph a noise certificate in relation to that aircraft.
- (5) The Civil Aviation Authority may exempt, either absolutely or subject to such conditions as it thinks fit, any aircraft or person from all or any of the provisions of this Part.

## Part VII

### FATIGUE OF CREW

#### Application and interpretation

51. (1) Subject to sub-paragraph (2) below, paragraphs 52 and 53 of this Regulation shall apply in relation to any Macao registered aircraft which is:
- (a) engaged on a flight for the purpose of commercial air transport; or
  - (b) operated by an air transport undertaking.
- (2) Paragraphs 52 and 53 of this Regulation shall not apply in relation to a flight made only for the purpose of instruction in flying given by or on behalf of a flying club or flying school or a person who is not an air transport undertaking.
- (3) In this Part, unless the context otherwise requires:

*Flight time* in relation to any person, means all time spent by that person in an aircraft whether or not registered in Macao (other than an aircraft of which the maximum certificated take-off mass does not exceed 1,600 kg and which is not flying for the purpose of commercial air transport or aerial work) while it is in flight and he is carried therein as a member of the crew thereof.

*Day* means a continuous period of 24 hours beginning at midnight.

- (4) For the purposes of this Part, a helicopter shall be deemed to be in flight from the moment when, after the embarkation of its crew, the helicopter's rotor blades start turning until the moment the helicopter finally comes to rest at the end of the flight, and the rotor blades are stopped.

#### Fatigue of crew – operator's responsibilities

52. (1) The operator of an aircraft to which this paragraph applies shall not cause or permit that aircraft to make a flight unless:
- (a) it has established a scheme for the regulation of flight time for every person flying in that aircraft as a member of its crew;
  - (b) the scheme is approved by the Civil Aviation Authority subject to such conditions as it thinks fit;
  - (c) either:
    - (i) the scheme is incorporated in the *Operations manual* required by paragraph 24 of this Regulation; or
    - (ii) in a case where an *Operations manual* is not required by paragraph 24 of this Regulation, the scheme is incorporated in a document, a copy of which has been made available to every person flying in that aircraft as a member of its crew; and

- (d) it has taken all such steps as are reasonably practicable to ensure that the provisions of the scheme will be complied with in relation to every person flying in that aircraft as a member of its crew.
- (2) The operator of an aircraft to which this paragraph applies shall not cause or permit any person to fly therein as a member of its crew if it knows or has reason to believe that that person is suffering from, or having regard to the circumstances of the flight to be undertaken, is likely to suffer from such fatigue while he/she is so flying as may endanger the safety of the aircraft or of its occupants.
- (3) The operator of an aircraft to which this paragraph applies shall not cause or permit any person to fly therein as a member of its flight crew unless the operator has in its possession an accurate and up-to-date record in respect of that person and in respect of the 28 days immediately preceding the flight showing:
- (a) all his/her flight times; and
- (b) brief particulars of the nature of the functions performed by him/she in the course of his/her flight times
- (4) The record referred to in sub-paragraph (3) above shall, subject to paragraph 58 of this Regulation, be preserved by the operator of the aircraft until a date 12 months after the flight referred to in that paragraph.

#### **Fatigue of crew – responsibilities of crew**

53. (1) A person shall not act as a member of the crew of an aircraft to which this paragraph applies if he/she knows or suspects that he/she is suffering from, or having regard to the circumstances of the flight to be undertaken, is likely to suffer from such fatigue as may endanger the safety of the aircraft or its occupants.
- (2) A person shall not act as a member of the flight crew of an aircraft to which this paragraph applies unless he/she has ensured that the operator of the aircraft is aware of his/her flight times during the period of 28 days preceding the flight.

#### **Flight times – responsibilities of flight crew**

54. (1) Subject to sub-paragraph (2), a person shall not act as a member of the flight crew of a Macao registered aircraft if at the beginning of the flight the aggregate of all his previous flight times:
- (a) during the period of 28 consecutive days expiring at the end of the day on which the flight begins exceeds 100 hours; or
- (b) during the period of 12 months expiring at the end of the previous month exceeds 900 hours.
- (2) Paragraph (1) above shall not apply to a flight made:
- (a) in aircraft of which the maximum certificated take-off mass does not exceed 1,600 kg and which is not flying for the purpose of commercial air transport or aerial work; or
- (b) in an aircraft not flying for the purpose of commercial air transport nor operated by an air transport undertaking, if at the time when the flight begins the aggregate of all the flight times of that person since he/she was last medically examined and found fit for the purpose of the renewal of the flight crew licence does not exceed 25 hours.



## Part VIII

### DOCUMENTS AND RECORDS

#### Documents to be carried

55. (1) An aircraft shall not fly unless it carries the documents which it is required to carry under the law of the State or Territory in which it is registered.
- (2) A Macao registered aircraft shall, when in flight, carry all the documents in accordance with the Tenth Schedule.

#### Keeping of records of exposure to cosmic radiation

56. The operator of a commercial air transport aircraft registered in Macao shall, in respect of any flight by that aircraft during which it may fly at an altitude of more than 49,000 feet, keep a record in a manner prescribed of the total dose of cosmic radiation to which the aircraft is exposed during the flight together with the total cosmic radiation dose received by each crew member over a period of 12 consecutive months.

#### Production of documents and records

57. (1) The commander of an aircraft shall, within a reasonable time after being requested to do so by an authorised entity, cause to be produced to that entity:
- (a) the *Certificate of registration* and *Certificate of airworthiness* in force in respect of the aircraft;
  - (b) the licences of its flight crew;
  - (c) the *Noise certificate* as required by paragraph 50 of this Regulation; and
  - (d) such other documents as the aircraft is required by paragraph 55 of this Regulation to carry when in flight.
  - (e) the *Aircraft flight manual*, which requires to be updated by implementing changes made mandatory by the Civil Aviation Authority for Macao registered aircraft or by the State or Territory where the aircraft is registered.
- (2) The operator of a Macao registered aircraft shall, within a reasonable time after being requested to do so by an authorised entity, cause to be produced to that person such of the following documents as may have been requested by that person being documents which are required, by or under this Regulation, to be in force or to be carried or preserved:
- (a) the documents referred to in the Tenth Schedule as Documents A, B and G;
  - (b) the aircraft *Log book*, power plant *Log books* and variable pitch propeller *Log books* required under this Regulation to be kept;
  - (c) the *Weight schedule*, if any, required to be preserved under paragraph 16 of this Regulation;
  - (d) in the case of a commercial air transport aircraft or aerial work aircraft, the documents referred to in the Tenth Schedule as Documents D, E, F and H;

- (e) any records of flight times, duty periods and rest periods which he/she is required by paragraph 52 (4) of this Regulation to preserve, and such other documents and information in the possession or control of the operator, as the authorised entity may require for the purpose of determining whether those records are complete and accurate;
- (f) any such *Operation manuals* as are required to be made available under paragraph 24 (2) (a) (i) of this Regulation;
- (g) the records made by any flight data recorder required to be carried by or under this Regulation;
- (h) the record made from any cosmic radiation detection equipment together with the record of the names of the members of the crew of the aircraft which are required to be kept under paragraph 56 of this Regulation;
- (i) in the case of a commercial air transport aircraft, fuel and oil records shall be retained by the operator for a period of three months to enable the Civil Aviation Authority to ascertain that, for each flight, the minimum fuel and oil quantities established by this Regulation have been carried on board of an aircraft;
- (j) in the case an aircraft engaged in commercial air transport, the flight preparation forms shall be retained by the operator for a period of three months; and
- (k) the maintenance records related to *Maintenance programmes* carried out in accordance with paragraph 9 (1) and (2) of this Regulation, which shall retain the following information:
  - (i) the total time in service (hours, calendar time and cycles, as appropriate) of the aircraft and all life limited components;
  - (ii) the current status of compliance with all mandatory continuing airworthiness information;
  - (iii) appropriate details of modifications and repairs;
  - (iv) the time in service (hours, calendar time and cycles, as appropriate) since last overhaul of the aircraft or its components subject to a mandatory overhaul life, including total time in service, the date of the last overhaul and the date of the last inspection;
  - (v) the current status of the aircraft's compliance with the *Maintenance programme*; and
  - (vi) the detailed maintenance records to show that all requirements for signing of a *Certificate of release to service* have been met.
- (l) The records in sub-paragraph (k) (i) to (v) shall be kept for a minimum period of 90 days after the unit to which they refer has been permanently withdrawn from service, and the records in sub-paragraph (k) (vi) for a minimum period of one year after the signing of the *Certificate of release to service*.
- (m) Lists containing information on the emergency and survival equipment carried on board any of their aircraft engaged in international air navigation, available for immediate communication to rescue co-ordination centres. The information shall include, as applicable, the number, colour and type of life rafts and pyrotechnics, details of emergency medical supplies, water supplies and the type and frequencies of the emergency portable radio equipment.

- (3) The holder of a licence granted or rendered valid under this Regulation shall, within a reasonable time after being requested to do so by an authorised entity, cause to be produced to that person his/her licence, including any *Certificate of validation*. The requirements of this sub-paragraph shall be deemed to have been complied with, except in relation to a licence required by paragraph 55 of this Regulation to be carried in the aircraft or kept at an aerodrome, if the licence requested is produced within 5 days after the request has been made, to an authorised entity of the Civil Aviation Authority specified, at the time of the request, by the person to whom the request is made.
- (4) Every person required by paragraph 22 of this Regulation to keep a personal flying log book shall cause it to be produced within a reasonable time to an authorised entity after being requested to do so by him/her within two years after the date of the last entry therein.

#### Preservation of documents

58. A person required by this Regulation to preserve any document by reason of being the operator of an aircraft shall, if it ceases to be the operator of the aircraft, continue to preserve the document or record as if it had not ceased to be the operator, and in the event of its death the duty to preserve the document or record shall fall upon its personal representative:

Provided that if:

- (a) another person becomes the operator of the aircraft and it remains registered in Macao the operator or its personal representative shall deliver to that other person upon demand the *Certificates of maintenance review* and *Certificates of release to service*, the *Log* books and the *Weight schedule* and any record made by a flight data recorder and preserved in accordance with this Regulation which are in force or required to be preserved in respect of that aircraft;
- (b) an engine or variable pitch propeller is removed from the aircraft and installed in another aircraft operated by another person and registered in Macao he/she or his/her personal representative shall deliver to that other person upon demand the *Log* book relating to that engine or propeller; and
- (c) any person in respect of whom a record has been kept by him/her in accordance with paragraph 52 (3) of this Regulation becomes a member of the flight crew of a commercial air transport aircraft registered in Macao and operated by another person he/she or his/her personal representative shall deliver those records to that other person upon demand, and it shall be the duty of that other person to deal with the document or record delivered to him/her as if he/she were the first mentioned operator.

#### Revocation, suspension and variation of certificates, licenses and other documents

59. (1) The Civil Aviation Authority may, if it thinks fit, provisionally suspend any certificate, licence, approval, permission, authorization, exemption or other document issued or granted under this Regulation pending investigation of the case.
- (2) The Civil Aviation Authority may, on sufficient ground being shown to its satisfaction after due inquiry, revoke, suspend or vary any such certificate, licence, approval, permission, authorization, exemption or other document.
- (3) The holder or any person having the possession or custody of any certificate, licence, approval, permission, authorization, exemption or other document which has been revoked, suspended or varied under this Regulation shall surrender it to the Civil Aviation Authority within a reasonable time after being required to do so.

- (4) The breach of any condition subject to which any certificate, licence, approval, permission, authorization, exemption or other document other than a licence issued in respect of an aerodrome, has been granted or issued under this Regulation shall render the document invalid during the continuance of the breach.

#### Offences in relation to documents and records

60. (1) A person shall not with intent to deceive:
- (a) use any certificate, licence, approval, permission, authorization, exemption or other document issued or required by or under this Regulation which has been forged, altered, revoked or suspended or to which he is not entitled;
  - (b) lend any certificate, licence, approval, permission, authorization, exemption or other document issued or required by or under this Regulation to or allow it to be used by any other person; or
  - (b) make any false representation for the purpose of procuring for himself/herself or any other person the grants issue, renewal or variation of any such certificate, licence, approval, permission authorization, or exemption or other document;

and in this sub-paragraph a reference to a certificate, license, approval, permission, exemption or other document includes a copy or purported copy thereof.

- (2) A person shall not wilfully mutilate, alter or render illegible any log book or other record required by or under this Regulation to be maintained or any entry made therein, or knowingly make, or procure or assist in the making of, any false entry in or material omission from any such log book or record or destroy any such log book or record during the period for which it is required under this Regulation to be preserved.
- (3) All entries made in writing in any log book and record referred to in sub-paragraph (2) above shall be in ink.
- (4) A person shall not wilfully or negligently make in a load sheet any entry which is incorrect in any material particular or any material omission from such a load sheet.
- (5) A person shall not purport to issue any certificate for the purposes of this Regulation or any regulations made or requirements notified where under unless he/she is authorised to do so under this Regulation.
- (6) A person shall not issue any such certificate as aforesaid unless he/she has satisfied himself/herself that all statements in the certificate are correct.

## Part IX

### CONTROL OF AIR TRAFFIC

**Note.** – Part IX of this Regulation as well as the Eleventh Schedule shall only apply to aircraft flying in the area for which Macao is responsible. Outside such area, those aircraft registered in Macao shall comply with ICAO Annex 2 – *Rules of the air* unless otherwise specified by the competent authorities.

#### Rules of the air and air traffic control

61. (1) Every person and every aircraft shall comply with the *Rules of the air* and *Air traffic control* contained in the Eleventh Schedule as may be applicable to that person or aircraft in the circumstances of the case.
- (2) Subject to sub-paragraph (3) below, it shall be an offence to contravene, to permit the contravention of, or to fail to comply with, the *Rules of the air* and *Air traffic control*.
- (3) It shall be lawful for the *Rules of the air* and *Air traffic control* to be departed from to the extent necessary:
- (a) for avoiding immediate danger; or
- (b) for complying with the law of any State or Territory within which the aircraft then is.
- (4) If an emergency situation, which endangers the safety of the aircraft or persons, necessitates the taking of action, which involves a violation of local regulations or procedures, or departure from the *Rules of the air* and *Air traffic control*, the commander of the aircraft shall cause written particulars of the departure, and of the circumstances giving rise to it, to be given within 10 days thereafter to the competent authority of the State or Territory in which the departure was made or to the Civil Aviation Authority.
- (5) Nothing in the *Rules of the air* and *Air traffic control* shall exonerate any person from the consequence of any neglect in the use of lights or signals or of the neglect of any precautions required by ordinary aviation practice or by the special circumstances of the case.
- (6) The Civil Aviation Authority may for the purpose of promoting the safety of the aircraft make regulations as to special signals and other communications to be made by or on an aircraft, as to the course on which and the height at which an aircraft shall fly and as to any other precautions to be observed in relation to the navigation and control of aircraft which the Civil Aviation Authority may consider expedient for the purpose aforesaid and no aircraft shall fly in contravention of any such regulations.

#### Licensing of air traffic controllers and student air traffic controllers

62. (1) The Civil Aviation Authority may grant a licence subject to such conditions as it thinks fit to any person to act as an air traffic controller or as a student air traffic controller, upon his/her being satisfied that the applicant is a fit person to hold the licence and is qualified by reason of his/her knowledge, experience, competence, skill, physical and mental fitness so to act, and for that purpose the applicant shall furnish such evidence and undergo such examinations and tests (including medical examinations) and undertake such courses of training as the Civil Aviation Authority may require of him/her:

Provided that the Civil Aviation Authority shall not grant:

- (a) a student air traffic controller licence to a person under the age of 18 years; or
- (b) an air traffic controller licence to a person under the age of 21 years.

(2) Every licence to act as an air traffic controller shall include:

- (a) ratings of the class set forth in Fourth Schedule to this Regulation specifying the type of air traffic control service which the holder of the licence is competent to provide; and
- (b) the name of the aerodrome(s) where he/she can exercise his/her privileges, and

If throughout any period of 90 days the holder of the licence has not at any time provided at a particular place the type of air traffic control service specified in the rating, the rating shall, without prejudice to the Civil Aviation Authority's powers under paragraph 59 of this Regulation, cease to be valid for that place at the end of that period, and upon a rating ceasing to be valid for a place the holder of the licence shall forthwith inform the Civil Aviation Authority to that effect and shall forward the licence to the Civil Aviation Authority to enable it to be endorsed accordingly.

- (3) Every licence to act as a student air traffic controller shall be valid only for the purpose of authorizing the holder to provide air traffic control service under the supervision of another person who is present at the time and is the holder of valid air traffic controller licence which includes a rating specifying the type of air traffic control service which is being provided by the student air traffic controller and valid at the place in question.
- (4) A licence to act as an air traffic controller or as a student air traffic controller shall not be valid unless the holder of the licence has signed his/her name thereon in ink with his/her ordinary signature.
- (5) Subject to the provisions of paragraph 59 of this Regulation and to the conditions outlined in the Fourth Schedule, a licence to act as air traffic controller or as a student air traffic controller, shall remain in force for the period indicated in the licence and may be renewed by the Civil Aviation Authority from time to time, upon it being satisfied that the applicant is a fit person and is qualified as aforesaid.
- (6) Every applicant for and holder of an air traffic controller licence or a student air traffic controller licence shall upon such occasions as the Civil Aviation Authority may require:
  - (a) submit himself/herself to medical examination by a person approved by the Civil Aviation Authority either generally or in a particular case who shall make a report to the Civil Aviation Authority according to the terms specified in the Fourteenth Schedule of this Regulation; and
  - (b) submit him/her to such examinations and tests and furnish such evidence as to his/her knowledge, experience, competence and skill, as the Civil Aviation Authority may require.
- (7) On the basis of the medical examination referred to in sub-paragraph (6) of this paragraph, the Civil Aviation Authority or any person authorised by the Civil Aviation Authority as competent to do so may issue a medical certificate subject to such conditions as he thinks fit to the effect that the holder of the licence has been assessed as fit to perform the functions to which the licence relates. The certificate shall, without prejudice to paragraph 65 of this Regulation, be valid for such period as is therein specified, and shall be deemed to form part of the licence.
- (8) The holder of an air traffic controller licence or student air traffic controller licence shall not provide any type of air traffic control service at any such aerodrome or place as is referred to in

paragraph 63 (1) of this Regulation unless his/her licence includes a medical certificate issued and in force under sub-paragraph (7) of this paragraph.

#### **Prohibition of unlicensed air traffic controllers and student air traffic controllers**

63. (1) A person shall not provide in Macao any type of air traffic control service or hold himself/herself out, whether by use of a radio call sign or in any other way, as a person who may provide any type of air traffic control service unless he/she is the holder, and complies with the terms of:
- (a) a valid student air traffic controller licence granted under this Regulation and he/she is supervised in accordance with paragraph 62 (3) of this Regulation; or
  - (b) a valid air traffic controller licence so granted authorizing him to provide that type of service at the Macao aerodrome(s); or
  - (c) a valid air traffic controller licence so granted which does not authorize him/her to provide that type of service at the Macao aerodrome(s), but he/she is supervised by a person who is present at the time and who is the holder of a valid air traffic controller licence so granted which authorizes him/her to provide at the Macao aerodrome(s) the type of air traffic control service which is being provided;
- (2) The holder of an air traffic controller licence shall not be entitled to perform any of the functions specified in Fourth Schedule to this Regulation in respect of a rating at any place unless:
- (a) his/her licence includes that rating, and the rating is valid for the Macao International Airport; or
  - (b) he/she is supervised by a person who is present at the time and who is the holder of a valid air traffic controller licence granted under this Regulation which authorizes him/her to provide at the Macao International Airport the type of air traffic control service which is being provided.
- (3) A person shall not provide any type of air traffic control service unless he/she identifies himself/herself in such a manner as may be notified.
- (4) Nothing in a licence granted under paragraph 62 of this Regulation shall permit any person to operate manually any direction finding equipment for the purpose of providing air traffic control service to an aircraft at a time when he/she is providing air traffic control service or making signals to that aircraft or to another aircraft.
- (5) Nothing in this paragraph shall prohibit the holder of a valid air traffic controller licence from providing at the Macao aerodrome(s) for which the licence includes a valid rating, information to aircraft in flight in the interest of safety.

#### **Flight information service manual**

64. (1) A person shall not provide an aerodrome flight information service at the Macao aerodrome(s) unless:
- (a) the service is provided in accordance with the standards and procedures specified in an aerodrome information service manual in respect of that aerodrome;
  - (b) the manual is presented to the Civil Aviation Authority according to its request and conditions;

- (c) such amendments or additions as the Civil Aviation Authority may from time to time require have been made to the manual.

#### **Incapacity of air traffic controllers**

65. (1) Every holder of an air traffic controller licence granted under paragraph 62 of this Regulation who:
- (a) suffers any personal injury or illness involving incapacity to undertake the functions to which his/her licence relates throughout a period of 20 consecutive days; or
  - (c) in the case of a woman, has reason to believe that she is pregnant;
- shall inform the Civil Aviation Authority in writing of such injury, illness or pregnancy as soon as possible.
- (2) An air traffic controller licence shall be deemed to be suspended upon the elapse of such period of injury or illness as is referred to in paragraph (1) (a) of this paragraph. The suspension of the licence shall cease:
- (a) upon the holder being medically examined under arrangements made by the Civil Aviation Authority and pronounced fit to resume his functions under the licence; or
  - (b) upon the Civil Aviation Authority exempting the holder from the requirement of a medical examination subject to such conditions as the Civil Aviation Authority may think fit.
- (3) Upon the pregnancy of the holder of an air traffic controller licence being confirmed, the licence shall be deemed to be suspended and such suspension may be lifted by the Civil Aviation Authority subject to such conditions as it thinks fit, and shall cease upon the holder being medically examined under arrangements made by the Civil Aviation Authority after the pregnancy has ended and pronounced fit to resume her functions under the licence.

#### **Power to prohibit or restrict flying**

66. Where the Civil Aviation Authority deems it necessary in the public interest to restrict or prohibit flying over any area of Macao by reason of:
- (a) the intended gathering or movement of a large number of persons, or
  - (b) the intended holding of an aircraft race or contest or of an exhibition of flying, or
  - (c) any other reason affecting the public interest,

the Civil Aviation Authority may make regulations prohibiting, restricting or imposing conditions on flight, either generally or in relation to any class of aircraft, within the Macao air traffic control zone, and an aircraft shall not fly in contravention of such regulations.

#### **Restriction of flying in Macao air traffic control zone**

67. Within the Macao air traffic control zone, a captive balloon, a kite, a balloon exceeding two metres in any linear dimension, an airship and an aircraft capable of being flown without a pilot shall not fly in any conditions or circumstances.



## Part X

# AERODROMES, AERONAUTICAL LIGHTS AND DANGEROUS LIGHTS

### Aerodrome – commercial air transport of passengers and instruction in flying

68. (1) An aircraft flying for the purpose of the commercial air transport of passengers, cargo or mail, or for the purpose of instruction in flying or any other purpose, shall not take off or land at a place in Macao other than an aerodrome licensed under this Regulation for the take off and landing of such aircraft.
- (2) The aircraft referred to in sub-paragraph (1) shall take off or land in accordance with any conditions subject to which the aerodrome may have been so licensed or notified, or subject to which such permission may have been given.

### Licensing of aerodromes

69. (1) The Civil Aviation Authority may licence any aerodrome or heliport in Macao for the take off and landing of aircraft engaged in flights for the purpose of commercial air transport of passengers, cargo or mail, or for the purpose of instruction in flying or of any class of such aircraft, and may issue any such licence subject to such conditions as it shall consider necessary in the public interest, including a condition that the aerodrome shall at all times when it is available for the take off or landing of aircraft be so available to all persons on equal terms and conditions, and any licence issued subject to such a condition shall be known as a licence for public use.
- (2) The Macao International Airport and the Macao Heliport must display in a prominent place at the aerodrome a copy of the licence and shall furnish to any person on request information concerning the terms of the licence.
- (3) The Macao International Airport and Macao Heliport must not cause or permit any condition of the licence to be contravened, in relation to an aircraft engaged on a flight for the commercial air transport of passengers or for instruction in flying, but the licence shall not cease to be valid by reason only of such a contravention.
- (4) A licence granted by the Civil Aviation Authority in respect either to the Macao International Airport or the Macao Heliport must, subject to paragraph 59 of this Regulation, remain in force as may be specified in the licence.
- (5) The Civil Aviation Authority will charge the Macao International Airport and the Macao Heliport with the fees described in the Twelfth Schedule for the purpose of granting, renewing or changing those licences mentioned in sub-paragraph (1) above.
- (6) Any expense incurred by reason of anything done during the course of investigations, approval procedures, supervision, certification, inspections or any other reason which requires the intervention of the Civil Aviation Authority in connection with either the Macao International Airport or the Macao Heliport, their personnel, any of their equipment, or any services performed there, shall be paid by and be recoverable from the holder of the respective aerodrome certificate of approval.

### Charges at aerodromes licensed for public use

70. (1) The Civil Aviation Authority may, in relation to the Macao International Airport and to the Macao Heliport, approve the charges, or the maximum charges, which may be made for the use of the aerodromes and for any services performed at the aerodromes to or in connection with aircraft, and may further prescribe the conditions to be observed in relation to those charges and the performance of these services.
- (2) The Macao International Airport and the Macao Heliport, whose charges or conditions have been approved under sub-paragraph (1) above, shall not cause or permit any charges to be made in contravention of those approved, and shall cause particulars of these charges to be kept exhibited at the respective aerodrome in such a place and manner as to be readily available for the information of any person affected thereby.
- (3) The Macao International Airport and the Macao Heliport must, when required by the Civil Aviation Authority, furnish to the Civil Aviation Authority such particulars as it may require of the charges established by the licence for the use of the aerodromes or of any facilities or services provided at these aerodromes or heliports for the safety, efficiency or regularity of air navigation.

#### **Use of aerodromes by aircraft of Contracting States**

71. The person or entity in charge of the Macao International Airport or the Macao Heliport shall cause the respective aerodrome or heliport, and all air navigation facilities provided thereat, to be available for use by aircraft registered in any State or Territory on the same terms and conditions as those set for use by a Macao registered aircraft.

#### **Noise and vibration caused by aircraft on aerodromes**

72. (1) Noise and vibration may be caused by aircraft at the Macao International Airport and the Macao Heliport, under the following conditions:
- (a) the aircraft is taking off or landing; or
  - (b) the aircraft is moving on the ground; or
  - (c) the engines are being operated in the aircraft
    - (i) for the purpose of ensuring their satisfactory performance;
    - (ii) for the purpose of bringing them to a proper temperature in preparation for, or at the end of, a flight; or
    - (iii) for the purpose of ensuring that the instruments, accessories or other components of the aircraft are in a satisfactory condition.

#### **Aeronautical lights**

73. (1) A person shall not establish or maintain an aeronautical light within Macao except with the permission of the Civil Aviation Authority and in accordance with any conditions subject to which the permission may be granted.
- (2) A person shall not alter the character of an aeronautical light within Macao except with the permission of the Civil Aviation Authority and in accordance with any conditions subject to which the authorisation may be granted.

- (3) A person shall not wilfully or negligently damage or interfere with any aeronautical light established and maintained by or with the authorisation of the Civil Aviation Authority.

#### **Dangerous lights**

74. (1) A person shall not exhibit in Macao any light which:
  - (a) by reason of its glare is liable to endanger aircraft taking off from, or landing at, an aerodrome; or
  - (b) by reason of its liability to be mistaken for an aeronautical light is liable to endanger aircraft.
- (2) If any light which appears to the Civil Aviation Authority to be such a light as aforesaid is exhibited the Civil Aviation Authority may cause a notice to be served upon the person who is the occupier of the place where the light is exhibited or having charge of the light, directing that person, within a reasonable time to be specified in the notice, to take such steps as may be specified in the notice for extinguishing or screening the light and for preventing for the future the exhibition of any other light which may similarly endanger aircraft.
- (3) The notice may be served either personally or by post, or by affixing it in some conspicuous place near to the light to which it relates.

## Part XI

### AIR OPERATOR CERTIFICATE

#### Issue of air operators' certificates

75. (1) A Macao registered aircraft shall not fly on any flight for the purpose of commercial air transport otherwise than under and in accordance with the terms of an *Air operator certificate* granted to the operator of the aircraft under sub-paragraph (2) certifying that the holder of the certificate is competent to ensure that the aircraft operated by the operator on such flights are operated safely.
- (2) The Civil Aviation Authority shall grant to a person an *Air operator certificate* if it is satisfied that the person is competent having regard, in particular to its previous conduct and experience, its equipment, organisation, staffing, method of control and supervision, training programme, maintenance arrangements and any other arrangements, to secure the safe operation of aircraft of the type specified in the certificate on flights of the description and for the purposes so specified. The *Air operator certificate* may be granted subject to such conditions and limitations as the Civil Aviation Authority thinks fit and shall remain in force for the period specified in the certificate.
- (3) The continued validity of an *Air operator certificate* shall depend upon the operator maintaining the requirements of sub-paragraph (2) above.
- (4) The *Air operator certificate* shall contain at least the following:
- (a) operator's identification (name, location);
  - (b) date of issue and period of validity;
  - (c) description of the types of operations authorized;
  - (d) the type(s) of aircraft authorized for use; and
  - (e) authorized areas of operation or routes.
- (5) The Civil Aviation Authority shall charge the fees highlighted in the Twelfth Schedule of this Regulation for the purpose of the grant, change or renewal of an *Air operator certificate*.
- (6) The system established by the Civil Aviation Authority for both, the certification and the continued surveillance of the operator, shall ensure that the required standards of operations established in sub-paragraph (2) above for granting or renewing the *Air operator certificate* are duly established and maintained by the operator.

## Part XII

### GENERAL

#### Power to prevent aircraft flying

76. (1) If it appears to the Civil Aviation Authority or an authorised entity that any aircraft is intended or likely to be flown:
- (a) in such circumstances that any provision of paragraph 3, 5, 6, 18, 19, 27, 38, or 40 of this Regulation would be contravened in relation to the flight;
  - (b) in such circumstances that the flight would be in contravention of any other provision of this Regulation or any regulations made there under and be a cause of danger to any person or property whether or not in the aircraft; or
  - (c) while in a condition unfit for the flight, whether or not the flight would otherwise be in contravention of any provision of this Regulation or of any regulations made there under,

the Civil Aviation Authority or that authorised entity may direct the operator or the commander of the aircraft that he/she is not to permit the aircraft to make the particular flight or any other flight of such description as may be specified in the direction, until the direction has been revoked by the Civil Aviation Authority or by an authorised entity, and the Civil Aviation Authority or that authorised entity may take such steps as are necessary to detain the aircraft.

- (2) For the purposes of sub-paragraph (1), the Civil Aviation Authority or any authorised entity may enter upon and inspect any aircraft or aircraft component.

#### Right of access to aerodromes and other places

77. The Civil Aviation Authority and any authorised entity shall have the right of access at all reasonable times:
- (a) to the Macao International Airport and the Macao Heliport, or any other aerodrome or heliport in Macao for the purpose of inspecting these aerodromes or heliports, or any related facilities; or
  - (b) to any place where an aircraft has landed, for the purpose of inspecting the aircraft or any document which he has power to demand under this Regulation and for the purpose of detaining the aircraft under the provisions of this Regulation.

#### Obstruction of person

78. A person shall not wilfully obstruct or impede any entity acting in the exercise of his/her powers or the performance of his/her duties under this Regulation.

#### Enforcement of directions

79. Any person who fails to comply with any direction given to him/her by the Civil Aviation Authority or by any authorised entity under any provision of this Regulation or any regulations made or requirements notified there under shall be deemed for the purposes of this Regulation to have contravened that provision.

**Fee**

80. (1) The provisions of the Twelfth Schedule shall have effect with respect to the fees to be charged in connection with the grant, validation, renewal, extension or variation of any certificate, licence or other document (including an application for, or the issue of a copy of, any such document), or the undergoing of any examination, test, inspection or investigation or the grant of any permission or approval, required by, or for the purpose of, this Regulation or any regulations made there under.
- (2) Upon an application being made in connection with which any fee is chargeable in accordance with sub-paragraph (1) above, the applicant shall be required, before the application is entertained, to pay the fee so chargeable. If after such payment has been made, this application is withdrawn by the applicant or otherwise ceases to have effect or is refused, the Civil Aviation Authority may in its discretion, refund all or part of such payment.

**Delegation of power**

81. In so far as the exercise of any power or the performance of any duty of the Civil Aviation Authority under this Regulation may be required outside Macao where there is no representative of the Civil Aviation Authority competent to exercise such power or to perform such duty the Civil Aviation Authority may authorise in writing any person appearing to him to be qualified to do so or the holder for the time being of any office, to exercise such power or to perform such duty.

**Power to prescribe**

82. The Civil Aviation Authority may make regulations for prescribing anything which under this Regulation is to be prescribed; and the expression "*prescribe*" shall be constructed accordingly.

**Penalties**

83. (1) If any provision of this Regulation or of any regulations made there under is contravened in relation to an aircraft, the operator of that aircraft and the commander thereof, if the operator or, as the case may be, the commander is not the person who contravened that provision shall (without prejudice to the liability of any other person under this Regulation for that contravention) be deemed for the purposes of the following provisions of this paragraph to have contravened that provision unless he proves that the contravention occurred without his/her consent or connivance and that he/she exercised all due diligence to prevent the contravention. Whenever penalties are due for the misuse or non-accomplishment of the provisions of this Regulation, these are published in the Thirteenth Schedule to this Regulation.
- (2) If it is proved that an act or omission of any person which would otherwise have been a contravention by that person of a provision of this Regulation or of any regulations made there under was due to any cause not avoidable by the exercise of reasonable care by that person the act or omission shall be deemed not to be a contravention by that person of that provision.
- (3) Where a person is charged with contravening a provision of this Regulation or any regulations made there under by reason of his having been a member of the flight crew of an aircraft on a flight for the purpose of commercial air transport or aerial work the flight shall be treated (without prejudice to the liability of any other person under this Regulation) as not having been for that purpose if he/she proves that he neither knew nor had reason to know that the flight was for that purpose.
- (4) If any person contravenes any provision of this Regulation, or a directive, procedure, requirement or any other type of regulation or circular issued by Civil Aviation Authority by the reason of implementing paragraph 89 of this Regulation, shall be liable on conviction to a fine. That fine is described the Thirteenth Schedule of this Regulation.

### Extra-territorial effect of this regulation

84. Except where the context otherwise requires, the provisions of this Regulation:

- (a) in so far as they apply (whether by express reference or otherwise) to Macao registered aircraft, shall apply to such aircraft wherever they may be;
- (b) in so far as they apply as aforesaid to other aircraft shall apply to such aircraft when they are within Macao;
- (c) in so far as they prohibit, require or regulate (whether by express reference or otherwise) the doing of anything by persons in, or by any of the crew of, any Macao registered aircraft, shall apply to such persons and crew, wherever they may be; and
- (d) in so far as they prohibit, require or regulate as aforesaid the doing of anything in relation to any Macao registered aircraft by other persons shall apply to them wherever they may be.

### Direction

85. The Civil Aviation Authority may direct that such of the provisions of this Regulation and of any regulations made or having effect there under as may be specified in the direction shall have effect as if reference in those provisions to aircraft registered in Macao included references to the aircraft specified in the direction, being an aircraft not so registered but for the time being under the management of a person who, or of persons each of whom, is qualified to hold a legal or beneficial interest by way of ownership in an aircraft registered in Macao.

### Exemption from this regulation

86. The Civil Aviation Authority may exempt from any of the provisions of this Regulation or any regulations made there under any aircraft or persons or classes of aircraft or persons, either absolutely or subject to such conditions as it thinks fit.

### Saving

87. Subject to paragraphs 65 and 66, nothing in this Regulation or the regulations made there under shall confer any right to land in any place as against the owner of the land or other persons interested therein.

### Mandatory reporting

88. (1) Subject to this paragraph, every person who:

- (a) is the operator or the commander of an aircraft registered in Macao; or
- (b) is the operator or the commander of an aircraft operating under the jurisdiction of a Macao operator; or
- (c) carries on the business of designing, manufacturing, maintaining, repairing or overhauling such an aircraft, or any equipment or part thereof; or
- (d) signs a *Certificate of maintenance review* and *Certificate of release to service* in respect of such an aircraft, part or equipment; or
- (e) is in charge of the Macao International Airport, the Macao Heliport or any other aerodromes or heliports in Macao;

shall:

- (i) make a report to the Civil Aviation Authority of any *Reportable occurrence* of which he/she knows and which is of such a description as may be prescribed; the report shall be made within such time, by such means, and shall contain such information as may be prescribed and it shall be presented in such form as the Civil Aviation Authority may in any particular case approve; and
- (ii) make a report to the Civil Aviation Authority, within such time, by such means, and containing such information as the Civil Aviation Authority may specify in a notice in writing served upon him/her, being information which is in his/her possession or control and which relates to a *Reportable occurrence* which has been reported by him/her or by another person to the Civil Aviation Authority in accordance with this paragraph.

(2) In this paragraph, *Reportable occurrence* means:

- (a) any incident relating to such an aircraft or any defect in or malfunctioning of such an aircraft or any part or equipment of such an aircraft, being an incident, faults, malfunctions, defect and other occurrences that cause or might cause adverse effects on the continuing airworthiness of aircraft, or which if not corrected would endanger the aircraft, its occupants or any other person;
- (b) any defect in or malfunctioning of any facility on the ground used or intended to be used for purposes of or in connection with the operation of such an aircraft, being a defect or malfunctioning endangering, or which if not corrected would endanger such an aircraft or its occupants;
- (c) any incident relating to a violation of any regulation or procedures of any State or Territory in which such an aircraft operates.

Note. - Any accident notified to the Civil Aviation Authority shall not constitute a reportable occurrence for purposes of this paragraph.

- (3) Subject to sub-paragraph (1) (ii) above, nothing in this paragraph shall require a person to report any occurrence which he/she has reason to believe has been or will be reported by another person to the Civil Aviation Authority in accordance with this paragraph.
- (4) A person shall not make any report under this paragraph if he/she knows or has reason to believe that the report is false in any particular.
- (5) Without prejudice to paragraph 38 (2) of this Regulation and subject to paragraph 58 of this Regulation, the operator of an aircraft shall, if it has reason to believe that a report has been or will be made in pursuance of this paragraph, preserve any data from a flight data recorder relevant to the reportable occurrence for 14 days from the date on which a report of that occurrence is made to the Civil Aviation Authority or for such longer period as the Civil Aviation Authority may in a particular case direct:

Provided that the record may be erased if the aircraft is outside Macao and it is not reasonably practicable to preserve the record until the aircraft reaches Macao.

#### Notification to public

89. Without prejudice to the contents of this Regulation, the Civil Aviation Authority whenever it thinks appropriate or necessary, shall notify the public in general and those involved in the aeronautical field in particular, with information regarding the approved procedures, requirements, directives, circulars or any other type of document or publication issued by the Civil Aviation Authority focusing on aeronautical matters related to the application of this Regulation for the purpose of enabling the provisions of this Regulation to be complied with.



## Part XIII

# REQUIREMENTS FOR AIRCRAFT FLYING FOR PURPOSE OTHER THAN COMMERCIAL AIR TRANSPORT OR AERIAL WORK

### Applicability

90. This Part applies only to Macao registered aircraft flying for purpose other than commercial air transport or aerial work, which requires complying with requirements which were not covered in the previous Parts I to XII of this Regulation, when there are applicable.

### Pilot responsibilities - regulation

91. The commander of a Macao registered aircraft flying for the purpose other than commercial air transport or aerial work shall comply with the following requirements:
- (1) To comply with the relevant laws, regulations and procedures of the States or Territories in which the aircraft is operated.
  - (2) Responsibility for notifying the Civil Aviation Authority or the nearest appropriate authority by the quickest available means of any accident involving the aircraft resulting in serious injury or death of any person or substantial damage to the aircraft or property.
  - (3) To have available on board the aircraft essential information concerning the search and rescue services in the areas over which it is intended the aircraft will be flown.

### Pilot responsibilities - facilities

92. The commander of a Macao registered aircraft flying for the purpose other than commercial air transport or aerial work, shall not commence a flight unless it has been ascertained by every reasonable means available that the ground and/or water areas and facilities available and directly required for such flight and for the safe operation of the aeroplane are adequate, including communication facilities and navigation aids.

### Pilot responsibilities - operations

93. The commander of a Macao registered aircraft flying for the purpose other than commercial air transport or aerial work, shall have sufficient information on climb performance with all engines operating to enable determination of the climb gradient that can be achieved during the departure phase for the existing take-off conditions and intended take-off technique. The aircraft shall be operated in the following conditions:
- (1) In compliance with the terms of its airworthiness certificate or equivalent approved document.
  - (2) Within the operating limitations prescribed by the Civil Aviation Authority or by the certificating authority of the State of Registry for non-Macao registered aircraft.
  - (3) Within the mass limitations imposed by compliance with the applicable noise certification Standards in Annex 16, Volume I, unless otherwise authorized, in exceptional circumstances for a

certain aerodrome (or heliport) or a runway where there is no noise disturbance problem, by the Civil Aviation Authority or by the competent authority of the State or Territory in which the aerodrome (or heliport) is situated.

- (4) Placards, listings, instrument markings, or combinations thereof, containing those operating limitations prescribed by the Civil Aviation Authority or by the certificating authority of the State of Registry for non Macao registered aircraft for visual presentation, shall be displayed in the aircraft.

#### **Pilot responsibilities – aerodromes operating minima**

94. The commander of a Macao registered aircraft flying for the purpose other than commercial air transport or aerial work shall not operate to or from an aerodrome (or heliport) using operating minima lower than those, which may be established for that aerodrome (or heliport) by the State or Territory in which it is located, except with the specific approval of that State or Territory.

- (1) A flight, except one of purely local character in visual meteorological conditions, to be conducted in accordance with the visual flight rules shall not be commenced unless available current meteorological reports, or a combination of current reports and forecasts, indicate that the meteorological conditions along the route, or that part of the route to be flown under the visual flight rules, will, at the appropriate time, be such as to render compliance with these rules possible.
- (2) *When a destination alternate aerodrome (or heliport) is required.* A flight to be conducted in accordance with the instrument flight rules shall not be commenced unless the available information indicates that conditions, at the aerodrome (or heliport) of intended landing and at least one destination alternate will, at the estimated time of arrival, be at or above the *Aerodrome (or heliport) operating minima*.

#### ***Applicable to aeroplanes only***

- (3) *When no destination alternate aerodrome is required.* A flight to be conducted in accordance with the instrument flight rules to an aerodrome when no alternate aerodrome is required shall not be commenced unless:
- (a) a standard instrument approach procedure is prescribed for the aerodrome of intended landing; and
- (b) available current meteorological information indicates that the following meteorological conditions will exist from two hours before to two hours after the estimated time of arrival:
- (i) a cloud base of at least 300 m (1 000 ft) above the minimum associated with the instrument approach procedure; and
- (ii) visibility of at least 5.5 km or of 4 km more than the minimum associated with the procedure.

#### ***Applicable to helicopters only***

- (4) *When no alternate is required.* A flight to be conducted in accordance with the instrument flight rules to a heliport when no alternate heliport is required shall not be commenced unless available current meteorological information indicates that the following meteorological conditions will exist from two hours before to two hours after the estimated time of arrival: or from the actual time of departure to two hours after the estimated time of arrival, whichever is the shorter period:

- (a) a cloud base of at least 120 m (400 ft) above the minimum associated with the instrument approach procedure; and
- (b) visibility of at least 1.5 km more than the minimum associated with the procedure.

***Applicable to all aircraft***

- (5) A flight shall not be continued towards the aerodrome (or heliport) of intended landing unless the latest available meteorological information indicates that conditions at that aerodrome (or heliport), or at least at one destination alternate aerodrome (or heliport), will, at the estimated time of arrival, be at or above the specified *Aerodrome (or heliport) operating minima*.
- (6) 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 (or heliport) in case of non-precision approach, unless the reported visibility or controlling RVR is above the specified minimum.
- (7) If, after passing the outer marker fix in case of precision approach, or after descending below 300 m (1 000 ft) above the aerodrome (or heliport) in case of non-precision approach, the reported visibility or controlling RVR falls below the specified minimum, the approach may be continued to DA/H or MDA/H. In any case, an aircraft shall not continue its approach-to-land beyond a point at which the limits of the *Aerodrome (or heliport) operating minima* would be infringed.

***Applicable to aeroplanes only***

- (8) For a flight to be conducted in accordance with the instrument flight rules, at least one destination alternate aerodrome shall be selected and specified in the flight plan, unless:
  - (a) the duration of the flight and the meteorological conditions prevailing are such that there is reasonable certainty that, at the estimated time of arrival at the aerodrome of intended landing, and for a reasonable period before and after such time, the approach and landing may be made under visual meteorological conditions; or
  - (b) the aerodrome of intended landing is isolated and there is no suitable destination alternate aerodrome.

***Applicable to helicopters only***

- (9) For a flight to be conducted in accordance with the instrument flight rules, at least one suitable alternate shall be specified in the flight plan, unless:
  - (a) the weather conditions in referred in sub-paragraph (4) above prevail, or
  - (b)
    - (i) the heliport of intended landing is isolated and no suitable alternate is available; and
    - (ii) an instrument approach procedure is prescribed for the isolated heliport of intended landing; and
    - (iii) a point of no return (PNR) is determined in case of an off-shore destination.
    - (iv) Except in the case of emergency, a helicopter shall not continue its approach-to-land beyond a point at which the limits of the heliport operating minima would be infringed.
- (10) Suitable off-shore alternates may be specified subject to the following:

- (a) the off-shore alternates shall be used only after passing a point of no return (PNR). Prior to PNR on-shore alternates shall be used;
  - (b) mechanical reliability of critical control systems and critical components shall be considered and taken into account when determining the suitability of the alternate;
  - (c) one engine inoperative performance capability shall be attainable prior to arrival at the alternate;
  - (d) deck availability shall be guaranteed;
  - (e) weather information must be reliable and accurate;
  - (f) the landing technique specified in the flight manual following control system failure may preclude the nomination of certain helidecks as alternate heliports.
- (11) Off-shore alternates should not be used when it is possible to carry enough fuel to have an on-shore alternate. Such circumstances should be exceptions and should not include payload enhancement in adverse weather conditions.
- (12) Only *performance Class 1* helicopters shall be permitted to operate from elevated heliports in congested areas. *Performance Class 3* helicopters shall not operate from elevated heliports or helidecks.

#### **Pilot responsibilities – Fuel and oil requirements**

95. The commander of a Macao registered aircraft flying for the purpose other than commercial air transport or aerial work shall not be commenced a flight unless, taking into account both the meteorological conditions and any delays that are expected in flight, the aircraft carries sufficient fuel and oil to ensure that it can safely complete the flight. In computing the fuel and oil required for the flight at least the following shall be considered:
- (1) Meteorological conditions forecast.
  - (2) Expected air traffic control routings and traffic delays.
  - (3) For IFR flight, one instrument approach at the destination aerodrome (or heliport), including a missed approach.
  - (4) The procedures for loss of pressurization, where applicable, or failure of one power-unit while en route.
  - (5) Any other conditions that may delay the landing of the aircraft or increase fuel and/or oil consumption.

#### **Pilot responsibilities – Fuel and oil requirements (Applicable to aeroplanes only)**

96. *Flight in accordance with the instrument flight rules.* To comply with paragraph 95 above at least sufficient fuel and oil shall be carried to allow the aeroplane:
- (1) When a destination alternate aerodrome is not required, to fly to the aerodrome to which the flight is planned and thereafter for a period of 45 minutes; or

- (2) When a destination alternate aerodrome is required, to fly to the aerodrome to which the flight is planned, thence to an alternate aerodrome, and thereafter for a period of 45 minutes.
- (3) Nothing precludes amendment of a flight plan in flight in order to re-plan the flight to another aerodrome, provided that the above requirements can be complied with from the point where the flight is re-planned.

**Pilot responsibilities – Fuel and oil requirements (*Applicable to helicopters only*)**

97. *Visual flight rules (VFR) operations.* To comply with paragraph 95 above, in the case of VFR operations, sufficient fuel and oil shall be carried to allow the helicopter:
- (1) To fly to the heliport to which the flight is planned;
  - (2) To fly thereafter for a period of 20 minutes at best-range speed plus 10 per cent of the planned flight time; and
  - (3) To have an additional amount of fuel, sufficient to provide for the increased consumption on the occurrence of potential contingencies, as determined by the Civil Aviation Authority and specified in the State regulations governing general aviation.

**Pilot responsibilities – Fuel and oil requirements (*Applicable to helicopters IFR only*)**

98. *Instrument flight rules (IFR) operations.* To comply with paragraph 95 above, in the case of IFR operations, sufficient fuel and oil shall be carried to allow the helicopter:
- (1) When no alternate is required, in terms of paragraph 94 (4) above, to fly to the heliport to which the flight is planned, and thereafter:
    - (a) to fly 30 minutes at holding speed at 450 m (1 500 ft) above the destination heliport under standard temperature conditions and approach and land; and
    - (b) to have an additional amount of fuel, sufficient to provide for the increased consumption on the occurrence of potential contingencies.
  - (2) When an alternate is required, in terms of paragraph 94 (2) above, to fly to and execute an approach, and a missed approach, at the heliport to which the flight is planned, and thereafter:
    - (a) to fly to the alternate specified in the flight plan; and then
    - (b) to fly for 30 minutes at holding speed at 450 m (1 500ft) above the alternate under standard temperature conditions, and approach and land; and
    - (c) to have an additional amount of fuel sufficient to provide for the increased consumption on the occurrence of potential contingencies.
  - (d) When no suitable alternate is available, in terms of paragraph 94 (9) (b) above, to fly to the heliport to which the flight is planned and thereafter for a period of two hours at holding speed.

**Report of hazardous flight conditions**

99. When weather conditions likely to affect the safety of other aircraft are encountered, the commander of the aircraft shall report them to the appropriate ATC unit or authority. Hazardous flight conditions, other than

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

#### **Pilot responsibilities – flight crew fitness**

100. The commander of a Macao registered aircraft flying for the purpose other than commercial air transport or aerial work shall be responsible for ensuring that a flight:
- (a) will not be commenced if any flight crew member is incapacitated from performing duties by any cause such as injury, sickness, fatigue, the effects of alcohol or drugs; and
  - (b) will not be continued beyond the nearest suitable aerodrome when flight crew members' capacity to perform functions is significantly reduced by impairment of faculties from causes such as fatigue, sickness, lack of oxygen.

#### **Break-in markings**

101. In the case of Macao registered aircraft, if areas of the fuselage suitable for break-in by rescue crews in an emergency are marked, such areas shall be marked. The colour of the markings shall be red or yellow, and if necessary they shall be outlined in white to contrast with the background. 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. This requirement does not necessitate any Macao registered aircraft to have break-in areas.

## FIRST SCHEDULE

[Paragraphs 2 (5) and 4 (6)]

### Part A – TABLE OF GENERAL CLASSIFICATION OF AIRCRAFT

Aircraft (Power - driven flying machines)	}	Aeroplane (Landplane) Aeroplane (Seaplane) Aeroplane (Amphibian) Helicopter (Landplane) Helicopter (Seaplane) Helicopter (Amphibian)
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### Part B – ORIGIN AND REGISTRATION MARKS OF AIRCRAFT REGISTERED IN MACAO

1. The mark of origin of the aircraft registered in Macao shall be the roman capital letter "B", and the registration mark shall be a group of 3 capital letters in roman characters assigned by the Civil Aviation Authority on the registration of the aircraft. A hyphen shall be placed between the mark of origin and the registration mark.
  
2. The origin and registration marks shall be painted on the aircraft or shall be affixed thereto by any other means ensuring a similar degree of permanence in the following manner:
  - (1) Position of marks.
    - (a) All aircraft
      - (i) *Wings* – On aeroplanes, the marks shall appear once on the lower surface of the wing structure. They shall be located on the left half of the lower surface of the wing structure unless they extend across the whole of the lower surface of the wing structure. So far as possible the marks shall be located equidistant from the leading and trailing edges of the wings. The tops of the letters and numbers shall be towards the leading edge of the wing.
      - (ii) *Fuselage (or equivalent structure) and vertical tail surface* – On all aircraft the marks shall also be either on each side of the fuselage (or equivalent structure) between the wings and the tail surfaces, or on the upper halves of the vertical tail surfaces. When located on a single vertical tail surface they shall be on both sides of the tail. When there is more than one vertical tail surface, the marks shall appear on the outboard sides of the outer surface.
      - (iii) If an aircraft does not possess parts corresponding to those mentioned in (i) and (ii) above the marks shall appear in a manner such that the aircraft can be identified readily.
  - (2) Size of marks.
    - (a) All aircraft

- (i) *Wings* – The marks on the wings shall be of equal height and at least 50 cm in height.
- (ii) *Fuselage (or equivalent structure) or vertical tail surface* – The marks on the fuselage (or equivalent structure) shall not interfere with the visible outlines of the fuselage (or equivalent structure). The marks on the vertical tail surfaces shall be such as to leave a margin of at least 5 cm along each side of the vertical tail surface. The letters and numerals constituting each group of marks shall be of equal height. The height of the marks shall be at least 30 cm: Provided that where owing to the structure of the aircraft a height of 30 cm is not reasonably practicable the height shall be the greatest height reasonably practicable in the circumstances, but not less than 15 cm.
- (iii) *Special cases* – If an aircraft does not possess parts corresponding to those mentioned in sub-paragraphs (i) and (ii) above, the measurements of the marks shall be such that the aircraft can be identified readily.

(3) Form, width and spacing of marks.

- (i) The letters shall be capital letters in roman characters without ornamentation. Numbers shall be Arabic numbers without ornamentation.
- (ii) The width of each character (except the letter I and the number 1) and the length of hyphens shall be two-thirds of the height of a character.
- (iii) The characters and hyphens shall be formed by solid lines and shall be of a colour contrasting clearly with the background. The thickness of the lines shall be one-sixth of the height of a character.
- (iv) Each character shall be separated from that which it immediately precedes or follows by a space equal to half the width of a character. A hyphen shall be regarded as a character for this purpose.

- 3. The origin and registration marks shall be displayed to the best advantage, taking into consideration the constructional features of the aircraft and shall always be kept clean and visible.
- 4. In addition to paragraphs 1 to 3, the origin and registration marks shall also be inscribed, together with the name and address of the registered owner of the aircraft, on a fire-proof metal plate affixed in a prominent position to the aircraft near the main entrance.



## SECOND SCHEDULE

[Paragraphs 3 (1), 4 (9), 6 (1) and 50 (2)]

### “A”, “B” AND “C” CONDITIONS

The “A” Conditions, the “B” Conditions and the “C” Conditions referred to in paragraphs 3 (1), 4 (9), 6 (1) and 50 (2) of the Regulation are as follows:

#### “A” Conditions

- (1) The aircraft shall be either an aircraft in respect of which a *Certificate of airworthiness* or validation has previously been in force under the provisions of the Regulation, or an aircraft identical in design with an aircraft in respect of which such a certificate is or has been in force.
- (2) The aircraft shall fly only for the purpose of enabling it to:
  - (a) qualify for the issue or renewal of a *Certificate of airworthiness* or of the validation thereof or the approval of a modification of the aircraft, after an application has been made for such issue, renewal, validation or approval, as the case may be; or
  - (b) proceed to or from a place at which any inspection, test or weighing of the aircraft is to take place for a purpose referred to in sub-paragraph (a).
- (3) The aircraft and its engines shall be certified as fit for flight by the holder of a licence as an aircraft maintenance engineer entitled in accordance with the provisions of the Fourth Schedule so to certify, or by a person approved by the Civil Aviation Authority for the purpose of issuing certificates under this condition.
- (4) The aircraft shall carry the minimum flight crew specified in any *Certificate of airworthiness* or validation which has previously been in force under the Regulation in respect of the aircraft, or is or has previously been in force in respect of any other aircraft of identical design.
- (5) The aircraft shall not carry any passenger or cargo except passengers performing duties in the aircraft in connection with the flight.
- (6) The aircraft shall not fly over any congested area of a city, town or settlement, except in accordance with procedures which have been approved by the Civil Aviation Authority in relation to that flight.
- (7) Without prejudice to paragraph 18 (2) of the Regulation the aircraft shall carry such flight crew as may be necessary to ensure the safety of the aircraft.

#### “B” Conditions

- (1) The flight shall be made under the supervision of a person approved by the Civil Aviation Authority for the purposes of these Conditions, and subject to any additional conditions which may be specified in such approval.
- (2) If it is not registered in Macao or under the law of any State or Territory referred to in paragraph 3 of the Regulation, the aircraft shall be marked in a manner approved by the Civil Aviation Authority for the purposes of these Conditions, and the provisions of paragraphs 13, 15, 19, 30, 35,

55, 56 and 57 of the Regulation shall be complied with in relation to the aircraft as if it was registered in Macao so far as such provisions are applicable to the aircraft in the circumstances.

- (3) The aircraft shall fly only for the purpose of:
  - (a) experimenting with or testing the aircraft (including in particular its engines) and its equipment; or
  - (b) enabling the aircraft to qualify for the issue or validation of a *Certificate of airworthiness* or the approval of a modification of the aircraft; or
  - (c) proceeding to or from a place at which any experiment, test, inspection or weighing of the aircraft is to take place for a purpose referred to in sub-paragraph (a) or (b).
- (4) The aircraft shall carry such flight crew as may be necessary to ensure the safety of the aircraft.
- (5) The aircraft shall not carry any cargo, or any person other than the flight crew except the following:
  - (a) persons employed by the operator who carry out during the flight duties in connection with the purposes specified in paragraph (3);
  - (b) persons employed by manufacturers of component parts of the aircraft (including the engines) who carry out during the flight duties in connection with the purposes so specified;
  - (c) persons approved by the Civil Aviation Authority under paragraph 7 (10) of the Regulation as qualified to furnish reports for the purposes of the Regulation; and
  - (d) persons, other than those carried under the preceding provisions of this paragraph, who are carried in the aircraft in order to carry out a technical evaluation of the aircraft or its operation.
- (6) The aircraft shall not fly over any congested area of a city, town or settlement, except in accordance with procedures which have been approved by the Civil Aviation Authority in relation to that flight.

#### “C” Conditions

- (1) The operator of the aircraft shall be the registered owner of the aircraft who shall be the holder of an aircraft dealer's certificate granted under this Regulation.
- (2) The aircraft shall fly only for the purpose of:
  - (a) testing the aircraft;
  - (b) demonstrating the aircraft with a view to the sale of that aircraft or other similar aircraft;
  - (c) proceeding to or from a place at which the aircraft is to be tested or demonstrated as aforesaid or overhauled, repaired or modified; or
  - (d) delivering the aircraft to a person who has agreed to buy or lease it.

## THIRD SCHEDULE

(Paragraph 7)

### CATEGORIES OF AIRCRAFT

1. Categories of aircraft.
  - Commercial air transport category (Passenger).
  - Commercial air transport category (Cargo).
  - Aerial work category.
  - Private category.
  - Special category.
2. The purposes for which the aircraft may fly are as follows:
  - Commercial air transport category (Passenger): any purpose.
  - Commercial air transport category (Cargo): any purpose, other than the commercial air transport of passengers.
  - Aerial work category: aerial work other than commercial air transport.
  - Private category: any purpose other than commercial air transport or aerial work.
  - Special category: any other purpose specified in the *Certificate of Airworthiness*.

## FOURTH SCHEDULE

(Paragraph 11)

### LICENCES, RATINGS AND PRIVILEGES FOR PERSONNEL OTHER THAN FLIGHT CREW MEMBERS

1. This Schedule establishes the various requirements, categories, ratings and privileges prescribed by the Civil Aviation Authority for granting, revalidating and using licences related to personnel other than flight crew members in Macao. The Civil Aviation Authority may grant or revalidate a licence to any person other than those attributed to flight crew members provided that they apply for one of the following cases:
  - (a) Aircraft maintenance engineer licence;
  - (b) Flight operations officer licence;
  - (c) Aeronautical station operator licence; or
  - (d) Air traffic controller licence.
2. (1) A person applying in Macao for the grant or renewal of any of the licences described in paragraph 1 to this Schedule shall be required to undergo a number of examinations under the supervision of the Civil Aviation Authority to ascertain whether his age, knowledge, experience, skills, eventually health condition or any other individual characteristics conforms with the requirements specified in this Schedule, provided that:
  - (a) an applicant who does not satisfy one or various of the requirements specified in this Schedule, whether in part or entirety, may, at the discretion of the Civil Aviation Authority, be accepted as eligible for the grant or renewal of any of the licences mentioned in paragraph 1; and any licence granted or renewed in accordance with this proviso may be made subject to such conditions and restrictions as the Civil Aviation Authority may consider appropriate in the particular case;
  - (b) a person applying for the grant or renewal of an air traffic controller licence in Macao shall meet the necessary medical requirements established in the Fourteenth Schedule to this Regulation;
  - (c) an applicant must be able to read and write in English;
  - (d) an applicant shall be employed by an organisation which operates or services Macao registered aircraft; and
  - (e) an applicant shall not be suffering from any disability likely to adversely affect his technical skill or judgement.
- (2) A person applying in Macao for the grant or renewal of any of the licences described in paragraph 1 to this Schedule may be required to undergo an interview with the Civil Aviation Authority to determine whether, in accordance with this Regulation, the applicant is a fit and proper person to hold a licence.

3. (1) The grant or renewal in Macao of any of the licences mentioned in paragraph 1 of this Schedule shall be carried out as follows:
- (a) an applicant shall submit an application to the Civil Aviation Authority in accordance with the terms and procedures defined by the Civil Aviation Authority in this respect;
  - (b) an applicant for the grant or renewal of an air traffic controller licence shall be required to undergo medical examinations according to the terms, standards and time periods prescribed in the Fourteenth Schedule to this Regulation;
  - (c) an applicant shall be required to undergo the number and type of written or oral examinations which the Civil Aviation Authority deems necessary and sufficient to ascertain his knowledge on the various subjects related to the exercise of the privileges of the applicant's licence. The written or oral examinations shall be performed as follows:
    - (i) take place at the time, in the place, with the means and in the way prescribed by the Civil Aviation Authority;
    - (ii) all the examinations are conducted in English by the Civil Aviation Authority. The Civil Aviation Authority may, on a discretionary basis, ascertain the knowledge and command of the applicant on the Chinese language;
    - (iii) the examinations are conducted and supervised by the Civil Aviation Authority. The Civil Aviation Authority may, on a discretionary basis, authorise a certified person or organisation to perform these duties;
    - (iv) candidates will be advised by the Civil Aviation Authority of the results of each examination on a pass or fail basis. A supplementary examination may be given in cases where the marks obtained are within a transitory range determined for each particular examination;
    - (v) each examination passed carries a permanent credit for all categories, groups or ratings to which it applies; and
    - (vi) if a candidate fails an examination, an advise shall be made for the period and additional training or practical experience required before being eligible to be re-examined in that subject.
  - (d) the applicant shall be required to undergo the number and type of practical examinations which the Civil Aviation Authority deems necessary and sufficient to ascertain his/her skills, knowledge, experience and competence on the various subjects related to the practical exercise of the privileges of the applicant's licence. The practical examinations shall be performed as prescribed in proviso (c) of this paragraph; and
  - (e) the applicant shall be required to pay the applicable fees specified in the Twelfth Schedule to this Regulation.
- (2) Based on the results and correct performance of the various requirements established in proviso (1) and when the Civil Aviation Authority is satisfied that the various licence requirements specified in this Schedule have been met, a licence may be issued or revalidated to the respective applicant.
4. The Civil Aviation Authority may grant any of the licences described in paragraph 1 to this Schedule or a certificate of validation to an applicant who holds a valid similar licence granted by other States.

5. The applicant shall:

- (a) satisfy the Civil Aviation Authority that he/she complies with the requirements for grant of licences specified in this Schedule and that the category of his licence, his recent practical experience and the requirements observed for the initial grant of his/her licence are compatible with this Regulation;
- (b) at the discretion of the Civil Aviation Authority and under his supervision, the applicant may be required to undergo such examinations as deemed necessary to establish that he/she is competent and eligible for the grant of a licence in Macao;
- (c) submit evidence that he/she has had adequate recent experience for him/her to understand the local procedures and practices necessary to exercise the privileges of his/her licence;
- (d) submit evidence that he/she is employed, or about to be employed, by a person or organisation who operates with, or perform services regarding, aircraft registered in Macao; and
- (e) submit evidence that the licence presented is an ICAO type of licence.

**Part A - Requirements for granting a licence**

*Aircraft maintenance engineer*

6. The Civil Aviation Authority requires an applicant for the grant or renewal of an aircraft maintenance engineer licence to meet the following requirements in respect of age, knowledge, experience and skill:

(1) *Age*

The applicant shall be not less than 18 years of age.

(2) *Knowledge*

The applicant shall have demonstrated a level of knowledge appropriate to the privileges granted to the holder of aircraft maintenance engineer licence, in at least the following subjects:

*Air law and airworthiness requirements*

- (a) rules and regulations relevant to an aircraft maintenance licence holder including applicable airworthiness requirements governing certification and continuing airworthiness of aircraft and approved aircraft maintenance organization and procedures;

*Natural science and aircraft general knowledge*

- (b) basic mathematics; units of measurement; fundamental principles and theory of physics and chemistry applicable to aircraft maintenance;

*Aircraft engineering*

- (c) characteristics and applications of the materials of aircraft construction including principles of construction and functioning of aircraft structures, fastening techniques; powerplants and their associated systems; mechanical, fluid, electrical and electronic power sources; aircraft

instrument and display systems; aircraft control systems; and airborne navigation and communication systems;

*Aircraft maintenance*

- (d) tasks required to ensure the continuing airworthiness of an aircraft including methods and procedures for the overhaul, repair, inspection, replacement, modification or defect rectification of aircraft structures, components and systems in accordance with the methods prescribed in the relevant Maintenance Manuals and the applicable Standards of airworthiness; and

*Human performance*

- (e) human performance relevant to the duties of an aircraft maintenance licence holder.

(3) *Experience*

The applicant shall have the following experience in the inspection, servicing and maintenance of aircraft or its components:

- (a) for the issue of a licence with privileges for the aircraft in its entirety, at least:
- (i) four years; or
  - (ii) two years if the applicant has satisfactorily completed an approved training course which will provide an equivalent level of practical experience; and
- (b) for the issue of a licence with privileges restricted in accordance with paragraph 20 (2) (a) (ii) or (iii) of this Schedule, a period of time that will enable a level of competency equivalent to that required in sub-paragraph (3) (a) above to be attained, provided that this is not less than:
- (i) two years; or
  - (ii) such a period as the Civil Aviation Authority considers necessary to provide an equivalent level of practical experience to applicants who have satisfactorily completed an approved training course.

(4) *Training*

The applicant shall have completed a course of training appropriate to the privileges to be granted.

(5) *Skill*

The applicant shall have demonstrated the ability to perform those functions applicable to the privileges to be granted.

*Flight operations officer*

7. The Civil Aviation Authority requires an applicant for the grant or renewal of a Flight operations officer licence to meet the following requirements in respect of age, knowledge, experience and skill:

(1) *Age*

Applicants shall be not less than 21 years of age.

(2) *Knowledge*

Applicants must satisfy the Civil Aviation Authority - at a level appropriate to the privileges to be granted - as to his/her knowledge of:

*Air law*

(a) rules and regulations relevant to the holder of a flight operations officer licence; appropriate air traffic services practices and procedures;

*Aircraft general knowledge*

(b) principles of operation of aeroplane powerplants, systems and instruments;

(c) operating limitations of aeroplanes and powerplants;

(d) minimum equipment list;

*Flight performance calculation and planning procedures*

(e) effects of loading and mass distribution on aircraft performance and flight characteristics; mass and balance calculations;

(f) operational flight planning; fuel consumption and endurance calculations; alternate airport selection procedures; en-route cruise control; extended range operation;

(g) preparation and filing of air traffic services flight plans;

(h) basic principles of computer-assisted planning systems;

*Human performance*

(i) human performance relevant to dispatch duties;

*Meteorology*

(j) aeronautical meteorology; the movement of pressure systems; the structure of fronts, and the origin and characteristics of significant weather phenomena which affect take-off, en-route and landing conditions;

(k) interpretation and application of aeronautical meteorological reports, charts and forecasts; codes and abbreviations; use of, and procedures for obtaining, meteorological information;

*Navigation*

(l) principles of air navigation with particular reference to instrument flight;

*Operational procedures*



- (m) use of aeronautical documentation;
- (n) operational procedures for the carriage of freight and dangerous goods;
- (o) procedures relating to aircraft accidents and incidents; emergency flight procedures;
- (p) procedures relating to unlawful interference and sabotage of aircraft;

*Principles of flight*

- (q) principles of flight relating to the appropriate category of aircraft; and

*Radio communication*

- (r) procedures for communicating with aircraft and relevant ground stations.

(3) *Experience*

- (a) The applicant shall, during the three years immediately preceding the date of his application, have completed two years service in any one or in any combination of the capacities specified in (i) to (v) inclusive, provided that in any combination of experience the period served in any one of these capacities shall not be less than one year:
  - (i) a pilot member of the crew in air transportation;
  - (ii) a flight navigator in air transportation; or
  - (iii) a meteorologist in an organization dispatching aircraft in air transportation; or
  - (iv) an air traffic controller; or
  - (v) a technical supervisor of flight operations officers or air transportation flight operations systems; or
- (b) The applicant shall have served as an assistant in the dispatching of air transport for not less than one year within the two years immediately preceding the date of his application; or
- (c) The applicant shall have satisfactorily completed an approved training course.
- (d) The applicant shall have served under the supervision of a flight operations officer for at least 90 working days within the six months immediately preceding the application.

(4) *Skills*

The applicant shall have demonstrated his ability to:

- (a) make an accurate and operationally acceptable weather analysis from a series of daily weather maps and weather reports and of weather conditions prevailing in the general neighbourhood of a specific air route and to forecast weather trends pertinent to air transportation with particular reference to designated terminals;
- (b) determine the optimum flight path for a given segment, and create accurate manual and/or computer generated flight plans; and
- (c) provide operating supervision and all other assistance to a flight in actual or simulated adverse weather conditions, as appropriate to the duties of the holder of a flight operations officer licence.

*Aeronautical station operator*

8. The Civil Aviation Authority requires an applicant for the grant or renewal of an aeronautical station operator licence to meet the following requirements in respect of age, knowledge, experience and skill:

(1) *Age*

The applicant shall not be less than 18 years of age.

(2) *Knowledge*

The applicant shall have demonstrated to the Civil Aviation Authority a level of knowledge appropriate to the holder of an aeronautical station operator, in at least the following subjects:

*General knowledge*

- a) air traffic services provided within Macao;

*Language*

- b) comprehensive knowledge of the English language for use in air-ground communications and ability to speak such language or languages without accent or impediment which would adversely affect radio communication;

*Operational procedures*

- c) radiotelephony procedures; phraseology; telecommunication network;

*Rules and regulations*

- d) rules and regulations applicable to the aeronautical station operator; and

*Telecommunication equipment*

- e) principles, use and limitations of telecommunication equipment in an aeronautical station.

(3) *Experience*

The applicant shall have:

- (a) satisfactorily completed an approved training course within the 12-month period immediately preceding application, and have served satisfactorily under a qualified aeronautical station operator for not less than two months; or
- (b) satisfactorily served under a qualified aeronautical station operator for not less than six months during the 12 months immediately preceding application.

(4) *Skill*

The applicant shall demonstrate, or have demonstrated, his/her competency in:

- (a) the manipulation and operation of typical transmit / receive equipment and controls, including ancillary facilities, and radio direction finding apparatus in use;

- (b) the visual inspection and daily operational check of the radio equipment he uses in such detail as is necessary to detect faults which should be revealed in such inspection, and to correct such faults that do not require the use of special tools or instruments;
- (c) the transmission of radiotelephony messages with efficiency and accuracy, including correct microphone technique, enunciation, and speech quality;
- (d) the reception of radiotelephony messages with efficiency and accuracy and, where relevant, the ability to copy radio signals and messages directly on to a typewriter.

If an extension of privileges to include operation of radiotelegraphy equipment is sought, the applicant shall demonstrate, or have demonstrated his/her competency in:

- (e) the transmission and aural reception of International Morse Code in groups (letters, figures and signs of punctuation) at a speed of not less than 16 groups per minute and plain language at a speed of not less than 20 words per minute. Code groups shall average five characters, each figure or punctuation mark counting as two characters, and plain language shall average five characters to the word. Each test shall be of not less than five minutes' duration; and
- (f) the manipulation and adjustment of the operating controls of a typical aeronautical station's radiotelegraph apparatus.

#### *Air traffic controller*

9. The Civil Aviation Authority requires an applicant for the grant or renewal of an air traffic controller licence to meet the following requirements in respect of age, knowledge, experience, skill and medical fitness and also the requirements for the controller rating set out in paragraph 17 of this Schedule.

(1) *Age*

The applicant shall be not less than 21 years of age.

(2) *Knowledge*

The applicant shall have demonstrated a level of knowledge appropriate to the holder of an air traffic controller licence, in at least the following subjects:

*Air law*

- (a) rules and regulations relevant to the air traffic controller;

*Air traffic control equipment*

- (b) principles, use and limitations of equipment used in air traffic control;

*General knowledge*

- (c) principles of flight; principles of operation and functioning of aircraft, powerplants and systems; aircraft performances relevant to air traffic control operations;

*Human performance*

- (d) human performance relevant to air traffic control;

*Language*

- (e) without prejudice of what has been specified in paragraph 2 (c) of this Schedule, the applicant has to demonstrate a comprehensive knowledge of the English language for use in air traffic control and ability to speak such languages without accent or impediment which would adversely affect radio communication;

*Meteorology*

- (f) aeronautical meteorology; use and appreciation of meteorological documentation and information; origin and characteristics of weather phenomena affecting flight operations and safety; altimetry;

*Navigation*

- (g) principles of air navigation; principle, limitation and accuracy of navigation systems and visual aids; and

*Operational procedures*

- (h) air traffic control, communication, radiotelephony and phraseology procedures (routine, non routine and emergency); use of the relevant aeronautical documentation; safety practices associated with flight.

(3) *Experience*

The applicant shall have completed an approved training course and not less than three months satisfactory service engaged in the actual control of air traffic under the supervision of an appropriately rated air traffic controller. The experience requirements specified for air traffic controller ratings in paragraph 17 of this Schedule may be credited as part of the experience specified in this paragraph.

(4) *Medical fitness*

The applicant shall have established his/her medical fitness on the basis of compliance with the requirements outlined in the Fourteenth Schedule of this Regulation.

## **Part B - Requirements for the validity and renewal of licences**

### *Aircraft maintenance engineer*

10. Aircraft maintenance engineer licences and ratings will remain in force for a period specified therein but not exceeding 24 months from the date of issue. Before the expiry of this period, an application for renewal shall be submitted to the Civil Aviation Authority, and the licence may be renewed provided the applicant:

- (a) in the preceding 24 months has exercised, for at least six months, the privileges of his licence or been engaged on comparable work; and
  - (b) is not suffering from any disability likely to adversely affect his technical skill or judgement.
11. In the process of revalidation of an aircraft maintenance engineer licence by the Civil Aviation Authority, the following requirements must be taken into consideration:
- (a) aircraft maintenance engineers should note that renewal of a licence which has expired cannot be back-dated and consequently any certifications made in the intervening period would be illegal;
  - (b) a licence which has lapsed for less than 24 months will only be renewed for a period not exceeding 24 months from the date of application for renewal, but a renewal fee for 24 months is payable;
  - (c) it is essential that the application for renewal is received by the Civil Aviation Authority approximately one month prior to the date of expiry of the licence; and
  - (d) a licence which has lapsed for more than 24 months will not be renewed without examination to determine the competency of the holder. The extent of examination is dependent upon the nature of employment of the holder since the licence has expired.

#### *Flight operations officer*

12. Flight operations officer licences issued by the Civil Aviation Authority may be, in principle, revalidated for a periods not longer than 24 months. If the licence holder applies for revalidation, the Civil Aviation Authority has to be satisfied that the holder has exercised the appropriate privileges of the licence as follows:
- (a) made within the preceding 12 months, at least a one-way qualification flight on the flight deck of an aircraft over any area in which that individual is authorized to exercise flight supervision. The flight should include landings at as many aerodromes as practicable;
  - (b) demonstrated to the operator knowledge of:
    - (i) the contents of the operations manual described in Part A of the Ninth Schedule;
    - (ii) the radio equipment in the aircraft used; and
    - (iii) the navigation equipment in the aircraft used;
  - (c) demonstrated to the operator 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:
    - (i) the seasonal meteorological conditions and the sources of meteorological information;
    - (ii) the effects of meteorological conditions on radio reception in the aircraft used;
    - (iii) the peculiarities and limitations of each navigation system which is used by the operation; and

- (iv) the aircraft loading instructions; and
- (d) demonstrated to the operator knowledge and skills related to human performance relevant to dispatch duties;
- (e) demonstrated to the operator complete familiarization with all features of the operation, which are pertinent to the duties specified in paragraph 34 of this Regulation; and
- (f) not be assigned to duty after 12 consecutive months of absence from such duty, unless the provisions of sub-paragraphs 12 (a) to (e) are met.

***Aeronautical station operator***

13. Aeronautical station operator licences issued by the Civil Aviation Authority may be, in principle, revalidated for periods not longer than 24 months. If the licence holder applies for revalidation, the Civil Aviation Authority has to be satisfied that the holder has exercised the appropriate privileges of the licence for not less than 6 months and has at least performed 70 hours of service as an aeronautical station operator officer in the last 12 months preceding the expiry date of the licence, as a minimum requirement.

***Air traffic controller***

14. The period of validity of an air traffic control licence is the same of the correspondent medical fitness certificate. This means that the licence automatically expires when the medical fitness certificate expires. If the licence holder applies for revalidation, the Civil Aviation Authority has to be satisfied that the holder has exercised the appropriate privileges of the licence in accordance with paragraphs 62, 63 and 65 of this Regulation and meets the requirements specified in the Fourteenth Schedule of this Regulation.

**Part C – Licences, ratings and categories**

15. Extension on any of the licences specified in paragraph 1 of this Schedule to include other categories of licences or additional ratings within a licence, may be granted by the Civil Aviation Authority provided the applicant has had the required practical experience and has passed the prescribed examinations or other requirements prescribed by the Civil Aviation Authority for the grant of a licence in the specific category or rating.

***Aircraft maintenance engineer***

16. (1) The Civil Aviation Authority requires that one or various of the following category ratings shall be included in an aircraft maintenance engineer’s license issued in Macao, whichever is the case:
- (a) Category A (Aircraft);
  - (b) Category C (Engines);
  - (c) Category E (Electrical Installations);

- (d) Category I (Instrument Installations); or
- (e) Category R (Radio Systems).
- (2) The limitations of each license are specified by a rating which is entered on the license document and states the applicable group, type or series of aircraft or system. Normally licences will be granted with a rating for specific types of aircraft, engines or systems. A group rating may be granted to include all aircraft, engines or systems included in a group specified herein or a series rating may be granted limiting the license to certain aircraft or engine series or system. All such limitations will be endorsed in the license.
- (3) In order that all the license privileges are exercised correctly, license holders must ensure that they are aware of all pertinent and current information regarding the airworthiness of the particular aircraft, engine or system on which maintenance or other work will be undertaken. The groups allocated to each of the categories specified in proviso (1) to this paragraph are:
- (i) Category A
- Group 1 - Metal, stressed skin and unpressurised aircraft, with fixed undercarriage and without power operated hydraulic or pneumatic systems.
- Group 2 - Unpressurised aircraft not exceeding 5,700 kg MTWA but having power operated hydraulic or pneumatic systems or retractable undercarriage.
- Group 3 - Unpressurised aircraft exceeding 5,700 kg MTWA and having power operated hydraulic or pneumatic systems or retractable undercarriage. Non-complex pressurised aircraft not exceeding 5,700 kg MTWA.
- Group 4 - Turbine-powered and/or complex pressurised aircraft.
- Group 5 - Other categories of aircraft of timber or tubular construction, fabric or plywood covered.
- Group 6 - Rotorcraft.
- Group 7 - Fibre reinforced plastic aircraft.
- Group 8 - Airships.
- Provided that:
- (A) Group or Series ratings may be granted in respect of aircraft in Group 1, 2 or 5.
- (B) Series ratings may be granted in respect of aircraft in Group 3, 4, 6, 7 or 8.

(C) Requirements for Groups 7 and 8 are available on request from the Civil Aviation Authority.

(ii) Category C

Group 1 - Piston engines of 500 b.h.p or less aeroplanes.

Group 2 - Piston engines installed in rotorcraft.

Group 3 - Piston engines over 500 b.h.p installed in aeroplanes.

Group 4 - Turbo-jet and turbo-fan powerplants aeroplanes.

Group 5 - Turbine powerplants installed in rotorcraft.

Group 6 - Turbo-propeller powerplants.

Group 7 - Propfan powerplants.

Provided that:

(A) Group or Series ratings may be granted in respect of engines in Group 1 or 2.

(B) Series ratings may be granted in respect of engines in Group 3, 4, 5, 6 or 7.

(C) Requirements for Group 7 are available on request from the Civil Aviation Authority.

(iii) Category E

Group 1 - Unpressurised aircraft or non-complex rotorcraft. Non-complex pressurised aircraft not exceeding 5,700 kg MTWA.

Group 2 - Complex pressurised aircraft and/or turbo-propeller aircraft. Complex rotorcraft.

Group 3 - Turbo-jet, turbo-fan and propfan aircraft.

Provided that:

(A) Group or Series ratings may be granted in respect of aircraft on Group 1 or 2.



(B) Series ratings may be granted in respect of aircraft in Group 3.

(iv) Category I

Group 1 - Unpressurised aircraft or non-complex rotorcraft. Non-complex pressurised aircraft not exceeding 5,700 kg MTWA.

Group 2 - Complex pressurised aircraft and/or turbo-propeller aircraft. Complex rotorcraft.

Group 3 - Turbo-jet, turbo-fan and propfan aircraft.

Provided that:

(A) Group or Series ratings may be granted in respect of aircraft in Group 1 or 2.

(B) Series ratings may be granted in respect of aircraft in Group 3.

(v) Category R

Group 1 - Communication systems, including HF, VHF, Selcal and Satcom systems and emergency locator transmitters.

Group 2 - Audio systems, including intercommunication, audio amplifiers and distribution networks, passenger cabin address and entertainment equipment and cockpit voice recorders.

Group 3 - Navigation systems, including ADF, VOR, localiser, glideslope and marker systems.

Group 4 - FM and radio hyperbolic navigation systems, including Doppler, Loran and Omega/VLF systems.

Group 5 - Primary radar systems, including weather radar and radio altimeter systems.

Group 6 - Secondary radar systems, including DME and ATC transponder systems.

Note: MTWA means "maximum total weight authorised" as defined in this Regulation.

(4) The syllabus approved by the Civil Aviation Authority applicable for each one of the groups and categories which are the object of this paragraph, shall be specified separately as part of the airworthiness requirements of Macao.

### *Air traffic Controller*

17. The Civil Aviation Authority requires that the following rating may be included in an air traffic controller licence issued in Macao granted under paragraph 63 of the Regulation and, subject to the provisions of this Regulation and of the licence:

(1) Aerodrome control rating

(a) Knowledge

The applicant shall have demonstrated a level of knowledge appropriate to the privileges granted, in at least the following subjects in so far as they affect the area of responsibility:

- (i) aerodrome layout; physical characteristics and visual aids;
- (ii) airspace structure;
- (iii) applicable rules, procedures and source of information;
- (iv) air navigation facilities;
- (v) air traffic control equipment and its use;
- (vi) terrain and prominent landmarks;
- (vii) characteristics of air traffic;
- (viii) weather phenomena; and
- (ix) emergency and search and rescue plans;

(b) Experience

The applicant shall have:

- (i) satisfactorily completed an approved training course;
- (ii) provided, satisfactorily, under the supervision of an appropriately rated air traffic controller for the *aerodrome control rating*: an aerodrome control service, for a period of not less than 90 hours or one month, whichever is greater, at the unit for which the rating is sought;
- (iii) the experience specified in sub-paragraph (1) (b) (ii) shall have been completed within the 6-month period immediately preceding application.

- (c) When the applicant already holds an air traffic controller rating in another category, or the same rating for another unit, the Civil Aviation Authority shall determine whether the experience requirement of sub-paragraph (1) (b) can be reduced, and if so, to what extent.

18. The Civil Aviation Authority requires an air traffic controller licence holder in Macao to be granted the rating mentioned in paragraph 17 (1) of this Schedule has to satisfy the Civil Aviation Authority, in addition to those referred in paragraph 9 (2) of this Schedule, to the following requirements in respect of knowledge:

(1) Knowledge

The applicant shall satisfy the Civil Aviation Authority as to his/her knowledge of:

- (a) local rules of the Macao International Airport;
  - (b) air navigation facilities within a circular area of a radius of 25 NM, measured from the centre of the aerodrome;
  - (c) identifying abbreviations and other pertinent data regarding meteorological reports and of effects of significant local weather characteristics, on and around the aerodrome;
  - (d) coordination procedures between the aerodrome control unit and the various air traffic services units, as appropriate; for local terrain and prominent landmarks;
  - (e) local procedures for the making and use of runway visual range observations, as appropriate; and
  - (f) local procedures for alerting of the various emergency services.
- (2) *Skills*

The applicant shall have demonstrated, at a level appropriate to the privileges being granted, the skill, judgement and performance required to provide a safe, orderly and expeditious control service.

19. The aerodrome control rating regarding the air traffic controller licences issued by the Civil Aviation Authority shall become invalid when an air traffic controller has ceased to exercise the privileges of the rating for a period of six months. A rating shall remain invalid until the controller's ability to exercise the privileges of the rating has been re-established.

#### **Part D - Privileges of the licences holders**

##### *Aircraft maintenance engineer<sup>8</sup>*

20. An aircraft maintenance engineer licensed in Macao, has, subject to the conditions of his/her licence, the following privileges:
- (1) Subject to compliance with the requirements specified in sub-paragraphs (2) and (3) of this paragraph, the privileges of the holder of an aircraft maintenance engineer licence shall be to certify the aircraft or parts of the aircraft as airworthy after an authorized repair, modification or installation of a power-plant, accessory, instrument, and/or item of equipment, and to sign a *Certificate of release to service* or a *Certificate of fitness for flight* following inspection, maintenance operations, routine servicing and/or sign a *Certificate of maintenance review* in accordance with the maintenance programme approved under this regulation.
  - (2) The privileges of the holder of an aircraft maintenance licence specified in sub-paragraph (1) of this paragraph shall be exercised only:
    - (a) in respect of such:
      - (i) aircraft as are entered on the licence in their entirety either specifically or under broad categories; or

- (ii) airframes and powerplants and aircraft systems or components as are entered on the licence either specifically or under broad categories; and/or
  - (iii) aircraft avionic systems or components as are entered on the licence either specifically or under broad categories;
- (b) provided that the licence holder is familiar with all the relevant information relating to the maintenance and airworthiness of the particular aircraft for which the licence holder is signing a Certificate of release to service, or such airframe, powerplant, aircraft system or component and aircraft avionic system or component which the licence holder is certifying as being airworthy; and
- (c) on condition that, within the preceding 24 months, the licence holder has either had experience in the inspection, servicing or maintenance of an aircraft or components in accordance with the privileges granted by the licence held for not less than six months, or has met the provision for the issue of a licence with the appropriate privileges, to the satisfaction of the Civil Aviation Authority.
21. The Civil Aviation Authority may prescribe the scope of the privileges of the aircraft maintenance licence holder in terms of the complexity of the tasks to which the certification relates.

#### *Flight operations officer*

22. The privileges of the holder of a Flight operations officer licence shall be to serve in that capacity with responsibility for any area in respect of which he can exercise his duties and satisfy the Civil Aviation Authority regarding the requirements for the grant or maintenance of the licence.

#### *Aeronautical station operator*

23. The privileges of the holder of an aeronautical station operator licence shall be to act as an operator in an aeronautical station provided that he/she has familiarized himself with all pertinent and current information regarding the types of equipment and operating procedures used at that aeronautical station. Where the knowledge and skill of the applicant has also been established in respect of radiotelegraphy, the Civil Aviation Authority shall endorse the licence for the operation of radiotelegraphy equipment. The holder of a licence with such endorsement may operate radiotelegraphy as well as radiotelephony equipment in an aeronautical station.

#### *Air traffic controller*

24. The privileges of the holder of an air traffic controller's licence with the inclusion of the respective aerodrome control rating issued by the Civil Aviation Authority shall have the effect of entitling the holder of the licence, to provide or to supervise the provision of aerodrome control service at the Macao International Airport (but not with any type of radar equipment for which a radar control rating is required) for any aircraft on the manoeuvring area or apron of the Macao International Airport or which is flying in the vicinity of this aerodrome traffic zone by visual reference to the surface. The holder of an air traffic controller licence is not allowed to carry out instruction in an operational environment unless such he/she has received proper authorization from the Civil Aviation Authority. The holder of an air traffic controller licence is required be familiar with all pertinent and current information.

## FIFTH SCHEDULE

[Paragraphs 10(2) and 12(2)]

### AIRCRAFT EQUIPMENT

1. Every aircraft registered in Macao shall be provided, when flying in circumstances specified in the first column of the *Table of aircraft equipment* set forth in paragraph 4, with adequate equipment, and for the purpose of this paragraph the expression *adequate equipment* shall mean the scales of equipment respectively indicated in that *Table*:
  - (i) Provided that, if the aircraft is flying in a combination of such circumstances the scales of equipment shall not on that account be required to be duplicated.
2. In addition to the minimum equipment necessary for the issuance of a *Certificate of airworthiness*, the instruments, equipment and flight documents prescribed in the *Table of aircraft equipment* set forth in paragraph 4 shall be installed or carried, as appropriate, in aircraft according to the aircraft used and to the circumstances under which the flight is to be conducted. The prescribed instruments and equipment, including their installation, shall be approved or accepted by the Civil aviation authority. The equipment carried in an aircraft as being necessary for the airworthiness of the aircraft shall be taken into account in determining whether this Schedule is complied with in respect of that aircraft.
3. The following items of equipment shall not be required to be of a type approved by the Civil aviation authority:
  - (i) The equipment referred to in Scale A (ii).
  - (ii) First aid equipment and handbook referred to in Scale B (i) and (ii).
  - (iii) Accurate timepiece indicating the time in hours, minutes and seconds referred in Scales D and F.
  - (iv) Torches referred to in Scales G, H and J.
  - (v) Whistles referred to in Scale H.
  - (vi) Sea anchors referred to in Scales I and J.
  - (vii) Equipment for mooring, anchoring or manoeuvring aircraft on the water referred to in Scale I.
  - (viii) Paddles referred to in Scale J.
  - (ix) Food and water referred to in Scales J, T and W.
  - (x) Rocket signals referred to in Scale I.
  - (xi) Stoves, cooking utensils, snow shovels, ice saws, sleeping bags and arctic suits referred to in Scale T.
  - (xii) First Aid Equipment referred to in Scales J, T and W.
  - (xiii) Megaphones referred to in scale V.
4. **TABLE OF AIRCRAFT EQUIPMENT**

<i>Aircraft and circumstances of flight</i>	<i>Scale of equipment required</i>
<b>(1) Aircraft flying for purpose <u>other</u> than commercial air transport category:</b>	
<i>(a)</i> Minimum requirements on all flights	A, B(i), C, D and N
<i>(b)</i> when flying under visual flight rules (VFR) within controlled airspace	E
<i>(c)</i> when flying under instrument flight rules (IFR)	E
<i>(d)</i> when flying at night	E + G
<i>(e)</i> when on flights over water	
	<i>(i)</i> For aeroplanes
	<i>(ii)</i> For helicopters
<i>(f)</i> when flying over designated land areas	S + W + DD
<i>(g)</i> when flying in icing conditions	F
<i>(h)</i> when flying on high altitude	K
<i>(i)</i> when carrying out aerobatic manoeuvres	M
<b><i>Requirements for aeroplanes only (other than commercial air transport category)</i></b>	
<i>(j)</i> all seaplanes	I
<i>(k)</i> all aeroplanes of maximum certificated take-off mass over 5,700kg	U except U (iii)
<i>(l)</i> all aeroplanes of maximum certificated take-off mass over 5,700 kg up to and including 27,000 kg	P except P (ii), (iii) and (xii)
<i>(m)</i> all aeroplanes of maximum certificated take-off mass over 27,000 kg	P except P (i), (iii) and (xii)
<i>(n)</i> all aeroplanes of maximum certificated take-off mass over 5,700 kg for which the individual <i>Certificate of airworthiness</i> is first issued after 1 January 2005	P except P (ii), (iii) and (xi)

<i>Aircraft and circumstances of flight</i>	<i>Scale of equipment required</i>
<p>(o) when on long-range over-water flights in case of:</p> <p>(i) 50NM away from land suitable for making an emergency landing;</p> <p>(ii) away from land suitable for making an emergency landing at a distance of more than 185km (100NM), in the case of single-engined aeroplanes, and more than 370km (200NM), in the case of multi-engined aeroplanes capable of continuing flight with one engine inoperative.</p>	<p>I (i) + DD</p> <p>J + DD</p>
<p>(p) when speed limitations are expressed in terms of Mach number</p>	<p>Y</p>
<p><b>Requirements for helicopters only (<i>other than commercial air transport category</i>)</b></p>	
<p>(q) all helicopters</p>	<p>L</p>
<p>(r) all helicopters of maximum certificated take-off mass over 3,180 kg up to and including 7,000 kg</p>	<p>AA except AA (ii) and (iii)</p>
<p>(s) all helicopters of maximum certificated take-off mass over 7,000 kg</p>	<p>AA except AA (i) and (iii)</p>
<p>(t) all helicopters of maximum certificated take-off mass over 3,180 kg for which the individual Certificate of airworthiness is first issued after 1 January 2005</p>	<p>AA except AA (i) and (ii)</p>
<p><b>(2) Aircraft flying for the purpose of commercial air transport category:</b></p>	
<p>(a) minimum requirements:</p> <p>(i) all aircraft of maximum certificated take-off mass less than 1,150 kg on all flights</p> <p>(ii) all aircraft of maximum certificated take-off mass over 1,150 kg up to and including 5,700 kg on all flights</p> <p>(iii) all aircraft of maximum certificated take-off mass over 5,700 kg on all flights</p>	<p>A, B(i), C, D and N</p> <p>A, B (i), C, D, N and V</p> <p>A, B, C, D, N and V</p>
<p>(b) when flying under visual flight rules (VFR) within controlled airspace</p>	<p>E</p>
<p>(c) when flying under instrument flight rules (IFR):</p>	<p>E</p>

<i>Aircraft and circumstances of flight</i>	<i>Scale of equipment required</i>
(d) when flying at night:	E + G + BB
(e) when on flights over water	
(i) For aeroplanes	H + DD
(ii) For helicopters	L + DD
(f) when flying over designated land areas	T + DD
(g) flying in icing conditions	F
(h) when flying on high altitude:	
(i) un-pressurized aircraft	K, Part I
(ii) pressurized aircraft	R + K, Part II
(i) when operating above 15,000 m (49,000 ft)	X
<b><i>Requirements for aeroplanes only (commercial air transport category)</i></b>	
(j) all seaplanes	I
(k) all aeroplanes of maximum certificated take-off mass over 5,700kg	O + U + Q
(l) all aeroplanes of maximum certificated take-off mass over 5,700 kg up to and including 27,000 kg	P except P (ii), (iii) and (xii)
(m) all aeroplanes of maximum certificated take-off mass over 27,000 kg	EE + P except P (i), (iii) and (xii)
(n) all aeroplanes of maximum certificated take-off mass over 5,700 kg for which the individual <i>Certificate of airworthiness</i> is first issued after 1 January 2005	P except P (i), (ii) and (xii)
(o) all multi-engine turbine powered aeroplanes of a maximum certificated take-off mass of 5,700 kg or less	P except P (ii), (iii) and (xi)



<i>Aircraft and circumstances of flight</i>	<i>Scale of equipment required</i>
(p) all turbine-engined aeroplanes of maximum certificated take-off mass over 5,700kg or authorized to carry more than 19 passengers	Z
(q) when on long-range over-water flights in case of:  (iii) 120 minutes at cruising speed or 400NM, whichever is the lesser, for aeroplanes capable of continuing the flight to an aerodrome with the critical power unit(s) becoming inoperative at any point along the route or planned diversions; or  (iv) 30 minutes at cruising speed or 100NM, whichever is the lesser, for all other aeroplanes.	J + DD
(r) when speed limitations are expressed in terms of Mach number	Y
<b><i>Requirements for helicopters only (commercial air transport category)</i></b>	
(s) all helicopters	L
(t) all helicopters of maximum certificated take-off mass over 3,180 kg up to and including 7,000 kg	O + AA except AA (ii) and (iii)
(u) all helicopters of maximum certificated take-off mass over 7,000 kg	O + AA except AA (i) and (iii)
(v) all helicopters of maximum certificated take-off mass over 3,180 kg for which the individual <i>Certificate of airworthiness</i> is first issued after 1 January 2005	O + AA except AA (i) and (ii)

## 5. SCALES

The scales of equipment indicated in the *Table of aircraft equipment* set out in paragraph 4 shall be as follows:

### Scale A.

- (i) Spare fuses of appropriate ratings for all electrical circuits the fuses of which can be replaced in flight, consisting of 10% of the number of each rating or 3 of each rating, whichever is the greater.
- (ii) Current and suitable maps, charts, codes and other documents and navigational equipment necessary to cover the route of the proposed flight, in addition to any other equipment required under the Air

Navigation Regulation of Macao for the intended flight of the aircraft, including any diversion which may reasonably be expected.

- (iii)
  - (a) Subject to Scale B (vii), in all aeroplanes, helicopters and gyroplanes, for every pilot's seat and for any seat situated alongside a pilot's seat, a safety belt with one diagonal shoulder strap or a safety harness;
  - (b) Subject to Scale B (ix) for every seat in use (not being a seat referred to in sub-paragraph (a) above a safety belt with or without one diagonal shoulder strap or a safety harness; and
  - (c) In addition and for attachment to the equipment required in sub-paragraph (b) above, a child restraint device for every child under the age of two years.
- (iv) One portable fire extinguishers of a type which, when discharged, will not cause dangerous contamination of the air within the aircraft. At least one shall be located in the pilot's compartment and each passenger compartment that is separate from the pilot's compartment and that is not readily accessible to the flight crew.

*Note.* - Any portable fire extinguisher so fitted in accordance with the Certificate of airworthiness of the aeroplane may count as one prescribed.

- (v) At least one crash axe readily accessible to a member of the flight crew.

#### **Scale B.**

- (i) In the case of aircraft with a maximum certificated take-off mass **not** exceeding 5,700 kg used for commercial air transport of passengers and aircraft used for other than commercial air transport category, the following first aid equipment of good quality, sufficient in quantity, having regard to the number of persons on board the aircraft, including the following:
  - (a) Roller bandages, triangular bandages, absorbent gauze, adhesive plaster, white absorbent lint, cotton wool (or wound dressing in place of the lint and cotton wool), burn dressings, safety pins;
  - (b) Haemostatic bandages or tourniquet, skylights; and
  - (c) Antiseptic, analgesic and stimulant drugs; and a handbook on first aid.
- (ii) In the case of aircraft with a maximum certificated take-off mass exceeding 5,700 kg used for the commercial air transport of passengers, having regard to the number of persons on board the aircraft, the following first aid equipment:
  - (a) A handbook on first aid;
  - (b) Ground-air visual signal code for use by survivors, as contained in ICAO Annex 12;
  - (c) Materials for treating injuries;
  - (d) Ophthalmic ointment;
  - (e) A decongestant nasal spray;
  - (f) Insect repellent;

- (g) Emollient eye drops;
  - (h) Sunburn cream;
  - (i) Water-miscible antiseptic/skin cleanser;
  - (j) Materials for treatment of extensive burns;
  - (k) Oral drugs as follows: analgesic, antispasmodic, central nervous system stimulant, circulatory stimulant, coronary vasodilator, antidiarrhoeic and motion sickness medications; and
  - (l) An artificial plastic airway and splints.
- (iii) It is essential that the required first-aid kits be distributed as evenly as practicable throughout the passenger cabin. They should be readily accessible to cabin crew, and, in view of the possible use of medical supplies outside the aeroplane in an emergency situation, they should be located near an exit.
- (iv) In the case of aircraft with a maximum certificated take-off mass exceeding 5,700 kg used for the commercial air transport of passengers, in addition to paragraph (ii) when carrying more than 250 passengers, a medical kit containing:

#### ***Equipment***

- (a) One pair of sterile surgical gloves;
- (b) Sphygmomanometer;
- (c) Stethoscope;
- (d) Sterile scissors;
- (e) Haemostatic forceps;
- (f) Haemostatic bandages or tourniquet;
- (g) Sterile equipment for suturing wounds;
- (h) Disposable syringes and needles;
- (i) Disposable scalpel handle and blade

#### ***Drugs***

- (j) Coronary vasodilators;
- (k) Analgesics;
- (l) Diuretics;
- (m) Anti-allergics;
- (n) Steroids;
- (o) Sedatives;

- (p) Ergometrine;
  - (q) If specifically authorised by Civil aviation authority, a narcotic drug in injectable form; and
  - (r) Injectable broncho dilator.
- (v) The medical kit, when carried, should be stored in an appropriate secure location.
- (vi) In the case of an aircraft used for the commercial air transport of passengers in which, while the aircraft is at rest on the ground, the sill of any external door intended for the disembarkation of passengers, whether normally or in an emergency:
- (a) is more than 1.82 metres from the ground when the undercarriage of the machine is in the normal position for taxiing; or
  - (b) would be more than 1.82 metres from the ground if the undercarriage or any part thereof should collapse, break or fail to function

apparatus readily available for use at each such door consisting of device or devices which will enable passengers to reach the ground safely in an emergency while the aircraft is on the ground, and can be readily fixed in position for use.

- (vii) For all aircraft on all flights a safety harness for each flight crew member seat in place of the safety belt referred to under Scale A. If the maximum certificated take-off mass for the aircraft is more than 2,730 kg the safety harness shall incorporate a device which will automatically restrain the occupant's torso in the event of rapid deceleration. The safety harness for each pilot seat should incorporate a device to prevent a suddenly incapacitated pilot from interfering with the flight controls.

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

- (viii) If the commander cannot, from his/her own seat, see all the passengers' seats in the aircraft, a means of indicating to the passengers that seat belts should be fastened.
- (ix) For all aircraft on all flights a seat with a forward or rearward facing (within 15° of the longitudinal axis of the aircraft), fitted with a safety harness for the use of each cabin crew specified in paragraph 18 (8) of this Regulation, in respect of emergency evacuation. Cabin crew seats shall be located near floor level and other emergency exits as required by Civil aviation authority for emergency evacuation.
- (x) Means of ensuring that the following information and instructions are conveyed to passengers:
- (a) when seat belts are to be fastened;
  - (b) when and how oxygen equipment is to be used if the carriage of oxygen is required;
  - (c) restrictions on smoking;
  - (d) location and use of life jackets or equivalent individual floatation devices where their carriage is required; and
  - (e) location and method of opening emergency exits.
- (xi) For use by survivors, equipment for making pyrotechnical distress signals described in ICAO Annex 2.

**Scale C.**

- (i) Equipment for displaying the lights required by the Rules of the Air and Air Traffic Control.
- (ii) Electrical equipment, supplied from the main source of supply in the aircraft, to provide sufficient illumination for all instruments and equipment that are essential for the safe operation of the aircraft to enable the flight crew properly to carry out their duties during flight.
- (iii) Unless the aircraft is equipped with radio, devices for making the visual signal specified in the Rules of the Air and Air Traffic Control as indicating a request for permission to land.

**Scale D.**

- (i) A magnetic compass;
- (ii) An accurate timepiece indicating the time in hours, minutes and seconds;
- (iii) A sensitive pressure altimeter;
- (iv) An airspeed indicator; and
- (v) Such additional instruments or equipment as may be prescribed by the Civil aviation authority.
- (vi) VFR flights which are operated as controlled flights shall be equipped in accordance Scale E.

**Scale E.**

- (i) A magnetic compass;
- (ii) An accurate timepiece indicating the time in hours, minutes and seconds;
- (iii) Two sensitive pressure altimeters with counter drum-pointer or equivalent presentation for aeroplanes or helicopters, and one sensitive pressure altimeters with counter drum-pointer or equivalent presentation for helicopters flying for purpose other than commercial air transport category or aerial work;
- (iv) An airspeed indicating system with means of preventing malfunctioning due to either condensation or icing;
- (v) A turn and slip indicator;
- (vi) An attitude indicator (artificial horizon) for aeroplanes. Three attitude indicators (artificial horizon), one of which may be replaced by a turn indicator for helicopters and only two attitude indicators (artificial horizon), one of which may be replaced by a turn indicator, for helicopter flying for purpose other than commercial air transport category or aerial work;
- (vii) A heading indicator (directional gyroscope);
- (viii) An emergency power supply, independent of the main electrical generating system, capable of operating and illuminating, for a minimum period of 30 minutes, an attitude indicating instrument (artificial horizon), clearly visible to the pilot-in-command. The emergency power supply shall be automatically operative after the total failure of the main electrical generating system and clear

indication shall be given on the instrument panel that the attitude indicator(s) is being operated by emergency power, in respect of:

- (a) newly constructed aeroplanes, fitted with electrical attitude indicating instruments, of which the maximum certificated take-off mass exceeds 5,700 kg issued with a Macao *Certificate of Airworthiness* in the commercial air transport category;
  - (b) aeroplanes, fitted with electrical attitude indicating instruments, certified in the commercial air transport Category for the carriage of more than 19 persons over the age of 3 years;
  - (c) aircraft, fitted with electrical attitude indicating instruments with a maximum certificated take-off mass exceeding 15,900 kg; and
  - (d) helicopters of *Performance Class 1 and Class 2* certified in the commercial air transport category only.
- (ix) A means of indicating whether the power supply to the gyroscopic instrument is adequate;
  - (x) A means of indicating in the flight crew compartment the outside air temperature;
  - (xi) A rate-of-climb and descent indicator;
  - (xii) Such additional instruments or equipment as may be prescribed by the appropriate authority; and

*Note.* — *The requirements of (v), (vi), and (vii) above 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.*

- (xiii) 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.
- (xiv) For helicopters a stabilization system, unless it has been demonstrated to the satisfaction of the Civil aviation authority that the helicopter possesses, by nature of its design, adequate stability without such a system.

#### Scale F.

- (i) Suitable equipment for anti-icing and/or de-icing when operated in circumstances in which icing conditions are reported to exist or are expected to be encountered. 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/anti-icing treatment. Accumulation of ice or other naturally occurring contaminants shall be removed so that the aircraft is kept in an airworthy condition prior to take-off.

#### Scale G.

- (i) For commercial air transport, two landing lights or, for aircraft of which the maximum certificated take-off mass do not exceed 5,700 kg, one single landing light having two separately energised filaments (for helicopters one of the landing lights should be trainable, at least in the vertical plane).

For other than commercial air transport, one landing light is required.

- (ii) The lights required by the Rules of the Air and Air Traffic Control for aircraft in flight or operating on the movement area of an aerodrome.

- (iii) An electric lighting system to provide illumination in every passenger compartment.
- (iv) (a) One electric torch for each member of the crew of the aircraft; or
  - (b) one electric torch for each member of the flight crew of the aircraft; and at least one electric torch affixed adjacent to each floor level exit intended for the disembarkation of passengers whether normally or in an emergency, except that such torches shall:
    - (A) be readily accessible for use by the crew of the aircraft at all times; and
    - (B) number in total not less than the minimum number of cabin crew required to be carried with a full passenger complement.
    - (C) in the case of an aircraft of which the maximum certificated take-off mass exceeds 5,700 kg, a means of observing the existence and build up of ice on the aircraft.

**Scale H.**

- (i) For each person on board, one life jacket stowed in a position easily accessible from the seat or berth of the person for whose use it is provided, equipped with a whistle and a waterproof torch;
- (ii) Provided that life jackets constructed and carried solely for use by children less than 3 years of age need not be equipped with a whistle.

**Scale I.**

- (i) one life jacket, or equivalent individual floatation device, for each person on board, stowed in a position readily accessible from the seat or berth;
- (ii) equipment for making the sound signals prescribed in the International Regulations for Preventing Collisions at Sea, where applicable;
- (iii) one sea anchor (drogue), when necessary to assist in manoeuvring;
- (iv) one anchor;

**Scale J.**

- (i) Life-saving rafts sufficient to accommodate all persons on board the aircraft with the following equipment:
  - (a) means for maintaining buoyancy;
  - (b) a sea anchor;
  - (c) life lines, and means of attaching one life-saving raft to another;
  - (d) paddles or other means of propulsion;
  - (e) means of protecting the occupants from the elements;
  - (f) a waterproof torch;
  - (g) marine type pyrotechnical distress signals;
  - (h) means of making sea water drinkable;

- (i) for each four or proportion of four persons the life-saving raft is designed to carry:
  - (A) 100 grams of glucose toffee tablets; and
  - (B) one litre of fresh water in durable containers; provided that in any case in which it is not reasonably practicable to carry the quantity of water above specified as large a quantity of fresh water as is reasonably practicable in the circumstances may be substituted. In no case however shall the quantity of water carried be less than is sufficient when added to the amount of fresh water capable of being produced by means of the equipment specified in item (h) of this sub-paragraph to provide one litre of water for each four or proportion of four persons the life-saving raft is designed to carry; and
- (j) first aid equipment.

**Note.-** Items (f) to (j) inclusive, shall be contained in a pack stowed with the life-saving raft.

**Scale K.**

A supply of oxygen and the associated equipment to meet the requirements set out in Parts I and II of this Scale. The duration for the purposes of this Scale shall be:

- (i) that calculated in accordance with the *Operations manual* prior to the commencement of the flight, being the period or periods which it is reasonably anticipated that the aircraft will be flown in the circumstances of the intended flight at a height where such requirements apply and in calculating the duration account shall be taken of:
  - (a) in the case of pressurised aircraft, the possibility of depressurisation when flying above flight level 100;
  - (b) the possibility of failure of one or more of the aircraft engines;
  - (c) restrictions due to required minimum safe altitude;
  - (d) fuel requirement; and
  - (e) the performance of the aircraft; or
- (ii) the period or periods during which the aircraft is actually flown in the circumstances specified in Parts I and II, whichever is the greater.

**PART I - Unpressurised aircraft**

- (i) When flying at or below flight level 100: No specific requirements.
- (ii) When flying above flight level 100 but not exceeding flight level 130:

<i>Supply for</i>	<i>Duration</i>
(a) Members of the flight crew	Any period during which the aircraft flies above flight level 100.



<i>Supply for</i>	<i>Duration</i>
(b) Cabin crew members and 10% of passengers	For any continuous period exceeding 30 minutes during which the aircraft flies above flight level 100 but not exceeding flight level 130, the duration shall be the period by which 30 minutes is exceeded.

(iii) When flying above flight level 130:

<i>Supply for</i>	<i>Duration</i>
(a) Members of the flight crew	Any period during which the aircraft flies above flight level 130
(b) Members of the cabin crew and all passengers	Any period during which the aircraft flies above flight level 130.

## PART II - Pressurised aircraft

(i) When flying at or below flight level 100: No specific requirements.

(ii) When flying above flight level 100 but not exceeding flight level 250:

<i>Supply for</i>	<i>Duration</i>
(a) Members of the flight crew	Sufficient quantity of stored breathing oxygen appropriate to the circumstances of the flight being undertaken, in the event of loss of pressurization whenever the cabin pressure altitude exceeds 3,000 m (10,000ft).
(b) Members of the cabin crew and all passengers	(A) When the aircraft is capable of descending and continuing to its destination as specified in (A) below, 30 minutes or whenever the cabin pressure altitude exceeds 3,000 m (10,000ft), whichever is greater.  (B) When the aircraft is not so capable, whenever the cabin pressure altitude is greater than 3,000 m (10,000ft) but does not exceed 4,000 m (13,000 ft).
(c) Members of the cabin crew and all passengers	(A) When the aircraft is capable of descending and continuing to its destination as specified in (A) above, no requirement other than that at (ii) (b) (A) of this part of this scale.  (B) When the aircraft is not so capable and the cabin pressure altitude exceeds 4,000 m (13,000 ft), the duration shall be the period when the cabin pressure altitude exceeds 4,000 m (13,000 ft). or 10 minutes whichever is the greater.

(iii) When flying above flight level 250:

<i>Supply for</i>	<i>Duration</i>
(a) Members of the flight crew	2 hours or whenever the cabin pressure altitude exceeds 3,000 m (10,000ft), whichever is the greater and flight crew shall have available at the flight duty station a quick-donning type of oxygen mask, which will readily supply oxygen upon demand.
(b) Members of the cabin crew	Whenever the cabin pressure altitude exceeds 3,000 m (10,000ft) and a portable supply for 15 minutes.
(c) 10% of passengers	Whenever the cabin pressure altitude exceeds 3,000 m (10,000ft), but does not exceed 4,000 m (13,000 ft).
(d) 30% of passengers	Whenever the cabin pressure altitude exceeds 4,000 m (13,000 ft), but does not exceed 5,000 m (15,000 ft).
(e) All passengers	If the cabin pressure altitude exceeds 5,000 m (15,000 ft) the duration shall be the period when the cabin pressure altitude exceeds 5,000 m (15,000 ft) or 10 minutes, whichever is the greater.
(f) 2% of passengers or two passengers, whichever is the greater, being supply of first aid oxygen which must be available for simultaneous first aid treatment of 2% or two passengers wherever they are seated in the aircraft	Whenever after decompression, cabin pressure altitude exceeds 2,400 m (8,000 ft).

- (iv) The aircraft is capable, at the time when a failure to maintain cabin pressurisation occurs, of descending in accordance with the emergency descent procedure specified in the relevant flight manual and without flying below the minimum altitudes for safe flight specified in the *Operations manual* relating to the aircraft, to 4,000 m (13,000 ft) within four minutes and of continuing at or below that flight level to its place of intended destination or any other place at which a safe landing can be made.
- (v) The aircraft is provided with automatically deployable oxygen equipment to satisfy the requirements in Part II above. The total number of oxygen dispensing units shall exceed the number of passenger and cabin crew seats by at least 10 per cent.
- (vi) The aircraft is equipped with advice to provide positive warning to the flight crew of any dangerous loss of pressurization.

#### Scale L.

- (i) All helicopters intended to be flown over water shall be fitted with a permanent or rapidly deployable means of floatation so as to ensure a safe ditching of the helicopter when flying over water at a distance from land corresponding to more than 10 minutes at normal cruise speed in the case of

performance Class 1 or 2 helicopters or flying over water beyond autorotational or safe forced landing distance from land in the case of performance Class 3 helicopters.

Each life jacket and equivalent individual floatation device shall be equipped with a means of electric illumination for the purpose of facilitating the location of persons.

*For helicopters Performance Class 1 and 2*

- (a) One life jacket, or equivalent individual floatation device, for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided;
- (b) 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; and
- (c) equipment for making the pyrotechnical distress signals.

*For helicopters Performance Class 3*

- (d) When operating beyond autorotational distance from land but within a distance from land specified by the Civil aviation authority shall be equipped with one life jacket, or equivalent individual floatation device, for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided; and
- (e) beyond a distance from land specified by the Civil aviation authority it shall be equipped in accordance with the requirements of sub-paragraphs (a), (b) and (c) above for *helicopter Performance Class 1 and 2*.

*For helicopters Performance Class 2 and 3*

- (f) When taking off or landing at a heliport where, in the opinion of the Civil aviation authority, the take-off or approach path is so disposed over water that in the event of a mishap there would be likelihood of a ditching, at least the equipment shall be one life jacket, or equivalent individual floatation device, for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided.

**Scale M.**

Safety harness for every seat in use.

**Scale N.**

An intercommunication system for use by all members of the flight crew and including boom or throat microphones, not of a hand-held type for use by pilots and flight engineer (if any). Below the transition level/altitude, all flight crew members required to be on flight deck duty shall communicate through boom or throat microphones.

**Scale O.**

Helicopters or pressurised 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.

**Scale P.*****Types II and IIA flight data recorders (FDRs)***

- (i) All aeroplanes of a maximum certificated take-off mass of over 5,700 kg, up to and including 27,000 kg, shall be equipped with a Type II FDR.

For commercial air transport, all multi-engine turbine-powered aeroplanes of a maximum certificated take-off mass of 5,700 kg or less for which the individual certificate of airworthiness is first issued on or after 1 January 1990 shall be equipped with a Type IIA FDR.

Types II and IIA flight data recorders shall record the parameters required to determine accurately the aeroplane flight path, speed, attitude, engine power and configuration of lift and drag devices, as follows:

- (a) Time (UTC when available, otherwise elapsed time);
- (b) Pressure-altitude;
- (c) indicated air speed;
- (d) magnetic heading;
- (e) normal acceleration;
- (f) pitch attitude;
- (g) roll attitude;
- (h) radio transmission keying;
- (i) thrust of each engine;
- (j) trailing edge flap or cockpit flap control position;
- (k) leading edge flap or cockpit flap control position;
- (l) position of each thrust reverser;
- (m) ground spoiler/speed brake selection;
- (n) outside air temperature or total air temperature;
- (o) autopilot/autothrottle/automatic flight control system mode and engagement status.

***Type I flight data recorder (FDR)***

- (ii) Type I flight data recorder (FDR) shall record the parameters required to determine accurately the aeroplane flight path, speed, attitude, engine power, configuration and operation, in addition to the parameters referred in paragraph (i) above, as follows:

- (a) longitudinal acceleration;
- (b) lateral acceleration or sideslip angle;
- (c) Pilot input and/or control surface position-primary controls (pitch, roll, yaw);

*Note.- For aeroplanes with conventional control systems "or" applies. For aeroplanes with non-mechanical control system "and" applies. In aeroplanes with split surfaces, a suitable combination of inputs is acceptable in lieu of recording each surface separately.*

- (d) pitch trim position;
- (e) radio altitude;
- (f) glide path deviation;
- (g) localiser deviation;
- (h) marker beacon passage;
- (i) cockpit master warning;
- (j) NAV 1 and 2 frequency selection;
- (k) DME 1 and 2 distance;
- (l) landing gear squat switch status;
- (m) GPWS (ground proximity warning system);
- (n) angle of attack;
- (o) each hydraulic system (low pressure);
- (p) navigation data (latitude and longitude, ground speed and drift angle);
- (q) landing gear or gear selector position.

***Type IA flight data recorder (FDR)***

- (iii) Type IA flight data recorder (FDR) shall record the parameters required to determine accurately the aeroplane flight path, speed, attitude, engine power, configuration and operation, as follows:

***Flight path and speed***

- (a) Pressure Altitude;
- (b) Indicated Airspeed or Calibrated Airspeed;
- (c) Air - ground status and each landing gear air ground sensor when practicable;
- (d) Total or Outside Air Temperature;
- (e) Heading (Primary flight crew reference);

- (f) Normal Acceleration;
- (g) Lateral Acceleration;
- (h) Longitudinal Acceleration (Body axis);
- (i) Time or Relative Time Count;
- (j) Navigation Data \*: Drift Angle, Wind Speed, Wind Direction, Latitude/Longitude;
- (k) Groundspeed \*;
- (l) Radio Altitude \*

#### **Attitude**

- (a) Pitch Attitude;
- (b) Roll Attitude;
- (c) Yaw or sideslip angle \*
- (d) Angle of attack \*;

#### **Engine power**

- (a) Engine Thrust/power: Propulsive thrust/power on each engine, Cockpit thrust / Power lever position;
- (b) Thrust reverse status \*;
- (c) Engine Thrust Command \*;
- (d) Engine Thrust Target \*;
- (e) Engine Bleed Valve Position \*;
- (f) Additional Engine Parameters \*: EPR,  $N_1$ , indicated vibration level,  $N_2$ , EGT, TLA, fuel flow, fuel cut-off lever position,  $N_3$ ;

#### **Configuration**

- (a) Pitch trim surface position;
- (b) Flaps \*: Trailing edge flap position, Cockpit control selection;
- (c) Slats \*: Leading edge flap (slat) position, Cockpit control selection;

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\*For a Type IA flight data recorder, the parameters without an asterisk (\*) are mandatory parameters, which shall be recorded. 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.

- (d) Landing gear \*: Landing gear, Gear selector position;
- (e) Yaw Trim Surface Position \*;
- (f) Roll Trim Surface Position \*;
- (g) Cockpit trim control input position Pitch \*;
- (h) Cockpit trim control input position Roll \*;
- (i) Cockpit trim control input position Yaw \*;
- (j) Ground spoiler and speed brake \*: Ground Spoiler position, Ground Spoiler selection, Speed brake position, Speed brake selection;
- (k) De-icing and/or anti-icing systems selection \*;
- (l) Hydraulic Pressure (each system) \*;
- (m) Fuel Quantity \*;
- (n) AC Electrical Bus Status \*;
- (o) DC Electrical Bus status \*;
- (p) APU Bleed Valve Position \*;
- (q) Computed Center of Gravity \*

#### **Operation**

- (a) Warnings;
- (b) Primary Flight Control surface and Primary Flight Control pilot input: pitch axis, roll axis, yaw axis;
- (c) Marker beacon passage;
- (d) Each Navigation Receiver Frequency Selection;
- (e) Manual Radio Transmission Keying and CVR/FDR synchronization reference;
- (f) Autopilot/Autothrottle/AFCS mode and engagement status \*;
- (g) Selected Barometric setting \*: Pilot, First Officer;
- (h) Selected Altitude (All pilot selectable modes of operation) \*;
- (i) Selected Speed (All pilot selectable modes of operation) \*;
- (j) Selected Mach (All pilot selectable modes of operation) \*;
- (k) Selected Vertical Speed (All pilot selectable modes of operation) \*;
- (l) Selected Heading (All pilot selectable modes of operation) \*;
- (m) Selected Flight Path (All pilot selectable modes of operation) \*: Course/DSTRK, Path Angle;

- (n) Selected Decision Height \*;
- (o) EFIS Display Format \*: Pilot, First Officer;
- (p) Multi-function/Engine/Alerts Display format \*;
- (q) 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;
- (r) Low pressure warning \*: Hydraulic pressure, Pneumatic pressure;
- (s) Computer Failure \*;
- (t) Loss of cabin pressure \*;
- (u) TCAS/ACAS (Traffic Alert and Collision Avoidance System/Airborne Collision Avoidance System)\*;
- (v) Ice Detection \*;
- (w) Engine warning each engine vibration \*;
- (x) Engine warning each engine over temperature \*;
- (y) Engine warning each engine oil pressure low \*;
- (z) Engine warning each engine over speed \*;
- (aa) Wind shear Warning \*;
- (bb) Operational Stall protection, Stick shaker and pusher activation \*;
- (cc) All cockpit flight control input forces \*: Control wheel, Control Column, Rudder pedal cockpit input forces;
- (dd) Vertical deviation \*: ILS Glide path, MLS Elevation, GNSS approach path;
- (ee) Horizontal deviation \*: ILS Localizer, MLS Azimuth, GNSS approach path;
- (ff) DME 1 and 2 Distances \*;
- (gg) Primary Navigation System Reference \*: GNSS, INS, VOR/DME, MLS, Loran C, ILS;
- (hh) Brakes \*: Left and Right Brake Pressure, Left and Right Brake Pedal Position;
- (ii) Date \*;
- (jj) Event Marker \*;
- (kk) Head up Display in use \*;
- (ll) Para Visual Display on \*

**Note 1.**— *Parameter requirements, including range, sampling, accuracy and resolution, as contained in the Minimum Operational Performance Specification (MOPS) document for Flight Recorder Systems of the European Organization for Civil Aviation Equipment (EUROCAE) or equivalent documents.*



**Note 2.**— *The number of parameters to be recorded will depend on aeroplane complexity. Parameters without an \* are to be recorded regardless of aeroplane complexity. Those parameters designated by an \* are to be recorded if an information source for the parameter is used by aeroplane systems and/or flight crew to operate the aeroplane.*

- (iv) All flight data recorders shall be capable of retaining the information recorded during at least the last 25 hours of their operation, except for the Type IIA flight data recorder, which shall be capable of retaining the information, recorded during at least the last 30 minutes of its operation.
- (v) 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.
- (vi) A cockpit voice recorder shall be capable of retaining the information recorded during at least the last 30 minutes of its operation. Except for aircraft with individual *Certificate of airworthiness* was first issued after 1 January 1990, the cockpit voice recorder shall be capable of retaining the information recorded during at least the last two hours of its operation. An approved four channel cockpit voice recorder shall be capable of simultaneously recording the following information:
  - (a) all communications spoken into any active microphone at the commander's normal flight station and all audio signals selected to the commander's headphones or loud speaker;
  - (b) all communications spoken into active microphone at the co-pilot's normal flight station and all audio signals selected to the co-pilot's headphones or loud speaker;
  - (c) all communications spoken into any active microphone at another flight crew station and all audio signals selected at that crew position; and
  - (d) all conversation within the cockpit.
- (vii) The flight data recorder and the cockpit voice recorder referred to above:
  - (a) shall be so located and installed in compliance with the requirements of the Civil aviation authority; and
  - (b) shall have securely attached an automatically activated underwater locating device.
- (viii) All aeroplanes for which the individual *Certificate of airworthiness* is first issued after 1 January 2005, which utilize data link communications and are required to carry a cockpit voice recorder, shall record on a flight recorder, all data link communications to and from the aeroplane. The minimum recording duration shall be equal to the duration of the CVR, and shall be correlated to the recorded cockpit audio.

From 1 January 2007, all aeroplanes which utilize data link communications and are required to carry a cockpit voice recorder, shall record on a flight recorder, all data link communications to and from the aeroplane. The minimum recording duration shall be equal to the duration of the CVR, and shall be correlated to the recorded cockpit audio.
- (ix) Sufficient information to derive the content of the data link communications message and, whenever practical, the time the message was displayed to or generated by the crew shall be recorded.

**Note.**— *Data link communications include, but are not limited to, automatic dependent surveillance (ADS), controller-pilot data link communications (CPDLC), data link-flight information services (D-FIS) and aeronautical operational control (AOC) messages.*

- (x) For Macao registered aircraft, the use of the following aircraft equipment is discontinued and not authorized:
  - (a) Engraving metal foil flight data recorders;
  - (b) Analogue data recorders using frequency modulation (FM); and
  - (c) Photographic film flight data recorders.
- (xi) All aeroplanes of a maximum certificated take-off mass over 5,700 kg, required to be equipped with a flight data recorder and a cockpit voice recorder, may alternatively be equipped with two combination recorders (FDR/CVR).
- (xii) All multi-engine turbine powered aeroplanes of a maximum certificated take-off mass of 5,700 kg or less, required to be equipped with a flight data recorder and/or a cockpit voice recorder, may alternatively be equipped with one combination recorder (FDR/CVR).

#### Scale Q.

- (i) If the maximum certificated take-off mass of the aeroplane exceeds 5,700 kg a flight crew compartment door shall be equipped.
- (ii) 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.
- (iii) From 1 November 2003, all aeroplanes of a maximum total weight in excess of 45500 kg or authorized to carry more than 60 passengers 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.
- (iv) In all aeroplanes which are equipped with a flight crew compartment door in accordance with (iii) above, 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.

#### Scale R.

- (i)
  - (a) In respect of aeroplanes having a maximum certificated take-off mass exceeding 5,700 kg., equipment sufficient to protect the eyes, nose and mouth of all members of the flight crew required to be carried by virtue of paragraph 18 for a period of not less than 15 minutes and, in addition, where the minimum flight crew required as aforesaid is more than one and a Cabin crew member is not required to be carried by virtue of paragraph 18, portable equipment sufficient to protect the eyes, nose and mouth of one member of the flight crew for a period of not less than 15 minutes.
  - (b) In respect of aeroplanes having a maximum certificated take-off mass not exceeding 5,700 kg., the equipment specified in (i) (a) of Scale R except that in the case of such aeroplanes restricted by virtue of the operator's *Operations manual* to fly at or below flight level 250 and

capable of descending as specified at sub-paragraph (A) hereunder, such equipment shall be sufficient to protect the eyes only.

- (ii) (a) In respect of aeroplanes having a maximum certificated take-off mass exceeding 5,700 kg., portable equipment to protect the eyes, nose and mouth of all Cabin crew members required to be carried by virtue of paragraph 18 for a period of not less than 15 minutes.
- (b) In respect of aeroplanes having a maximum certificated take-off mass not exceeding 5,700 kg., the equipment specified in (ii) (a) of Scale R except that this requirement shall not apply to such aeroplanes restricted by virtue of the operator's *Operations manual* to fly at or below flight level 250 and capable of descending as specified at sub-paragraph (A) hereunder.

(A) The aeroplane is capable of descending in accordance with the emergency descent procedure specified in the relevant flight manual and without flying below the minimum altitudes for safe flight specified in the *Operations manual* relating to the aeroplane, to flight level 100 within 4 minutes and of continuing at or below that flight level to its place of intended destination or any other place at which a safe landing can be made.

#### Scale S.

- (i) Signalling devices.
- (ii) Life-saving equipment including means of sustaining life as may be appropriate to the area overflown.

#### Scale T.

- (i) Marine type pyrotechnical distress signals.
- (ii) For each four or proportion of four persons on board, 100 grams of glucose toffee tablets.
- (iii) For each four or proportion of four persons on board, 1 litre of fresh water in durable containers.
- (iv) First aid equipment.
- (v) For every 75 or proportion of 75 persons on board, 1 stove suitable for use with aircraft fuel.
- (vi) One cooking utensil, in which snow or ice can be melted.
- (vii) Two snow shovels.
- (viii) Two ice saws.
- (ix) Single or multiple sleeping-bags, sufficient for the use of one-third of all persons on board.
- (x) One arctic suit for each member of the crew of the aircraft.

#### Scale U.

- (i) A ground proximity warning system which shall be capable of providing automatically a timely and distinctive warning to the flight crew when the aeroplane is in potentially hazardous proximity to the earth's surface.

- (ii) A ground proximity warning system shall provide, as a minimum, warnings of the following circumstances:
  - (a) excessive descent rate;
  - (b) excessive terrain closure rate;
  - (c) excessive altitude loss after take-off or go-around;
  - (d) unsafe terrain clearance while not in landing configuration;
    - (A) gear not locked down;
    - (B) flaps not in a landing position; and
  - (e) excessive descent below the instrument glide path.
- (iii) All turbine-engined aeroplanes of a maximum total weight authorized in excess of 15000kg 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.
- (iv) All turbine-engined aeroplanes of a maximum total weight authorized in excess of 5700 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.
- (v) From 1 January 2007, all turbine-engined aeroplanes of a maximum total weight authorized in excess of 5700 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.
- (vi) From 1 January 2007, all turbine-engined aeroplanes of a maximum total weight authorized in 5700 kg or less and authorized to carry more than five but not more than nine passengers shall be equipped with a ground proximity warning system which provides the warnings in (ii)(a) and (c), warning of unsafe terrain clearance and a forward looking terrain avoidance function.
- (vii) From 1 January 2007, all piston-engined aeroplanes of a maximum total weight authorized in excess of 5700 kg or authorized to carry more than nine passengers shall be equipped with a ground proximity warning system which provides the warnings in (ii)(a) and (c), warning of unsafe terrain clearance and a forward looking terrain avoidance function.

#### Scale V.

- (i) If the aircraft may in accordance with its *Certificate of airworthiness* carry more than 19 and less than 100 passengers, one portable battery-powered megaphone capable of conveying instructions to all persons in the passenger compartment and readily available for use by a member of the crew.
- (ii) If the aircraft may in accordance with its *Certificate of airworthiness* carry more than 99 and less than 200 passengers, two portable battery-powered megaphones together capable of conveying instructions to all persons in the passenger compartment and each readily available for use by a member of the crew.
- (iii) If the aircraft may in accordance with its *Certificate of airworthiness* carry more than 199 passengers, 3 portable battery-powered megaphones together capable of conveying instructions to all persons in the passenger compartment and each readily available for use by a member of the crew.

- (iv) If the aeroplane may in accordance with its *Certificate of airworthiness* carry more than 19 passengers:
- (a) a public address system; and
  - (b) an interphone system of communication between members of the flight crew and the Cabin crew members.

**Scale W.**

- (i) Marine type pyrotechnical distress signals.
- (ii) For each four or proportion of four persons on board, 100 grams of glucose toffee tablets.
- (iii) For each four or proportion of four persons on board, 1 litre of fresh water in durable containers.
- (iv) First aid equipment.

**Scale X.**

- (i) 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.
- (ii) Provided that an aircraft shall not be required to carry the said equipment if before take-off the equipment is found to be unserviceable and it is not reasonably practicable to repair or replace it at the aerodrome of departure and the radiation forecast available to the commander of the aircraft indicates that hazardous radiation conditions are unlikely to be encountered by the aircraft on its intended route or any planned diversion there from.

*Note.- The equipment is calibrated on the basis of assumptions acceptable to the appropriate national authorities*

**Scale Y.**

- (i) If the speed limitations of the aeroplane are expressed in terms of mach number, a mach number indicator.

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

**Scale Z.**

- (i) All turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 15 000 kg or authorized to carry more than 30 passengers shall be equipped with an airborne collision avoidance system (ACAS II).
- (ii) From 1 January 2005 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).

- (iii) An airborne collision avoidance system (ACAS II) shall operate in accordance with the relevant provisions of ICAO Annex 10, Volume IV.

**Scale AA.**

***Type V flight data recorder (FDR)***

- (i) Type V flight data recorder (FDR) shall record the parameters required to determine accurately the helicopter flight path, speed, attitude and engine power, as follows:
- (a) Time (UTC when available, otherwise elapsed time);
  - (b) Pressure-altitude;
  - (c) Indicated air speed;
  - (d) Magnetic heading;
  - (e) Normal acceleration;
  - (f) Pitch attitude;
  - (g) Roll attitude;
  - (h) Radio transmission keying;
  - (i) Thrust of each engine;
  - (j) Main rotor speed;
  - (k) Pilot input and/or control surface position-primary controls (Collective pitch, longitudinal cyclic pitch, lateral cyclic pitch, tail rotor pedal);
  - (l) Hydraulics, each system (low pressure);
  - (m) outside air temperature or total air temperature;
  - (n) autopilot/autothrottle/automatic flight control system mode and engagement status;
  - (o) Stability augmentation system engagement.

***Type IV flight data recorder (FDR)***

- (ii) Type IV flight data recorder (FDR) shall record the parameters required to determine accurately the helicopter flight path, speed, attitude, engine power and operation, in addition to the parameters referred in paragraph (i) above, as follows:
- (a) Main gear box oil pressure;
  - (b) Main gear box oil temperature;
  - (c) Yaw acceleration (or yaw rate);
  - (d) Slingshot load force;

- (e) Longitudinal acceleration;
- (f) Lateral acceleration or sideslip angle;
- (g) Longitudinal acceleration;
- (h) Lateral acceleration or sideslip angle;
- (i) Radio altitude;
- (j) Glide path deviation;
- (k) Localiser deviation;
- (l) Marker beacon passage;
- (m) Cockpit master warning;
- (n) NAV 1 and 2 frequency selection;
- (o) DME 1 and 2 distance;
- (p) Navigation data (latitude and longitude, ground speed and drift angle);
- (q) Landing gear or gear selector position.

***Type IVA flight data recorder (FDR)***

- (iii) Type IVA flight data recorder (FDR) shall record the parameters required to determine accurately the helicopter flight path, speed, attitude, engine power, configuration and operation. The parameters that satisfy the requirements for a Type IVA flight data recorder are listed in the paragraphs below:

***Flight path and speed***

- (a) Pressure Altitude;
- (b) Indicated Airspeed;
- (c) Outside Air Temperature;
- (d) Heading;
- (e) Normal Acceleration;
- (f) Lateral Acceleration;
- (g) Longitudinal Acceleration (Body axis);
- (h) Time or Relative Time Count;

- (i) Navigation Data \*†: Drift Angle, Wind Speed, Wind Direction, Latitude/Longitude;
- (j) Radio Altitude \*.

**Attitude**

- (a) Pitch Attitude;
- (b) Roll Attitude;
- (c) Yaw rate.

**Engine power**

- (a) Power on each engine: Free Power Turbine Speed ( $N_F$ ), Engine Torque, Engine Gas Generator Speed ( $N_G$ ), Cockpit Power Control position;
- (b) Rotor: Main rotor speed, Rotor brake;
- (c) Main gearbox oil pressure \*;
- (d) Gearbox oil temperature \*: Main gearbox oil temperature, Intermediary gearbox oil temperature, Tail rotor gearbox oil temperature;
- (e) Engine exhaust gas temperature (T4) \*;
- (f) Turbine inlet temperature (TIT/ITT) \*

**Configuration**

- (a) Landing gear or gear selector position \*;
- (b) Fuel Quantity \*;
- (c) Ice detector liquid water content \*

**Operation**

- (a) Hydraulics low pressure;
- (b) Warnings;
- (c) Primary Flight Controls - Pilot input and/or control output position: Collective pitch, Longitudinal cyclic pitch, Lateral cyclic pitch, Tail rotor pedal, Controllable stabilator, Hydraulic selection;
- (d) Marker beacon passage;

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\* For Type IVA flight data recorder, the parameters without an asterisk (\*) are mandatory parameters, which shall be recorded. In addition, the parameters designated by an asterisk (\*) shall be recorded if an information data source for the parameter is used by helicopter systems or the flight crew to operate the helicopter.



- (e) Each Navigation Receiver Frequency Selection;
- (f) AFCS mode and engagement status \*;
- (g) Stability augmentation system engagement \*;
- (h) Indicated sling load force \*;
- (i) Vertical deviation \*: ILS Glide Path, MLS Elevation, and GNSS approach path;
- (j) Horizontal deviation \*: ILS Localizer, MLS Azimuth, and GNSS approach path;
- (k) DME 1 and 2 Distances \*;
- (l) Altitude rate \*;
- (m) Ice detector liquid water content \*;
- (n) Helicopter Health and Usage Monitor System (HUMS) \*: Engine data, Chip detectors, track timing, Exceedances discretely, and broadband average engine vibration

**Note 1.** — *Parameter requirements, including range, sampling, accuracy and resolution, as contained in the Minimum Operational Performance Specification (MOPS) document for Flight Recorder Systems of the European Organization for Civil Aviation Equipment (EUROCAE) or equivalent documents.*

**Note 2.** — *The number of parameters to be recorded will depend on helicopter complexity. Parameters without an \* are to be recorded regardless of helicopter complexity. Those parameters designated by an \* are to be recorded if an information source for the parameter is used by helicopter systems and/or flight crew to operate the helicopter.*

- (iv) Types IV and V flight data recorders shall be capable of retaining the information recorded during at least the last ten hours of their operation.
- (v) 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.
- (vi) A cockpit voice recorder shall be capable of retaining the information recorded during at least the last 30 minutes of its operation. Except for aircraft with individual *Certificate of airworthiness* was first issued after 1 January 1990, the cockpit voice recorder shall be capable of retaining the information recorded during at least the last two hours of its operation. An approved four channel cockpit voice recorder shall be capable of simultaneously recording the following information:
  - (a) all communications spoken into any active microphone at the commander's normal flight station and all audio signals selected to the commander's headphones or loud speaker;
  - (b) all communications spoken into active microphone at the co-pilot's normal flight station and all audio signals selected to the co-pilot's headphones or loud speaker;
  - (c) all communications spoken into any active microphone at another flight crew station and all audio signals selected at that crew position; and

- (d) all conversation within the cockpit.
- (vii) The flight data recorder and the cockpit voice recorder referred to above:
  - (a) shall be so located and installed in compliance with the requirements of the Civil aviation authority; and
  - (b) shall have securely attached an automatically activated underwater locating device.
- (viii) All helicopters for which the individual *Certificate of airworthiness* is first issued after 1 January 2005, which utilize data link communications and are required to carry a cockpit voice recorder, shall record on a flight recorder, all data link communications to and from the helicopter. The minimum recording duration shall be equal to the duration of the CVR, and shall be correlated to the recorded cockpit audio.

From 1 January 2007, all helicopters which utilize data link communications and are required to carry a cockpit voice recorder, shall record on a flight recorder, all data link communications to and from the helicopter. The minimum recording duration shall be equal to the duration of the CVR, and shall be correlated to the recorded cockpit audio.

- (ix) Sufficient information to derive the content of the data link communications message and, whenever practical, the time the message was displayed to or generated by the crew shall be recorded.

*Note.*— *Data link communications include, but are not limited to, automatic dependent surveillance (ADS), controller-pilot data link communications (CPDLC), data link-flight information services (D-FIS) and aeronautical operational control (AOC) messages.*

- (x) For Macao registered aircraft, the use of the following aircraft equipment is discontinued and not authorized:
  - (a) Engraving metal foil flight data recorders;
  - (b) Analogue data recorders using frequency modulation (FM); and
  - (c) Photographic film flight data recorders.
- (xi) All helicopters of a maximum certificated take-off mass over 2 700 kg, required to be equipped with a flight data recorder and/or a cockpit voice recorder, may alternatively be equipped with one combination recorder (FDR/CVR).

#### Scale BB.

- (i) An emergency lighting system to provide illumination in the passenger compartments sufficient to facilitate the evacuation of the aircraft notwithstanding the failure of the lighting systems specified in paragraph (ii) of Scale G.
- (ii) An emergency lighting system to provide illumination outside the aircraft sufficient to facilitate the evacuation of the aircraft.

#### Scale CC.

- (i) A quick donning type of oxygen mask which will readily supply oxygen upon demand at the duty station of each flight crew member.

**Scale DD.**

- (i) 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.
- (ii) Flights over water (Helicopters) - For performance Class 1 and 2 helicopters when flying over water at a distance from land corresponding to more than 10 minutes at normal cruise speed; and for Class 3 helicopters when flying over water beyond autorotational or safe forced landing distance from land.
- (iii) Designated land areas - Aircraft when operated across land areas which have been concerned as areas in which search and rescue would be especially difficult, shall be equipped with such signaling devices and life-saving equipment (including means of sustaining life) as may be appropriate to the area overflown.

**For aeroplane commercial air transport operations:**

- (iv) Except as provided for in (v), until 1 January 2005 all aeroplanes operated on long-range over-water flights shall be equipped with at least two survival ELT (ELT(S)).
- (v) All aeroplanes for which the individual certificate of airworthiness is first issued after 1 January 2002, operated on long-range over-water flights shall be equipped with at least two ELTs, one of which shall be automatic.
- (vi) From 1 January 2005, all aeroplanes operated on long-range over-water flights shall be equipped with at least two ELTs, one of which shall be automatic.
- (vii) Except as provided for in (viii), until 1 January 2005 aeroplanes on flight over designated land areas shall be equipped with at least one ELT.
- (viii) All aeroplanes for which the individual certificate of airworthiness is first issued after 1 January 2002, on flight over designated land areas shall be equipped with at least one automatic ELT.
- (ix) From 1 January 2005, aeroplanes on flight over designated land areas shall be equipped with at least one automatic ELT.

**For aeroplane other than commercial air transport operations:**

- (x) Except as provided for in (xi), until 1 January 2005 all aeroplanes operated on long-range over-water flights and when operated on flights over designated land areas shall be equipped with one ELT.
- (xi) All aeroplanes for which the individual certificate of airworthiness is first issued after 1 January 2002, operated on long-range over-water flights and when operated on flights over designated land areas shall be equipped with one automatic ELT.

- (xii) From 1 January 2005, all aeroplanes operated on long-range over-water flights and when operated on flights over designated land areas shall be equipped with one automatic ELT.

**For helicopter:**

- (xiii) Except as provided for in (xiv), until 1 January 2005 all helicopters operating on flights over water shall be equipped with at least one ELT(S) per raft if raft is required to be carried according to RNAM Fifth Schedule but not more than a total of two ELTs are required.
- (xiv) Helicopters for which the individual certificate of airworthiness is first issued after 1 January 2002, operating on flights over water shall be equipped with at least one automatic ELT and at least one ELT(S) in a raft if raft is required to be carried according to this Schedule.
- (xv) From 1 January 2005, all helicopters operating on flights over water shall be equipped with at least one automatic ELT and at least one ELT(S) in a raft if raft is required to be carried according to this Schedule.
- (xvi) Except as provided for in (xvii), until 1 January 2005 helicopters on flights over designated land areas shall be equipped with at least one ELT.
- (xvii) Helicopters for which the individual certificate of airworthiness is first issued after 1 January 2003, on flights over designated land area shall be equipped with at least one automatic ELT.
- (xviii) From 1 January 2005, helicopters on flights over designated land areas shall be equipped with at least one automatic ELT.
- (xix) All ELT equipment carried to satisfy the requirements of this scale shall operate in accordance with the relevant provisions of ICAO Annex 10, Volume III.

**Scale EE**

- (i) From 1 January 2005, the operator of a Macao registered 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 accident prevention and flight safety programme as required by paragraph 26 (7) of this Regulation.

*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.*

- (ii) The flight data analysis programme established by the operator of a Macao registered aeroplane shall be non-punitive and contain adequate safeguards to protect the source(s) of the data.

## SIXTH SCHEDULE

(Paragraph 13)

### RADIO AND NAVIGATION EQUIPMENT TO BE CARRIED IN AIRCRAFT

1. Every aircraft shall be provided, when flying in the circumstances specified in the first column of the *Table of radio and navigation equipment to be carried in aircraft* set forth in paragraph 2, with the scales of equipment respectively indicated in that *Table*:

(a) Provided that, if the aircraft is flying in a combination of such circumstances the scales of equipment shall not on that account be required to be duplicated.

#### 2. TABLE OF RADIO AND NAVIGATION EQUIPMENT TO BE CARRIED IN AIRCRAFT

<i>Aircraft and circumstances of flight</i>	<i>Scale of equipment required</i>								
	A	B	C	D	E	F	G	H	I
<b>(1) All aircraft within Macao:</b>									
(a) when flying under Instrument Flight Rules (IFR) within controlled air space	A (i) only	B (iii) only			E		G		
(b) where required by Rules of the Air and Air Traffic Control to comply in whole or in part with Instrument Flight Rules (IFR) in Visual Meteorological Conditions (VMC)	A* (i) only	B* (iii) only			E		G		
(c) when flying within any airspace in respect of which special rules are made in relation to a particular aerodrome, so as to require two-way radio-communication with that aerodrome	A* (i) only						G		
(d) when making an approach to landing at an aerodrome notified for the purpose of this sub-paragraph						F*	G		

\* Unless the appropriate air traffic control unit otherwise permits in relation to the particular flight and provided that the aircraft complies with any instructions which the air traffic control unit may give in the particular case.

<i>Aircraft and circumstances of flight</i>	<i>Scale of equipment required</i>								
	A	B	C	D	E	F	G	H	I
<b>(3) All aircraft registered in Macao:</b>									
(a) when flying for the purpose of commercial air transport under Instrument Flight Rules (IFR):									
(i) while making an approach to landing	A	B	C	D	E		G		
(ii) on all other occasions	A	B	C		E		G		
(b) over 2,300 kg maximum certificated take-off mass when flying for the purpose of commercial air transport under Visual Flight Rules	A	B					G		
(c) under 2,300 kg maximum certificated take-off mass when flying for the purpose of commercial air transport under Visual Flight Rules (VFR):									
(i) over a route on which navigation is not effected solely by visual reference to landmarks	A	B					G		
(ii) over water, beyond gliding distance from any land	A						G		
(d) for flights in defined portions of airspace where, based on Regional Air Navigation Agreement, minimum navigation performance specifications (MNPS) are prescribed								H	
(e) for flights in defined portions of airspace where, based on Regional Air Navigation Agreement, a vertical separation minimum (VSM) of 300 m (1 000 ft) is applied above FL 290									I

\* Unless the appropriate air traffic control unit otherwise permits in relation to the particular flight and provided that the aircraft complies with any instructions which the air traffic control unit may give in the particular case.

### 3. SCALES

The scales of radio equipment indicated in the foregoing *Table of radio and navigation equipment to be carried in aircraft* shall be as follows:

#### Scale A.

Radio equipment capable of:

- (i) Conducting two-way communication for aerodrome control purposes;
- (ii) 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.
- (iii) The radio communication equipment required in accordance with sub-paragraph (ii) above shall provide for communications on the aeronautical emergency frequency 121.5 MHz.

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

- (iv) The equipment installation shall be such that the failure of any single unit required for communication purposes will not result in the failure of another unit required for communication purposes.

#### Scale B.

Radio equipment capable of enabling the aircraft to be navigated:

- (i) In accordance with its operational flight plan;
- (ii) In accordance with prescribed RNP types; and
- (iii) In accordance with the requirements of air traffic services,

except when, if not so precluded by the appropriate authority, navigation for flights under the visual flight rules is accomplished by visual reference to landmarks.

- (iv) The aircraft 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 aircraft to navigate in accordance with sub-paragraphs (i), (ii) and (iii).
- (v) The equipment installation shall be such that the failure of any single unit required for navigation purposes will not result in the failure of another unit required for navigation purposes.

#### Scale C.

Radio equipment capable of receiving from the appropriate aeronautical radio stations meteorological broadcasts relevant to the intended flight.

**Scale D.**

Radio equipment capable of receiving signals from one or more aeronautical radio stations on the surface to enable the aircraft to be guided to a point from which a visual landing can be made at the aerodrome (or heliport) at which a visual landing can be effected. This equipment shall be capable of providing such guidance at each aerodrome (or heliport) at which it is intended to land in instrument meteorological conditions and at any designated alternate aerodrome (or heliport).

**Scale E.**

Radio navigation equipment capable of providing a continuous indication of the aircraft's distance from the appropriate aeronautical radio stations.

**Scale F.**

Radio navigation equipment capable of enabling the aircraft to make an approach to landing using the Instrument Landing System (ILS).

**Scale G.**

Such type of radio equipment (pressure-altitude transponder) as may be notified as being capable of:

- (i) Replying to an interrogation from secondary surveillance radar units on the surface;
- (ii) Being set in an aerodrome (or heliport) with such instructions as may be given to the aircraft by the appropriate air traffic control unit: and
- (iii) Pressure-altitude transponder shall operate in accordance with the relevant provisions of Annex 10, Volume IV.

**Scale H.**

Radio navigation equipment which is capable of:

- (i) Continuously provides indications to the flight crew of adherence to or departure from track to the required degree of accuracy at any point along that track; and
- (ii) Has been authorized by the Civil Aviation Authority for MNPS operations concerned.

**Scale I.**

Radio navigation equipment which is capable of:



- (i) Indicating to the flight crew the flight level being flown;
  - (a) automatically maintaining a selected flight level;
  - (b) providing an alert to the flight crew when a deviation occurs from the selected flight level. The threshold for the alert shall not exceed  $\pm 90$  m (300 ft); and
  - (c) automatically reporting pressure-altitude; and
- (ii) Shall be authorized by the Civil Aviation Authority for operation in the airspace concerned.

## SEVENTH SCHEDULE

(Paragraph 15)

### AIRCRAFT, POWER PLANT AND PROPELLER LOG BOOKS

#### 1. Aircraft Log book.

The following entries shall be included in the aircraft Log book:

- (a) the name of the constructor, the type of the aircraft, the number assigned to it by the constructor and the date of the construction of the aircraft;
- (b) the nationality and registration marks of the aircraft;
- (c) the name and address of the operator of the aircraft;
- (d) particulars of the date and duration of each flight, or, if more than one flight was made on one day, the number of flights and total duration of flights on that day;
- (e) particulars of all maintenance work carried out on the aircraft or its equipment;
- (f) particulars of any defects occurring in the aircraft or in any equipment required to be carried therein by the Regulation, and of the action taken to rectify such defects including a reference to the relevant entries in the *Technical log* required by paragraph 9 (7) and (8) of the Regulation;
- (g) particulars of any overhauls, repairs, replacements and modifications relating to the aircraft or any such equipment as aforesaid:

Provided that entries shall not be required to be made under sub-paragraphs (e), (f) and (g) in respect of any power plant or variable pitch propeller.

#### 2. Power plant Log book.

The following entries shall be included in the power plant Log book:

- (a) the name of the constructor, the type of the power plant, the number assigned to it by the constructor and the date of the construction of the power plant;
- (b) the nationality and registration marks of each aircraft in which the power plant is fitted;
- (c) the name and address of the operator of each such aircraft;
- (d) particulars of the date and duration of each occasion on which the power plant is run in flight, or, if the power plant is run on more than one occasion on one day, the number of occasions and the total duration of the running of the power plant on that day;
- (e) particulars of all maintenance work done on the power plant;

- (f) particulars of any defects occurring in the power plant, and of the rectification of such defects, including a reference to the relevant entries in the *technical log* required by paragraph 9 (7) and 9 (8) of the Regulation; and
- (g) particulars of all overhauls, repairs, replacements and modifications relating to the power plant or any of its accessories.

### 3. Variable pitch propeller Log book.

The following entries shall be included in the variable pitch propeller Log book:

- (a) the name of the constructor, the type of the propeller, the number assigned to it by the constructor and the date of the construction of the propeller;
- (b) the nationality and registration marks of each aircraft, and the type and number of each power plant, to which the propeller is fitted;
- (c) the name and address of the operator of each such aircraft;
- (d) particulars of the date and duration of each occasion on which the propeller is run in flight, or, if the propeller is run on more than one occasion on one day, the number of occasions and the total duration of the running of the propeller on that day;
- (e) particulars of all maintenance work done on the propeller;
- (f) particulars of any defects occurring in the propeller, and of the rectification of such defects, including a reference to the relevant entries in the *technical log* required by paragraph 9 (7) and 9 (8) of the Regulation;
- (g) particulars of any overhauls, repairs, replacements and modifications relating to the propeller.

## EIGHTH SCHEDULE

(Paragraph 20)

### LICENCES, RATINGS AND PRIVILEGES OF FLIGHT CREW MEMBERS

1. This Schedule establishes the various requirements, categories, ratings and privileges prescribed by the Civil Aviation Authority for granting, validating, revalidating and using licences related to flight crew of aircraft in Macao. The Civil Aviation Authority may grant, validate or revalidate a licence to any person who acts or intends to act as a member of flight crew of aircraft in Macao provided that they apply for any of the following cases:
  - (a) Student pilot licence (aeroplanes or helicopters);
  - (b) Private pilot licence (aeroplanes);
  - (c) Private pilot licence (helicopters);
  - (d) Commercial pilot licence (aeroplanes);
  - (e) Commercial pilot licence (helicopters);
  - (f) Airline transport pilot licence (aeroplanes);
  - (g) Airline transport pilot licence (helicopters);
  - (h) Flight navigator licence;
  - (i) Flight engineer licence; or
  - (j) Flight radiotelephony operator licence (general or restricted).
2. (1) A person applying in Macao for the grant or renewal of any of the licences described in paragraph 1 to this Schedule shall be required to undergo a number of examinations under the supervision of the Civil Aviation Authority to ascertain whether his/her age, knowledge, experience, flight instruction, skills, eventually health condition or any other individual characteristics conforms with the requirements specified in this Schedule, provided that:
  - (a) an applicant who does not satisfy one or various of the requirements specified in this Schedule, whether in part or entirety, may, at the discretion of the Civil Aviation Authority, be accepted as eligible for the grant or renewal of any of the licences mentioned in paragraph 1; and any licence granted or renewed in accordance with this proviso may be made subject to such conditions and restrictions as the Civil Aviation Authority may consider appropriate in the particular case;
  - (b) a person applying for the grant or renewal of any of the licences specified in paragraph 1 of this Schedule shall meet the necessary medical requirements established in the Fourteenth Schedule to this Regulation;
  - (c) an applicant must be able to read and write in English;

- (d) an applicant shall be employed by an organisation which operates or services Macao registered aircraft; and
    - (e) an applicant shall not be suffering from any disability likely to adversely affect his/her technical skill or judgement.
  - (2) A person applying in Macao for the grant or renewal of any of the licences described in paragraph 1 to this Schedule may be required to undergo an interview with the Civil Aviation Authority to determine whether, in accordance with this Regulation, the applicant is a fit and proper person to hold a licence.
- 3. (1) The grant or renewal in Macao of any of the licences mentioned in paragraph 1 of this Schedule shall be carried out as follows:
  - (a) an applicant shall submit an application to the Civil Aviation Authority in accordance with the terms and procedures defined by the Civil Aviation Authority in this respect;
  - (b) an applicant shall be required to undergo medical examinations according to the terms, standards and time periods prescribed in the Fourteenth Schedule to this Regulation;
  - (c) an applicant shall be required to undergo the number and type of written or oral examinations which the Civil Aviation Authority deems necessary and sufficient to ascertain his/her knowledge on the various subjects related to the exercise of the privileges of the applicant's licence. The written or oral examinations shall be performed as follows:
    - (i) take place at the time, in the place, with the means and in the way prescribed by the Civil Aviation Authority;
    - (ii) all the examinations are conducted in English by the Civil Aviation Authority. The Civil Aviation Authority may, on a discretionary basis, ascertain the knowledge and command of the applicant on the Chinese language;
    - (iii) the examinations are conducted and supervised by the Civil Aviation Authority. The Civil Aviation Authority may, on a discretionary basis, authorise a certified person or organisation to perform these duties;
    - (iv) candidates will be advised by the Civil Aviation Authority of the results of each examination on a pass or fail basis. A supplementary examination may be given in cases where the marks obtained are within a transitory range determined for each particular examination;
    - (v) each examination passed carries a permanent credit for all categories, groups or ratings to which it applies; and
    - (vi) if a candidate fails an examination, an advise shall be made for the period and additional training or practical experience required before being eligible to be re-examined in that subject.
  - (d) the applicant shall be required to undergo the number and type of practical examinations which the Civil Aviation Authority deems necessary and sufficient to ascertain his/her skills, knowledge, experience and competence on the various subjects related to the practical exercise of the privileges of the applicant's licence. The practical examinations shall be performed as prescribed in proviso (c) of this paragraph; and
  - (e) the applicant shall be required to pay the applicable fees specified in the Twelfth Schedule to this Regulation.

- (2) Based on the results and correct performance of the various requirements established in proviso (1) and when the Civil Aviation Authority is satisfied that the various licence requirements specified in this Schedule have been met, a licence may be granted, validated or revalidated to the respective applicant.
4. The Civil Aviation Authority may grant any of the licences described in paragraph 1 to this Schedule, or a certificate of validation, to an applicant who holds a valid similar licence granted by other countries, provided that the applicant shall:
- (a) satisfy the Civil Aviation Authority that he/she complies with the requirements for grant of licences specified in this Schedule and that the category of his/her licence, his/her recent practical experience and the requirements observed for the initial grant of his/her licence are compatible with this Regulation;
  - (b) at the discretion of the Civil Aviation Authority and under its supervision, the applicant may be required to undergo such examinations as deemed necessary to establish that he/she is competent and eligible for the grant of a licence in Macao;
  - (c) submit evidence that he/she has had adequate recent experience for him/she to understand the local procedures and practices necessary to exercise the privileges of his/her licence;
  - (d) submit evidence that he/she is employed, or about to be employed, by a person or organisation who operates with, or perform services regarding, aircraft registered in Macao; and
  - (e) submit evidence that the licence presented is an ICAO type of licence.
5. The holder of a pilot licence granted, validated or revalidated in Macao by the Civil Aviation Authority in order to credit flight time for the purpose of demonstrate experience and comply with the requirements established by the Civil Aviation Authority, shall take note of the following conditions:
- (a) a student pilot or the holder of a pilot licence shall be entitled to be credited in full with all solo, dual instruction and pilot-in-command flight time towards the total flight time required for the initial issue of a pilot licence or the issue of a higher grade of pilot licence;
  - (b) the holder of a pilot licence, when acting as co-pilot of an aircraft required to be operated with a co-pilot, shall be entitled to be credited with no more than 50 per cent of the co-pilot flight time towards the total flight time required for a higher grade of pilot licence; and
  - (c) the holder of a pilot licence, when acting as co-pilot performing under the supervision of the pilot-in-command the functions and duties of a pilot-in-command, shall be entitled to be credited in full with this flight time towards the total flight time required for a higher grade of pilot licence.
6. The Civil Aviation Authority requires that the use of a synthetic flight trainer for performing any manoeuvre required during the demonstration of skill for the grant, validation or revalidation of a licence or rating in Macao shall be previously approved by the Civil Aviation Authority. The synthetic flight trainer must be of a type and embody such technical specifications considered appropriate to the task.
7. The Civil Aviation Authority requires that holders of any of the licences specified in paragraph 1 of this Schedule, shall not exercise the privileges of their licences and related ratings at any time when they are aware of any decrease in their medical fitness which might render them unable to safely exercise these privileges.

## Part A - Requirements for granting a licence

### *Student pilot licence*

8. The Civil Aviation Authority requires an applicant for a student pilot licence in Macao to meet the following requirements in respect of age and medical fitness:

(1) *Age*

The applicant shall not be less than 18 years of age.

(2) *Medical fitness*

The Civil Aviation Authority shall not permit a student pilot to fly unless he/she satisfies the medical standards applicable to the private pilot licence specified in the Fourteenth Schedule of this Regulation.

### *Private pilot licence - Aeroplanes*

9. The Civil Aviation Authority requires an applicant for a private pilot licence of aeroplanes in Macao to meet the following requirements in respect of age, knowledge, experience, skill and medical fitness:

(1) *Age*

The applicant shall not be less than 18 years of age.

(2) *Knowledge*

The applicant shall have demonstrated a level of knowledge appropriate to the privileges granted to the holder of a private pilot licence - aeroplanes, in at least the following subjects:

*Air law*

- (a) rules and regulations relevant to the holder of a private pilot licence - aeroplanes; rules of the air; appropriate air traffic services practices and procedures;

*Aircraft general knowledge*

- (b) principles of operation of aeroplane powerplants, systems and instruments;
- (c) operating limitations of aeroplanes and powerplants; relevant operational information from the flight manual or other appropriate document;

*Flight performance and planning*

- (d) effects of loading and mass distribution on flight characteristics; mass and balance calculating;
- (e) use and practical application of take-off, landing and other performance data;
- (f) pre-flight and en-route flight planning appropriate to private operations under VFR; preparation and filing of air traffic services flight plans; appropriate air traffic services procedures; position reporting procedures; altimeter setting procedures; operations in areas of high-density traffic;

*Human performance*

- (g) human performance relevant to the private pilot - aeroplane;

*Meteorology*

- (h) application of elementary aeronautical meteorology; use of, and procedures for obtaining, meteorological information; altimetry;

*Navigation*

- (i) practical aspects of air navigation and dead-reckoning techniques; use aeronautical charts;

*Operational procedures*

- (j) use of aeronautical documentation such as AIP, NOTAM, aeronautical codes and abbreviations;
- (k) appropriate precautionary and emergency procedures, including action to be taken to avoid hazardous weather, wake turbulence and other operating hazards;

*Principles of flight*

- (l) principles of flight relating to aeroplanes;

*Radiotelephony*

- (m) radiotelephony procedures and phraseology as applied to VFR operations; action to be taken in case of communication failure.

(3) *Experience*

- (a) the applicant shall have completed not less than 40 hours of flight time as a pilot of aeroplanes. The Civil Aviation Authority shall determine whether experience as a pilot under instruction in a synthetic flight trainer, which must be approved, is acceptable as part of the total flight time of 40 hours. Credit for such experience shall be limited to a maximum of 5 hours;
- (b) when the applicant has flight time as a pilot of aircraft in other categories, the Civil Aviation Authority shall determine whether such experience is acceptable and, if so, the extent to which the flight time requirements specified in proviso (a) can be reduced accordingly;
- (c) the applicant shall have completed in aeroplanes not less than 10 hours of solo flight time under the supervision of an authorized flight instructor, including 5 hours of solo cross-country flight time with at least one cross-country flight totalling not less than 270 Km (150NM) in the course of which full-stop landings at two different aerodromes shall be made;

*Flight instruction*

- (d) the applicant shall have received dual instruction in aeroplanes from an authorized flight instructor. The instructor shall ensure that the applicant has operational experience in at least the following areas to the level of performance required for the private pilot:



- (i) pre-flight operations, including mass and balance determination, aeroplane inspection and servicing;
  - (ii) aerodrome and traffic pattern operations, collision avoidance precautions and procedures;
  - (iii) control of the aeroplane by external visual reference;
  - (iv) flight at critically slow airspeeds; recognition of, and recovery from, incipient and full stalls;
  - (v) flight at critically high airspeeds; recognition of, and recovery from, spiral dives;
  - (vi) normal and cross-wind take-offs and landings;
  - (vii) maximum performance (short field and obstacle clearance) take-offs; short-field landings;
  - (viii) flight by reference solely to instruments, including the completion of a level 180° turn;
  - (ix) cross-country flying using visual reference, dead-reckoning and, where available, radio navigation aids;
  - (x) emergency operations, including simulated aeroplane equipment malfunctions; and
  - (xi) operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures, radiotelephony procedures and phraseology.
- (e) if the privileges of the licence are to be exercised at night, the applicant shall have received dual instruction in aeroplanes in night flying, including take-offs, landings and navigation.

**Note.** - The instrument experience specified in proviso (d) (viii) and the night flying experience specified in proviso (e) do not entitle the holder of a private pilot licence - aeroplane to pilot aeroplanes under IFR.

#### (4) *Skills*

The applicant shall have demonstrated the ability to perform as pilot-in-command of an aeroplane, the procedures and manoeuvres required in sub-paragraph (3) for the flight instruction with a degree of competency appropriate to the privileges granted to the holder of a private pilot licence - aeroplane, and to:

- (a) operate the aeroplane within its limitations;
- (b) complete all manoeuvres with smoothness and accuracy;
- (c) exercise good judgement and airmanship;
- (d) apply aeronautical knowledge; and
- (e) maintain control of the aeroplane at all times in a manner such that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

#### (5) *Medical fitness*

The Civil Aviation Authority requires an applicant to satisfy the medical standards applicable to the granting or renewal of private pilot licences specified in the Fourteenth Schedule of this Regulation.

**Note.** - The applicant shall meet the applicable additional medical requirements prescribed by the Civil Aviation Authority in the case of seeking an instrument rating.

### *Private pilot licence - Helicopters*

10. The Civil Aviation Authority requires an applicant for a private pilot licence of helicopters in Macao to meet the following requirements in respect of age, knowledge, experience, skill and medical fitness:

(1) *Age*

The applicant shall be not less than 18 years of age.

(2) *Knowledge*

The applicant shall have demonstrated a level of knowledge appropriate to the privileges granted to the holder of a private pilot licence - helicopter, in at least the following subjects:

*Air law*

(a) rules and regulations relevant to the holder of a private pilot licence - helicopter; rules of the air; appropriate air traffic services practices and procedures;

*Aircraft general knowledge*

(b) principles of operation of helicopter powerplants, transmission (power - trains), systems and instruments;

(c) operating limitations of helicopters and powerplants; relevant operational information from the flight manual;

*Flight performance and planning*

(d) effects of loading and mass distribution on flight characteristics; mass and balance calculations;

(e) use and practical application of take-off, landing and other performance data;

(f) pre-flight and en-route flight planning appropriate to private operations under VFR; preparation and filing of air traffic services flight plans; appropriate air traffic services procedures; position reporting procedures; altimeter setting procedures; operations in areas of high-density traffic;

*Human performance*

(g) human performance relevant to the private pilot - helicopter;

*Meteorology*

(h) application of elementary aeronautical meteorology; use of, and procedures for obtaining, meteorological information; altimetry;

*Navigation*

- (i) practical aspects of air navigation and dead-reckoning techniques; use of aeronautical charts;

*Operational procedures*

- (j) use of aeronautical documentation such as AIP, NOTAM, aeronautical codes and abbreviations;
- (k) appropriate precautionary and emergency procedures, including action to be taken to avoid hazardous weather and wake turbulence; settling with power, ground resonance, roll-over and operating hazards;

*Principles of flight*

- (l) principles of flight relating to helicopters;
- (m) radiotelephony procedures and phraseology as applicable to VFR operations; action to be taken in case of communication failure.

(3) *Experience*

- (a) the applicant shall have completed not less than 40 hours of flight time as pilot of helicopters. The Civil Aviation Authority shall determine whether experience as a pilot under instruction in a synthetic flight trainer, which it has approved, is acceptable as part of the total flight time of 40 hours. Credit for such experience shall be limited to a maximum of 5 hours;
- (b) when the applicant has flight time as a pilot of aircraft in other categories, the Civil Aviation Authority shall determine whether such experience is acceptable and, if so, the extent to which the flight time requirements of proviso (a) can be reduced accordingly;
- (c) the applicant shall have completed in helicopters not less than 10 hours of solo flight time under the supervision of an authorized flight instructor, including 5 hours of solo cross-country flight totalling not less than 180Km (100NM) in the course of which landings at two different points shall be made;

*Flight instruction*

- (d) the applicant shall have received not less than 20 hours of dual instruction time in helicopters from an authorized flight instructor. The instructor shall ensure that the applicant has operational experience in at least the following areas to the level of performance required for the private pilot:
  - (i) pre-flight operations, including mass and balance determination, helicopter inspection and servicing;
  - (ii) aerodrome and traffic pattern operations, collision avoidance precautions and procedures;
  - (iii) control of the helicopter by external visual reference;
  - (iv) recovery at the incipient stage from settling with power; recovery techniques from low-rotor rpm within the normal range of engine rpm;
  - (v) ground manoeuvring and run-ups; hovering; take-offs and landings - normal, out of wind and sloping ground;

- (vi) take-offs and landings with minimum necessary power; maximum performance take-off and landing techniques; restricted site operations; quick stops;
  - (vii) cross-country flying using visual reference, dead-reckoning and, where available, radio navigation aids, including a flight of at least one hour;
  - (viii) emergency operations, including simulated helicopter equipment malfunctions; autorotative approach and landing; and
  - (ix) operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures, radiotelephony procedures and phraseology.
- (e) the applicant shall have received dual instrument flight instruction from an authorized flight instructor. The instructor shall ensure that the applicant has operational experience in flight solely by reference to instruments, including the completion of a level 180° turn, in a suitably instrumented helicopter; and
- (f) if the privileges of the licence are to be exercised at night, the applicant shall have received dual instruction in helicopters in night flying, including take-offs, landings and navigation.

**Note.** - The instrument experience specified in proviso (e) and the night flying experience specified in proviso (f) do not entitle the holder of a private pilot licence - helicopter to pilot helicopters under IFR.

(4) *Skill*

The applicant shall have demonstrated the ability to perform as pilot-in-command of a helicopter, the procedures and manoeuvres required in sub-paragraph (3) for the flight instruction with a degree of competency appropriate to the privileges granted to the holder of a private pilot licence - helicopter, and to:

- (a) operate the helicopter within its limitations;
- (b) complete all manoeuvres with smoothness and accuracy;
- (c) exercise good judgement and airmanship;
- (d) apply aeronautical knowledge; and
- (e) maintain control of the helicopter at all times in a manner such that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

(5) *Medical fitness*

The Civil Aviation Authority requires an applicant to satisfy the medical standards applicable to the granting or renewal of private pilots licences specified in the Fourteenth Schedule of this Regulation.

**Note.** - The applicant shall meet the applicable additional medical requirements prescribed by the Civil Aviation Authority in the case of seeking an instrument rating.

**Commercial pilot licence - Aeroplanes**

11. The Civil Aviation Authority requires an applicant for a commercial pilot licence of aeroplanes in Macao to meet the following requirements in respect of age, knowledge, experience, skill and medical fitness:

(1) *Age*

The applicant shall be not less than 18 years of age.

(2) *Knowledge*

The applicant shall have demonstrated a level of knowledge appropriate to the privileges granted to the holder of a commercial pilot licence - aeroplane, in at least the following subjects:

*Air law*

- (a) rules and regulations relevant to the holder of a commercial pilot licence - aeroplanes; rules of the air; appropriate air traffic services practices and procedures;

*Aircraft general knowledge*

- (b) principles of operation and functioning of aeroplane powerplants, systems and instruments;
- (c) operating limitations of appropriate aeroplanes and powerplants; relevant operational information from the flight manual or other appropriate document;
- (d) use and serviceability checks of equipment and systems of appropriate aeroplanes;
- (e) maintenance procedures for airframes, systems and powerplants of appropriate aeroplanes;

*Flight performance and planning*

- (f) effects of loading and mass distribution on aeroplane handling, flight characteristics and performance; mass and balance calculations;
- (g) use and practical application of take-off, landing and other performance data;
- (h) pre-flight and en-route flight planning appropriate to operations under VFR; preparation and filing of air traffic services flight plans; appropriate air traffic services procedures; altimeter setting procedures;

*Human performance*

- (i) human performance relevant to the commercial pilot - aeroplane;

*Meteorology*

- (j) interpretation and application of aeronautical meteorological reports, charts and forecasts; use of, and procedures for obtaining, meteorological information, pre-flight and in-flight; altimetry;
- (k) aeronautical meteorology; climatology of relevant areas in respect of the elements having an effect upon aviation, the movement of pressure systems, the structure of fronts, and the origin and characteristics of significant weather phenomena which affect take-off, en-route and landing conditions; hazardous weather avoidance;

*Navigation*

- (l) Air navigation, including the use of aeronautical charts, instruments and navigation aids; an understanding of the principles and characteristics of appropriate navigation systems; operation of airborne equipment;

*Operational procedures*

- (m) use of aeronautical documentation such as AIP, NOTAM, aeronautical codes and abbreviations;
- (n) appropriate precautionary and emergency procedures;
- (o) operational procedures for carriage of freight; potential hazards associated with the carriage of dangerous goods;
- (p) requirements and practices for safety briefing to passengers, including precautions to be observed when embarking and disembarking from aeroplanes;

*Principles of flight*

- (q) principles of flight relating to aeroplanes;

*Radiotelephony*

- (r) radiotelephony procedures and phraseology as applied to VFR operations; action to be taken in case of communication failure.

(3) *Experience*

- (a) the applicant shall have completed not less than 200 hours of flight time, or 150 hours if completed during a course of approved training, as a pilot of aeroplanes. The Civil Aviation Authority shall determine whether experience as a pilot under instruction in a synthetic flight trainer, which it has approved, is acceptable as part of the total flight time of 200 hours or 150 hours, as the case may be. Credit for such experience shall be limited to a maximum of 10 hours;
- (b) the applicant shall have completed in aeroplanes not less than:
  - (i) 100 hours as pilot-in-command or, in the case of a course of approved training, 70 hours as pilot-in-command;
  - (ii) 20 hours of cross-country flight time as pilot-in-command including a cross-country flight totalling not less than 540 km (300NM) in the course of which full-stop landings at two different aerodromes shall be made;
  - (iii) 10 hours of instrument instruction time of which not more than 5 hours may be instrument ground time; and
  - (iv) if the privileges of the licence are to be exercised at night, 5 hours of night flight time including 5 take-offs and 5 landings as pilot-in-command.
- (c) when the applicant has flight time as a pilot of aircraft in other categories, the Civil Aviation Authority shall determine whether such experience is acceptable and, if so, the extent to which the flight time requirements of proviso (a) can be reduced accordingly;

*Flight instruction*

- (d) the applicant shall have received dual instruction in aeroplanes from an authorized flight instructor. The instructor shall ensure that the applicant has operational experience in at least the following areas to the level of performance required for the commercial pilot:
- (i) pre-flight operations, including mass and balance determination, aeroplane inspection and servicing;
  - (ii) aerodrome and traffic pattern operations, collision avoidance precautions and procedures;
  - (iii) control of the aeroplane by external visual reference;
  - (iv) flight at critically slow airspeed; spin avoidance recognition of, and recovery from, incipient and full stalls;
  - (v) flight at critically high airspeeds; recognition of, and recovery from, spiral dives;
  - (vi) normal and cross-wind take-offs and landings;
  - (vii) maximum performance (short field and obstacle clearance) take-offs; short-field landings;
  - (viii) basic flight manoeuvres and recovery from unusual attitudes by reference solely to basic flight instruments;
  - (ix) cross-country flying using visual reference, dead-reckoning and radio navigation aids; diversion procedures;
  - (x) abnormal and emergency procedures and manoeuvres; and
  - (xi) operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures, radiotelephony procedures and phraseology.
- (e) if the privileges of the licence are to be exercised at night, the applicant shall have received dual instruction in aeroplanes in night flying, including take-offs, landings and navigation.

**Note.-** The instrument experience specified in proviso (b) (iii) and proviso (d) (viii) and the night flying experience specified in proviso (b) (iv) and proviso (e) of this sub-paragraph do not entitle the holder of a commercial pilot licence - aeroplanes to pilot aeroplanes under IFR.

(4) *Skill*

The applicant shall have demonstrated the ability to perform as pilot-in-command of an aeroplane, the procedures and manoeuvres described in sub-paragraph (3) for the flight instruction with a degree of competency appropriate to the privileges granted to the holder of a commercial pilot licence - aeroplane, and to:

- (a) operate the aeroplane within its limitations;
- (b) complete all manoeuvres with smoothness and accuracy;
- (c) exercise good judgement and airmanship;

- (d) apply aeronautical knowledge; and
- (e) maintain control of the aeroplane at all times in a manner such that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

(5) *Medical fitness*

The Civil Aviation Authority requires an applicant to satisfy the medical standards applicable to the granting or renewal of commercial pilots licences specified in the Fourteenth Schedule of this Regulation.

***Commercial pilot licence - Helicopters***

12. The Civil Aviation Authority requires an applicant for a commercial pilot licence of helicopters in Macao to meet the following requirements in respect of age, knowledge, experience, skill and medical fitness:

(1) *Age*

The applicant shall be not less than 18 years of age.

(2) *Knowledge*

The applicant shall have demonstrated a level of knowledge appropriate to the privileges granted to the holder of a commercial pilot licence - helicopter, in at least the following subjects:

*Air law*

- (a) rules and regulations relevant to the holder of a commercial pilot licence - helicopter; rules of the air; appropriate air traffic services practices and procedures;

*Aircraft general knowledge*

- (b) principles of operation and functioning of helicopter powerplants, transmission (power - trains), systems and instruments;
- (c) operating limitations of appropriate helicopters and powerplants; relevant operational information from the flight manual;
- (d) use and serviceability checks of equipment and systems of appropriate helicopters;
- (e) maintenance procedures for airframes, systems and powerplants of appropriate helicopters;

*Flight performance and planning*

- (f) effects of loading and mass distribution, including external loads, on helicopter handling, flight characteristics and performance; mass and balance calculations;
- (g) use and practical application of take-off, landing and other performance data;
- (h) pre-flight and en-route flight planning appropriate to operations under VFR; preparation and filing of air traffic services flight plans; appropriate air traffic services procedures; altimeter setting procedures;



*Human performance*

- (i) human performance relevant to the commercial pilot - helicopter;

*Meteorology*

- (j) interpretation and application of aeronautical meteorological reports, charts and forecasts; use of, and procedures for obtaining, meteorological information, pre-flight and in-flight; altimetry;
- (k) aeronautical meteorology; climatology of relevant areas in respect of the elements having an effect upon aviation; the movement of pressure systems, the structure of fronts, and the origin and characteristics of significant weather phenomena which affect take-off, en-route and landing conditions; hazardous weather avoidance;

*Navigation*

- (l) air navigation, including the use of aeronautical charts, instruments and navigation aids; an understanding of the principles and characteristics of appropriate navigation systems; operation of airborne equipment;

*Operation procedures*

- (m) use of aeronautical documentation such as AIP, NOTAM, aeronautical codes and abbreviations;
- (n) appropriate precautionary and emergency procedures; settling with power, ground resonance, roll-over and other operating hazards;
- (o) operational procedures for carriage of freight, including external loads; potential hazards associated with dangerous goods;
- (p) requirements and practices for safety briefing to passengers, including precautions to be observed when embarking and disembarking from helicopters;

*Principles of flight*

- (q) principles of flight relating to helicopters;

*Radiotelephony*

- (r) radiotelephony procedures and phraseology as applied to VFR operations; action to be taken in case of communication failure.

(3) *Experience*

- (a) the applicant shall have completed not less than 150 hours of flight time, or 100 hours if completed during a course of approved training, as a pilot of helicopters. The Civil Aviation Authority shall determine whether experience as a pilot under instruction in a synthetic flight trainer, which it has approved, is acceptable as part of the total flight time of 150 hours or 100 hours, as the case may be. Credit for such experience shall be limited to a maximum of 10 hours;
- (b) the applicant shall have completed in helicopters not less than:
  - (i) 35 hours as pilot-in-command;

- (ii) 10 hours of cross-country flight time as pilot-in-command including a cross-country flight in the course of which landings at two different points shall be made;
  - (iii) 10 hours of instrument instruction time of which not more than 5 hours may be instrument ground time; and
  - (iv) if the privileges of the licence are to be exercised at night, 5 hours of night flight time including 5 take-offs and 5 landing patterns as pilot-in-command.
- (c) when the applicant has flight time as a pilot of aircraft in other categories, the Civil Aviation Authority shall determine whether such experience is acceptable and, if so, the extent to which the flight time requirements of proviso (a) can be reduced accordingly;

*Flight instruction*

- (d) the applicant shall have received dual instruction in helicopters from an authorized flight instructor. The instructor shall ensure that the applicant has operational experience in at least the following areas to the level of performance required for the commercial pilot:
- (i) pre-flight operations, including mass and balance determination, helicopter inspection and servicing;
  - (ii) aerodrome and traffic pattern operations, collision avoidance precautions and procedures;
  - (iii) control of the helicopter by external visual reference;
  - (iv) recovery at the incipient stage from settling with power; recovery techniques from low-rotor rpm within the normal range of engine rpm;
  - (v) ground manoeuvring and run-ups; hovering; take-offs and landings - normal, out of wind and sloping ground; steep approaches;
  - (vi) take-offs and landings with minimum necessary power; maximum performance take-off and landing techniques; restricted site operations; quick stops;
  - (vii) hovering out of ground effect; operations with external load, if applicable; flight at high altitude;
  - (viii) basic flight manoeuvres and recovery from unusual attitudes by reference solely to basic flight instruments;
  - (ix) cross-country flying using visual reference, dead-reckoning and radio navigation aids; diversion procedures;
  - (x) abnormal and emergency procedures, including simulated helicopter equipment malfunctions, auto-rotative approach and landing; and
  - (xi) operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures, radiotelephony procedures and phraseology.
- (e) if the privileges of the licence are to be exercised at night, the applicant shall have received dual instruction in helicopters in night flying, including take-offs, landings and navigation.

**Note.**— The instrument experience specified in proviso (b) (iii) and proviso (d) (viii) and the night flying experience specified in proviso (b) (iv) and proviso (e) of this sub-paragraph do not entitle the holder of a commercial pilot licence - helicopter to pilot helicopters under IFR.

(4) *Skill*

The applicant shall have demonstrated the ability to perform as pilot-in-command of an helicopter, the procedures and manoeuvres described in sub-paragraph (3) with a degree of competency appropriate to the privileges granted to the holder of a commercial pilot licence - helicopter, and to:

- (a) operate the helicopter within its limitations;
- (b) complete all manoeuvres with smoothness and accuracy;
- (c) exercise good judgement and airmanship;
- (d) apply aeronautical knowledge; and
- (e) maintain control of the helicopter at all times in a manner such that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

(5) *Medical fitness*

The Civil Aviation Authority requires an applicant to satisfy the medical standards applicable to the granting or renewal of commercial pilots licences specified in the Fourteenth Schedule of this Regulation.

***Airline transport pilot licence - Aeroplanes***

13. The Civil Aviation Authority requires an applicant for an airline transport pilot licence of aeroplanes in Macao to meet the following requirements in respect of age, knowledge, experience, skill and medical fitness:

(1) *Age*

The applicant shall be not less than 21 years of age.

(2) *Knowledge*

The applicant shall have demonstrated a level of knowledge appropriate to the privileges granted to the holder of a commercial pilot licence - aeroplane, in at least the following subjects:

*Air law*

- (a) rules and regulations relevant to the holder of a commercial pilot licence - aeroplane; rules of the air; appropriate air traffic services practices and procedures;

*Aircraft general knowledge*

- (b) general characteristics and limitations of electrical, hydraulic, pressurization and other aeroplane systems; flight control systems, including autopilot and stability augmentation;

- (c) principles of operation, handling procedures and operating limitations of aeroplane powerplants; effects of atmospheric conditions on engine performance; relevant operational information from the flight manual or other appropriate document;
- (d) operating procedures and limitations of appropriate aeroplanes; effects of atmospheric conditions on aeroplane performance;
- (e) use and serviceability checks of equipment and systems of appropriate aeroplanes;
- (f) flight instruments; compasses, turning and acceleration errors; gyroscopic instruments, operational limits and procession effects, practices and procedures in the event of malfunctions of various flight instruments;
- (g) maintenance procedures for airframes, systems and powerplants of appropriate aeroplanes;

#### *Flight performance and planning*

- (h) effects of loading and mass distribution on aeroplane handling, flight characteristics and performance; mass and balance calculations;
- (i) use and practical application of take-off, landing and other performance data, including procedures for cruise control;
- (j) pre-flight and en-route operational flight planning; preparation and filing of air traffic services flight plans; appropriate air traffic services procedures; altimeter setting procedures;

#### *Human performance*

- (k) human performance relevant to the airline transport pilot - aeroplane;

#### *Meteorology*

- (l) interpretation and application of aeronautical meteorological reports, charts and forecasts; codes and abbreviations; use of, and procedures for obtaining, meteorological information, pre-flight and in-flight; altimetry;
- (m) aeronautical meteorology; climatology of relevant areas in respect of the elements having an effect upon aviation; the movement of pressure systems; the structure of fronts, and the origin and characteristics of significant weather phenomena which affect take-off, en-route and landing conditions;
- (n) causes, recognition and effects of engine and airframe icing; frontal zone penetration procedures; hazardous weather avoidance;
- (o) practical high altitude meteorology, including interpretation and use of weather reports, charts and forecasts; jetstreams;

#### *Navigation*

- (p) air navigation, including the use of aeronautical charts, radio navigation aids and area navigation systems specified navigation systems; specified navigation requirements for long-range flights;

- (q) use, limitation and serviceability of avionics and instruments necessary for the control and navigation of aeroplanes;
- (r) use, accuracy and reliability of navigation systems used in departure, en-route, approach and landing phases of flight; identification of radio navigation aids;
- (s) principles and characteristics of self-contained and external-referenced navigation systems; operation of airborne equipment;

*Operational procedures*

- (t) interpretation and use of aeronautical documentation such as AIP, NOTAM, aeronautical codes and abbreviations, and instrument procedure charts for departure, en-route, descent and approach;
- (u) precautionary and emergency procedures; safety practices associated with flight under IFR;
- (v) operational procedures for carriage of freight and dangerous goods;
- (w) requirements and practices for safety briefing to passengers, including precautions to be observed when embarking and disembarking from aeroplanes;

*Principles of flight*

- (x) principles of flight relating to aeroplanes; sub-sonic aerodynamics; compressibility effects, manoeuvre boundary limits, wing design characteristics, effects of supplementary lift and drag devices; relationships between lift, drag and thrust at various airspeeds and in different flight configurations;

*Radiotelephony*

- (y) radiotelephony procedures and phraseology; action to be taken in case of communication failure.

(3) *Experience*

- (a) the applicant shall have completed not less than 1500 hours of flight time, as a pilot of aeroplanes. The Civil Aviation Authority shall determine whether experience as a pilot under instruction in a synthetic flight trainer, which it has approved, is acceptable as part of the total flight time of 1500 hours. Credit for such experience shall be limited to a maximum of 100 hours, of which not more than 25 hours shall have been acquired in a flight procedure trainer or a basic instrument flight trainer;
- (b) the applicant shall have completed in aeroplanes not less than:
  - (i) 250 hours, either as pilot-in-command, or made up by not less than 100 hours as pilot-in-command and the necessary additional flight time as co-pilot performing, under the supervision of the pilot-in-command, the duties and functions of a pilot-in-command, provided that the method of supervision employed is acceptable to the Civil Aviation Authority;
  - (ii) 200 hours of cross-country flight time, of which not less than 100 hours shall be as pilot-in-command or as co-pilot performing, under the supervision of the pilot-in-command,

the duties and functions of a pilot-in-command, provided that the method of supervision employed is acceptable to the Civil Aviation Authority;

- (iii) 75 hours of instrument time, of which not more than 30 hours may be instrument ground time; and
  - (iv) 100 hours of night flight as pilot-in-command or as co-pilot.
- (c) when the applicant has flight time as a pilot of aircraft in other categories, the Civil Aviation Authority shall determine whether such experience is acceptable and, if so, the extent to which the flight time requirements of proviso (a) can be reduced accordingly;

*Flight instruction*

- (d) the applicant shall have received the dual flight instruction required for the issue of the commercial pilot licence - aeroplane as specified in paragraph 11 (3) of this Schedule for the flight instruction and paragraph 48 (2) (c) of this Schedule for the issue of the instrument rating - aeroplane.

(4) *Skill*

- (a) The applicant shall have demonstrated the ability to perform as pilot-in-command of a multi-engine aeroplane required to be operated with a co-pilot, the following procedures and manoeuvres:
- (i) pre-flight procedures, including the preparation of the operational flight plan and filing of the air traffic services flight plan;
  - (ii) normal flight procedures and manoeuvres during all phases of flight;
  - (iii) procedures and manoeuvres for IFR operations under normal, abnormal and emergency conditions, including simulated engine failure, and covering at least the following:
    - transition to instrument flight on take-off;
    - standard instrument departures and arrivals;
    - en-route IFR procedures and navigation;
    - holding procedures;
    - instrument approaches to specified minima;
    - missed approach procedures; and
    - landings from instrument approaches.
- (b) abnormal and emergency procedures and manoeuvres related to failures and malfunctions of equipment, such as powerplant, systems and airframe;
- (c) procedures for crew incapacitation and crew co-ordination, including allocation of pilot tasks, crew co-operation and use of checklists; and

- (d) the applicant shall have demonstrated the ability to perform the procedures and manoeuvres described in proviso (a) with a degree of competency appropriate to the privileges granted to the holder of an airline transport pilot licence - aeroplanes, and to:
- (i) operate the aeroplane within its limitations;
  - (ii) complete all manoeuvres with smoothness and accuracy;
  - (iii) exercise good judgement and airmanship;
  - (iv) apply aeronautical knowledge;
  - (v) maintain control of the aeroplane at all times in a manner such that the successful outcome of a procedure or manoeuvre is never in doubt;
  - (vi) understand and apply crew co-ordination and incapacitation procedures; and
  - (vii) communicate effectively with the other flight crew members.

(5) *Medical fitness*

The Civil Aviation Authority requires an applicant to satisfy the medical standards applicable to the granting or renewal of airline transport pilot licences specified in the Fourteenth Schedule of this Regulation.

*Airline transport pilot licence - Helicopters*

14. The Civil Aviation Authority requires an applicant for an airline transport pilot licence of helicopters in Macao to meet the following requirements in respect of age, knowledge, experience, skill and medical fitness:

(1) *Age*

The applicant shall be not less than 21 years of age.

(2) *Knowledge*

The applicant shall have demonstrated a level of knowledge appropriate to the privileges granted to the holder of an airline transport pilot licence - helicopter, in at least the following subjects:

*Air law*

- (a) rules and regulations relevant to the holder of an airline transport pilot licence - helicopter; rules of the air; appropriate air traffic services practices and procedures;

*Aircraft general knowledge*

- (b) general characteristics and limitations of electrical, hydraulic, and other helicopter systems; flight control systems, including autopilot and stability augmentation;
- (c) principles of operation, handling procedures and operating limitations of helicopter powerplants; transmission (power - trains); effects of atmospheric conditions on engine performance; relevant operational information from the flight manual;

- (d) operating procedures and limitations of appropriate helicopters; effects of atmospheric conditions on helicopter performance; relevant operational information from the flight manual;
- (e) use and serviceability checks of equipment and systems of appropriate helicopters;
- (f) flight instruments; compasses, turning and acceleration errors; gyroscopic instruments, operational limits and precession effects; practices and procedures in the event of malfunctions of various flight instruments;
- (g) maintenance procedures for airframes, systems and powerplants of appropriate helicopters;

*Flight performance and planning*

- (h) effects of loading and mass distribution, including external loads, on helicopter handling, flight characteristics and performance; mass and balance calculations;
- (i) use and practical application of take-off, landing and other performance data, including procedures for cruise control;
- (j) pre-flight and en-route operational flight planning; preparation and filing of air traffic services flight plans; appropriate air traffic services procedures; altimeter setting procedures;

*Human performance*

- (k) human performance relevant to the airline transport pilot - helicopter;

*Meteorology*

- (l) interpretation and application of aeronautical meteorological reports, charts and forecasts; codes and abbreviations; use of, and procedures for obtaining, meteorological information, pre-flight and in-flight; altimetry;
- (m) aeronautical meteorology; climatology of relevant areas in respect of the elements having an effect upon aviation; the movement of pressure systems, the structure of fronts, and the origin and characteristics of significant weather phenomena which affect take-off, en-route and landing conditions;
- (n) cause, recognition and effects of engine, airframe and rotor icing; hazardous weather avoidance;

*Navigation*

- (o) air navigation, including the use of aeronautical charts, radio navigation aids and area navigation systems; specific navigation requirements for long-range flights;
- (p) use, limitation and serviceability of avionics and instruments necessary for the control and navigation of helicopters;
- (q) use, accuracy and reliability of navigation systems; identification of radio navigation aids;
- (r) principles and characteristics of self-contained and external-referenced navigation systems; operation of airborne equipment;

*Operation procedures*



- (s) interpretation and use of aeronautical documentation such as AIP, NOTAM, aeronautical codes and abbreviations;
- (t) precautionary and emergency procedure; settling with power, ground resonance, retreating blade stall, dynamics roll-over and other operating hazards; safety practices associated with flight under VFR;
- (u) operational procedures for carriage of freight, including external loads, and dangerous goods;
- (v) requirements and practices for safety briefing to passengers, including precautions to be observed when embarking and disembarking from helicopters;

*Principles of flight*

- (w) principles of flight relating to helicopters;

*Radiotelephony*

- (x) radiotelephony procedures and phraseology; action to be taken in case of communication failure.

(3) *Experience*

- (a) the applicant shall have completed not less than 1000 hours of flight time as a pilot of helicopters;
- (b) the Civil Aviation Authority shall determine whether experience as a pilot under instruction in a synthetic flight trainer, which it has approved, is acceptable as part of the total flight time of 1000 hours. Credit for such experience shall be limited to a maximum of 100 hours, of which not more than 25 hours shall have been acquired in a flight procedure trainer or a basic instrument flight trainer;
- (c) the applicant shall have completed in helicopters not less than:
  - (i) 250 hours, either as pilot-in-command, or made up by not less than 100 hours as pilot-in-command and the necessary additional flight time as co-pilot performing, under the supervision of the pilot-in-command, the duties and functions of a pilot-in-command, provided that the method of supervision employed is acceptable to the Civil Aviation Authority;
  - (ii) 200 hours of cross-country flight time, of which not less than 100 hours shall be as pilot-in-command or as co-pilot performing, under the supervision of the pilot-in-command, the duties and functions of a pilot-in-command, provided that the method of supervision employed is acceptable to the Civil Aviation Authority;
  - (iii) 30 hours of instrument time, of which not more than 10 hours may be instrument ground time; and
  - (iv) 50 hours of night flight as pilot-in-command or as co-pilot.
- (d) when the applicant has flight time as a pilot of aircraft in other categories, the Civil Aviation Authority shall determine whether such experience is acceptable and, if so, the extent to which the flight time requirements of proviso (a) can be reduced accordingly; and

*Flight instruction*

- (e) the applicant shall have received the flight instruction required for the issue of the commercial pilot licence - helicopter as specified in paragraph 12 (3) (d).

**Note.** The instrument time specified in proviso (c) (iii) and the night flying time specified in proviso (c) (iv) of this sub-paragraph do not entitle the holder of the airline transport pilot licence - helicopter to pilot helicopters under IFR.

(4) *Skill*

- (a) the applicant shall have demonstrated the ability to perform, as pilot-in-command of a helicopter required to be operated with a co-pilot, the following procedures and manoeuvres:
- (i) pre-flight procedures, including the preparation of the operation flight plan and filing of the air traffic service flight plans;
  - (ii) normal flight procedures and manoeuvres during all phase of flight;
  - (iii) abnormal and emergency procedures and manoeuvres related to failures and malfunctions of equipment, such as powerplant, systems and airframe; and
  - (iv) procedures for crew incapacitation and crew co-ordination including allocation of pilot tasks, crew co-operation and use of checklists.
- (b) the applicant shall have demonstrated the ability to perform the procedures and manoeuvres described in proviso (a) with a degree of competency appropriate to the privileges granted to the holder of an airline transport pilot licence - helicopter, and to:
- (i) operate the helicopter within its limitations;
  - (ii) complete all manoeuvres with smoothness and accuracy;
  - (iii) exercise good judgement and airmanship;
  - (iv) apply aeronautical knowledge;
  - (v) maintain control of the helicopter at all times in a manner such that the successful outcome of a procedure or manoeuvre is never in doubt;
  - (vi) understand and apply crew co-ordination and incapacitation procedures; and
  - (vii) communicate effectively with the other flight crew members.

(5) *Medical fitness*

The Civil Aviation Authority requires an applicant to satisfy the medical standards applicable to the granting or renewal of airline transport pilot licences specified in the Fourteenth Schedule of this Regulation.

*Flight navigator licence*

15. The Civil Aviation Authority requires an applicant for a flight navigator licence in Macao to meet the following requirements in respect of age, knowledge, experience, skill and medical fitness:

(1) *Age*

The applicant shall be not less than 21 years of age.

(2) *Knowledge*

The applicant shall have demonstrated a level of knowledge appropriate to the privileges granted to the holder of a flight navigator licence, in at least the following subjects:

*Air law*

- (a) rules and regulations relevant to the holder of a flight navigator licence; appropriate air traffic services practices and procedures;

*Flight performance and planning*

- (b) effects of loading and mass distribution on aircraft performance;
- (c) use of take-off, landing and other performance data including procedures for cruise control;
- (d) pre-flight and en-route operational flight planning preparation and filing of air traffic services flight plans; appropriate air traffic services procedures; altimeter setting procedures;

*Human performance*

- (e) human performance relevant to the flight navigator;

*Meteorology*

- (f) interpretation and practical application of aeronautical meteorological reports, charts and forecasts; codes and abbreviations; use of, and procedures for obtaining meteorological information, pre-flight and in-flight; altimetry;
- (g) aeronautical meteorology; climatology of relevant areas in respect of the elements having an effect upon aviation; the movement of pressure systems; the structure of fronts, and the origin and characteristics of significant weather phenomena which affect take-off, en-route and landing conditions;

*Navigation*

- (h) dead-reckoning, pressure-pattern and celestial navigation procedures; the use of aeronautical charts, radio navigation aids and area navigation systems; specific navigation requirements for long-range flights;
- (i) use, limitation and serviceability of avionics and instruments necessary for the navigation of the aircraft;
- (j) use, accuracy and reliability of navigation systems used in departure, en-route and approach phases of flight; identification of radio navigation aids;

- (k) principles, characteristics and use of self-contained and external-referenced navigation systems; operation of airborne equipment;
- (l) the celestial sphere including the movement of heavenly bodies and their selection and identification for the purpose of observation and reduction of sights; calibration of sextants; the completion of navigation documentation;
- (m) definitions, units and formulae used in air navigation;

*Operational procedures*

- (n) interpretation and use of aeronautical documentation such as AIP, NOTAM, aeronautical codes, abbreviations, and instrument procedure charts for departure, en-route, descent and approach;

*Principles of flight*

- (o) principles of flight; and

*Radiotelephony*

- (p) radiotelephony procedures and phraseology.

(3) *Experience*

- (a) the applicant shall have completed in the performance of the duties of a flight navigator, not less than 200 hours of flight time acceptable to the Civil Aviation Authority, in aircraft engaged in cross-country flights, including not less than 30 hours by night;
- (b) when the applicant has flight time as a pilot, the Civil Aviation Authority shall determine whether such experience is acceptable and, if so, the extent to which the flight time requirements of proviso (a) can be reduced accordingly;
- (c) the applicant shall produce evidence of having satisfactorily determined the aircraft's position in flight, and used that information to navigate the aircraft, as follows:
  - (i) by night - not less than 25 times by celestial observations; and
  - (ii) by day - not less than 25 times by celestial observations in conjunction with self-contained or external-referenced navigation systems.

(4) *Skill*

The applicant shall have demonstrated the ability to perform as flight navigator of an aircraft with a degree of competency appropriate to the privileges granted to the holder of a flight navigator licence, and to:

- (a) exercise good judgement and airmanship;
- (b) apply aeronautical knowledge;
- (c) perform all duties as part of an integrated crew; and
- (d) communicate effectively with the other flight crew members.

(5) *Medical fitness*

The Civil Aviation Authority requires an applicant to satisfy the medical standards applicable to the granting or renewal of flight navigator licences specified in the Fourteenth Schedule of this Regulation.

*Flight engineer licence*

16. The Civil Aviation Authority requires an applicant for a flight engineer licence in Macao to meet the following requirements in respect of age, knowledge, experience, skill and medical fitness:

(1) *Age*

The applicant shall be not less than 21 years of age.

(2) *Knowledge*

The applicant shall have demonstrated a level of knowledge appropriate to the privileges granted to the holder of a flight engineer licence, in at least the following subjects:

*Air law*

- (a) rules and regulations relevant to the holder of a flight engineer licence; rules and regulations governing the operation of civil aircraft pertinent to the duties of a flight engineer;

*Aircraft general knowledge*

- (b) basic principles of powerplants, gas turbines and/or piston engines; characteristics of fuels, fuel systems including fuel control; lubricants and lubrication systems; afterburners and injection systems, function and operation of engine ignition and starter systems;
- (c) principles of operation, handling procedures and operating limitations of aircraft powerplants; effects of atmospheric conditions on engine performance;
- (d) airframes, flight controls, structures, wheel assemblies, brakes and anti-skid units, corrosion and fatigue life; identification of structural damage and defects;
- (e) ice and rain protection systems;
- (f) pressurization and air-conditioning systems, oxygen systems;
- (g) hydraulic and pneumatic systems;
- (h) basic electrical theory, electric systems (AC and DC), aircraft wiring systems, bonding and screening;
- (i) principles of operation of instruments, compasses, auto-pilots, radio communication equipment, radio and radar navigation aids, flight management systems, displays and avionics;
- (j) limitations of appropriate aircraft;
- (k) fire protection, detection, suppression and extinguishing systems;

- (l) use and serviceability checks of equipment and systems of appropriate aircraft;

*Flight performance and planning*

- (m) effects of loading and mass distribution on aircraft handling, flight characteristics and performance; mass and balance calculations;
- (n) use and practical application of performance data including procedures for cruise control;

*Human performance*

- (o) human performance relevant to the flight engineer;

*Operation procedures*

- (p) principles of maintenance, procedures for the maintenance of airworthiness, defect reporting, pre-flight inspections, precautionary procedures for fuelling and use of external power; installed equipment and cabin systems;
- (q) normal, abnormal and emergency procedures;
- (r) operational procedures for carriage of freight and dangerous goods;

*Principles of flight*

- (s) fundamentals of aerodynamics; and

*Radiotelephony*

- (t) radiotelephony procedures and phraseology.

- (3) The applicant should have demonstrated a level of knowledge appropriate to the privileges granted to the holder of a flight engineer licence in at least the following subjects:

- (a) fundamentals of navigation; principles and operation self-contained systems; and
- (b) operational aspects of meteorology.

- (4) *Experience*

- (a) the applicant shall have completed, under the supervision of a person accepted by the Civil Aviation Authority for that purpose, not less than 100 hours of flight time in the performance of the duties of a flight engineer. The Civil Aviation Authority shall determine whether experience as a flight engineer in a flight simulator, which it has approved, is acceptable as part of the total flight time of 100 hours. Credit for such experience shall be limited to a maximum of 50 hours.
- (b) when the applicant has flight time as a pilot, the Civil Aviation Authority shall determine whether such experience is acceptable and, if so, the extent to which the flight time requirements of proviso (a) can be reduced accordingly.
- (c) the applicant shall have operational experience in the performance of the duties of a flight engineer, under the supervision of a flight engineer accepted by the Civil Aviation Authority for that purpose, in at least the following areas:

(i) *Normal procedures*

- pre-flight inspections;
- fuelling procedures, fuel management;
- inspection of maintenance documents;
- normal flight deck procedures during all phases of flight;
- crew co-ordination and procedures in case of crew incapacitation; and
- defect reporting.

(ii) *Abnormal and alternate (standby) procedures*

- recognition of abnormal functioning of aircraft systems; and
- use of abnormal and alternate (standby) procedures.

(iii) *Emergency procedures*

- recognition of emergency conditions; and
- use of appropriate emergency procedures.

(5) *Skill*

(a) the applicant shall have demonstrated the ability to perform as flight engineer of an aircraft, the duties and procedures described in sub-paragraph (3) (c) with a degree of competency appropriate to the privileges granted to the holder of a flight engineer licence, and to:

- (i) use aircraft systems within the aircraft's capabilities and limitations;
- (ii) exercise good judgement and airmanship;
- (iii) apply aeronautical knowledge;
- (iv) perform all the duties as part of an integrated crew with the successful outcome never in doubt; and
- (v) communicate effectively with the other flight crew members.

(b) the use of a synthetic flight trainer for performing any of the procedures required during the demonstration of skill described in this sub-paragraph shall be approved by the Civil Aviation Authority, which shall ensure that the synthetic flight trainer is appropriate to the task.

(6) *Medical fitness*

The Civil Aviation Authority requires an applicant to satisfy the medical standards applicable to the granting or renewal of flight engineer licences specified in the Fourteenth Schedule of this Regulation.

***Flight radiotelephony operator licence (general or restricted)***

17. The Civil Aviation Authority requires an applicant for a flight radiotelephony operator licence (general or restricted) in Macao to meet the following requirements in respect of age, knowledge, experience, skill and medical fitness:

(1) *Age*

The applicant shall not be less than 18 years of age.

(2) *Knowledge*

The applicant shall satisfy the Civil Aviation Authority as to his/her knowledge of:

- (a) the basic organisation of an aeronautical radiotelephony network system;
- (b) characteristics of high frequency propagation and the use of frequency families;
- (c) terms used in the aeronautical mobile service, procedure words and phrases, the spelling alphabet;
- (d) the various communication codes and abbreviations used;
- (e) the relevant aeronautical fixed service organisation associated with the local radiotelephony network area or areas, with particular emphasis on the need for rapid relay of messages to and from aircraft;
- (f) ICAO radiotelephony operating procedures, including their application with particular reference to the handling of distress, urgency and safety traffic;
- (g) a comprehensive knowledge of the Chinese and English languages designated for the use in air-ground communications, and ability to speak such languages without accent or impediment which would adversely affect radio communication; and
- (h) a general understanding of the air traffic services provided within Macao.

(3) *Experience*

The applicant shall have:

- (a) satisfactorily completed an approved training course within the 12 month period immediately preceding the application, and have served satisfactorily under a qualified aeronautical station operator or flight radiotelephony operator, for not less than two months; or
- (b) satisfactorily served under a qualified flight radiotelephony operator for not less than six months during the 12 months immediately preceding the application.

(4) *Skill*

- (a) the applicant shall demonstrate, or have demonstrated, his/her competency in:
  - (i) the manipulation and operation of typical transmit/receive equipment and controls, including ancillary facilities, and radio direction finding apparatus in use;



- (ii) the visual inspection and daily operational check of the radio equipment he uses in such detail as is necessary to detect faults which should be revealed in such inspection, and to correct such faults that do not require the use of special tools or instruments;
  - (iii) the transmission of telephony messages, including correct microphone technique, enunciation, and speech quality; and
  - (iv) the reception of telephony message and, where relevant, the ability to copy radio signals and messages directly on to a typewriter.
- (b) if an extension of privileges to include operation of radiotelegraphy equipment is sought, the applicant shall demonstrate, or have demonstrated his/her competency in:
- (i) the transmission and aural reception of International Morse Code in groups (letters, figures and signs of punctuation) at a speed of not less than 16 groups per minute and plain language at a speed of not less than 20 words per minute. Code groups shall average five characters, each figure or punctuation mark counting as two characters, and plain language shall average five characters to the word. Each test shall be of not less than five minutes duration; and
  - (ii) the manipulation and adjustment of the operating controls of a typical aeronautical station's radiotelegraph apparatus.

(5) *Medical fitness*

The Civil Aviation Authority requires an applicant to satisfy the medical standards applicable to the granting or renewal of flight radiotelephony operator licences specified in the Fourteenth Schedule of this Regulation.

**Part B - Requirements for the validity and renewal of licences and ratings**

18. Flight crew licences and ratings issued or validated in Macao by the Civil Aviation Authority will remain in force for a period specified therein but not exceeding the periods established in paragraph 3 of the Fourteenth Schedule of this Regulation regarding the frequency of the medical routine checks. Before the expiry of this period, an application for renewal shall be submitted to the Civil Aviation Authority if the holder wishes to continue to use the privileges of his/her licences or ratings, and the licence or rating may be renewed, provided the applicant:
- (a) in the preceding period has exercised the privileges of his/her licence or rating in order to meet, at least, the minimum requirements regarding the recent experience specified in Part B of this Schedule;
  - (b) is not suffering from any disability likely to adversely affect his/her technical skill or judgement and has satisfactorily meet the requirements of the medical examinations in accordance with the standards, requirements and time periods specified in the Fourteenth Schedule to this Regulation; and
  - (c) do not pass the limit of 60 years of age.
19. In the process of revalidation of flight crew licences and ratings issued or validated in Macao by the Civil Aviation Authority, the applicant shall take note of the following conditions:
- (a) applicants should note that renewal of a licence which has expired cannot be back-dated and consequently any exercise of privileges in the intervening period would be illegal;

- (b) a licence which has lapsed for a period less than the limit specified in paragraph 3 of the Fourteenth Schedule will only be renewed for a period not exceeding that limit from the date of application for renewal, but a renewal fee for the whole period is payable;
- (c) it is essential that the application for renewal is received by the Civil Aviation Authority approximately one month prior to the date of expiry of the licence; and
- (d) a licence which has lapsed for a period more than the limit specified in paragraph 3 of the Fourteenth Schedule will not be renewed without a number and type of examinations which the Civil Aviation Authority deems necessary and sufficient to ascertain the competency of the holder. The number and type of the examinations are dependent upon the nature of employment of the holder and the time lapsed since the licence has expired.

20. The Civil Aviation Authority, having issued, validated or revalidated a flight crew licence or rating in Macao, shall, at any time, cancel, revoke, or restrain the privileges granted by that licence, or by related ratings, unless the holder satisfactorily demonstrates continuous competency and meets the requirements for recent experience established by the Civil Aviation Authority provided that:

- (a) the maintenance of competency of flight crew members, engaged in commercial air transport operations, may be satisfactorily established by demonstrations of skill during proficiency flight checks completed under the supervision of the Civil Aviation Authority or any other authorised person;
- (b) maintenance of competency may be satisfactorily recorded in the operator's records, or in the flight crew member's personal flying log book or licence; and
- (c) flight crew members may, to the extent deemed feasible by the Civil Aviation Authority, demonstrate their continuing competency in synthetic flight trainers approved by the Civil Aviation Authority.

***Requirements to revalidate a private pilot licence - Aeroplanes and helicopters***

21. The holder of a valid private pilot licence (aeroplanes or helicopters) issued or validated in Macao may apply for his/her revalidation to the Civil Aviation Authority and such revalidation may be granted if the following requirements are met:

- (a) the applicant must demonstrate evidence of recently acquired flight experience appropriate to the qualifications held as part of the privileges of his/her licence. For the purpose of this type of licence revalidation, recent experience shall be considered as a minimum of 6 hours of flight time within the preceding 12 months and 3 landings within the preceding 90 days from the date of the application;
- (b) in the case where the applicant wishes to continue exercising the privileges of his/her licence in respect to night flying according to paragraph 9 (3) (e) or 10 (3) (f) of this Schedule, whichever is the applicable case, he/she has to produce evidence of recent experience in the form of 5 landings at night to a full stop within the preceding 90 days of the application. These landings may count towards the requirements referred to in proviso (a).
- (c) the applicant must submit to the Civil Aviation Authority a medical certificate in accordance with the terms and conditions specified in the Fourteenth Schedule of this Regulation. Renewal of the applicant's licence is subject to the satisfaction of the medical requirements described in the Fourteenth Schedule of this Regulation;

- (d) the applicant must pay the applicable fees in accordance with the specifications of the Twelfth Schedule of this Regulation; and
- (e) in the case the applicant fails to comply with the requirements specified in this paragraph, the Civil Aviation Authority shall stamp the word "CANCELLED" in all non-revalidated qualifications.

22. Whenever a holder of a private pilot licence (aeroplanes or helicopters) issued or validated in Macao by the Civil Aviation Authority, let the privileges of his/her licence to expiry and wishes to apply for the revalidation of the licence, the applicant shall meet the following requirements:

- (a) hold a valid medical certificate obtained in accordance with the terms and conditions specified in the Fourteenth Schedule to this Regulation;
- (b) comply with the minimum recent experience required in paragraph 21 (a) of this Schedule and, if applicable, also with proviso (b) of the same paragraph;
- (c) demonstrate that he/she still has the aeronautical knowledge required for the issuing of such licence. To fulfil this requirement, the candidate shall obtain from an authorised flight instructor, or approved flight school, an endorsement testifying that the candidate is complying with the requirements referred to in paragraph 9 (4) or 10 (4) of this Schedule, whichever is the applicable case, and has accomplished the minimum experience required in paragraph 21 (a) of this Schedule, and if applicable in proviso (b) of the same paragraph; and
- (d) pay the applicable fees specified in the Twelfth Schedule of this Regulation.

#### ***Commercial pilot licence - Aeroplanes and helicopters***

23. The holder of a valid commercial pilot licence (aeroplanes or helicopters) issued or validated in Macao may apply for his/her revalidation to the Civil Aviation Authority and such revalidation may be granted if the following requirements are met:

- (a) the applicant must demonstrate evidence of recently acquired flight experience appropriate to the qualifications hold as part of the privileges of his/her licence. For the purpose of this type of licence revalidation, recent experience shall be considered as a minimum of 6 hours of flight time within the preceding 6 months and 5 landings within the preceding 90 days from the date of the application;
- (b) in the case where the applicant wishes to continue exercising the privileges of his/her licence in respect to night flying according to paragraph 11 (3) (e) or 12 (3) (e) of this Schedule, whichever is the applicable case, he/she has to produce evidence of recent experience in the form of 5 landings at night to a full stop within the preceding 90 days of the application. These landings may count towards the requirements referred to in proviso (a).
- (c) the applicant must submit to the Civil Aviation Authority a medical certificate in accordance with the terms and conditions specified in the Fourteenth Schedule of this Regulation. Renewal of the applicant's licence is subject to the satisfaction of the medical requirements described in the Fourteenth Schedule of this Regulation;
- (d) the applicant must pay the applicable fees in accordance with the specifications of the Twelfth Schedule of this Regulation; and

(e) in the case the applicant fails to comply with the requirements specified in this paragraph, the Civil Aviation Authority shall stamp the word “CANCELLED” in all non-revalidated qualifications.

24. Whenever a holder of a commercial pilot licence (aeroplanes or helicopters) issued or validated in Macao by the Civil Aviation Authority, let the privileges of his/her licence to expiry and wishes to apply for the revalidation of the licence, the applicant shall meet the following requirements:

- (a) hold a valid medical certificate obtained in accordance with the terms and conditions specified in the Fourteenth Schedule to this Regulation;
- (b) comply with the minimum recent experience required in paragraph 23 (a) of this Schedule and, if applicable, also with proviso (b) of the same paragraph;
- (c) demonstrate that he/she still has the aeronautical knowledge required for the issuing of such licence. To fulfil this requirement, the candidate shall obtain from an authorised flight instructor, or approved flight school, an endorsement testifying that the candidate is complying with the requirements referred to in paragraph 11 (4) or 12 (4) of this Schedule, whichever is the applicable case, and has accomplished the minimum experience required in paragraph 23 (a) of this Schedule, and if applicable in proviso (b) of the same paragraph; and
- (d) pay the applicable fees specified in the Twelfth Schedule of this Regulation.

***Airline transport pilot licence - Aeroplanes and helicopters***

25. The holder of a valid airline transport pilot licence (aeroplanes or helicopters) issued or validated in Macao may apply for his/her revalidation to the Civil Aviation Authority and such revalidation may be granted if the following requirements are met:

- (a) in the case of an aeroplane licence, the applicant must demonstrate evidence of recently acquired flight experience appropriate to the qualifications hold as part of the privileges of his/her licence. For the purpose of this type of licence revalidation, recent experience shall be considered as a minimum of 12 hours of flight time within the preceding 6 months and 6 hours of instrument flight time within the preceding 90 days from the date of the application;
- (b) in the case of a helicopter licence, the applicant must demonstrate evidence of recently acquired flight experience appropriate to the qualifications hold as part of the privileges of his/her licence. For the purpose of this type of licence revalidation, recent experience shall be considered as a minimum of 12 hours of flight time within the preceding 6 months and 10 landings within the preceding 90 days from the date of the application;
- (c) in the case of a helicopter licence and where the applicant wishes to continue exercising the privileges of his/her licence in respect to night flying according to paragraph 14 (3) (c) of this Schedule, he/she has to produce evidence of recent experience in the form of 5 landings at night to a full stop within the preceding 90 days of the application. These landings may count towards the requirements referred to in proviso (b);
- (d) the applicant must submit to the Civil Aviation Authority a medical certificate in accordance with the terms and conditions specified in the Fourteenth Schedule of this Regulation. Renewal of the applicant's licence is subject to the satisfaction of the medical requirements described in the Fourteenth Schedule of this Regulation;
- (e) the applicant must pay the applicable fees in accordance with the specifications of the Twelfth Schedule of this Regulation; and

(f) in the case the applicant fails to comply with the requirements specified in this paragraph, the Civil Aviation Authority shall stamp the word "CANCELLED" in all non-revalidated qualifications.

26. Whenever a holder of an airline transport pilot licence (aeroplanes or helicopters) issued or validated in Macao by the Civil Aviation Authority, let the privileges of his/her licence to expiry and wishes to apply for the revalidation of the licence, the applicant shall meet the following requirements:

- (a) hold a valid medical certificate obtained in accordance with the terms and conditions specified in the Fourteenth Schedule to this Regulation;
- (b) comply with the minimum recent experience required in paragraph 25 (a) or (b) of this Schedule, whichever is the applicable case, and, if applicable, also with proviso (c) of the same paragraph;
- (c) demonstrate that he/she still has the aeronautical knowledge required for the issuing of such licence. To fulfil this requirement, the candidate shall obtain from an authorised flight instructor, or approved flight school, an endorsement testifying that the candidate is complying with the requirements referred to in paragraph 13 (4) or 14 (4) and of this Schedule and has accomplished the minimum experience required in paragraph 25 (a) of this Schedule, and if applicable in proviso (b) of the same paragraph; and
- (d) pay the applicable fees specified in the Twelfth Schedule of this Regulation.

#### *Flight navigator licence*

27. The holder of a valid flight navigator licence issued or validated in Macao may apply for his/her revalidation to the Civil Aviation Authority and such revalidation may be granted if the following requirements are met:

- (a) the applicant must demonstrate evidence of recently acquired flight experience appropriate to the qualifications held as part of the privileges of his/her licence. For the purpose of this type of licence revalidation, recent experience shall be considered as a minimum of 6 hours of flight time exercising the privileges of the licence within the preceding 6 months from the date of the application;
- (b) the applicant must submit to the Civil Aviation Authority a medical certificate in accordance with the terms and conditions specified in the Fourteenth Schedule of this Regulation. Renewal of the applicant's licence is subject to the satisfaction of the medical requirements described in the Fourteenth Schedule of this Regulation;
- (d) the applicant must pay the applicable fees in accordance with the specifications of the of this Regulation; and
- (e) in the case the applicant fails to comply with the requirements specified in this paragraph, the Civil Aviation Authority shall stamp the word "CANCELLED" in all non-revalidated qualifications.

28. Whenever a holder of a flight navigator licence issued or validated in Macao by the Civil Aviation Authority, let the privileges of his/her licence to expiry and wishes to apply for the revalidation of the licence, the applicant shall meet the following requirements:

- (a) hold a valid medical certificate obtained in accordance with the terms and conditions specified in the Fourteenth Schedule to this Regulation;

- (b) comply with the minimum recent experience required in paragraph 27 (a) of this Schedule;
- (c) demonstrate that he/she still has the aeronautical knowledge required for the issuing of such licence. To fulfil this requirement, the candidate shall obtain from an authorised flight instructor, or approved flight school, an endorsement testifying that the candidate is complying with the requirements referred to in paragraph 15 (4) of this Schedule and has accomplished the minimum experience required in paragraph 27 (a) of this Schedule; and
- (d) pay the applicable fees specified in the Twelfth Schedule of this Regulation.

### *Flight engineer licence*

29. The holder of a valid flight engineer licence issued or validated in Macao may apply for his/her revalidation to the Civil Aviation Authority and such revalidation may be granted if the following requirements are met:

- (a) the applicant must demonstrate evidence of recently acquired flight experience appropriate to the qualifications held as part of the privileges of his/her licence. For the purpose of this type of licence revalidation, recent experience shall be considered as a minimum of 6 hours of flight time exercising the privileges of the licence within the preceding 6 months from the date of the application;
- (b) the applicant must submit to the Civil Aviation Authority a medical certificate in accordance with the terms and conditions specified in the Fourteenth Schedule of this Regulation. Renewal of the applicant's licence is subject to the satisfaction of the medical requirements described in the Fourteenth Schedule of this Regulation;
- (c) the applicant must pay the applicable fees in accordance with the specifications of the Twelfth Schedule of this Regulation; and
- (d) in the case the applicant fails to comply with the requirements specified in this paragraph, the Civil Aviation Authority shall stamp the word "CANCELLED" in all non-revalidated qualifications.

30. Whenever a holder of a flight engineer licence issued or validated in Macao by the Civil Aviation Authority, let the privileges of his/her licence to expiry and wishes to apply for the revalidation of the licence, the applicant shall meet the following requirements:

- (a) hold a valid medical certificate obtained in accordance with the terms and conditions specified in the Fourteenth Schedule to this Regulation;
- (b) comply with the minimum recent experience required in paragraph 29 (a) of this Schedule;
- (c) demonstrate that he/she still has the aeronautical knowledge required for the issuing of such licence. To fulfil this requirement, the candidate shall obtain from an authorised flight instructor, or approved flight school, an endorsement testifying that the candidate is complying with the requirements referred to in paragraph 16 (4) of this Schedule and has accomplished the minimum experience required in paragraph 29 (a) of this Schedule; and
- (d) pay the applicable fees specified in the Twelfth Schedule of this Regulation.

### *Flight radiotelephony operator*

31. The holder of a valid flight radiotelephony operator licence issued or validated in Macao may apply for his/her revalidation to the Civil Aviation Authority and such revalidation may be granted if the following requirements are met:
- (a) the applicant must demonstrate evidence of recently acquired flight experience appropriate to the qualifications held as part of the privileges of his/her licence. For the purpose of this type of licence revalidation, recent experience shall be considered as a minimum of 6 months of exercise of privileges and at least 70 hours of service as a flight radiotelephony officer in the last 12 months preceding the date of the application;
  - (b) the applicant must submit to the Civil Aviation Authority a medical certificate in accordance with the terms and conditions specified in the Fourteenth Schedule of this Regulation. Renewal of the applicant's licence is subject to the satisfaction of the medical requirements described in the Fourteenth Schedule of this Regulation;
  - (c) the applicant must pay the applicable fees in accordance with the specifications of the Twelfth Schedule of this Regulation; and
  - (d) in the case the applicant fails to comply with the requirements specified in this paragraph, the Civil Aviation Authority shall stamp the word "CANCELLED" in all non-revalidated qualifications.
32. Whenever a holder of a flight radiotelephony operator licence issued or validated in Macao by the Civil Aviation Authority, let the privileges of his/her licence to expire and wishes to apply for the revalidation of the licence, the applicant shall meet the following requirements:
- (a) hold a valid medical certificate obtained in accordance with the terms and conditions specified in the Fourteenth Schedule to this Regulation;
  - (b) comply with the minimum recent experience required in paragraph 31 (a) of this Schedule;
  - (c) demonstrate that he/she still has the aeronautical knowledge required for the issuing of such licence. To fulfil this requirement, the candidate shall obtain from an authorised flight instructor, or approved flight school, an endorsement testifying that the candidate is complying with the requirements referred to in paragraph 17 (4) of this Schedule and has accomplished the minimum experience required in paragraph 31 (a) of this Schedule; and
  - (d) pay the applicable fees specified in the Twelfth Schedule of this Regulation.

***Flight instructor rating - Aeroplanes and (or) helicopters***

33. The holder of a valid flight instructor rating - aeroplane and (or) helicopter issued or validated in Macao may apply for his/her revalidation to the Civil Aviation Authority and such revalidation may be granted if the following requirements are met:
- (a) the applicant shall hold a valid pilot licence issued or revalidated by the Civil Aviation Authority according with the requirements established in this Schedule;
  - (b) the flight instructor rating - aeroplane and (or) helicopter may be, in principle, revalidated for maximum periods of 24 months;
  - (c) the applicant must demonstrate evidence of recently provided flight instruction work appropriate to the flight instructor rating - aeroplane and (or) helicopter qualification(s) held as part of the privileges of his/her licence. For the purpose of this type of rating revalidation, recent

experience shall be ascertained every 12 months and shall consist of a practical test, or those portions of the test that the Civil Aviation Authority deems necessary to determine his/her competency as a flight instructor. The Civil Aviation Authority may exempt the applicant from the practical test, provided that:

- (i) his/her record of instruction shows that he/she is a competent and diligent flight instructor; or
  - (ii) he/she has a satisfactory record as a company check pilot, chief flight instructor or any other activity involving the regular evaluation of pilots and passes any oral test that the Civil Aviation Authority deems necessary to determine the instructor's knowledge of current pilot training and standards; or
  - (iii) he/she has successfully completed within 90 days before the application for the renewal of the rating, an approved flight instructor refresher course consisting of not less than 24 hours of ground flight instruction.
- (d) the applicant must pay the applicable fees in accordance with the specifications of the Twelfth Schedule of this Regulation; and
- (e) in the case the applicant fails to comply with the requirements specified in this paragraph, the Civil Aviation Authority shall stamp the word "CANCELLED" in all non-revalidated qualifications.

34. Whenever a holder of a flight instructor rating - aeroplane and (or) helicopter issued or validated in Macao by the Civil Aviation Authority, let the privileges of his/her licence rating to expiry and wishes to apply for the revalidation of the rating, the applicant shall meet the following requirements:

- (a) the applicant shall hold a valid pilot licence issued or revalidated by the Civil Aviation Authority according with the requirements established in this Schedule;
- (b) hold a valid medical certificate obtained in accordance with the terms and conditions specified in the Fourteenth Schedule to this Regulation;
- (c) comply with the minimum recent experience required in paragraph 33 (c) of this Schedule;
- (d) pass the number and type of tests that the Civil Aviation Authority deems necessary to demonstrate that he/she still has the aeronautical knowledge skills and competence required for the issuing of such licence rating; and
- (e) the applicant must pay the applicable fees in accordance with the specifications of the Twelfth Schedule of this Regulation.

***Instrument rating - Aeroplanes and (or) helicopters***

35. The holder of a valid instrument rating - aeroplane and (or) helicopter issued or validated in Macao may apply for his/her revalidation to the Civil Aviation Authority and such revalidation may be granted if the following requirements are met:

- (a) the applicant shall hold a valid pilot licence issued or revalidated by the Civil Aviation Authority according with the requirements established in this Schedule;



- (b) the instrument rating - aeroplane and (or) helicopter may be, in principle, revalidated for maximum periods of 6 months;
  - (c) the applicant must demonstrate evidence of recently acquired instrument flight experience appropriate to the instrument rating - aeroplane and (or) helicopter qualification hold as part of the privileges of his/her licence. For the purpose of this type of rating revalidation, recent experience shall be ascertained every 6 months and shall be considered as a minimum of 6 hours of instrument flight time within the preceding 90 days from the date of the application and having completed satisfactorily an instrument check ride;
  - (d) the applicant must pay the applicable fees in accordance with the specifications of the Twelfth Schedule of this Regulation; and
  - (e) in the case the applicant fails to comply with the requirements specified in this paragraph, the Civil Aviation Authority shall stamp the word "CANCELLED" in all non-revalidated qualifications.
36. Whenever a holder of an instrument rating - aeroplane and (or) helicopter issued or validated in Macao by the Civil Aviation Authority, let the privileges of his/her licence rating to expiry and wishes to apply for the revalidation of the rating, the applicant shall meet the following requirements:
- (a) the applicant shall hold a valid pilot licence issued or revalidated by the Civil Aviation Authority according with the requirements established in this Schedule;
  - (b) hold a valid medical certificate obtained in accordance with the terms and conditions specified in the Fourteenth Schedule to this Regulation;
  - (c) comply with the minimum recent experience required in paragraph 35 (c) of this Schedule and;
  - (d) demonstrate that he/she still has the aeronautical knowledge required for the issuing of such rating. To fulfil this requirement, the candidate shall obtain from an authorised flight instructor, or approved flight school, an endorsement testifying that the candidate is complying with the requirements referred to in paragraph 48 (3) or 49 (3) of this Schedule and has accomplished the minimum experience required in paragraph 35 (c) of this Schedule; and
  - (e) pay the applicable fees specified in the Twelfth Schedule of this Regulation.

### Part C - Licence ratings and categories

37. (1) The following ratings may be included in a pilot licence (other than a student pilot licence) in Macao granted under the present Part of this Schedule, and, subject to the provisions of this Regulation and of the licence, the inclusion of a rating in a licence shall have the consequences respectively specified as follows:

**Aircraft rating** - the licence shall entitle the holder to act as pilot only of aircraft of the types specified in the aircraft rating and different types of aircraft may be specified in respect of different privileges of a licence.

**Instrument rating (Aircraft)** - shall entitle the holder of the licence to act as pilot of an aircraft flying in controlled airspace in accordance with the Instrument Flight Rules:

Provided that the holder shall not be so entitled unless the licence bears a certificate, signed by a person authorised by the Civil Aviation Authority for that purpose, indicating that the holder has, within the previous 6 months, passed an instrument flying test.

**Night rating (Private pilot licence - Aeroplane)** - shall entitle the holder of a private pilot licence - aeroplane to act as pilot-in-command of an aeroplane carrying passengers by night.

**Night rating (Private pilot licence - Helicopter)** - shall entitle the holder of a private pilot licence - helicopters to act as pilot-in-command of a helicopter carrying passengers by night.

**Flight instructor rating** - shall entitle the holder of the licence to give instruction in flying aircraft of such types as may be specified in the rating for that purpose, provided that:

Such instruction shall only be given under the supervision of a person present during the take off and landing at the aerodrome at which the instruction is to begin and end and holding a pilot licence endorsed with a flying instructor rating;

- (2) An aircraft rating may be included in every flight engineer licence. The licence shall entitle the holder to act as flight engineer only of aircraft of a type specified in the aircraft rating.
- (3) For the purposes of this Schedule:

**Solo flight** means a flight on which the pilot of the aircraft is not accompanied by a person holding a pilot licence granted or rendered valid under this Regulation;

**Cross-country flight** means any flight during the course of which the aircraft is more than 4.8 km from the aerodrome of departure.

38. A person shall not act either as pilot-in-command or as co-pilot of a Macao registered aircraft unless that person is the holder of a pilot licence issued, validated or revalidated by the Civil Aviation Authority in accordance with the provisions of this Schedule and in any of the following categories:

- (a) aeroplanes
- (b) helicopters

Provided that the category of aircraft shall be included in the title of the licence itself, or endorsed as a category rating on the licence.

39. The holder of a valid pilot licence issued, validated or revalidated in Macao by the Civil Aviation Authority seeking a licence for an additional category of aircraft, shall apply to the Civil Aviation Authority to either:

- (a) issue the licence holder with an additional pilot licence for that category of aircraft; or
- (b) endorse the original licence with the new category rating, subject to the conditions established by the Civil Aviation Authority for the issuing of category ratings.

In this respect, the applicant shall follow the Civil Aviation Authority's requirements for category ratings in terms of licensing specifications for pilots and at levels appropriate to the privileges to be granted to the licence holder.

40. In the process of issuing or validating category ratings for pilot licences issued, validated or revalidated in Macao by the Civil Aviation Authority, the following requirements must be taken into consideration:
- (a) when established, category ratings shall be for categories of aircraft listed in paragraph 38 of this Schedule;
  - (b) category ratings shall not be endorsed on a licence when the category is included in the title of the licence itself;
  - (c) any additional category rating endorsed on a pilot licence shall indicate the level of licensing privileges at which the category rating is granted; and
  - (d) the holder of a pilot licence seeking additional category ratings shall meet the requirements specified in this Schedule appropriate to the privileges for which the category rating is sought.
41. The Civil Aviation Authority establishes the following class ratings for aeroplanes and helicopters for those flight crew members holding a pilot licence issued or validated in Macao by the Civil Aviation Authority:
- (a) single-engine, land;
  - (b) single-engine, sea;
  - (c) multi-engine, land; or
  - (d) multi-engine, sea.
- The provisions of this paragraph do not preclude the establishment of other class ratings within this basic structure.
42. The Civil Aviation Authority shall establish type ratings to be incorporated in the pilots licences issued or validated in Macao, for:
- (a) each type of aircraft certificated for operation with a minimum crew of at least two pilots;
  - (b) each type of helicopter certificated for single-pilot operation; and
  - (c) any type of aircraft whenever considered necessary by the Civil Aviation Authority.
43. The Civil Aviation Authority having issued, validated or revalidated a pilot licence in Macao shall not permit the holder of such licence to act either as pilot-in-command or as a co-pilot of an aeroplane or helicopter unless the holder has received authorization as follows:
- (a) the appropriate class rating specified in paragraph 41 of this Schedule;
  - (b) a type rating when required in accordance with the provisions of paragraph 42 of this Schedule; or
  - (c) for the purpose of training, testing, or specific special purpose non-revenue, non-passenger carrying flights, special authorization may be provided in writing to the licence holder by the Civil Aviation Authority in place of issuing the class or type rating in accordance with this paragraph. This authorization shall be limited in validity to the time needed to complete the specific flight.

(d) When a type rating is issued limiting the privileges to act as co-pilot, such limitation shall be endorsed on the rating.

44. The applicant for the incorporation of class or type ratings in his/her licence in Macao shall have to demonstrate to the Civil Aviation Authority a degree of skill appropriate to the licence in an aircraft of the class for which the rating is sought. The requirements established by the Civil Aviation Authority for the issue, validation or revalidation of type ratings for pilot licences in Macao is as follows:

(1) *Type rating as required by paragraph 42 (a)*

(a) the applicant shall have gained, under appropriate supervision, experience in the applicable type of aircraft and/or flight simulator in the following:

- (i) normal flight procedures and manoeuvres during all phases of flight;
- (ii) abnormal and emergency procedures and manoeuvres in the event of failures and malfunctions of equipment, such as powerplant, systems and airframe;
- (iii) where applicable, instrument procedures, including instrument approach, missed approach and landing procedures under normal, abnormal and emergency conditions, including simulated engine failure;
- (iv) procedures for crew incapacitation and crew co-ordination including allocation of pilot tasks; and
- (v) crew co-operation and use of checklists.

(b) the applicant shall have demonstrated the skill and knowledge required for the safe operation of the applicable type of aircraft, relevant to the duties of a pilot-in-command or a co-pilot as applicable; and

(c) the applicant shall have demonstrated, at the airline transport pilot licence level, an extent of knowledge determined by the Civil Aviation Authority on the basis of the requirements specified in paragraphs 13 (2) or 14 (2) of this Schedule, as applicable.

(2) *Type rating as required by paragraph 42 (b) and (c)*

The applicant shall have demonstrated the skill and knowledge required for the safe operation of the applicable type of aircraft, relevant to the licensing requirements and piloting functions of the applicant.

(3) *Use of synthetic flight trainers for demonstrations of skill*

The use of a synthetic flight trainer for performing any manoeuvre required during the demonstration of skill for the issue of a licence or rating shall be approved by the Civil Aviation Authority which shall ensure that the synthetic flight trainer used is appropriate to the task.

45. The Civil Aviation Authority, having issued, validated or revalidated a pilot licence in Macao, shall not permit the holder thereof to act either as pilot-in-command or as a co-pilot of an aircraft under instrument flight rules (IFR) unless such holder has received proper authorization from the Civil Aviation Authority. Proper authorization shall comprise an instrument rating appropriate to the aircraft category. In the case of an airline transport pilot licence - aeroplane, the instrument rating shall be automatically granted as part of the requirements to obtain this licence.

46. The Civil Aviation Authority, having issued, validated or revalidated a pilot licence shall not permit the holder thereof to carry out flight instruction required for the issue of a private pilot licence - aeroplane or helicopter, commercial pilot licence - aeroplane or helicopter, or a flight instructor rating appropriate to aeroplanes and helicopters, unless such holder has received proper authorisation from the Civil Aviation Authority. Proper authorisation shall comprise:
- (a) a flight instructor rating on the holder's licence; or
  - (b) the authority to act as an agent of an approved organisation authorised by the Civil Aviation Authority to carry out flight instruction; or
  - (c) a specific authorisation granted by the Civil Aviation Authority.

***Flight instructor rating - Aeroplanes and helicopters***

47. The Civil Aviation Authority requires an applicant for a flight instructor rating either in aeroplanes or helicopters in Macao to meet the following requirements in respect of knowledge, experience and skill:

(1) *Knowledge*

The applicant shall have met the knowledge requirements for the issue of a commercial pilot licence as specified in paragraphs 11 (2) or 12 (2) of this Schedule, as appropriate. In addition, the applicant shall have demonstrated a level of knowledge appropriate to the privileges granted to the holder of a flight instructor rating, in at least the following areas:

- (a) techniques of applied instruction;
- (b) assessment of student performance in those subjects in which ground instruction is given;
- (c) the learning process;
- (d) elements of effective teaching;
- (e) student evaluation and testing, training philosophies;
- (f) training programme development;
- (g) lesson planning;
- (h) classroom instructional techniques;
- (i) use of training aids;
- (j) analysis and correction of student errors;
- (k) human performance relevant to flight instruction; and
- (l) hazards involved in simulating system failures and malfunctions in the aircraft.

(2) *Experience*

- (a) the applicant shall have met the experience requirements for the issue of a commercial pilot licence as specified in paragraphs 11 (3) or 12 (3) of this Schedule, as appropriate.

*Flight instruction*

- (b) the applicant shall, under the supervision of a flight instructor accepted by the Civil Aviation Authority for that purpose:
- (i) have received instruction in flight instructional techniques including demonstration, student practices, recognition and correction of common student errors; and
  - (ii) have practised instructional techniques in those flight manoeuvres and procedures in which it is intended to provide flight instruction.

(3) *Skill*

The applicant shall have demonstrated, in the category of aircraft for which flight instructor privileges are sought, the ability to instruct in those areas in which flight instruction is to be given, including pre-flight, post-flight and ground instruction as appropriate.

*Instrument rating - Aeroplanes*

48. The Civil Aviation Authority requires an applicant in Macao for the incorporation of an instrument rating - aeroplane in his/her pilot licence to meet the following requirements in respect of knowledge, experience, skill and medical fitness:

(1) *Knowledge*

The applicant shall have demonstrated a level of knowledge appropriate to the privileges granted to the holder of an instrument rating - aeroplane, in at least the following subjects:

*Air law*

- (a) rules and regulations relevant to flight under IFR; related air traffic services practices and procedures;

*Aircraft general knowledge*

- (b) use, limitation and serviceability of avionics and instruments necessary for the control and navigation of aeroplanes under IFR and in instrument meteorological conditions; use and limitations of autopilot;
- (c) compasses, turning and acceleration errors; gyroscopic instruments, operational limits and precession effects; practices and procedures in the event of malfunctions of various flight instruments;

*Flight performance and planning*

- (d) pre-flight preparations and checks appropriate to flight under IFR;
- (e) operational flight planning; preparation and filing of air traffic services flight plans under IFR; altimeter setting procedures;

*Human performance*

- (f) human performance relevant to instrument flight in aeroplanes;

*Meteorology*

- (g) application of aeronautical meteorology; interpretation and use of reports, charts and forecasts; codes and abbreviations; use of, and procedures for obtaining, meteorological information; altimetry;
- (h) cause, recognition and effects of engine and airframe icing; frontal zone penetration procedures; hazardous weather avoidance;

*Navigation*

- (i) practical air navigation using radio navigation aids;
- (j) use, accuracy and reliability of navigation systems used in departure, en-route, approach and landing phases of flight; identification of radio navigation aids;

*Operational procedures*

- (k) interpretation and use of aeronautical documentation such as AIP, NOTAM, aeronautical codes and abbreviations, and instrument procedure charts for departure, en-route, descent and approach;
- (l) precautionary and emergency procedures; safety practices associated with flight under IFR; and

*Radiotelephony*

- (m) radiotelephony procedures and phraseology as applied to aircraft operations under IFR, action to be taken in case of communication failure.

(2) *Experience*

- (a) the applicant shall hold a private or commercial pilot licence - aeroplane.
- (b) the applicant shall have completed not less than:
- (i) 50 hours of cross-country flight time as pilot-in-command of aircraft in categories acceptable to the Civil Aviation Authority, of which not less than 10 hours shall be in aeroplanes; and
  - (ii) 40 hours of instrument time in aeroplanes or helicopters of which not more than 20 hours, or 30 hours where a flight simulator is used, may be instrument ground time. The ground time shall be under the supervision of an authorised ground instructor.

*Flight instruction*

- (c) the applicant shall have gained not less than 10 hours of the instrument flight time required in proviso (b) (ii) while receiving dual instrument flight instruction in aeroplanes from an authorized flight instructor. The instructor shall ensure that the applicant has operational experience in at least the following areas to the level of performance required for the holder of an instrument rating:

- (i) pre-flight procedures, including the use of the flight manual or equivalent document, and appropriate air traffic services documents in the preparation of an IFR flight plan;
  - (ii) pre-flight inspection, use of checklists, taxiing and pre-take-off checks;
  - (iii) procedures and manoeuvres for IFR operation under normal, abnormal and emergency conditions covering at least:
    - transition to instrument flight on take-off;
    - standard instrument departures and arrivals;
    - en-route IFR procedures;
    - holding procedures;
    - instrument approaches to specified minima;
    - missed approach procedures; and
    - landings from instrument approaches.
  - (d) in-flight manoeuvres and particular flight characteristics.
  - (e) if the privileges of the instrument rating are to be exercised on multi-engine aeroplanes, the applicant shall have received dual instrument flight instruction in such an aeroplane from an authorized flight instructor. The instructor shall ensure that the applicant has operational experience in the operation of the aeroplane solely by reference to instruments with one engine inoperative or simulated inoperative.
- (3) *Skill*
- (a) the applicant shall have demonstrated the ability to perform the procedures and manoeuvres described in sub-paragraph (2) (c) with a degree of competency appropriate to the privileges granted to the holder of an instrument rating - aeroplane, and to:
    - (i) operate the aeroplane within its limitations;
    - (ii) complete all manoeuvres with smoothness and accuracy;
    - (iii) exercise good judgement and airmanship;
    - (iv) apply aeronautical knowledge; and
    - (v) maintain control of the aeroplane at all times in a manner such that the successful outcome of a procedure or manoeuvre is never seriously in doubt.
  - (b) the applicant shall have demonstrated the ability to operate multi-engine aeroplanes solely by reference to instruments with one engine inoperative, or simulated inoperative, if the privileges of the instrument rating are to be exercised on such aeroplanes.

**Note.-** Attention is called to paragraph 6 of this Schedule on the use of synthetic flight trainers for demonstrations of skill.



(4) *Medical fitness*

Applicants who hold a private pilot licence shall comply with the Class 1 Medical Assessment according to the Fourteenth Schedule.

*Instrument rating - Helicopters*

49. The Civil Aviation Authority requires an applicant in Macao for the incorporation of an instrument rating - helicopter in his/her pilot licence to meet the following requirements in respect of knowledge, experience, skill and medical fitness:

(1) *Knowledge*

The applicant shall have demonstrated a level of knowledge appropriate to the privileges granted to the holder of an instrument rating - helicopter, in at least the following subjects:

*Air law*

- (a) rules and regulations relevant to flight under IFR; related air traffic services practices and procedures;

*Aircraft general knowledge*

- (b) use, limitation and serviceability of avionics and instruments necessary for the control and navigation of helicopters under IFR and in instrument meteorological conditions; use and limitations of autopilot;
- (c) compasses, turning and acceleration errors; gyroscopic instruments, operational limits and precession effects; practices and procedures in the event of malfunctions of various flight instruments;

*Flight performance and planning*

- (d) pre-flight preparations and checks appropriate to flight under IFR;
- (e) operational flight planning; preparation and filing of air traffic services flight plans under IFR; altimeter setting procedures;

*Human performance*

- (f) human performance relevant to instrument flight in helicopters;

*Meteorology*

- (g) application of aeronautical meteorology; interpretation and use of reports, charts and forecasts; codes and abbreviations; use of, and procedures for obtaining, meteorological information; altimetry;
- (h) causes, recognition and effects of engine, airframe and rotor icing; frontal zone penetration procedures; hazardous weather avoidance;

*Navigation*

- (i) practical air navigation using radio navigation aids;
- (j) use, accuracy and reliability of navigation systems used in departure, en-route, approach and landing phases of flight; identification of radio navigation aids;

*Operation procedures*

- (k) interpretation and use of aeronautical documentation such as AIP, NOTAM, aeronautical codes and abbreviations, and instrument procedure charts for departure, en-route, descent and approach;
- (l) precautionary and emergency procedures; safety practices associated with flight under IFR; and

*Radiotelephony*

- (m) radiotelephony procedures and phraseology as applied to aircraft operations under IFR; action to be taken in case of communication failure.

(2) *Experience*

- (a) the applicant shall hold a private, commercial or airline transport pilot licence - helicopter.
- (b) the applicant shall have completed not less than:
  - (i) 50 hours of cross-country flight time as pilot-in-command of aircraft in categories acceptable to the Civil Aviation Authority, of which not less than 10 hours shall be in helicopters; and
  - (ii) 40 hours of instrument time in helicopters or aeroplanes of which not more than 20 hours, or 30 hours where a flight simulator is used, may be instrument ground time. The ground time shall be under the supervision of an authorized instructor.

*Flight instruction*

- (c) the applicant shall have gained not less than 10 hours of the instrument flight time required in proviso (b) (ii) while receiving dual instrument flight instruction in helicopters from an authorized flight instructor. The instructor shall ensure that the applicant has operational experience in at least the following areas and to the level of performance required for the holder of an instrument rating:
  - (i) pre-flight procedures, including the use of the flight manual or equivalent documents, and appropriate air traffic services documents in the preparation of an IFR flight plan;
  - (ii) pre-flight inspection, use of checklists, taxiing and pre-take-off checks;
  - (iii) procedures and manoeuvres for IFR operation under normal, abnormal and emergency conditions covering at least:
    - transition to instrument flight on take-off;
    - standard instrument departures and arrivals;
    - en-route IFR procedures;

- holding procedures;
  - instrument approaches to specified minima;
  - missed approach procedures; and
  - landings from instrument approaches.
- (d) in-flight manoeuvres and particular flight characteristics; and
- (e) if appropriate, operation of a multi-engined helicopter solely by reference to instruments with one engine inoperative or simulated inoperative.

(3) *Skill*

The applicant shall have demonstrated the ability to perform the procedures and manoeuvres specified in sub-paragraph (2) (c) with a degree of competency appropriate to the privileges granted to the holder of an instrument rating - helicopter, and to:

- (a) operate the helicopter within its limitations;
- (b) complete all manoeuvres with smoothness and accuracy;
- (c) exercise good judgement and airmanship;
- (d) apply aeronautical knowledge; and
- (e) maintain control of the helicopter at all times in a manner such that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

**Note.-** Attention is called to paragraph 6 of this Schedule on the use of synthetic flight trainers for demonstrations of skill.

(4) *Medical fitness*

Applicants who hold a private pilot licence shall comply with the Class 1 Medical Assessment according to the Fourteenth Schedule.

**Part D - Privileges of the licences and ratings holders**

***Student pilot licence - Aeroplanes and helicopters***

50. Subject to compliance with the requirements specified in paragraph 8 of this Schedule, the privileges of the holder of a student pilot licence - aeroplanes or helicopters, granted in Macao by the Civil Aviation Authority, shall be:
- (a) to entitle the holder to fly as pilot-in-command of an aircraft for the purpose of becoming qualified for the grant or renewal of a pilot licence;
  - (b) shall be valid only for flights within Macao and within any country specified in the licence;

- (c) shall not entitle the holder to fly as pilot-in-command of an aircraft in which any person is carried;
- (d) shall be valid only for flights carried out in accordance with instructions given by a person holding a valid pilot licence granted under the terms of this Schedule, being a licence which includes a flying instructor's rating entitling he/she to give instruction in flying the type of aircraft to be flown.

Provided that:

- (e) a student pilot shall not fly solo unless under the supervision of, or with the authority of, an authorized flight instructor with a valid licence; and
- (f) a student pilot shall not fly solo in an aircraft on an international flight unless by special, or general arrangement, between the Civil Aviation Authority and under other Contracting States.

#### ***Private pilot licence - Aeroplanes and helicopters***

51. Subject to compliance with the requirements specified in paragraphs 7, 18, 20, 21 and 22 of this Schedule, the privileges of the holder of a private pilot licence - aeroplane or helicopter, granted or revalidated in Macao by the Civil Aviation Authority, shall be:
- (a) to entitle the holder to fly as pilot-in-command or co-pilot of an aeroplane or a helicopter of any of the types specified in the aircraft rating included in the licence, when the aircraft is flying for any purpose other than commercial air transport or aerial work, meaning that engagement in any flights which involve any kind of remuneration or revenue is not allowed;
  - (b) not to entitle the holder to act as pilot-in-command by night unless a valid night rating is included in the licence, or unless a valid instrument rating is included therein meaning the compliance with the requirements specified in paragraphs 48 and (or) 49 of this Schedule, whichever is the applicable case; or
  - (c) to entitle the holder to act as a holder of a flight radiotelephony operator's restricted licence.

#### ***Commercial pilot licence - Aeroplanes and helicopters***

52. Subject to compliance with the requirements specified in paragraphs 7, 18, 20, 23 and 24 of this Schedule, the privileges of the holder of a commercial pilot licence - aeroplane or helicopter, granted or revalidated in Macao by the Civil Aviation Authority, shall be:
- (a) to exercise all the privileges of the holder of a private pilot licence - aeroplane or helicopter, whichever is the applicable case;
  - (b) to act as pilot-in-command in any aeroplane or helicopter, whichever is the applicable case of his/her licence, engaged in operations other than commercial air transportation;
  - (c) to act as pilot-in-command in commercial air transportation in any aeroplane or helicopter, whichever is the applicable case of his/her licence, certified for single-pilot operation; but which maximum certificated take-off mass does not exceed 5,700 kg and which is of a type specified in the aircraft rating section included in the licence, when the aeroplane is engaged in a flight for the purpose of commercial air transportation; and

Provided that:

- (i) he/she shall not, unless his/her licence includes an instrument rating, fly such an aircraft on any scheduled journey;
  - (ii) he/she shall not fly such an aircraft on a flight carrying passengers at night unless an instrument rating is included in his/her licence; and
  - (iii) he/she shall not, unless his/her licence includes an instrument rating, fly any such aircraft of which the maximum certificated take-off mass exceeds 2,300 kg on any flight for the purpose of commercial air transport except a flight beginning and ending at Macao and not extending beyond 25 nautical miles from Macao;
- (d) to act as co-pilot in commercial air transportation in aeroplanes or helicopters, whichever is the applicable case of his/her licence, required to be operated with a co-pilot.

53. Before exercising the privileges of a commercial pilot licence at night, the Civil Aviation Authority requires that the licence holder shall have completed, within the immediately preceding 90 days, with the requirements specified in paragraphs 11 (3) (b) (iv) or 12 (3) (b) (iv) of this Schedule, whichever is the applicable case, and paragraphs 11 (3) (e) or 12 (3) (e) of this Schedule, whichever is the applicable case, as pilot-in-command.

#### ***Airline transport pilot licence - Aeroplanes and helicopters***

54. Subject to compliance with the requirements specified in paragraphs 7, 18, 20, 25 and 26 of this Schedule, the privileges of the holder of an airline transport pilot licence - aeroplane or helicopter, granted or revalidated in Macao by the Civil Aviation Authority, shall be:

- (a) to exercise all the privileges of the holder of a private and commercial pilot licence - aeroplane or helicopter, whichever is the applicable case of his/her licence, and of an instrument rating in the case of an aeroplane licence when the aircraft is engaged on a flight for commercial purposes, provided that:
- (b) he/she shall not fly as pilot-in-command on a night flight carrying passengers unless he has a valid instrument rating qualification issued or revalidated by the Civil Aviation Authority; and
- (c) to act as pilot-in-command and co-pilot in aeroplanes or helicopters, whichever is the applicable case of his/her licence, required to carry two pilots and of a type specified in the respective aircraft rating for the purposes of commercial air transport or aerial work in air transportation.

#### ***Instrument rating - Aeroplanes and (or) helicopters***

55. Subject to compliance with the requirements specified in paragraphs 7, 18, 20, 35 and 36 of this Schedule, the privileges of the holder of an instrument rating - aeroplane and (or) helicopter, granted or revalidated in Macao by the Civil Aviation Authority, shall be to pilot the applicable aircraft under IFR. Before exercising such privileges on multi-engine aeroplanes, the holder of the rating shall have complied with the requirements of paragraph 48 (3) (b) of this Schedule.

56. The privileges granted in paragraph 55 of this Schedule may be conferred by the Civil Aviation Authority in a single instrument rating in lieu of issuing separate instrument ratings for aeroplanes and helicopters provided that the requirements for the issue of both ratings, as specified in paragraphs 48 and 49 of this Schedule, have been met.

***Flight instructor rating - Aeroplanes and (or) helicopters***

57. Subject to compliance with the requirements specified in paragraphs 7, 18, 20, 33 and 34 of this Schedule, the privileges of the holder of a flight instructor rating - aeroplane and (or) helicopter, granted or revalidated in Macao by the Civil Aviation Authority, shall be:
- (a) to supervision solo flights by student pilots; and
  - (b) to carry out flight instruction for the issue of a private pilot licence, a commercial pilot licence, an instrument rating, and a flight instructor rating provided that the flight instructor:
    - (i) holds, at least, a valid licence and rating for which instruction is being given, in the appropriate aircraft category;
    - (ii) holds a valid licence and rating necessary to act as the pilot-in-command of the aircraft on which the instruction is given; and
    - (iii) has the flight instructor privileges granted, entered on the licence.

***Flight navigator licence***

58. Subject to compliance with the requirements specified in paragraphs 7, 18, 20, 27 and 28 of this Schedule, the privileges of the holder of a flight navigator licence granted or revalidated in Macao by the Civil Aviation Authority shall be to act as flight navigator of any aircraft registered in Macao.

***Flight engineer licence***

59. Subject to compliance with the requirements specified in paragraphs 7, 18, 20, 29 and 30 the privileges of the holder of a flight engineer licence granted or revalidated in Macao by the Civil Aviation Authority shall be to act as flight engineer of any type of aircraft registered in Macao on which the holder has demonstrated a level of knowledge and skill, as determined by the Civil Aviation Authority on the basis of those requirements specified in paragraphs 16 (2) and 16 (4) of this Schedule, which are applicable to the safe operation of that type of aircraft.

***Flight radiotelephony operator licence***

60. The privileges of the holder of a flight radiotelephony operator licence shall be to act as an operator of a radiotelephone on board of an aircraft registered in Macao provided that he/she has familiarized himself/herself with all pertinent and current information regarding the types of equipment and operating procedures used at that aeronautical station. Where the knowledge and skill of the application has also been established in respect of radiotelegraphy, the Civil Aviation Authority shall endorse the licence for the operation of radiotelegraphy equipment. The holder of a licence with such endorsement may operate radiotelegraphy as well as radiotelephony equipment in an aeronautical station on board of an aircraft registered in Macao.

## NINTH SCHEDULE

(Paragraph 24)

### COMMERCIAL AIR TRANSPORT – OPERATIONAL REQUIREMENTS

#### PART A – OPERATIONS MANUAL

1. Information and instructions relating to the following matters shall be included in the *Operations manual* referred to in paragraph 24 (2) of this Regulation:
  - (1) ***Operations administration and supervision***
    - (a) Instructions outlining the responsibilities of operations personnel pertaining to the conduct of flight operations.
    - (b) The checklists system and instructions for its use:
      - (i) The checklists system to be followed by the crew of the aircraft shall be used 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 *Aircraft flight manual* or other documents associated with the *Certificate of airworthiness*; and
      - (ii) The design and utilization of checklists shall observe human factors principles.
    - (c) The *Minimum equipment list* (MEL) for the aircraft types operated and specific operations authorized, including any requirements relating to operations in RNP airspace.
    - (d) Safety precautions during refueling with passengers on board.
  - (2) ***Accident prevention and flight safety programme***
    - (a) Details of the accident prevention and flight safety programme provided in accordance with paragraph 26 (7) of this Regulation, including a statement of safety policy and the responsibility of personnel and a flight data analysis programme in compliance with the requirements of Scale EE of the Fifth Schedule.
  - (3) ***Personnel training***
    - (a) Details of the flight crew training program and requirements.
    - (b) Details of the cabin crew duties training program as required by regulations.
  - (4) ***Fatigue and flight time limitations***
    - (a) Rules limiting the flight time and flight duty periods and providing for adequate rest periods for the flight crew members and cabin crew as required by regulations.
  - (5) ***Flight operations***
    - (a) The flight crew for each type of operation including the designation of the succession of command.
    - (b) The in-flight and the emergency duties assigned to each crew member.

- (c) Specific instructions for the computation of the quantities of fuel and oil to be carried, having regard to all circumstances of the operation including the possibility of the failure of one or more powerplants while en route.
- (d) The conditions under which oxygen shall be used and the amount of oxygen determined in accordance with this Regulations.
- (e) Instructions for mass and balance control.
- (f) Instructions for the conduct and control of ground de/anti-icing operations.
- (g) The specifications for the operational flight plan.
- (h) The normal, abnormal and emergency procedures to be used by the flight crew, the checklists relating thereto and aircraft systems information as required.
- (i) Standard operating procedures (SOP) for each phase of flight.
- (j) Instructions on the use of normal checklists and the timing of their use.
- (k) Emergency evacuation procedures.
- (l) Departure contingency procedures.
- (m) Instructions on the maintenance of altitude awareness and the use of automated or flight crew altitude call-out.
- (n) Instructions on the use of autopilots and auto-throttles in IMC.
- (o) Instructions on the clarification and acceptance of ATC clearances, particularly where terrain clearance is involved.
- (p) Departure and approach briefings.
- (q) Route and destination familiarization.
- (r) Stabilized approach procedure. *(Not applicable to helicopter operations)*
- (s) Limitation on high rates of descent near the surface. *(Not applicable to helicopter operations)*
- (t) Conditions required to commence or to continue an instrument approach.
- (u) Instructions for the conduct of precision and non-precision instrument approach procedures.
- (v) Allocation of flight crew duties and procedures for the management of crew workload during night and IMC instrument approach and landing operations.
- (w) Instructions and training requirements for the avoidance of controlled flight into terrain and policy for the use of the ground proximity warning systems (GPWS). *(Not applicable to helicopter operations)*
- (x) Information and instructions relating to the interception of civil aircraft including:
  - (i) Procedures, as prescribed in ICAO Annex 2, for pilots-in-command of intercepted aircraft; and
  - (ii) Visual signals for use by intercepting and intercepted aircraft, as contained in ICAO Annex 2.
- (y) For aeroplanes intended to be operated above 15000m (49000ft): *(Not applicable to helicopter operations)*
  - (i) 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
  - (ii) Procedures in the event that a decision to descend is taken, covering:



- (A) The necessity of giving the appropriate ATS unit prior warning of the situation and of obtaining a provisional descent clearance; and
- (B) The action to be taken in the event that communication with the ATS unit cannot be established or is interrupted.

(6) ***Aircraft performance***

- (a) Operating instructions and information on climb performance with all engines operating.

(7) ***Route guides and charts***

- (a) A route guide to ensure that the flight crew will have, for each flight, information relating to communication facilities, navigation aids, aerodrome (or heliport), and such other information as the operator may deem necessary for the proper conduct of flight operations.

(8) ***Minimum flight altitudes***

- (a) The method for determining minimum flight altitudes, approved by the Civil Aviation Authority.
- (b) The minimum flight altitudes for each route to be flown:
  - (i) for which minimum flight altitudes have been established by the State flown over or the responsible State or Territory, provided that they shall not be less than those established by that State or Territory.
  - (ii) 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 or Territory flown over or the responsible State or Territory, and this shall include the following aspects:
    - (A) the accuracy and reliability with which the position of the aircraft can be determined;
    - (B) the inaccuracies in the indications of the altimeters used;
    - (C) the characteristics of the terrain (e.g. sudden changes in the elevation);
    - (D) the probability of encountering unfavourable meteorological conditions (e.g. severe turbulence and descending air currents);
    - (E) possible inaccuracies in aeronautical charts; and
    - (F) airspace restrictions.

(9) ***Aerodrome (or heliport) operating minima***

- (a) The methods for determining *Aerodrome (or heliport) operating minima*.
- (b) *Aerodrome (or heliport) operating minima* for each of the aerodromes (or heliports) that are likely to be used as aerodromes (or heliports) of intended landing or as alternate aerodromes (or heliports).
- (c) The increase of *Aerodrome (or heliport) operating minima* in case of degradation of approach or aerodrome (or heliport) facilities.

(10) ***Search and rescue***

- (a) The ground-air visual signal code for use by survivors, as contained in ICAO Annex 12.
- (b) Procedures, as prescribed in ICAO Annex 12, for pilots-in-command observing an accident.

(11) ***Dangerous goods***

- (a) Information and instructions on the carriage of dangerous goods, including action to be taken in the event of an emergency.

(12) ***Navigation***

- (a) A list of the navigational equipment to be carried. For aeroplanes operations, the list of the navigational equipment to be carried must include any requirements relating to operations in RNP airspace.
- (b) When relevant to the operations, the long-range navigation procedures to be used.

(13) ***Communications***

- (a) The circumstances in which a radio listening watch is to be maintained.
- (b) The procedures for making meteorological observations on board aircraft in flight and for recording and reporting them to the appropriate authorities.

(14) ***Security***

- (a) Security instructions and guidance.
- (b) The 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. The checklist shall be supported by guidance on the course of action to be taken should the bomb or suspicious object be found and information on the least-risk bomb location specific to the aircraft.

(15) ***Human Factors***

- (a) Information on the operators' training programme for the development of knowledge and skills related to human performance.

## **PART B – CREW TRAINING AND TESTS**

[Paragraph 26 (2)]

1. The training, experience, practice and periodical tests required under paragraph 26 (2) of this Regulation, in the case of members of the crew of an aircraft engaged on a flight for the purpose of commercial air transport shall be as follows:

(1) **The crew**

Every member of the crew shall:

- (a) have been tested within the relevant period by or on behalf of the operator as to his/her knowledge of the use of the emergency and life saving equipment required to be carried in the aircraft on the flight, including knowledge on the effect of lack of oxygen and, in the case of pressurized aircraft, as regards physiological phenomena accompanying a loss of pressurization;

- (b) have practised within the relevant period under the supervision of the operator or of a person or organization appointed by the operator for the purpose of carrying out of the necessary functions they are to perform in an emergency or in a situation requiring emergency evacuation, either in an aircraft of the type to be used on the flight or in apparatus approved by the Civil Aviation Authority for the purpose and controlled by persons so approved. Annual training in accomplishing these functions shall be contained in the operator's training programme and shall include instruction in the use of all emergency and life-saving equipment required to be carried, and drills in the emergency evacuation of the aircraft;
  - (c) have been trained in the transport of dangerous goods referred to in paragraph 41;
  - (d) have been trained in crew co-ordination in all types of emergency or abnormal situations or procedures, including training in knowledge and skills related to human performance to ensure that all crew members know the functions for which they are responsible and the relation of these functions to the functions of other crew members; and
  - (e) the training programme referred above shall be given on a recurrent basis, as determined by the Civil Aviation Authority and shall include an examination to determine competence.
- (2) Pilots
- (a) Every pilot included in the flight crew who is intended by the operator to fly as pilot in circumstances requiring compliance with Instrument Flight Rules shall within the relevant period have been tested by or on behalf of the operator:
    - (i) as to his/her has demonstrated the piloting technique, ability and competence to perform his/her duties while executing normal manoeuvres and procedures in flight, in an aircraft of the type to be used on the flight, including the use of the instruments and equipment provided in the aircraft; and
    - (ii) as to his/her has demonstrated the piloting technique, ability and competence to perform his/her duties in instrument flight conditions while executing emergency manoeuvres and procedures in flight, in an aircraft of the type to be used on the flight, including the use of the instruments and equipment provided in the aircraft.
  - (b) A pilot's ability to carry out normal manoeuvres and procedures shall be tested in the aircraft in flight. The other tests required by this sub-paragraph may be conducted either in the aircraft in flight or under the supervision of a person approved by the Civil Aviation Authority for the purpose, by means of an approved flight simulator.
  - (c) The tests specified in sub-paragraph (2) (a) (ii) when conducted in the aircraft in flight shall be carried out either in actual instrument flight conditions or in approved simulated instrument flight conditions.
  - (d) Every pilot included in the flight crew whose licence does not include an instrument rating or who, notwithstanding the inclusion of such a rating in his/her licence, is not intended by the operator to fly in the circumstances requiring compliance with the Instrument Flight Rules shall within the relevant period have been tested, by or on behalf of the operator, in flight in an aircraft of the types to be used on the flight:
    - (i) as to his/her has demonstrated the piloting technique, ability and competence to act as pilot of the aircraft while executing normal manoeuvres and procedures; and

- (ii) as to his/her has demonstrated the piloting technique, ability and competence to act as pilot of the aircraft while executing emergency manoeuvres and procedures.
- (e) Every pilot included in the flight crew who is seated at the flying controls during take-off or landing shall within the relevant period:
  - (i) have been tested as to his/her proficiency in using instrument approach-to-land systems of the type in use at the aerodrome (or heliport) of intended landing and any alternate aerodrome (or heliport), such test being carried out either in flight in instrument flight conditions or in approved simulated instrument flight conditions or under the supervision of a person approved by the Civil Aviation Authority for the purpose by means of an approved flight simulator; and
  - (ii) have carried out when seated at the flying controls not less than 3 take-offs and 3 landings in aircraft of the type to be used on the flight within the preceding 90 days.

(3) Flight engineers

Every flight engineer included in the flight crew shall within the relevant period have been tested by or on behalf of the operator, either in flight, or, under the supervision of a person approved by the Civil Aviation Authority for the purpose, by means of apparatus on the ground, as to his/her competence to perform the duties of flight engineer in an aircraft of the type to be used on the flight, including his/her ability to execute emergency procedures in the course of such duties.

(4) Flight navigators and flight radiotelephony operators.

Every flight navigator and flight radiotelephony operator whose inclusion in the flight crew is required under paragraph 18 (4) and (6) respectively of this Regulation, shall within the relevant period have been tested by or on behalf of the operator as to his/her competence to perform his/her duties in conditions corresponding to those likely to be encountered on the flight:

- (a) in the case of a flight navigator, using equipment of the type to be used in the aircraft on the flight for purposes of navigation; and
- (b) in the case of a flight radiotelephony operator using radio equipment of the type installed in the aircraft to be used on the flight, and including a test of his/her ability to carry out emergency procedures.

(5) Aircraft commanders

- (a) The pilot designated as commander of the aircraft for the flight shall have demonstrated to the satisfaction of the operator that he/she has adequate knowledge of the route to be taken, the aerodromes (or heliports) of take-off and landing, and any alternate aerodromes (or heliports), including in particular his/her knowledge of the terrain, the seasonal meteorological conditions, the meteorological communications and air traffic facilities, services and procedures, the search and rescue procedures and the navigational facilities, relevant to the route;
- (b) In determining whether a pilot's knowledge of the matters referred to in sub-paragraph (5) (a) is sufficient to render him/her competent to perform the duties of aircraft commander on the flight, the operator shall take into account the pilot's flying experience in conjunction with the following aspects:
  - (i) the experience of other members of the intended flight crew;

- (ii) the influence of terrain and obstructions on departure and approach procedures at the aerodromes (or heliports) of take-off and intended landing and at alternate aerodromes (or heliports);
  - (iii) the similarity of the instrument approach procedures and let down aids to those with which the pilot is familiar;
  - (iv) the dimensions of runways which may be used in the course of the flight in relation to the performance limits of aircraft of the type to be used on the flights;
  - (v) the reliability of meteorological forecasts and the probability of difficult meteorological conditions in the areas to be traversed;
  - (vi) the adequacy of the information available regarding the aerodrome (or heliport) of intended landing and any alternate aerodromes (or heliports);
  - (vii) the nature of air traffic control procedures and familiarity of the pilot with such procedures;
  - (viii) the influence of terrain on route conditions and the extent of the assistance obtainable en-route from navigational aids and air-to-ground communication facilities;
  - (ix) the extent to which it is possible for the pilot to become familiar with unusual aerodrome (or heliport) procedures and features of the route by means of ground instruction and training devices; and
  - (x) 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.
- (6) A commander shall have made an actual approach into each aerodrome (or heliport) of landing on the route, accompanied by a pilot who is qualified for the aerodrome (or heliport), as a member of the flight crew or as an observer on the flight deck, unless:
- (a) the approach to the aerodrome (or heliport) is not over difficult terrain and the instrument approach procedures and aids available are similar to those with which the pilot is familiar, and a margin to be approved by the Civil Aviation Authority 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 commander to land at the aerodrome (or heliport) concerned by means of an adequate pictorial presentation; or
  - (d) the aerodrome (or heliport) concerned is adjacent to another aerodrome (or heliport) at which the commander is currently qualified to land.
- (7) For the purposes of this paragraph:

***Instrument flight conditions*** mean weather conditions such that the pilot is unable to fly by visual reference to objects outside the aircraft;

**Relevant period** means a period which immediately precedes the commencement of the flight being a period:

- (a) in the case of sub-paragraph (2) (e) (ii), of 90 days;
- (b) in the case of sub-paragraphs (2) (a) (ii), 2 (d) (ii), (2) (e) (i) and (3), of 6 months;
- (c) in the case of sub-paragraphs (1), (2) (a) (i), (4) and (5) (a), of 13 months;

Provided that:

- (i) any pilot of the aircraft to whom sub-paragraph (2) (a) (ii) or 2 (d) (ii) or (2) (e) (i) and any flight engineer of the aircraft to whom sub-paragraph (3) applies shall for the purposes of the flight be deemed to have complied with such requirements within the relevant period if he/she has qualified to perform his/her duties in accordance therewith on two occasions within the period of 13 months immediately preceding the flight, such occasions being separated by an interval of not less than 4 months;
- (ii) the requirements of sub-paragraph (5) (a) shall be deemed to have been complied with within the relevant period by a pilot designated as commander of the aircraft for the flight if, having become qualified so to act on flights between the same places over the same route more than 13 months before commencement of the flight, he/she has within the period of 13 months immediately preceding the flight flown as pilot of an aircraft between those places over that route.

2. (1) The records required to be maintained by an operator under paragraph 26 (2) of this Regulation shall be accurate and up to date records so kept as to show, on any date, in relation to each person who has during the period of two years immediately preceding that date flown as a member of the crew of any commercial air transport aircraft operated by that operator:
  - (a) the date and particulars of each test required by this Schedule undergone by that person during the said period including the name and qualifications of the examiner;
  - (b) the date upon which that person last practised the carrying out of the duties referred to in paragraph 1 (1) (b);
  - (c) the operator's conclusions based on each such test and practice as to that person's competence to perform his/her duties;
  - (d) the date and particulars of any decision taken by the operator during the said period in pursuance of paragraph 1 (5) (a) including particulars of the evidence upon which that decision was based.
- (2) The operator shall whenever called upon to do so by any authorised person produce for the inspection of any person so authorised all records referred to in sub-paragraph (1) and furnish to any such person all such information as it may require in connection with any such records and produce for its inspection all log books, certificates, papers and other documents whatsoever which it may reasonably require to see for the purpose of determining whether such records are complete or of verifying the accuracy of their contents.
- (3) The operator shall at the request of any person in respect of whom he/she is required to keep records as aforesaid furnish to that person, or to any operator of aircraft for the purpose of commercial air transport by whom that person may subsequently be employed, particulars of any qualifications in accordance with this Schedule.

## PART C – TRAINING MANUAL

(Paragraph 25)

1. The following information and instructions in relation to the training, experience, practice and periodical tests required under paragraph 26 (2) of this Regulation shall be included in the training manual referred to in paragraph 25 (2) of this Regulation:
  - (a) the manner in which the training, practice and periodical tests required under paragraph 26 (2) of this Regulation and specified in Part B of this Schedule are to be carried out;
  - (b)
    - (i) the minimum qualifications and experience which the operator requires of persons appointed by him to give or to supervise the training, practice and periodical tests; and
    - (ii) the type of training, practice and periodical tests which each such person is appointed to give or to supervise; and
    - (iii) the type of aircraft in respect of which each such person is appointed to give or to supervise the training, practice and periodical tests;
  - (c) the minimum qualifications and experience required of each member of the crew undergoing the training, practice and periodical tests;
  - (d) the syllabus for, and specimen forms for recording, the training, practice and periodical tests;
  - (e) the manner in which instrument flight conditions and engine failure are to be simulated in the aircraft in flight;
  - (f) the extent to which the training and testing is permitted in the course of flights for the purpose of commercial air transport; and
  - (g) the use to be made in the training and testing of equipment approved for the purpose by the Civil Aviation Authority.

## PART D – AERODROME (OR HELIPORT) OPERATING MINIMA

[Paragraphs 28 (3) and 29 (5) (6)]

1. *Aerodrome (or heliport) operating minima* for take-off, approach to landing and landing by commercial air transport aircraft registered in Macao.

- (1) In this paragraph:

*Approach to landing* means that portion of the flight of the aircraft in which it is descending below an altitude/height of 1,000 feet above the decision altitude/height of the relevant *aerodrome (or heliport) operating minimum* for landing.

*Approved*, in relation to the *Operations manual*, means accepted by the Civil Aviation Authority after any additions or amendments required by the Civil Aviation Authority have been incorporated.

***Aerodrome (or heliport) operating minima*** mean the limits of usability of an aerodrome (or heliport) for:

- (a) take-off, expressed in terms of runway visual range and/or visibility and, if necessary, cloud conditions;
- (b) landing in precision approach and landing operations, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H) as appropriate to the category of the operation; and
- (c) landing in non-precision approach and landing operations, expressed in terms of visibility and/or runway visual range, minimum descent altitude/height (MDA/H) and, if necessary, cloud conditions.

***Cloud ceiling***, in relation to an aerodrome (or heliport), means the vertical distance from the elevation of the aerodrome (or heliport) to the lowest part of any cloud visible from the aerodrome (or heliport) which is sufficient to obscure more than one-half of the sky so visible.

***Decision altitude (DA) or decision height (DH)*** means 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.

***Instrument approach and landing operations*** means instrument approach and landing operations using instrument approach procedures are classified as follows:

*Non-precision approach and landing operations.* An instrument approach and landing which does not utilize electronic glide path guidance.

*Precision approach and landing operations.* An instrument approach and landing using precision azimuth and glide path guidance with minima as determined by the category of operation.

Categories of precision approach and landing operations:

***Category I (CAT I) operation.*** A precision instrument approach and landing with 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 550m.

***Category II (CAT II) operation.*** A precision instrument approach and landing with 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 350 m.

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

- (a) a decision height lower than 30 m (100 ft) or no decision height; and
- (b) a runway visual range not less than 200 m.

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

- (a) a decision height lower than 15 m (50 ft) or no decision height; and
- (b) a runway visual range less than 200 m but not less than 50 m.



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

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

**Minimum descent altitude (MDA) or minimum descent height (MDH)** means a specified altitude or height in a non-precision approach or circling approach below which descent must not be made without the required visual reference.

**Runway visual range (RVR)** means 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.

**Specified**, in relation to an aircraft, means specified in or ascertainable by reference to the *Operations manual* relating to that aircraft.

**Visibility** means the ability, as expressed in units of distance, to see and identify prominent unlighted objects by day and prominent lighted objects by night; and, in the case of an aerodrome (or heliport) in Macao, the distance, if any, communicated to the commander of the aircraft by or on behalf of the person in charge of the aerodrome (or heliport) as being the visibility shall be taken as the visibility for the time being.

- (2) In compliance with paragraph 24 (2) of this Regulation and paragraph 1 (9) of Part A of this Schedule, the operator of every aircraft to which this Schedule applies shall establish and include in the *Operations manual* relating to the aircraft particulars of *Aerodrome (or heliport) operating minima* appropriate to every aerodrome (or heliport) of intended departure or landing and every alternate aerodrome (or heliport):

Provided that:

- (a) in respect of aerodromes (or heliport) to be used only on a flight which is not a scheduled journey or any part thereof it shall be sufficient to include in the *Operations manual*, data and instructions by means of which the appropriate *Aerodrome (or heliport) operating minima* can be calculated by the commander of the aircraft; and
- (b) in respect of aerodromes (or heliport) at which meteorological observations cannot be communicated to the commander of an aircraft in flight, it shall be sufficient to include in the approved *Operations manual*, general directions to pilots concerning *Aerodrome (or heliport) operating minima* for safe operation.
- (3) The *Aerodrome (or heliport) operating minima* specified shall not, in respect of any aerodromes (or heliports), be less favourable than any declared in respect of that aerodromes (or heliports) by the Civil Aviation Authority, unless the Civil Aviation Authority otherwise permits in writing.
- (4) In establishing *Aerodrome (or heliport) operating minima* for the purposes of this Part the operator of the aircraft registered in Macao shall take into account the following matters:
- (a) the type, performance and handling characteristics of the aircraft;

- (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 for aeroplanes or the declared distances for helicopters;
  - (d) the adequacy and performance of the available visual and non-visual ground aids;
  - (e) the equipment available on the aircraft 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;
  - (h) the obstacles in the climb-out areas and necessary clearance margins;
  - (i) instrument approach and landing operations of Category II and Category III shall not be authorized unless RVR information is provided. For instrument approach and landing operations, *Aerodrome (or heliport) operating minima* below 800 m visibility shall not be authorized unless RVR information is provided; and
  - (j) operational procedures designed to ensure that an aircraft being used to conduct precision approaches crosses the threshold by a safe margin, with the aircraft in the landing configuration and attitude.
- (5) With reference to paragraph 28 (3) and 29 (5) (6) of this Regulation, an aircraft shall not commence a flight at a time when:
- (a) the cloud ceiling or the runway visual range or visibility as appropriate, at the aerodrome (or heliport) of departure is less than the minimum respectively specified for take-off; or
  - (b) according to the information available to the commander of the aircraft it would not be able, without contravening paragraph (7) of this Part, commence or continue an approach to landing at the aerodrome (or heliport) of intended destination at the estimated time of arrival there and at any alternate aerodrome (or heliport) at any time at which according to a reasonable estimate the aircraft would arrive there.
- (6) With reference to paragraph 28 (3) and 29 (5) (6) of this Regulation, an aircraft shall not:
- (a) commence or continue an instrument approach beyond the outer marker fix in case of precision approach, or below 300 m (1 000 ft) above the aerodrome (or heliport) in case of non-precision approach, unless the reported visibility or controlling RVR is above the specified minimum; or
  - (b) commence or continue an instrument approach if, after passing the outer marker fix in case of precision approach, or after descending below 300 m (1 000 ft) above the aerodrome (or heliport) in case of non-precision approach, the reported visibility or controlling RVR falls below the specified minimum, the approach may be continued to DA/H or MDA/H. In any case, an aircraft shall not continue its approach-to-land at any aerodrome (or heliport) beyond a point at which the limits of the operating minima specified for that aerodrome (or heliport) would be infringed.

- (7) One or more instrument approach procedures designed in accordance with the classification of instrument approach and landing operations shall be promulgated and made available by the State or Territory in which the aerodrome (or heliport) is located to serve each instrument runway or aerodrome (or heliport) utilized for instrument flight operations. All aircraft registered in Macao operated in accordance with instrument flight rules (IFR) shall comply with the instrument flight procedures approved by the State or Territory in which the aerodrome (or heliport) is located.
- (8) Noise abatement procedures specified by an operator for any one aircraft type registered in Macao should be the same for all aerodrome (or heliport) utilized by that operator.

**Note.** – Aeroplane operating procedures for noise abatement should comply with the provisions of ICAO PANS-OPS (Doc 8168), Volume I, Part V.

## **PART E – FUEL POLICY REQUIREMENTS**

### *Paragraph 26 (11)*

#### **Fuel Policy – Commercial Air Transportation (Aeroplanes)**

1. An operator should base the company fuel policy, including calculation of the amount of fuel to be carried, on the following planning criteria:
  - (1) The amount of:
    - (a) Taxi fuel, which should not be less than the amount, expected to be used prior to take-off. Local conditions at the departure aerodrome and APU consumption should be taken into account.
    - (b) Trip fuel, which should include:
      - (i) Fuel for take-off and climb from aerodrome elevation to initial cruising level/altitude, taking into account the expected departure routing;
      - (ii) Fuel from top of climb to top of descent, including any step climb/descent;
      - (iii) Fuel from top of descent to the point where the approach is initiated, taking into account the expected arrival procedure; and
      - (iv) Fuel for approach and landing at the destination aerodrome.
    - (c) Contingency fuel, which should be the higher of (i) or (ii) below:
      - (i) Either:
        - (A) 5% of the planned trip fuel or, in the event of in-flight replanning, 5% of the trip fuel for the remainder of the flight; or
        - (B) Not less than 3% of the planned trip fuel or, in the event of in-flight replanning, 3% of the trip fuel for the remainder of the flight provided that an en-route alternate is available. The en-route alternate should be located within a circle having a radius equal to 20% of the total flight plan distance, the centre of which lies on the planned route at a distance from the destination of 25% of the total flight plan distance, or at 20% of the total flight plan distance plus 50nm, whichever is greater; or
        - (C) An amount of fuel sufficient for 20 minutes flying time based upon the planned trip fuel consumption provided that the operator has established a fuel consumption

monitoring program for individual aeroplanes and uses valid data determined by means of such a program for fuel calculation; or

- (D) An amount of fuel of not less than that which would be required to fly for 15 minutes at holding speed at 1500 ft (450 m) above the destination aerodrome in standard conditions, when an operator has established a program, approved by Civil Aviation Authority, to monitor the fuel consumption on each individual route/aeroplane combination and uses this Data for a statistical analysis to calculate contingency fuel for that route/aeroplane combination; or
- (ii) An amount to fly for 5 minutes at holding speed at 1500 ft (450 m) above the destination aerodrome in Standard Conditions.
- (d) Alternate fuel, which should be sufficient for:
- (i) A missed approach from the applicable MDA/DH at the destination aerodrome to missed approach altitude, taking into account the complete missed approach procedure;
- (ii) A climb from missed approach altitude to cruising level/altitude;
- (iii) The cruise from top of climb to top descent;
- (iv) Descent from top of descent to the point where the approach is initiated, taking into account the expected arrival procedure; and
- (v) Executing an approach and landing at the destination alternate aerodrome.
- (vi) If two destination alternates are required, alternate fuel should be sufficient to proceed to the alternate which requires the greater amount of alternate fuel.
- (e) Final reserve fuel, which should be:
- (i) For aeroplanes with reciprocating engines, fuel to fly for 45 minutes; or
- (ii) For aeroplanes with turbine power units, fuel to fly for 30 minutes at holding speed at 1500 ft (450 m) above aerodrome elevation in standard conditions, calculated with the estimated mass on arrival at the alternate or the destination, when no alternate is required.
- (f) The minimum additional fuel which should permit:
- (i) Holding for 15 minutes at 1500 ft (450 m) above aerodrome elevation in standard conditions, when a flight is operated under IFR without a destination alternate; and
- (ii) Following the possible failure of a power unit or loss of pressurisation, based on the assumption that such a failure occurs at the most critical point along the route, the aeroplane to:
- (A) Descend as necessary and proceed to an adequate aerodrome; and
- (B) Hold there for 15 minutes at 1500 ft (450 m) above aerodrome elevation in standard conditions; and
- (C) Make an approach and landing,

except additional fuel is only required, if the minimum amount of fuel calculated in accordance with sub-paragraphs 1.(1)(b) to 1. (1)(e) above is not sufficient for such an event.

- (g) Extra fuel, which should be at the discretion of the commander.
- (2) Decision Point Procedure. If an operator's fuel policy includes planning to a destination aerodrome via a decision point along the route, the amount of fuel should be greater of sub-paragraphs 1. (2)(a) or 1. (2)(b) below:
- (a) The sum of:
    - (i) Taxi fuel;
    - (ii) Trip fuel to the destination aerodrome, via the decision point;
    - (iii) Contingency fuel equal to not less than 5% of the estimated fuel consumption from the decision point to the destination aerodrome;
    - (iv) Alternate fuel, if a destination alternate is required;
    - (v) Final reserve fuel;
    - (vi) Additional fuel; and
    - (vii) Extra fuel if required by the commander; or,
  - (b) The sum of:
    - (i) Taxi fuel;
    - (ii) The estimated fuel consumption from the departure aerodrome to a suitable en-route alternate, via the decision point;
    - (iii) Contingency fuel equal to not less than 3% of the estimated fuel consumption from the departure aerodrome to the en-route alternate;
    - (iv) Final reserve fuel;
    - (v) Additional fuel; and
    - (vi) Extra fuel if required by the commander.
- (3) Isolated aerodrome procedure. If an operator's fuel policy includes planning to an isolated aerodrome for which a destination alternate does not exist, the amount of fuel at departure should include:
- (a) Taxi fuel;
  - (b) Trip Fuel;
  - (c) Contingency Fuel calculated in accordance with sub-paragraph 1. (1)(c) above;
  - (d) Additional Fuel if required, but not less than:

- (i) For aeroplanes with reciprocating engines, fuel to fly for 45 minutes plus 15% of the flight time planned to be spent at cruising level, or two hours, whichever is less; or
  - (ii) For aeroplanes with turbine engines, fuel to fly for two hours at normal cruise consumption after arriving overhead destination aerodrome,  
  
including final reserve fuel; and
  - (e) Extra Fuel is required by the commander.
- (4) Pre-determined point procedure. If an operator's fuel policy includes planning to a destination alternate where the distance between the destination aerodrome and the destination alternate is such that a flight can only be routed via a predetermined point to one of these aerodromes, the amount of fuel should be the greater of sub-paragraphs 1. (4)(a) or 1. (4)(b) below:
- (a) The sum of:
    - (i) Taxi Fuel;
    - (ii) Trip Fuel from the departure aerodrome to the destination aerodrome, via the predetermined point;
    - (iii) Contingency Fuel calculated in accordance with sub-paragraph 1. (1)(c) above;
    - (iv) Additional Fuel if required, but not less than:
      - (A) For aeroplanes with reciprocating engines, fuel to fly for 45 minutes plus 15% of the flight time planned to be spent at cruising level or two hours, whichever is less; or
      - (B) For aeroplanes with turbine engines, fuel to fly for two hours at normal cruise consumption after arriving overhead the destination aerodrome,  
  
including Final Reserve Fuel; and
    - (v) Extra Fuel if required by the commander; or
  - (b) The sum of:
    - (i) Taxi Fuel;
    - (ii) Trip Fuel from the departure aerodrome to the alternate aerodrome, via the predetermined point;
    - (iii) Contingency Fuel calculated in accordance with sub-paragraph 1.(1)(c) above;
    - (iv) Additional Fuel if required, but not less than:
      - (A) For aeroplanes with reciprocating engines: fuel to fly for 45 minutes; or
      - (B) For aeroplanes with turbine engines: fuel to fly for 30 minutes at holding speed at 1500 ft (450 m) above aerodrome elevation in standard conditions;  
  
including Final Reserve Fuel; and
    - (v) Extra Fuel if required by the commander.

### Fuel Policy - Commercial Air Transportation (Helicopters)

2. An operator should base the company fuel policy, including calculation of the amount of fuel to be carried, on the following planning criteria:
  - (1) The amount of:
    - (a) Taxi fuel, which should not be less than the amount, expected to be used prior to take-off. Local conditions at the departure heliport and APU consumption should be taken into account.
    - (b) Trip fuel, which should include:
      - (i) Fuel for take-off and climb from heliport elevation to initial cruising level/altitude, taking into account the expected departure routing;
      - (ii) Fuel from top of climb to top of descent, including any step climb/descent;
      - (iii) Fuel from top of descent to the point where the approach procedure is initiated, taking into account the expected arrival procedure; and
      - (iv) Fuel for approach and landing at the destination heliport.
    - (c) Contingency fuel, which should be:
      - (i) For IFR flights, or for VFR flights in a hostile environment, 10% of the planned trip fuel;  
or
      - (ii) For VFR flights in a non-hostile environment, 5% of the planned trip fuel;
    - (d) Alternate fuel, which should be sufficient for:
      - (i) A missed approach from the applicable MDA/DH at the destination heliport to missed approach altitude, taking into account the complete missed approach procedure;
      - (ii) A climb from missed approach altitude to cruising level/altitude;
      - (iii) The cruise from top of climb to top of descent;
      - (iv) Descent from top to the point where the approach is initiated, taking into account the expected arrival procedure; and
      - (v) Executing an approach and landing at the destination alternate heliport.
    - (e) Final reserve fuel, which should be:
      - (i) For VFR flights navigating by day with reference to visual landmarks, 20 minutes fuel at best range speed; or
      - (ii) For IFR flights or when flying VFR and navigating by means other than by reference to visual landmarks or at night, fuel to fly for 30 minutes at holding speed at 1500 ft (450 m) above the destination heliport in standard conditions calculated with the estimated mass on arrival above the alternate, or the destination, when no alternate is required.
    - (f) Extra fuel, which should be at the discretion of the commander.

- (2) Isolated heliport IFR procedure. If an operator's fuel policy includes planning to an isolated heliport flying IFR, or when flying VFR and navigating by means other than by reference to visual landmarks, for which a destination alternate does not exist, the amount of fuel at departure should include:
- (a) Taxi fuel;
  - (b) Trip fuel;
  - (c) Contingency fuel calculated in accordance with sub-paragraph 2. (1)(c) above;
  - (d) Additional fuel to fly for two hours at holding speed including final reserve fuel; and
  - (e) Extra fuel at the discretion of the commander.

## PART F – MINIMUM EQUIPMENT LIST

[Paragraphs 14 (2) (b) and 30 (b) (i) (ii)]

1. For the purposes of this Part:

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

*Minimum equipment list (MEL)* means 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.

2. The operator of a commercial air transport aircraft registered in Macao shall include in the *Operations manual*, as referred in paragraph 14 (2) (b) and 30 (b) (i) (ii) of this Regulation, a *Minimum equipment list (MEL)*, approved by the Civil Aviation Authority which will enable the commander to determine whether a flight may be commenced or continued from any intermediate stop should any instrument, equipment or systems become inoperative. Where the aircraft is not a registered Macao aircraft, the Civil Aviation Authority shall ensure that the MEL does not affect the aircraft's compliance with the airworthiness requirements applicable in the State or Territory where that aircraft is registered. The following aspects shall be taken into account by the operator when developing the MEL for approval by the Civil Aviation Authority:
- (1) If deviations from the requirements of the Civil Aviation Authority in the certification of aircraft are not permitted an aircraft could not be flown unless all systems and equipment are operable. Experience has proved that some un-serviceability can be accepted in the short term when the remaining operative systems and equipment provide for continued safe operations.
  - (2) The Civil Aviation Authority shall indicate through approval of a MEL 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 MEL, approved by the Civil Aviation Authority, is therefore necessary for each aircraft, based on the *Master minimum equipment list (MMEL)* established for the aircraft type by the organization responsible for the type design in conjunction with the State of Design.



- (4) The Civil Aviation Authority should require the operator to prepare a MEL designed to allow the operation of an aircraft with certain systems or equipment inoperative provided an acceptable level of safety is maintained.
- (5) The MEL is not intended to provide for operation of the aircraft for an indefinite period with inoperative systems or equipment. The basic purpose of the MEL 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 MEL 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 MEL may not deviate from requirements of the *Aircraft flight manual* limitations section, emergency procedures or other airworthiness requirements of the Civil Aviation Authority or the State or Territory for no registered Macao aircraft or unless the appropriate airworthiness authority or the *Aircraft flight manual* provides otherwise.
- (8) Systems or equipment accepted as inoperative for a flight should be placarded where appropriate and all such items should be noted in the aircraft *Technical log* to inform the flight crew and maintenance personnel of the inoperative system or equipment.
- (9) For a particular system or item of equipment to be accepted as inoperative, it may be necessary to establish a maintenance procedure, for completion prior to flight, to de-activate or isolate the system or equipment. It may similarly be necessary to prepare an appropriate flight crew operating procedure.
- (10) The responsibilities of the commander in accepting an aircraft for operation with deficiencies in accordance with a MEL are specified in paragraph 30 (b) of this Regulation.

## TENTH SCHEDULE

(Paragraphs 56 and 58)

### 1. DOCUMENTS TO BE CARRIED BY AIRCRAFT REGISTERED IN MACAO

<i>Documents to be carried on board</i>	<i>Types of document</i>
1. On a flight for the purpose of commercial air transport.	A, B, C, D, E, F, H and J
2. On a flight for the purpose of commercial air transport, if the flight is international air navigation.	A, B, C, D, E, F, G, H, I and J
3. On a flight for the purpose of aerial work.	A, B, C, D, E, F and J
4. On a flight for the purpose of aerial work, if the flight is international air navigation.	A, B, C, D, E, F, G, H, I and J
5. On a flight, being international air navigation, for a purpose <b>other</b> than commercial air transport or aerial work.	A, B, C, G, H, I and J
6. On a flight made in accordance with the terms of an authorization granted to the operator pursuant to paragraph 14 (1) or (2) of the Regulation, whichever is applicable.	K

### 2. For the purposes of this Schedule:

*Document A* means the licence in force issued by competent authority of Macao, in respect of the aircraft radio station installed in the aircraft.

*Document B* means the *Certificate of airworthiness* in force in respect of the aircraft required by paragraph 6 (1) of this Regulation.

*Document C* means the licences of the members of the flight crew of the aircraft required by paragraph 19 (1) of this Regulation.

*Document D* means one copy of the load sheet, if any, required by paragraph 27 of this Regulation in respect of the flight;

*Document E* means one copy of each *Certificate of maintenance review*, required by paragraph 9 (2) of this Regulation, if any, in force in respect of the aircraft, and/or a *Certificate of release to service* required by paragraph 10 (1) of this Regulation.

*Document F* means the *Technical log* referred to in paragraph 9 (7) of this Regulation.

*Document G* means the *Certificate of registration* in force in respect of the aircraft required by paragraph 4 (9) of this Regulation.

**Document H** means the *Operations manual*, if any, required by paragraph 24 (2) (a) of this Regulation to be carried on the flight or the *Aircraft flight manual*, when the *Operations Manual* is not required to be carried under this Regulation.

**Document I** means a copy of the notified procedures to be followed by the commander of an intercepted aircraft, and the notified visual signals for use by intercepting and intercepted aircraft:

**Document J** means a copy of noise certificate prescribed in Part VI in this Regulation.

**Document K** means the authorisation, if any, granted in respect of the aircraft pursuant to paragraph 14 (1) or a *Minimum equipment list* approved by the Civil Aviation Authority, if any, granted in respect of the aircraft pursuant to paragraphs 14 (2) and 30 (b) (i) of this Regulation.

**Note.** – *International air navigation* means any flight which includes passage over the territory of any State or Territory other than Macao.

## ELEVENTH SCHEDULE

(Paragraph 62)

### RULES OF THE AIR AND AIR TRAFFIC CONTROL

#### PART I - INTERPRETATION

1. In these Rules, unless the context otherwise requires:

*Aerodrome reference point* means the notified geographical location of an aerodrome.

*Air traffic control clearance* means authorisation by an air traffic control unit for an aircraft to proceed under conditions specified by that unit.

*Anti-collision light* means a flashing red or flashing white light showing in all directions for the purpose of enabling the aircraft to be more readily detected by the pilots of distant aircraft.

*Apron* means the part of an aerodrome provided for the stationing of aircraft for the embarkation and disembarkation of passengers, the loading and unloading of cargo and for parking.

*Cloud ceiling* in relation to an aerodrome means the distance measured vertically from the notified elevation of that aerodrome to the lowest part of any cloud visible from the aerodrome which is sufficient to obscure more than one-half of the sky so visible.

*Ground visibility* means the horizontal visibility at ground level.

*IFR flight* means a flight conducted in accordance with the Instrument Flight Rules in Part VI of these Rules.

*Manoeuvring area* means that part of an aerodrome provided for the take-off and landing of aircraft and for the movement of aircraft on the surface, excluding the apron and any part of the aerodrome provided for the maintenance of aircraft.

*Runway* means an area, whether or not paved, which is provided for the take-off or landing run of aircraft.

*VFR flight* means a flight conducted in accordance with the Visual Flight Rules in Part V of these Rules.

#### PART II - GENERAL

##### *Application of rules to aircraft*

2. These Rules, insofar as they are applicable in relation to aircraft, shall, subject to rule 30, apply in relation to:

(a) all aircraft whilst in Macao; and

(b) all Macao aircraft, wherever they may be.

### *Misuse of signals and markings*

3. (1) A signal marking to which a meaning is given by these Rules, or which is required by these Rules to be used in circumstances or for a purpose therein specified, shall not be used except with that meaning, or for that purpose.
- (2) A person in an aircraft or on an aerodrome or at any place at which an aircraft taking off or landing shall not make any signal which may be confused with a signal specified in these Rules, and, except with lawful authority, shall not make any signal which he knows or ought reasonably to know to be a signal in use for signalling to or from an aircraft of the Armed Forces.

### *Reporting hazardous conditions*

4. The commander of an aircraft shall, on meeting with hazardous conditions in the course of a flight, or as soon as possible thereafter, send to the appropriate air traffic control unit by the quickest means available information containing such particulars of the hazardous conditions as may be pertinent to the safety of other aircraft.

### *Low flying*

5. (1) Subject to paragraphs (2) and (3):
- (a) an aircraft, other than a helicopter, shall not fly over any congested area of a city, town or settlement below:
- (i) such height as would enable the aircraft to alight clear of the area and without danger to persons or property on the surface, in the event of failure of a power unit; or
- (ii) a height of 1,500 feet above the highest fixed object within 2,000 feet of the aircraft, whichever is the higher;
- (b) a helicopter shall not fly below such height as would enable it to alight without danger to persons or property on the surface, in the event of failure of a power unit;
- (c) except with the permission in writing of the Civil Aviation Authority and in accordance with any conditions therein specified a helicopter shall not fly:
- (i) over a congested area of a city, town or settlement, below a height of 1,500 feet above the highest fixed object within 2,000 feet of the helicopter; or
- (ii) over any area notified for the purpose of this sub-paragraph, below such height as would enable it to alight clear
- (d) an aircraft shall not fly:

- (i) over, or within 3,000 feet of any assembly in the open air of more than 1,000 persons assembled for the purpose of witnessing or participating in any organised event, except with the permission in writing of the Civil Aviation Authority and in accordance with any conditions therein specified and with the consent in writing of the organisers of the event; or
- (ii) below such height as would enable it to alight clear of the assembly in the event of failure of a power unit:

Provided that where a person is charged with an offence under the Regulation by reason of a contravention of this sub-paragraph, it shall be a good defence to prove that the flight of the aircraft over or within 3,000 feet of the assembly was made at a reasonable height and for a reason not connected with the assembly or with the event which was the occasion for the assembly;

- (e) an aircraft shall not fly closer than 500 feet to any person, vessel, vehicle or structure;
- (2) (a) sub-paragraph (1) (d) and (e) shall not apply to an aircraft which is being used for police purposes.
- (b) sub-paragraph (1) (d) and (e) shall not apply to the flight of an aircraft over or within 3,000 feet of an assembly of persons gathered for the purpose of witnessing an event which consists wholly or principally of an aircraft race or contest or an exhibition of flying, if the aircraft is taking part in such a race, contest or exhibition or is engaged in a flight arranged by, or made with the consent in writing of, the organisers of the event, and the races, contest, exhibition or flight are approved by the Civil Aviation Authority.
  - (c) sub-paragraph (1) (e) shall not apply to:
    - (i) any aircraft while it is landing or taking off in accordance with normal aviation practice; and
    - (ii) any glider while it is hill-soaring.
  - (d) The alternatives in sub-paragraphs (1) (a) (ii) and (1) (c) (i) shall not apply to an aircraft flying:
    - (i) on a route notified for the purposes of this rule; or
    - (ii) on a special VFR flight as defined in rule 23 in accordance with instructions given for the purposes of that rule by the appropriate air traffic control unit.
- (3) Nothing in this rule shall prohibit any aircraft from:
- (a) taking off, landing or practising approaches to landing; or

- (b) flying for the purpose of checking navigational aids or procedures in accordance with normal aviation practice at a Government or licensed aerodrome in Macao or at any aerodrome in any Contracting State; or
- (c) flying in such a manner as may be necessary for the purpose of saving life:

Provided that in the case of practising approaches to landing as aforesaid such practising is confined to the airspace customarily used by aircraft when landing or taking off in accordance with normal aviation practice at the aerodrome concerned.

- (4) Nothing in this rule shall apply to any captive balloon or kite.

### ***Simulated instrument flight***

- 6. An aircraft shall not be flown in simulated instrument flight conditions unless:
  - (a) the aircraft is fitted with dual controls which are functioning properly;
  - (b) an additional pilot (referred to in this rule as a safety pilot) is carried in a second control seat of the aircraft for the purpose of rendering such assistance as may be necessary to the pilot flying the aircraft; and
  - (c) if the safety pilot's field of vision is not adequate both forward and to each side of the aircraft, a third person, being an observer approved by the Civil Aviation Authority, shall occupy a position in the aircraft from which his field of vision makes good the deficiencies of the field of vision of the safety pilot, and from which he can readily communicate with the safety pilot.

For the purposes of this rule the expression "*simulated instrument flight*" means a flight during which mechanical or optical devices are used in order to reduce the field of vision or the range of visibility from the cockpit of the aircraft.

### ***Practice instrument approaches***

- 7. Within Macao, an aircraft shall not carry out instrument approach practice when flying in Visual Meteorological Conditions unless:
  - (a) the appropriate air traffic control unit has previously been informed that the flight is to be made for the purpose of instrument approach practice; and
  - (b) if the flight is not being carried out in simulated instrument flight conditions, an observer approved by the Civil Aviation Authority is carried in such a position in the aircraft that he has an adequate field of vision and can readily communicate with the pilot flying the aircraft.

## **PART III - LIGHTS AND OTHER SIGNALS TO BE SHOWN BY AIRCRAFT**

### ***General***

8. (1) For the purpose of this Part the horizontal plane of a light shown by an aircraft means the plane which would be the horizontal plane passing through the source of that light, if the aircraft were in level flight.
- (2) Where by reason of the physical construction of an aircraft it is necessary to fit more than one lamp in order to show a light required by this part of these Rules, the lamps shall be so fitted and constructed that, so far as is reasonably practicable, not more than one such lamp is visible from any one point outside the aircraft.
- (3) Where in these Rules a light is required to show through specified angles in the horizontal plane, the lamps giving such light shall be so constructed and fitted that the light is visible from any point in any vertical plane within those angles throughout angles of 90° above and below the horizontal plane, but, so far as is reasonably practicable, through no greater angle, either in the horizontal plane or the vertical plane.
- (4) Where in these Rules a light is required to show in all directions the lamps giving such light shall be so constructed and fitted that, so far as is reasonably practicable, the light is visible from any point in the horizontal plane and on any vertical plane passing through the source of that light.

#### *Display of lights by aircraft*

9. (1) By night an aircraft shall display such of the lights specified in these Rules as may be appropriate to the circumstances of the case, and shall not display any other lights which might obscure or otherwise impair the visibility of, or be mistaken for, such lights:

Provided that nothing in this paragraph shall prevent the display of an anti-collision light.

- (2) A flying machine on a land aerodrome in Macao at which aircraft normally land or take off at night shall, unless it is stationary on a part of the aerodrome set aside for the embarkation or disembarkation of passengers, the loading or unloading of cargo or the maintenance or parking of aircraft, display by night either the lights which it would be required to display if it were flying, or the lights specified in rule 11 (2) (a) and (c).

#### *Failure of navigation lights*

10. In Macao, in the event of the failure of any light which is required by these Rules to be displayed in flight, if the light cannot be immediately repaired or replaced the aircraft shall land as soon as in the opinion of the commander of the aircraft it can safely do so, unless authorised by the appropriate air traffic control unit to continue its flight.

#### *Flying machines*

11. (1) A flying machine when flying at night shall display lights as follows:
- (a) in the case of a flying machine registered in Macao having a maximum total weight authorised of more than 5,700 kg, it shall display the system of lights specified in paragraph 2 (b);
- (b) in the case of a flying machine registered in Macao having a maximum total weight authorised of 5,700 kg or less, any one of the following systems of lights:
- (i) that specified in paragraph (2) (a);
- (ii) that specified in paragraph (2) (b); or



- (iii) that specified in paragraph (2) (d) excluding paragraph (2) (d) (ii); and
  - (c) in the case of any other flying machine one of the systems of lights specified in paragraph (2).
- (2) The systems of lights referred to in paragraph (1) are as follows:
- (a) (i) a green light of at least 5 candela showing to the starboard side through an angle of 110° from dead ahead in the horizontal plane;
  - (ii) a red light of at least 5 candela showing to the port side through an angle of 110° from dead ahead in the horizontal plane; and
  - (iii) a white light of at least 3 candela showing through angles of 70° from dead astern to each side in the horizontal plane, all being steady lights;
  - (b) (i) the lights specified in sub-paragraph (a); and
  - (ii) an anti-collision light;
  - (c) the lights specified in sub-paragraph (a), but all being flashing lights flashing together; and
  - (d) the lights specified in sub-paragraph (a), but all being flashing lights flashing together in alternation with one or both of the following:
    - (i) a flashing white light of at least 20 candelas showing in all directions;
    - (ii) a flashing red light of at least 20 candela showing through angles of 70° from dead astern to each side in the horizontal plane.
- (3) If the lamp showing either the red or the green light specified in paragraph (2) (a) is fitted more than two metres from the wing tip, a lamp may, notwithstanding rule 9 (1), be fitted at the wing tip to indicate its position, showing a steady light of the same colour through the same angle.

#### PART IV - GENERAL FLIGHT RULES

##### *Weather reports and forecasts*

16. (1) Immediately before an aircraft flies the commander of the aircraft shall examine the current reports and forecasts of the weather conditions on the proposed flight path, being reports and forecasts which it is reasonably practicable for him to obtain in order to determine whether Instrument Meteorological Conditions prevail or are likely to prevail during any part of the flight.
- (2) An aircraft which is unable to communicate by radio with an air traffic control unit at the aerodrome of destination shall not begin a flight to an aerodrome within a control zone if the information which it is reasonably practicable for the commander of the aircraft to obtain indicates that it will arrive at that aerodrome when the ground visibility is less than 8 km or the cloud ceiling is less than 1,500 feet, unless the commander of the aircraft has obtained from an air traffic control unit at that aerodrome permission to enter the aerodrome traffic zone.

##### *Rules for avoiding aerial collisions*

*General*

17. (1) (a) Notwithstanding that the flight is being made with air traffic control clearance it shall remain the duty of the commander of an aircraft to take all possible measures to ensure that his aircraft does not collide with any other aircraft.
- (b) An aircraft shall not be flown in such proximity to other aircraft as to create a danger of collision.
- (c) Aircraft shall not fly in formation unless the commanders of the aircraft have agreed to do so.
- (d) An aircraft which is obliged by these Rules to give way to another aircraft shall avoid passing over or under the other aircraft, or crossing ahead of it, unless passing well clear of it.
- (e) An aircraft which has the right of way under this rule shall maintain its course and speed.
- (f) For the purposes of this rule, a glider and a flying machine which is towing it shall be considered to be a single aircraft under the command of the commander of the towing flying machine.

*Converging*

- (2) (a) Subject to paragraphs (3) and (4), an aircraft in the air shall give way to other converging aircraft as follows:
- (i) flying machines shall give way to airships, gliders and balloons;
- (ii) airships shall give way to gliders and balloons; and
- (iii) gliders shall give way to balloons.
- (b) Subject to sub-paragraph (a), when two aircraft are converging in the air at approximately the same altitude, the aircraft which has the other on its right shall give way:

Provided that mechanically driven aircraft shall give way to aircraft which are towing other aircraft or objects.

*Approaching head-on*

- (3) When two aircraft are approaching head-on or approximately so in the air and there is danger of collision, each shall alter its course to the right.

*Overtaking*

- (4) An aircraft which is being overtaken in the air shall have the right of way and the overtaking aircraft, whether climbing, descending or in horizontal flight, shall keep out of the way of the other

aircraft by altering course to the right, and shall not cease to keep out of the way of the other aircraft until that other aircraft has been passed and is clear, notwithstanding any change in the relative positions of the two aircraft:

Provided that a glider overtaking another glider in Macao may alter its course to the right or to the left.

#### *Landing*

- (5) An aircraft while landing on a final approach to land shall have the right of way over other aircraft in flight or on the ground or water.

#### *Two or more aircraft landing*

- (6) In the case of two or more aeroplanes or gliders approaching any place for the purpose of landing, the aircraft at the lower altitude shall have the right of way, but it shall not cut in front of another aircraft which is on final approach to land or overtake that aircraft:

Provided that:

- (a) when an air traffic control unit has communicated to any aircraft an order of priority for landing, the aircraft shall approach to land in that order; and
- (b) when the commander of an aircraft is aware that another aircraft is making an emergency landing, he shall give way to that aircraft, and at night, notwithstanding that he may have received permission to land, shall not attempt to land until he has received further permission to do so.

#### *Aerobatic manoeuvres*

18. An aircraft shall not carry out any aerobatic manoeuvre:

- (a) over the congested area of any city, town or settlement; or
- (b) within controlled airspace except with the consent of the appropriate air traffic control unit.

#### *Right-hand traffic rule*

19. An aircraft which is flying within Macao in sight of the ground and following a road, railway, canal or coastline, or any other line of landmarks, shall keep such line of landmarks on its left.

#### *Verification of flight and arrival*

20. (1) Before commencing a flight for the purpose of commercial air transport over an area notified for the purpose of this rule as an area in which search and rescue operations would be difficult, the

commander of an aircraft shall submit or cause to be submitted to the appropriate air traffic control unit a flight notification containing such particulars as may be specified.

- (2) Before commencing a flight for a purpose other than commercial air transport over an area notified in accordance with paragraph (1), the commander of the aircraft may submit or cause to be submitted for the appropriate air traffic control unit a flight notification containing such particulars as may be specified.
- (3) When a flight notification has been submitted in accordance with paragraph (1) or (2), the commander of an aircraft able to communicate by radio with the appropriate air traffic control unit or aeronautical radio station shall also comply with rule 28 as if the flight were an IFR flight.
- (4) The commander of an aircraft complying with the requirements of paragraph (3) shall, if he finds it necessary to deviate from any particular route specified in the flight notification, report by radio to the appropriate air traffic control unit or aeronautical radio station the nature of the deviation.
- (5) The commander of an aircraft in respect of which a flight notification, in accordance with paragraph (1) or (2), or a flight plan in accordance with rule 27 (1), has been submitted, shall take all reasonable steps in accordance with notified procedures to ensure upon landing that notice of the arrival of the aircraft is given to the air traffic control unit notified for this purpose.
- (6) The commander of an aircraft required to comply with paragraph (5), or if he has caused notice of its intended arrival at an aerodrome to be given to the air traffic control unit or other authority at that aerodrome, shall ensure that the air traffic control unit notified for the purpose of paragraph (5) or the air traffic control unit or other authority at the aerodrome is informed as quickly as possible of any changes of intended destination and any estimated delay in arrival of 30 minutes or more
- (7) Nothing in this rule shall relieve the commander of an aircraft of the obligations imposed on him by rule 35 (3).

***Flight in notified airspace***

21. In relation to flights in Visual Meteorological Conditions in controlled airspace notified for purpose of this rule, the commander of an aircraft shall comply with rules 27, 28 and 29 as if the flights were IFR flights:

Provided that the commander of the aircraft shall not elect to continue the flight in compliance with the Visual Flight Rules for the purposes of rule 27 (3).

***Choice of VFR or IFR***

22. Subject to rule 21, an aircraft shall always be flown in accordance with the Visual Flight Rules or the Instrument Flight Rules:

Provided that in Macao an aircraft flying at night shall be flown in accordance with the Instrument Flight Rules, or, in a control zone, in accordance with the Instrument Flight Rules or the proviso to rule 23 (b).

**PART V - VISUAL FLIGHT RULES**

23. The Visual Flight Rules shall be as follows:
  - (a) An aircraft intending to operate under Visual Flight Rules shall maintain a flight visibility of at least 8 kilometres and remain at least 1.5 kilometres horizontally and 1,000 feet vertically clear of cloud in the following area:
    - (i) within controlled airspace; and
    - (ii) outside controlled airspace above 3,000 feet.

- (b) An aircraft flying at speeds of 140 knots or less may operate under Visual Flight Rules at or below 3,000 feet outside controlled airspace with a flight visibility of at least 1.5 kilometres. An aircraft flying at speeds above 140 knots may operate under Visual Flight Rules with a flight visibility of at least 5 kilometres. In both cases, the aircraft shall remain clear of cloud and in sight of ground or water.
- (c) A helicopter may operate with a flight visibility below 1.5 kilometres if manoeuvred at a speed that will give adequate opportunity to observe other traffic or any obstructions in time to avoid collision.

**PART VI - INSTRUMENT FLIGHT RULES**

24. The Instrument Flight Rules shall be as follows:

- (a) outside controlled airspace--in relation to flights outside controlled airspace rules 25 and 26 shall apply; and
- (b) within controlled airspace--in relation to flights within controlled airspace rules 25, 27, 28 and 29 shall apply.

**Minimum height**

25. Without prejudice to rule 5, in order to comply with the Instrument Flight Rules an aircraft shall not fly at a height of less than 1,000 feet above the highest obstacle within a distance of 5 nautical miles of the aircraft unless otherwise authorised by the competent authority or unless it is necessary to do so in order to take off or land.

**Quadrantal rule**

26. In order to comply with the Instrument Flight Rules an aircraft when in level flight at or above a notified height outside controlled airspace shall be flown at a level appropriate to its magnetic track, in accordance with the appropriate table set forth in this rule. The level of flights shall be measured by an altimeter set according to the system notified, or in the case of flight over a country other than Macao, otherwise published by the competent authority, in relation to the area over which the aircraft is flying.

**Table I - Flights at levels below 29,000 Feet**

<i>Magnetic track</i>	<i>Cruising level</i>
Less than 90°	Odd thousands of feet
90° but less than 180°	Odd thousands of feet + 500 feet
180° but less than 270°	Even thousands of feet
270 ° hut less than 360°	Even thousands of feet + 500 feet

**Note.** – Quadrantal rules apply only below FL 250. Above this level semi-circular flight rules apply.

**Table II**

Within controlled airspaces at all levels and outside controlled airspaces above FL 250, semi-circular rules apply in accordance with the following:

**TRACK (Magnetic)**

<i>FL</i>	<i>000°-179° IFR flights altitude (Feet)</i>	<i>VFR flights altitude (Feet)</i>	<i>FL</i>	<i>180°-359° IFR flights altitude (Feet)</i>	<i>VFR flights altitude (Feet)</i>
10	1,000	--	20	2,000	--
30	3,000	3,500	40	4,000	4,500
50	5,000	5,500	60	6,000	6,500
70	7,000	7,500	80	8,000	8,500
90	9,000	9,500	100	10,000	10,500
110	11,000	11,500	120	12,000	12,500
130	13,000	13,500	140	14,000	14,500
150	15,000	15,500	160	16,000	16,500
170	17,000	17,500	180	18,000	18,500
190	19,000	19,500	200	20,000	20,500
210	21,000	21,500	220	22,000	22,500
230	23,000	23,500	240	24,000	24,500
250	25,000	25,500	260	26,000	26,500
270	27,000	27,500	280	28,000	28,500
290	29,000	30,000	310	31,000	32,000
330	33,000	34,000	350	35,000	36,000
370	37,000	38,000	390	39,000	40,000
410	41,000	42,000	430	43,000	44,000
450	45,000	46,000	470	47,000	48,000
490	49,000	50,000	510	51,000	52,000
etc.	etc.	etc.	etc.	etc.	etc.

***Flight plan and air traffic control clearance.***

27. (1) In order to comply with the Instrument Flight Rules, before an aircraft either takes off from a point within any controlled airspace or enters any controlled airspace the commander of the aircraft shall cause a flight plan to be communicated to the appropriate air traffic control unit and shall obtain an air traffic control clearance based on such flight plan.
- (2) The flight plan shall contain such particulars of the intended flight as may be necessary to enable the air traffic control unit to issue an air traffic control clearance or for search and rescue purposes.
- (3) The commander of the aircraft shall fly in conformity with the air traffic control clearance issued for the flight as amended by any further instructions given by an air traffic control unit and with the holding and instrument approach procedures, notified in relation to the aerodromes of destination unless:
- (a) he is able to fly in uninterrupted Visual Meteorological Conditions for so long as he remains in controlled airspace; and
  - (b) he has informed the appropriate air traffic control unit of his intention to continue the flight in compliance with Visual Flight Rules and has requested that unit to cancel his flight plan:

Provided that if an emergency arises which requires an immediate deviation from an air traffic control clearance, the commander of the aircraft shall, as soon as possible, inform the appropriate air traffic control unit of the deviation.

- (4) The commander of the aircraft after it has flown in controlled airspace shall, unless he has requested the appropriate air traffic control unit to cancel his flight plan, forthwith inform that unit when the aircraft lands within or leaves the controlled airspace.

***Position reports***

28. In order to comply with the Instrument Flight Rules the commander of an aircraft in IFR flight who flies in or is intending to enter controlled airspace shall report to the appropriate air traffic control unit the time and the position and altitude of the aircraft at such reporting points or at such intervals of time as may be notified for this purpose or as may be directed by the air traffic control unit.

***Communication failure***

29. In order to comply with the Instrument Flight Rules the commander of an aircraft flying in controlled airspace who is unable to establish or maintain two-way communication with the appropriate air traffic control unit shall:
- (a) continue to fly to his destination, if it is possible to do so by flying only in conditions not inferior to those specified in rule 23 (b);
  - (b) if he has received and acknowledged an air traffic control clearance to fly to his destination or to enter the controlled airspace in which it lies, and sufficient navigational assistance is obtainable to enable him to comply with such clearance:

- (i) continue to fly in compliance with the current flight plan to the holding point at the aerodrome of destination, maintaining the last acknowledged cruising levels for the portion of the route for which levels have been specified in the clearance, and thereafter the cruising levels shown in the flight plan;
  - (ii) arrange the flight to arrive over the holding point as closely as possible to the last acknowledged estimated time of arrival;
  - (iii) begin to descend over the holding point at the last acknowledged expected approach time, or, if no such expected approach time has been acknowledged the last acknowledged estimated time of arrival:
  - (iv) land within 30 minutes of the time at which the descent should have been started; or
- (c) if he is unable to comply with the provisions of paragraph (a) or (b), leave or avoid controlled airspace either:
- (i) fly to an area in which flight may be continued in Visual Meteorological Conditions, and land at an aerodrome there; or
  - (ii) select a suitable area in which to descend through cloud, and land at an aerodrome there.

## PART VII - AERODROME TRAFFIC RULES

### *Application of aerodrome traffic rules*

30. The rules in this section which are expressed to apply to flying machines shall also be observed, so far as practicable, in relation to all other aircraft.

### *Visual signals*

31. The commander of an aeroplane on, or in the traffic zone of an aerodrome shall observe such visual signals as may be displayed at, or directed to him from, the aerodrome by the authority of the person in charge of the aerodrome and shall obey any instruction which may be given to him by means of such signals:

Provided that he shall not be required to obey the signals referred to in rule 44 if in his opinion it is inadvisable to do so in the interests of safety.

### *Access to and movement on the manoeuvring area and other parts of the aerodrome*

32. (1) A person or vehicle shall not go into any part of an aerodrome provided for the use of aircraft and under the control of the person in charge of the aerodrome without the permission of the person in charge of the aerodrome, and except in accordance with any conditions subject to which that permission may have been granted.



- (2) A vehicle shall not move on the manoeuvring area of an aerodrome having an air traffic control unit without the permission of that unit, and except in accordance with any conditions subject to which that permission may have been granted.
- (3) Any permission granted for the purposes of this rule may be granted either in respect of persons or vehicles generally, or in respect of any particular person or vehicle or any class of person or vehicle.

*Right of way on the ground.*

33. (1) This rule shall apply to:

- (a) flying machines; and
- (b) vehicles,

on any part of a land aerodrome provided for the use of aircraft and under the control of the person in charge of the aerodrome.

- (2) Notwithstanding any air traffic control clearance it shall remain the duty of the commander of an aircraft to take all possible measures to ensure that his aircraft does not collide with any other aircraft or with any vehicle.
- (3)
  - (a) Flying machines and vehicles shall give way to aircraft which are taking off or landing.
  - (b) Vehicles and flying machines which are not taking off or landing shall give way to vehicles towing aircraft.
  - (c) Vehicles which are not towing aircraft shall give way to aircraft.
- (4) Subject to paragraph (3) and rule 35 (3) (b), in case of danger of collision between two flying machines:
  - (a) when the two are approaching head-on or approximately so, each shall alter its course to the right;
  - (b) when the two flying machines are on converging courses, the one which has the other on its right shall give way to the other and shall avoid crossing ahead of the other unless passing well clear of it; and
  - (c) a flying machine which is being overtaken shall have the right of way, and the overtaking aeroplane shall keep out of the way of the other aeroplane by altering its course to the left until that other aeroplane has been passed and is clear, notwithstanding any change in the relative positions of the two aeroplanes.
- (5) Subject to paragraph (3) (b) a vehicle shall:

- (a) overtake another vehicle so that the other vehicle is on the left of the overtaking vehicle; and
- (b) keep to the left when passing another vehicle which is approaching head-on or approximately so.

***Dropping of tow ropes, etc.***

34. Tow ropes, banners or similar articles towed by aircraft shall not be dropped from aircraft except at an aerodrome and:
- (a) in accordance with arrangements made with an air traffic control unit at the aerodrome or, if there is no such unit, with the person in charge of the aerodrome; or
  - (b) in the area designated by the marking described in rule 41 (7) and the ropes, banners or similar articles shall be dropped when the aircraft is flying in the direction appropriate for landing.

***Aerodromes not having air traffic control units***

35. (1) An aircraft shall not fly within a zone which the commander knows or ought reasonably to know to be the aerodrome traffic zone of an aerodrome which does not have an air traffic control unit, except for the purpose of taking off, and landing or observing the signals in the signals area with a view to landing. An aircraft flying within such a zone for the purpose of observing the signals shall remain clear of cloud and at least 500 feet above the level of the aerodrome.
- (2) The commander of an aircraft flying in such a zone or moving on such an aerodrome shall:
- (a) conform to the pattern of traffic formed by other aircraft, or keep clear of the airspace in which the pattern is formed;
  - (b) make all turns to the left unless ground signals otherwise indicate; and
  - (c) take off and land in the direction indicated by the ground signals or, if no such signal is displayed, into the wind, unless good aviation practice demands otherwise.
- (3) (a) A flying machine or glider shall not land on a runway at such an aerodrome unless the runway is clear of other aircraft.
- (b) Where take-offs and landings are not confined to a runway:
- (i) a flying machine or glider when landing shall leave clear on its left any aircraft which has already landed or is already landing or is about to take off; if such a flying machine or glider is obliged to turn, it shall turn to the left after the commander of the aircraft has satisfied himself that such action will not interfere with other traffic movements; and
  - (ii) a flying machine about to take-off shall take up position and manoeuvre in such a way as to leave clear on its left any aircraft which is already taking off or is about to take off.

- (4) A flying machine after landing shall move clear of the landing area in use as soon as it is possible to do so.

*Aerodromes having air traffic control units*

36. (1) An aircraft shall not fly within a zone which the commander of the aircraft knows or ought reasonably to know to be the aerodrome traffic zone of an aerodrome having an air traffic control unit except for the purpose of taking off, landing or observing the signals in the signals area with a view to landing, unless he has the permission of the appropriate air traffic control unit.
- (2) The commander of an aircraft flying in the aerodrome traffic zone of an aerodrome having an air traffic control unit or moving on the manoeuvring area of such an aerodrome shall:
- (a) cause a continuous watch to be maintained on the appropriate radio frequency notified for air traffic control communications at the aerodrome, or if this is not possible, cause a watch to be kept for such instructions as may be issued by visual means;
- (b) not taxi, take off or land except with the permission of the air traffic control unit; and
- (c) comply with rule 35 (1) (b), (2), (3) and (4) as if the aerodrome did not have an air traffic control unit, unless he has the permission of the air traffic control unit, at the aerodrome, or has been instructed by such unit, to do otherwise.
- (3) Without prejudice to rules 20 and 27 the commander of an aircraft shall, immediately upon arrival at, or prior to departure from an aerodrome within Macao having an air traffic control unit, ensure that such unit is informed of the flight which he has just made or which he is about to undertake.

*Special rules for certain aerodromes*

37. The Civil Aviation Authority may make special rules for the operation of aircraft in the vicinity of notified aerodromes. Such special rules unless expressly stated otherwise, shall apply in addition to the other rules in this Part.

## PART VIII - AERODROME SIGNALS AND MARKINGS

### VISUAL AND AURAL SIGNALS

#### *General*

38. (1) Whenever any signal specified in this section is given or displayed, or whenever any marking so specified is displayed, by any person in an aircraft, or at an aerodrome, or at any other place which is being used by aircraft for landing or take-off, it shall, when given or displayed in Macao, have the meaning assigned to it in this section.
- (2) All dimensions specified in this section shall be subject to a tolerance of 10% plus or minus.

#### *Signals in the signals area*

39. (1) When any signal specified in the following paragraphs is displayed it shall be placed in a signals area, which shall be a square visible in all directions bordered by a white strip 30 centimetres wide the internal sides measuring 12 metres.
- (2) A white landing T, as illustrated in this paragraph, signifies that aeroplanes and gliders taking off or landing shall do so in a direction parallel with the shaft of the T and towards the cross arm, unless otherwise authorised by the appropriate air traffic control unit.

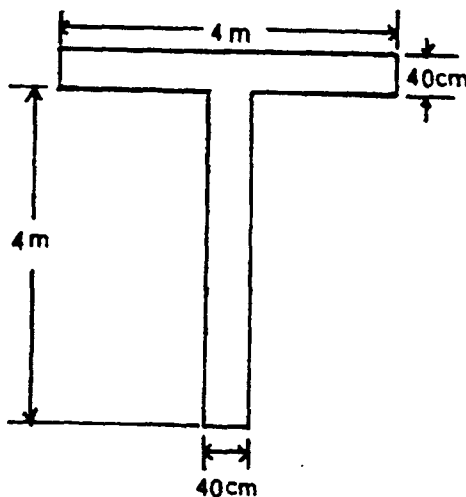
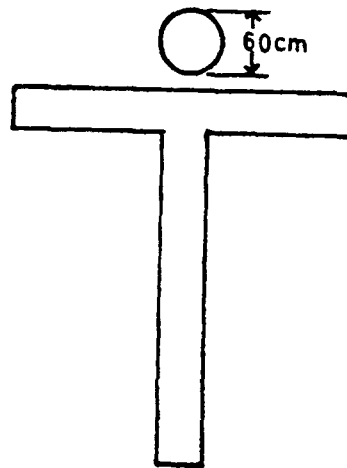


Figure 1

- (3) A white disc 60 centimetres in diameter displayed alongside the cross arm of the T and in line with the shaft of the T, as illustrated in this paragraph, signifies that the direction of landing and take-off do not necessarily coincide.



Dimensions of  
'T' same as  
Figure 1.

Figure 2

- (4) A white dumb-bell, as illustrated in this paragraph, signifies that movements of aeroplanes and gliders on the ground shall be confined to paved, metallised or similar hard surfaces.

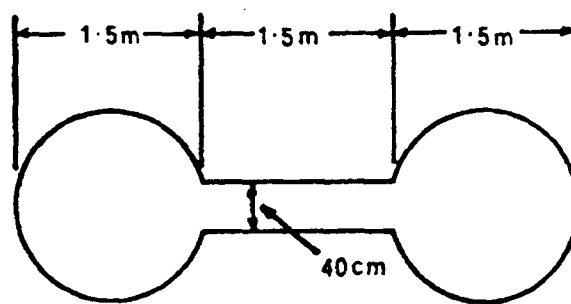


Figure 3

- (5) A white dumb-bell as described in paragraph (4) but with a black stripe 60 centimetres wide across each disc at right angles to the shaft of the dumb-bell, as illustrated in this paragraph, signifies that aeroplanes and gliders taking off or landing shall do so on a runway but that movement on the ground is not confined to paved, metallised or similar hard surfaces.

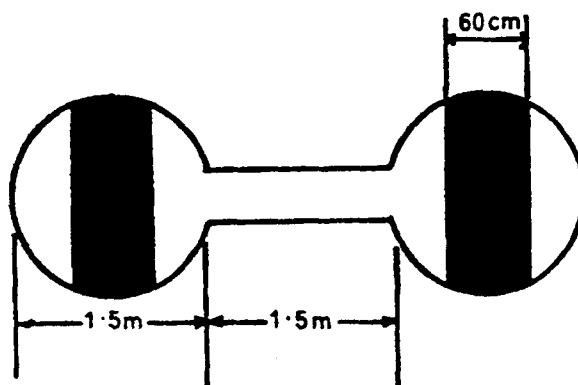


Figure 4

- (6) A red and yellow striped arrow, as illustrated in this paragraph, the shaft of which is at least one metre wide placed along the whole or not less than a total of 11 metres of two adjacent sides of the signals area and pointing in a clockwise direction signifies that a right-hand circuit is in force.

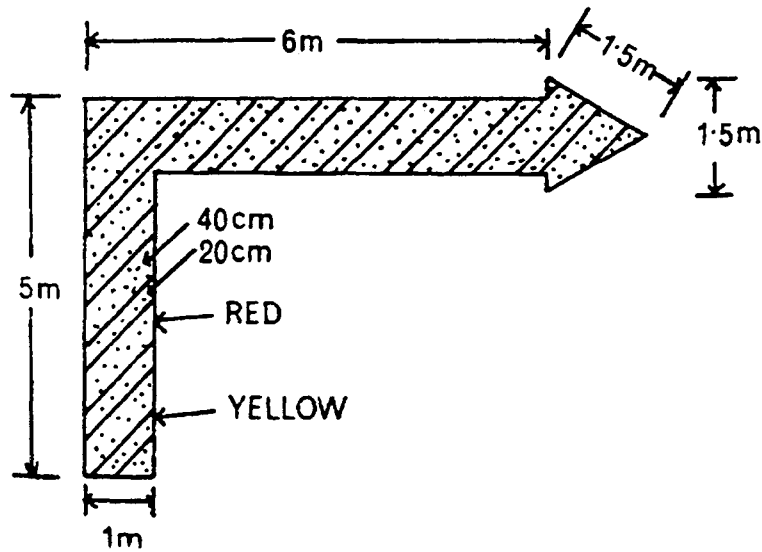


Figure 5

- (7) A red panel 3 metres square with a yellow stripe along one diagonal at least 50 centimetres wide, as illustrated in this paragraph, signifies that the state of the manoeuvring area is poor and pilots must exercise special care when landing.

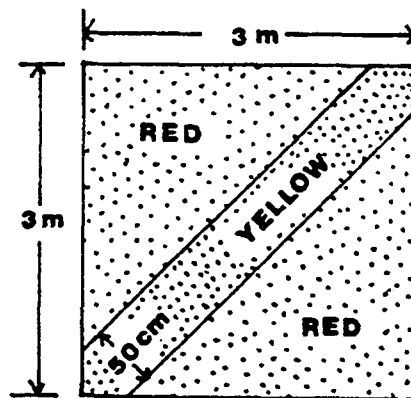
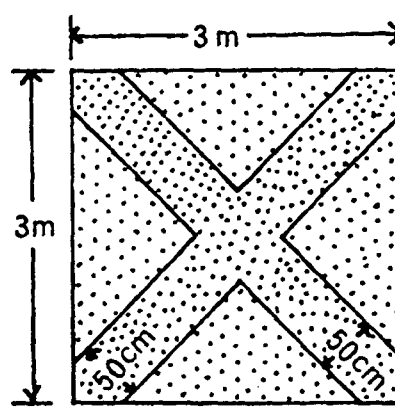


Figure 6

- (8) A red panel 3 metres square with a yellow stripe, at least 50 centimetres wide, along each diagonal, as illustrated in this paragraph, signifies that the aerodrome is unsafe for the movement of aircraft and that landing on the aerodrome is prohibited.



YELLOW STRIPES ON  
RED BACKGROUND

Figure 7

- (9) A white letter H, as illustrated in this paragraph, signifies that helicopters shall take off and land only within the area designated by the marking specified in rule 41 (5).

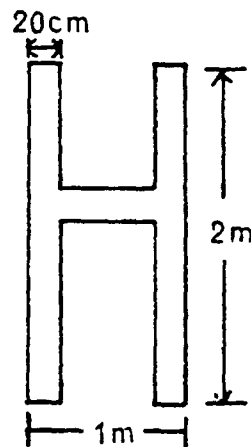


Figure 8

- (10) A red letter L displayed on the dumb-bell specified in paragraphs (4) and (5), as illustrated in this paragraph, signifies that light aircraft are permitted to take off and land either on a runway or on the area designated by the marking specified in rule 41 (6).

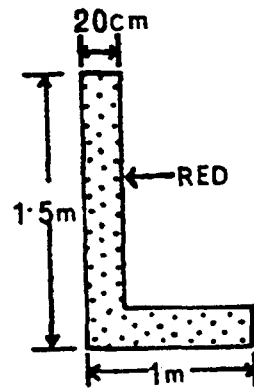


Figure 9

(11) A white double cross, as illustrated in this paragraph, signifies that glider flying is in progress.

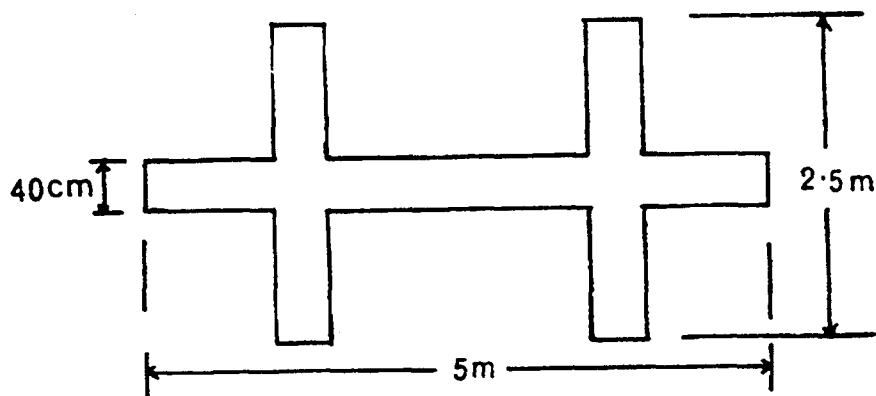


Figure 10

*Markings for paved runways and taxiways*

40. (1) Two or more white crosses, as illustrated in this paragraph, displayed on a runway or taxiway, with the arms of the crosses at an angle of 45° to the centre line of the runway, at intervals of not more than 300 metres signify that the section of the runway or taxiway marked by them is unfit for the movement of aircraft.



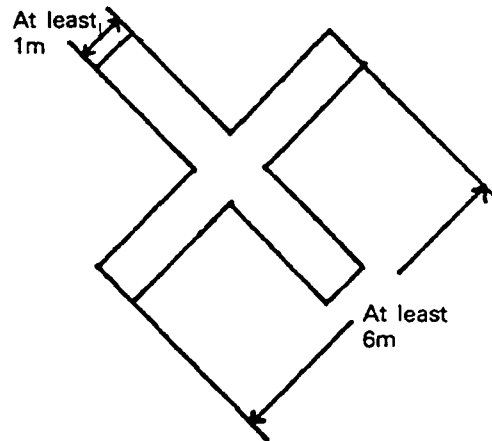


Figure 11

- (2) A broken white line and a continuous line, as illustrated in this paragraph, signify a holding position beyond which no part of an aircraft or vehicle shall project in the direction of the runway without permission from an air traffic control unit.

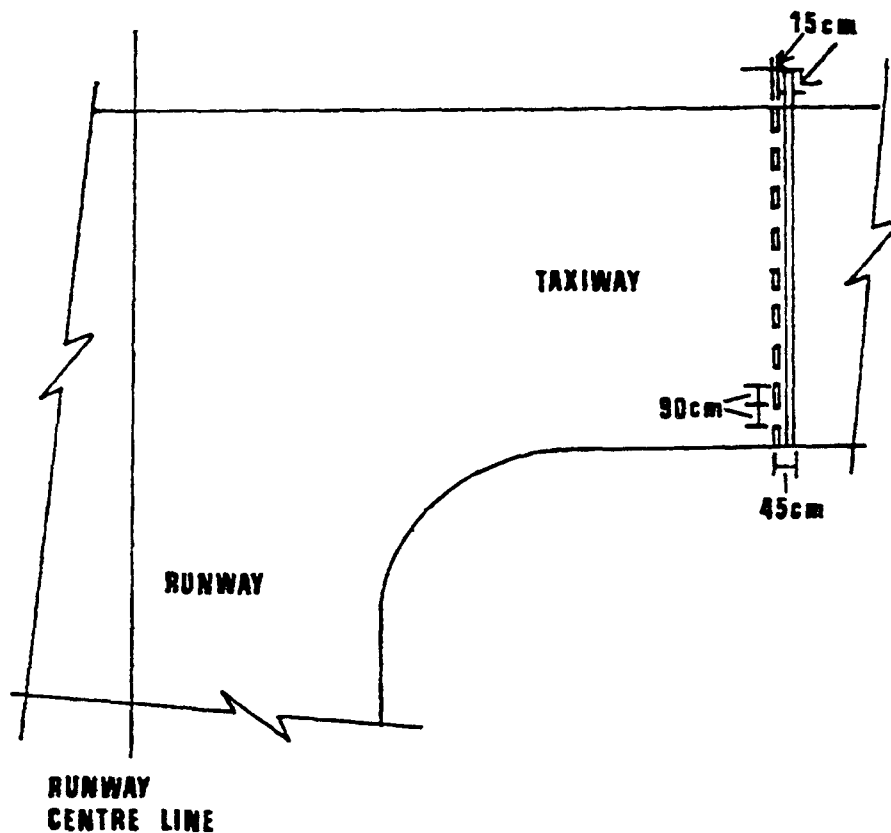


Figure 12

- (3) Orange and white markers, as illustrated in this paragraph, spaced not more than 15 metres apart, signify the boundary of that part of a paved runway, taxiway or apron which is unfit for the movement of aircraft.

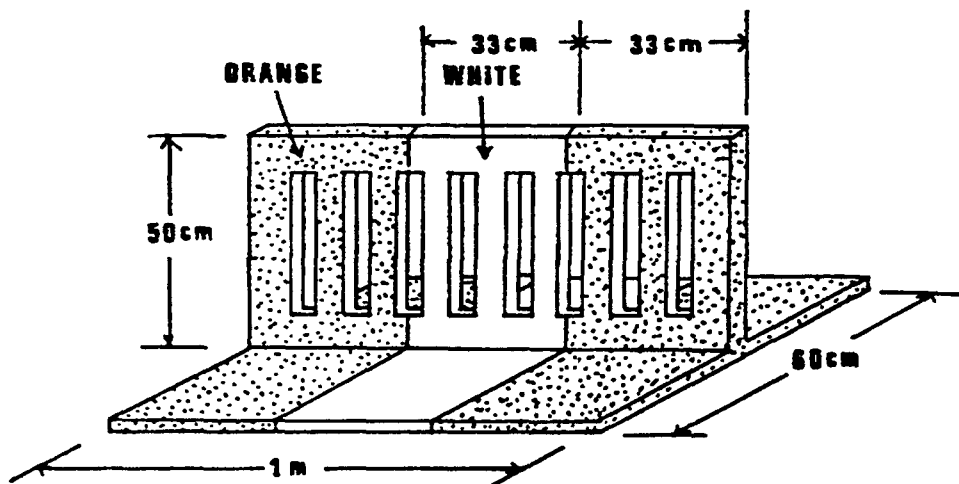


Figure 13

*Markings on unpaved manoeuvring areas*

41. (1) Markers with orange and white stripes of an equal width of not less than 50 centimetres, with an orange stripe at each end, as illustrated in this paragraph, alternating with flags not less than 60 centimetres square showing equal orange and white triangular areas, indicate the boundary of an area unfit for the movement of aircraft and one or more white crosses as specified in rule 40 (1) indicate the said area. The distance between any two successive orange and white flags shall not exceed 90 metres.

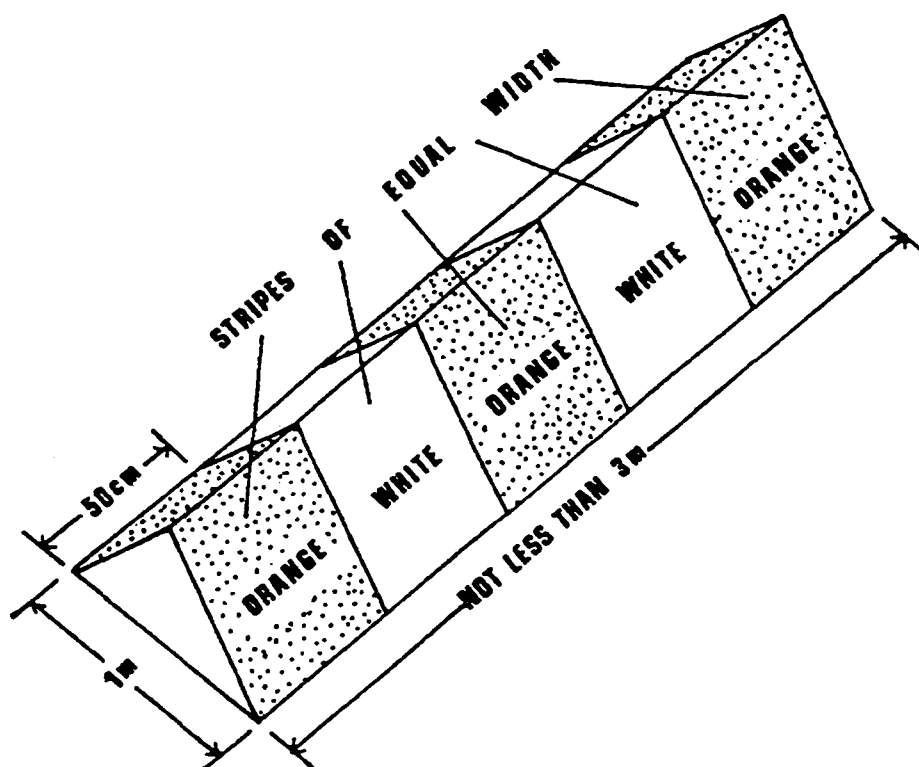


Figure 14

- (2) Striped markers, as specified in paragraph (1), spaced not more than 45 metres apart, indicate the boundary of an aerodrome.
- (3) On structures, markers with orange and white vertical stripes, of an equal width of not less than 50 centimetres, with an orange stripe at each end, as illustrated in this paragraph, spaced not more than 45 metres apart, indicate the boundary of an aerodrome. The pattern of the marker shall be visible from inside and outside the aerodrome and the marker shall be affixed not more than 15 centimetres from the top of the structure.

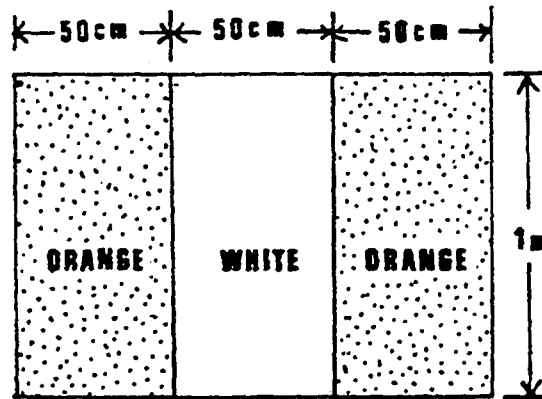


Figure 15

- (4) White flat rectangular markers 3 metres long and one metre wide at intervals not exceeding 90 metres, flush with the surface of the unpaved runway or stopway, as the case may be, indicate the boundary of an unpaved runway or of a stopway.
- (5) A white letter H, as illustrated in this paragraph, indicates an area which shall be used only for the taking off and landing of helicopters.

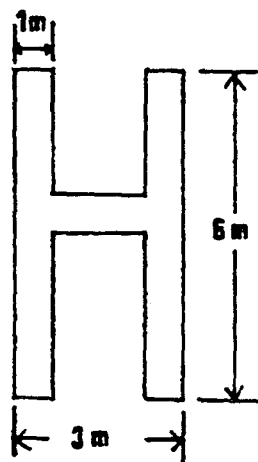


Figure 16

- (6) A white letter L as illustrated in this paragraph, indicates a part of the manoeuvring area which shall be used only for the taking off and landing of light aircraft.

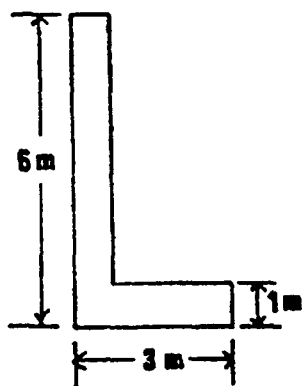


Figure 17

- (7) A yellow cross with two arms 6 metres long by 1 metre wide at right angles, indicates that tow ropes and similar articles towed by aircraft shall only be dropped in the area in which the cross is placed.
- (8) A white double cross as illustrated in this paragraph, indicates an area which shall be used only for the taking off and landing of gliders.

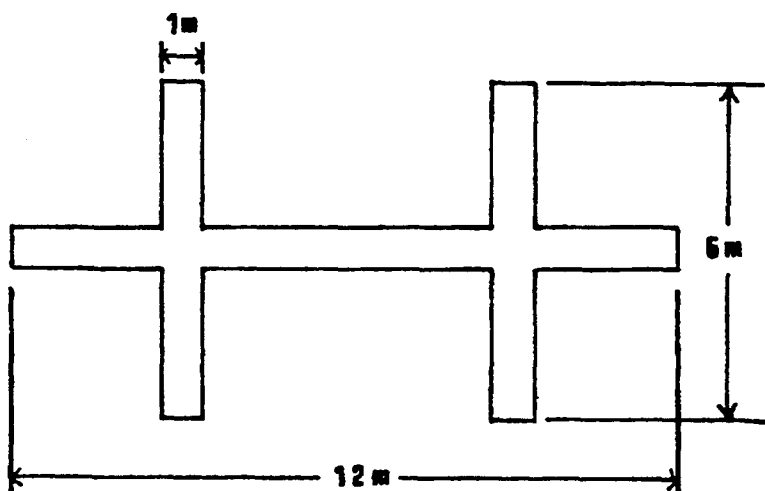


Figure 18

- (9) A white landing T as specified in rule 30 (2) placed at the left hand side of the runway when viewed from the direction of landing indicates the runway to be used, and at an aerodrome with no runway it indicates the direction for take-off and landing.

**Signals visible from the ground**

- 42. (1) A black ball 60 centimetres in diameter suspended from a mast signifies that the directions of take-off and landing are not necessarily the same.
- (2) A chequered flag or board, 1.2 metres by 90 centimetres containing 12 equal squares, 4 horizontally and 3 vertically, coloured red and yellow alternatively, signifies that aerodrome traffic

- on the manoeuvring area is subject to control by means of the lights and pyrotechnic signals referred to in rule 43.
- (3) Two red balls 60 centimetres in diameter, disposed vertically one above the other, 60 centimetres apart and suspended from a mast, signify that glider flying is in progress at the aerodrome.
  - (4) Black Arabic numerals in two-figure groups and, where parallel runways are provided the letter or letters L (Left), LC (Left Centre), C (Centre), RC (Right Centre) and R (Right), placed against a yellow background, indicate the direction for take-off or the runway in use.
  - (5) A black letter C against a yellow background, as illustrated in this paragraph, indicates the position at which a pilot can report to the air traffic control unit or to the person in charge of the aerodrome.

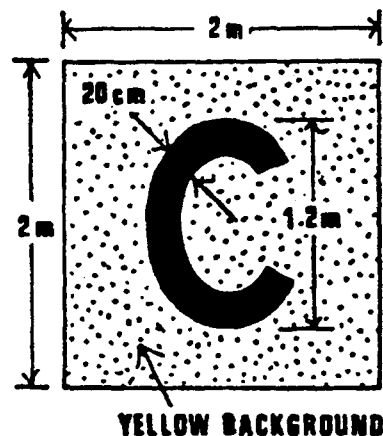


Figure 19

- (6) A rectangular green flag of not less than 60 centimetres square flown from a mast indicates that a right-hand circuit is in force.

***Lights and pyrotechnic signals for control of aerodrome traffic***

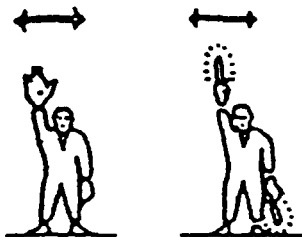
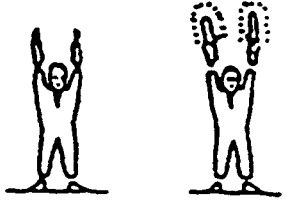
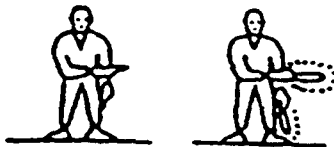
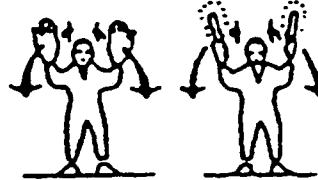
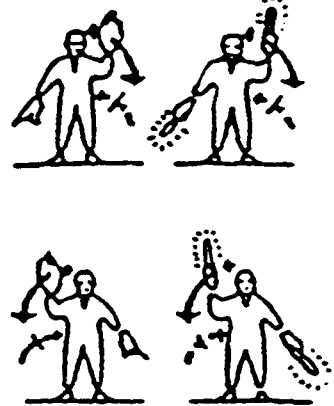
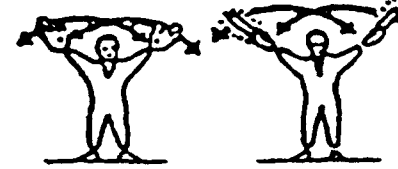
43. Each signal described in the first column of Table A, when directed from an aerodrome to an aircraft or to a vehicle, or from an aircraft, shall have the meanings respectively appearing in the second, third and fourth columns of that Table opposite the description of the signal.

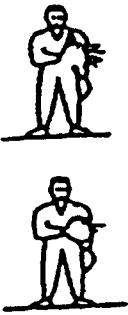
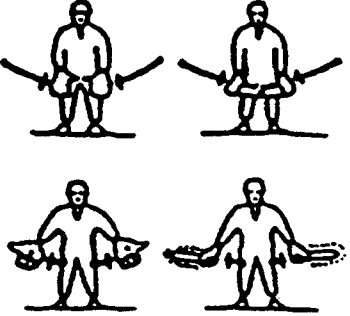

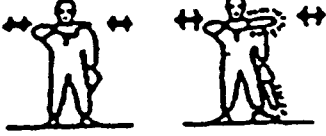


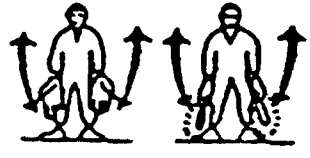
TABLE A

<i>Characteristic and colour of light beam or pyrotechnic</i>	<i>From an aerodrome</i>		<i>From an aircraft in flight to an aerodrome</i>
	<i>to an aircraft in flight</i>	<i>to an aircraft or vehicle on the aerodrome</i>	
(a) Continuous red light	Give way to other aircraft and continue circling	Stop	-----
(b) Red pyrotechnic light, or Red flare	Do not land; wait for permission	-----	Immediate assistance is required
(c) Red flashes	Do not land; aerodrome not available for landing	Move clear of landing area	-----
(d) Green flashes	Return to aerodrome; wait for permission to approach and land	To an aircraft: You may move on the manoeuvring area and apron;  To a vehicle: You may move on the manoeuvring area	-----
(e) Continuous green light	You may land	You may take off (not applicable to a vehicle)	-----
(f) Continuous green light or green flashes, or green pyrotechnic light	-----	-----	By night: May I land? By day May I land in direction different from that indicated by landing T?
(g) White flashes	Land at this aerodrome after receiving continuous green light, and then, after receiving green flashes, proceed to the apron	Return to starting point on the aerodrome	I am compelled to land immediately
(h) White pyrotechnic lights, switching on and off the navigation lights, or switching on and off the landing lights	-----	-----	I am compelled to land immediately


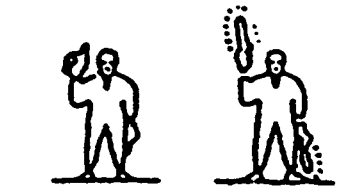
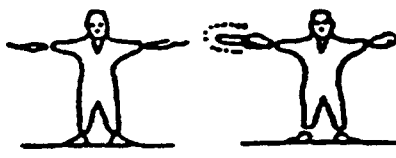
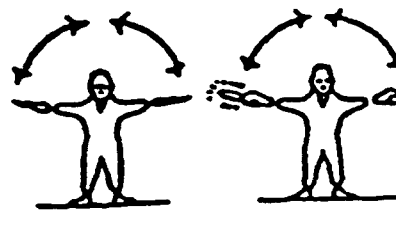
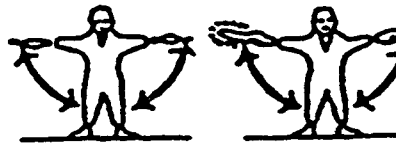
44. Signals for the guidance of aircraft manoeuvring on or off the ground shall, in Macao, have the meaning as shown in Table B. By day any such signals shall be given by hand or by circular bats and by night by torches or illuminated wands.



**TABLE B - MEANING OF MARSHALLING SIGNALS (Rule 44)**

<p>1. To proceed under further guidance by signalman.</p> <p>Signalman directs pilot if traffic conditions on aerodrome require this action.</p>	
<p>2. This bay.</p> <p>Arms above head in vertical position with palms facing inward.</p>	
<p>3. Proceed to next signalman.</p> <p>Right or left arm down, other arm moved across the body and extended to indicate direction of next signalman.</p>	
<p>4. Move ahead.</p> <p>Arms little aside, palms facing backward and repeatedly moved upward-backward from shoulder height.</p>	
<p>5. Turn.</p> <p>a) <i>Turn to your left:</i> right arm downward, left arm repeatedly moved upward-backward. Speed of arm movement indicating rate of turn.</p> <p>b) <i>Turn to your right:</i> left arm downward, right arm repeatedly moved upward-backward. Speed of arm movement indicating rate of turn.</p>	
<p>6. Stop.</p> <p>Arms repeatedly crossed above head (the rapidity of the arm movement should be related to the urgency of the stop i.e. the faster the movement the quicker the stop).</p>	

<p>7. Brakes.</p> <p>a) <i>Engage brakes</i>: raise arm and bend, with fingers extended, horizontally in front of body, then clench fist.</p> <p>b) <i>Release brakes</i>: raise arm, with fist clenched, horizontally in front of body, then extend fingers.</p>	
<p>8. Chokes.</p> <p>a) <i>Chokes inserted</i>: arms down, palms facing inwards, move arms from extended position inwards.</p> <p>b) <i>Chokes removed</i>: arms down, palms facing outwards, move arms outwards.</p>	
<p>9. Start engine(s).</p> <p>Left hand overhead with appropriate number of fingers extended, to indicate the number of the engine to be started, and circular motion of right hand at head level.</p>	
<p>10. Cut engine(s).</p> <p>Either arm and hand level with shoulder, hand across throat, palm downward. The hand is moved sideways with the arm remaining bent.</p>	
<p>11. Slow down.</p> <p>Arms down with palms toward ground then moved up and down several times.</p>	
<p>12. Slow down engine(s) on indicated side.</p> <p>Arms down with palms toward ground.</p>	
<p>13. Move back.</p> <p>Arms by sides, palms facing forward, swept forward and upward repeatedly to shoulder height.</p>	



<p>14. Turns while backing.</p> <p>a) <i>For tail to starboard:</i> point left arm down, and right arm brought from overhead, vertical position to horizontal forward position, repeating right arm movement.</p> <p>b) <i>For tail to port:</i> point right arm down, and left arm brought from overhead, vertical position to horizontal forward position, repeating left arm movement.</p>	
<p>15. All clear.</p> <p>Right arm rose at elbow with thumb erect.</p>	
<p>16. Hover.</p> <p>Arms extended horizontally sideways.</p>	
<p>17. Move upwards.</p> <p>Arms extended horizontally to the side beckoning upwards, with palms turned up. Speed of movement indicates rate of ascent.</p>	
<p>18. Move downwards.</p> <p>Arms extended horizontally to the side beckoning downwards, with palm turned down. Speed of movement indicates rate of descent.</p>	

<p>19. Move horizontally</p> <p>Appropriate arm extended horizontally sideways in direction of movement and other arm moved in front of body in same direction, in a repeating movement.</p>	
<p>20. Land</p> <p>Arms crossed and extended downwards in front of the body.</p>	

**Marshalling signals (from a pilot of an aircraft to a marshaller)**

45. The following signals made by a pilot in an aircraft to a marshaller on the ground shall respectively have the following meanings:

<i>Description of signal</i>	<i>Meaning of signal</i>
(a) Raise arm and hand with fingers extended horizontally in front of, face, then clench fist.	Brakes engaged.
(b) Raise arm with fist clenched horizontally in front of face, then extend fingers.	Brakes released.
(c) Arms extended palms facing outwards, move hands inwards to cross in front of face.	Insert chocks.
(d) Hands crossed in front of face, palms, facing outwards, move arms outwards.	Remove chocks.
(e) Raise the number of fingers on one hand indicating the number of the engine to be started. For this purpose the aircraft engines shall be numbered in relation to the marshaller facing the aircraft, from his right to his left, for example, No. 1 engine shall be the port outer engine, No. 2 shall be the port inner engine, No. 3 engine shall be the starboard inner engine and No. 4 engine shall be the starboard outer engine.	Ready to start engine.

***Distress, urgency and safety signals***

46. (1) The following signals, given either together or separately before the sending of a message, signify that an aircraft is threatened by grave and imminent danger and requests immediate assistance:
- (a) by radiotelephony - the spoken word "Mayday";
  - (b) by visual signalling:
    - (i) the signal SOS (... --- ...);
    - (ii) a succession of pyrotechnic lights fired at short intervals each showing a single red light;
    - (iii) a parachute flare showing a red light;
  - (c) by sound signalling other than radiotelephony:
    - (i) the signal SOS (... --- ...);
    - (ii) a continuous sounding with any sound apparatus.
- (2) The following signals, given either together or separately, before the sending of a message, signify that the commander of the aircraft wishes to give notice of difficulties but that he does not require immediate assistance:
- (a) a succession of white pyrotechnic lights;
  - (b) the repeated switching on and off of the aircraft landing lights;
  - (c) the repeated switching on and off of its navigation lights, in such a manner as to be clearly distinguishable from the flashing navigation lights described in rule 11.
- (3) The following signals, given either together or separately, indicate that the commander of the aircraft has an urgent message to transmit concerning the safety of the aircraft or of any person or property:
- (a) by radio telephony - the spoken word "PAN";
  - (b) by visual signalling:
    - (i) the signal XXX (- . . . . .);
    - (ii) a succession of green pyrotechnic lights;
    - (iii) a succession of green flashes;

- (c) by sound signalling other than radiotelephony - the signal XXX (- . . . . . - . . . . .).

***Warning signals to aircraft in flight***

47. In Macao, the following signals shall respectively have the following meanings:

- (a) (i) by day - a series of projectiles discharged at intervals of 10 seconds, each showing on bursting black or white smoke; or
- (ii) by night - a series of projectiles discharged at intervals of 10 seconds, each showing on bursting white lights or stars, or an intermittent white luminous beam directed at the aircraft - indicates that the aircraft to which the signal is directed is in the vicinity of such an area as is referred to in paragraph 63 (1) of the Regulation and is required to change its course;
- (b) by day or by night, a series of projectiles discharged at intervals of 10 seconds, each showing on bursting green lights or stars, indicates that the aircraft is required to land at the nearest aerodrome in accordance with paragraph 63 of the Regulation.

## TWELFTH SCHEDULE

*(Paragraph 80)*

### FEES

The contents of this Schedule is published in a separate ordinance.

## THIRTEENTH SCHEDULE

(Paragraph 83)

### PENALTIES

1. If any person contravenes any provision of this Regulation, or any regulations made there under, not being a provision referred to in paragraphs 2 or 3 of this Schedule shall be liable on conviction to a fine not exceeding MOP 50,000.00 or in the case of a second or subsequent conviction for the like offence to a fine not exceeding MOP 100,000.00.
  
2. If any person contravenes any provision of this Regulation specified in this paragraph shall be liable on conviction to a fine not exceeding MOP 100,000.00 or in the case of a second or subsequent conviction for the like offence to a fine not exceeding MOP 200,000.00.

<b>Provision</b>	<b>Subject Matter</b>
Paragraph 3.	<b>Aircraft flying unregistered</b>
Paragraph 5.	<b>Aircraft flying without markings or with incorrect markings</b>
Paragraph 10 (5).	<b>Preserve the certificate of release to service</b>
Paragraph 15.	<b>Requirement to keep log books</b>
Paragraph 16 (3).	<b>Requirement to keep weight schedule</b>
Paragraph 24.	<b>Operations manual requirements</b>
Paragraph 27 (5).	<b>Preserve the load sheets</b>
Paragraph 35. [ <i>Except (2)</i> ]	<b>Requirement for radio station in aircraft to be licenced and for operation of radio in aircraft</b>
Paragraph 50.	<b>Aircraft noise requirement</b>
Paragraph 52 (3).	<b>Operator's obligation to obtain flight time records of flight crew</b>
Paragraph 58.	<b>Preservation of documents</b>
Paragraph 71.	<b>Use of Macao International Airport and Heliport</b>

3. If any person contravenes any provision of this Regulation specified in this paragraph shall be liable on conviction to a fine not exceeding MOP 500,000.00 or in the case of a second or subsequent conviction for the like offence to a fine not exceeding MOP 1,000,000.00.

Paragraph 6.	<b>Flight without a Certificate of airworthiness</b>
Paragraph 9 (1).	<b>Maintenance programme and certificate of maintenance review</b>

- Paragraph 10. *[Except (5)]* **Inspection, overhaul, repair, replacement and modification**
- Paragraph 12. **Equipment of aircraft**
- Paragraph 13. **Radio equipment of aircraft**
- Paragraph 16. *[Except (3)]* **Aircraft weight schedule**
- Paragraph 18. **Composition of crew of aircraft**
- Paragraph 26. **Commercial air transport – operator’s responsibilities**
- Paragraph 27. *[Except (5)]* **Requirements for aircraft loading**
- Paragraph 28. **Commercial air transport – operating conditions**
- Paragraph 29. **Aerodrome Operating Minima**
- Paragraph 37. **Requirements for minimum navigation performance**
- Paragraph 38. **Use of flight recording system and preservation of records**
- Paragraph 39. **Dropping of persons, animals and articles by aircraft**
- Paragraph 40. **Carriage of weapons or munitions of war**
- Paragraph 41. **Carriage of dangerous goods**
- Paragraph 42. **Carriage of persons in or on any part of an aircraft not designed for that purpose**
- Paragraph 43. **Requirements for exits and break-in markings**
- Paragraph 52 (1). **Operator’s obligation to regulate flight times of flight crew**
- Paragraph 52 (2). **Operator’s obligation not to allow flight by crew in dangerous state of fatigue**
- Paragraph 68. **Requirement for licenced aerodrome**
- Paragraph 69 (3) **Contravention of condition of aerodrome licence**
- Paragraph 78. **Obstruction of persons performing duties under ANRM**
- Paragraph 79. **Contravention of Civil Aviation Authority’s direction**

4. Notwithstanding the above-mentioned penalties, if any aeronautical licence holder contravenes any provision of this Regulation, or any regulations made thereunder, his/her licence may additionally be suspended or revoked.

## FOURTEENTH SCHEDULE

[Paragraphs 20, 62 (7) and (8)]

### MEDICAL REQUIREMENTS FOR THE GRANT AND RENEWAL OF LICENCES TO MEMBERS OF FLIGHT CREW AND AIR TRAFFIC CONTROLLERS IN MACAO

1. The following are the medical requirements prescribed by the Civil Aviation Authority, necessary for the grant and renewal of licences to members of flight crew and air traffic controllers in Macao. A person applying in Macao for the grant or renewal of a licence to act either as member of the operating crew of an aircraft, or an air traffic controller, shall be required to undergo a medical examination to ascertain whether his health condition conforms with the standard of fitness, i.e. physical and mental, visual, colour perception and hearing, applicable to the case, as specified in paragraph 10 of this Schedule. The standards established in this Schedule cannot, on their own, be sufficiently detailed to cover all possible individual situations. Of necessity many decisions relating to the evaluation of medical fitness must be left to the judgement and discretion of the individual designated medical examiner. The evaluation must, therefore, be based on a medical examination conducted throughout in accordance with the high standards of medical practice. Due regard must be given to the privileges granted by the licence applied for or held by the applicant for the medical assessment, and the conditions under which the licence holder is going to exercise those privileges in carrying out assigned duties. The examination will be based upon the requirements specified in paragraphs 11 to 29 of this Schedule, provided that:
  - (1) an applicant who does not satisfy the appropriate medical requirements may, at the discretion of the Civil Aviation Authority, be accepted as eligible for the grant or renewal of a licence so far as medical requirements are concerned; and any licence granted or renewed in accordance with this proviso may be made subject to such conditions and restrictions as the Civil Aviation Authority may consider appropriate in the particular case;
  - (2) if an applicant for the renewal of a licence is for the time being on duty as a member of the operating crew of an aircraft in a region distant from official medical centres the medical examination which he/she should normally pass to obtain renewal of the licence may exceptionally, at the discretion of the Civil Aviation Authority:
    - (a) be deferred once for a period of 6 months in the case of a member of the operating crew of a private aircraft; or
    - (b) be deferred for two consecutive periods of 3 months each in the case of a member of the operating crew of a commercial air transport or aerial work aircraft, on condition that the applicant obtains locally on each occasion a satisfactory medical certificate after having been examined by a qualified medical officer; or
    - (c) be deferred for a single period not exceeding 24 months in the case of a private pilot, where the medical examination is carried out by a medical examiner designated under paragraph 4 (1) (a) of this Schedule in which the applicant is temporarily located. A report of the medical examination shall be sent to the Civil Aviation Authority.



2. The requirements to be met for the renewal of a Medical Assessment are the same as those established for the initial assessment except where otherwise specifically stated. For the purpose of this Schedule the following definitions apply:

*Accredited medical conclusion* means the conclusion reached by one or more medical experts acceptable to the Civil Aviation Authority for the purposes of the case concerned, in consultation with flight operations or other experts as necessary.

3. (1) Medical examinations must be performed on a routine timely basis for the purpose of renewing the medical certificates of the licence holder. Except as provided in sub-paragraphs (2) and (3) to this paragraph, reports of medical fitness obtained in accordance with paragraph 4 shall be submitted at intervals of not greater than the following maximum periods:
- Private pilot licence (aeroplanes and helicopters) .....24 months
  - Commercial pilot licence (aeroplanes and helicopters) .....12 months
  - Airline transport pilot licence (aeroplanes and helicopters) .....12 months
  - Flight navigator licence .....12 months
  - Flight engineer licence .....12 months
  - Flight radiotelephony operator licence .....12 months
  - Air traffic controller licence .....24 months
- (2) When the holders of either, airline transport pilot licences (aeroplanes or helicopters), or commercial pilot licences (aeroplanes or helicopters), have passed their 40<sup>th</sup> birthday, the 12 month maximum period interval specified in sub-paragraph (1) shall be reduced to 6 months.
- (3) When the holders of either private pilot licences (aeroplanes, helicopters or gyroplanes) or air traffic controller licences have passed their 40<sup>th</sup> birthday, the 24 month maximum interval specified in sub-paragraph (1) shall be reduced to 12 months.
4. (1) The medical examinations, excepting, however, the examination referred to in paragraph 1 (1) of this Schedule shall be carried out as follows:
- (a) the medical examination shall be carried out by one or more authorised medical examiners, qualified and licensed in the practice of medicine, who have been or will be trained in aviation medicine, and appointed by or acting under the authority of the Civil Aviation Authority;
  - (b) the medical examiner(s) appointed by the Civil Aviation Authority after completion of the various assessments in accordance with the standards and periods specified in this Schedule, shall issue individual confidential reports which shall include the results of the various tests and an overhaul general recommendation. These reports must be forwarded to the Civil Aviation Authority;
  - (c) the medical examiner(s) shall report to the Civil Aviation Authority any individual case where, in the examiner's judgement, an applicant's failure to meet any requirement, whether numerical or otherwise, is such that exercise of the privileges of the licence being applied for, or held, is not likely to jeopardise flight safety. In such cases relevant ability, skill and experience of the applicant and operational conditions have been

given due consideration and the licence will be endorsed with any special limitation or limitations when the safe performance of the licence holder's duties is dependent on compliance with such limitation or limitations;

(d) when the medical examination is carried out by a constituted group of medical examiners, the Civil Aviation Authority will appoint the head of the group to be responsible for co-ordinating the results of the examination and signing the report. The Civil Aviation Authority will use the services of physicians experienced in the practice of aviation medicine when it is necessary to evaluate reports submitted to the Civil Aviation Authority by medical examiners; and

(e) the medical examiners appointed by or acting under the authority of the Civil Aviation Authority should acquire practical knowledge and experience of the conditions in which the holders of licences and ratings carry out their duties.

(2) Based on the medical examiner(s) reports, when the Civil Aviation Authority is satisfied that the requirements prescribed in this Schedule have been met, a medical certificate shall be issued to the respective applicant.

5. Every applicant who presents himself for medical examination for the grant or renewal of a flight crew or an air traffic controller licence in Macao shall be required to furnish to the medical examiner a certified statement of the medical facts concerning personal, familial and hereditary history. The applicant shall be made aware of the necessity for giving a statement that is as complete and accurate as the applicant's knowledge permits and any false declaration may entail the cancellation of any licence granted or renewed as a result of the examination.

6. Every applicant who presents himself for medical examination for the grant or renewal of a flight crew or an air traffic controller licence in Macao shall be required to furnish to the medical examiner a declaration signed by him stating whether he/her has previously undergone such medical examination, and if so, where, when and with what result. A false declaration may entail the cancellation of any licence granted or renewed as a result of the examination.

7. If the holder of a licence is aware, or has reasonable grounds to suspect, that his/her physical, aural or eye condition has deteriorated in any respect, even if only temporarily as the result of a common minor ailment, so that it may be below the standard of medical fitness required for the grant of such a licence, he/she shall not act in any capacity for which he/she is so licensed until he/she is satisfied that his/her condition has been restored to the required standard.

8. (1) If the holder of a licence:

(a) suffers any personal injury as the result of an accident occurring while he/she is acting in any capacity for which he/she is licensed; or

(b) suffers any personal injury involving incapacity for work as the result of an accident occurring otherwise than while he/her is acting in any capacity for which he/she is licensed; or

(c) suffers from any illness involving incapacity for work during 20 days or more,

he/she shall send a notification of the occurrence, in writing to the Civil Aviation Authority, as soon as possible in the case of accident and, in the case of illness, as soon as the period of 20 days has elapsed.

(2) The holder of a licence may after suffering any such personal injury or illness, be required to undergo a full or partial medical examination. He/she shall not, therefore, resume acting in any

capacity for which he/she is licensed until he/she has arranged for a medical report, detailing the nature of the injury or illness, the treatment received, the progress made whilst under treatment and his/her present condition, to be forwarded to the Civil Aviation Authority and has, in the light of such report either been examined and pronounced fit or has been informed by the Civil Aviation Authority that an examination is not required.

(3) Pregnancy shall be regarded as incapacitating the holder of a licence from carrying out flying duties. As soon as the condition has been diagnosed the holder of a licence shall cease flying and shall not again fly until she has in due course, been examined and pronounced fit. Provided that:

(a) in exceptional circumstances, relaxations of the requirements of this sub-paragraph may be made at the discretion of the Civil Aviation Authority.

9. The medical examinations required for the purpose of paragraph 8 of this Schedule shall conform to the same conditions and standards as for the grant or renewal of a licence except, however as provided in paragraph (b) of the proviso to paragraph 1 of this Schedule.

10. An applicant for a Medical Assessment issued in accordance with the terms specified in this Schedule shall undergo a medical examination based on the following requirements:

- (a) physical and mental;
- (b) visual;
- (c) colour perception; and
- (d) hearing.

11. The standards of medical fitness appropriate to the various classes of licences are set out below:

(a) **Class 1** applies to applicants for, and holders of:

- Commercial pilot licences (aeroplanes, helicopters)
- Airline pilot licences (aeroplanes, helicopters)
- Flight navigator licences
- Flight engineer licences

(b) **Class 2** applies to applicants for, and holders of:

- Private pilot licences (aeroplanes and helicopters)
- Flight radiotelephony operator licences

(c) **Class 3** applies to applicants for, and holders of:

- Air traffic controller licences

12. A person who is the holder of a private pilot licence (aeroplanes, helicopters and gyroplanes) and who has been granted or makes application for an instrument rating shall be required to satisfy **hearing Class 1**.

***Physical and mental requirements***

13. **Physical and mental Class 1** – The Medical Assessment will be based on the following requirements of physical and mental fitness:

- (a) The applicant shall be required to be free from:
  - (i) any abnormality, congenital or acquired, or
  - (ii) any active, latent, acute or chronic disability, or
  - (iii) any wound, injury or sequelae from operation, or
  - (iv) any effect or side-effect of any prescribed or non-prescribed therapeutic medication taken,

such as would entail a degree of functional incapacity which is likely to interfere with the safe handling of an aircraft or with the safe performance of duties.

- (b) The medical examination will include a full inquiry into the family and personal history of the applicant. The information obtained shall be given in a statement made and signed by him and will be taken into consideration by the medical examiner.
- (c) The applicant shall not suffer from any disease or disability, which could render that applicant likely to become suddenly unable either to operate an aircraft safely or to perform assigned duties safely.
- (d) The applicant shall have no established medical history or clinical diagnosis of:
  - (i) a psychosis;
  - (ii) alcoholism;
  - (iii) drug dependence;
  - (iv) any personality disorder, particularly if severe enough to have repeatedly resulted in overt acts;
  - (v) a mental abnormality, or neurosis of a significant degree;

such as might render the applicant unable to safely exercise the privileges of the licence or rating applied for or held, unless accredited medical conclusion indicates that in special circumstances, the applicant's failure to meet the requirement is such that exercise of the privileges of the licence or rating applied for is not likely to jeopardize flight safety.

The applicant shall have no established medical history or clinical diagnosis of any mental abnormality, personality disorder or neurosis which, according to accredited medical conclusion, makes it likely that within two years of the examination the applicant will be unable to safely exercise the privileges of the licence or rating applied for or held. A history of acute toxic psychosis need not be regarded as disqualifying, provided that the applicant has suffered no permanent impairment.

- (e) The applicant shall have no established medical history or clinical diagnosis of any of the following:

- (i) a progressive or non-progressive disease of the nervous system, the effects of which, according to accredited medical conclusion, are likely to interfere with the safe exercise of the applicant's licence and rating privileges;
  - (ii) epilepsy;
  - (iii) any disturbance of consciousness without satisfactory medical explanation of cause.
- (f) Cases of head injury, the effects of which, according to accredited medical conclusion, are likely to interfere with the safe exercise of the applicant's licence and rating privileges shall be assessed as unfit.
- (g) The applicant shall not possess any abnormality of the heart, congenital or acquired, which is likely to interfere with the safe exercise of the applicant's licence and rating privileges. A history of proven myocardial infarction shall be disqualifying. Such commonly occurring conditions as respiratory arrhythmia, occasional extrasystoles which disappear on exercise, increase of pulse rate from excitement or exercise, or a slow pulse not associated with auriculoventricular dissociation may be regarded as being within "normal" limits.
- (h) Electrocardiography shall form part of the heart examination for the first issue of a licence and shall be included in re-examination of applicants no less frequently than every 5 years up to the age of 30, between the ages of 30 and 40 no less frequently than every 2 years, and thereafter no less frequently than annually. The purpose of routine electrocardiography is case finding. It does not provide sufficient evidence to justify disqualification without further thorough cardiovascular investigation.
- (i) The systolic and diastolic blood pressures shall be within normal limits. The use of drugs for control of high blood pressure is disqualifying except for those drugs, the use of which, according to accredited medical conclusion, is compatible with the safe exercise of the applicant's licence and rating privileges. There shall be no significant functional nor structural abnormality of the circulatory tree.
- (j) There shall be no acute disability of the lungs nor any active disease of the structures of the lungs, mediastinum or pleura. In the case of an examination for the first issue of a licence, radiography shall form a part of the chest examination and shall be repeated periodically thereafter. Radiography shall form a part of the medical examination in all doubtful clinical cases.
- (k) Any extensive mutilation of the chest wall with collapse of the thoracic cage and sequelae of surgical procedures resulting in decreased respiratory efficiency at altitude shall be assessed as unfit. Cases of pulmonary emphysema will be assessed as unfit if the condition is causing symptoms.
- (l) Cases of active pulmonary tuberculosis, duly diagnosed, shall be assessed as unfit. Cases of quiescent or healed lesions which are known to be tuberculous, or are presumably tuberculous in origin, may be assessed as fit. Cases of doubt about the activity of a lesion, where symptoms of activity of the disease are lacking, clinically, be assessed as temporarily unfit for a period of not less than 3 months from the date of the medical examination. At the end of the 3-month period, a further radiographic record shall be made and compared carefully with the original. If there is no sign of extension of the disease and there are no general symptoms nor symptoms referable to the chest, the applicant may be assessed as fit for 3 months. Thereafter, provided there continues to be no sign of extension of the disease as shown by radiographic examinations carried out at

the end of each 3-month period, the validity of the licence will be restricted to consecutive periods of 3 months. When the applicant has been under observation under this scheme for a total period of at least two years and comparison of all the radiographic records shows no changes or only retrogression of the lesion, the lesion will be regarded as "quiescent" or "healed".

- (m) Cases of disabling disease with important impairment of functions of the gastrointestinal tract and its adnexae shall be assessed as unfit.
- (n) The applicant shall be required to be completely free from those hernias that might give rise to incapacitating symptoms.
- (o) Any sequelae of disease or surgical intervention on any part of the digestive tract and its adnexae, likely to cause sudden incapacity in flight, in particular any obstructions due to stricture or compression, shall be assessed as unfit. An applicant who has undergone a major surgical operation on the biliary passages or the digestive tract or its adnexae, which has involved a total or partial excision or a diversion of any of these organs will be assessed as unfit until such time as the medical examiner designated by the Civil Aviation Authority and having access to the details of the operation concerned considers that the effects of the operation are not likely to cause sudden incapacity in the air.
- (p) Cases of metabolic, nutritional or endocrine disorders likely to interfere with the safe exercise of the applicant's licence and rating privileges shall be assessed as unfit.
- (q) Proven cases of diabetes mellitus shown to be satisfactorily controlled without the use of any anti-diabetic drug, may be assessed as fit.
- (r) Cases of severe and moderate enlargement of the spleen persistently below the costal margin shall be assessed as unfit.
- (s) Cases of significant localised and generalised enlargement of the lymphatic glands and of diseases of the blood shall be assessed as unfit, except in cases where accredited medical conclusion indicates that the condition is not likely to affect the safe exercise of the applicant's licence and rating privileges. Cases due to a transient condition will be assessed as only temporarily unfit. Possession of the sickle cell trait should not be a reason for disqualification unless there is positive medical evidence to the contrary.
- (t) Cases presenting any signs of organic disease of the kidney shall be assessed as unfit; those due to a transient condition may be assessed as temporarily unfit. The urine shall contain no abnormal element considered by the medical examiner to be of pathological significance. Cases of affections of the urinary passages and of the genital organs shall be assessed as unfit; those due to a transient condition may be assessed as temporarily unfit.
- (u) Any sequelae of disease or surgical procedures on the kidneys and the urinary tract liable to cause sudden incapacity, in particular any obstructions due to stricture or compression, shall be assessed as unfit. Compensated nephrectomy without hypertension or uraemia may be assessed as fit. An applicant who has undergone a major surgical operation on the urinary system, which has involved a total or partial excision or a diversion of any of its organs will be assessed as unfit, until such time as the medical examiner designated by the Civil Aviation Authority and having access to the details of the operation concerned considers that the effects of the operation are not likely to cause sudden incapacity in the air.

- (v) An applicant for the first issue of a licence who has a personal history of syphilis shall be required to furnish evidence, satisfactory to the medical examiner, that he has undergone adequate treatment.
- (w) Applicants who have a history of severe menstrual disturbances that have proven unnameable to treatment and that are likely to interfere with the safe exercise of the applicant's licence and rating privileges shall be assessed as unfit. Pregnancy shall be a cause of temporary unfitness. In the absence of significant abnormalities, accredited medical conclusion may indicate fitness during the middle months of pregnancy. After confinement or termination of pregnancy the applicant shall not be permitted to exercise the privileges of her licence until she has undergone re-examination and has been assessed as fit. Those who have undergone gynaecological operations will be considered individually.
- (x) Any active disease of the bones, joints, muscles or tendons and all serious functional sequelae of congenital or acquired disease shall be assessed as unfit. Functional after-effects of lesion affecting the bones, joints, muscles or tendons and certain anatomical defects compatible with the safe handling of an aircraft at any altitude and throughout a prolonged or difficult flight may be assessed as fit.
- (y) There shall be:
  - (i) no active pathological process, acute or chronic, of the internal ear or of the middle ear;
  - (ii) no unhealed (unclosed) perforation of the tympanic membranes except that a single dry perforation of non-infectious origin, need not render the applicant unfit; and licences shall not be issued or renewed in these circumstances unless the appropriate hearing requirements in paragraphs 25 to 29 of this Schedule are complied with;
  - (iii) no permanent obstruction of the Eustachian tubes; and
  - (iv) no permanent disturbances of the vestibular apparatus; and transient conditions may be assessed as temporarily unfit.

*Note:* The details of the hearing requirements are set out in paragraphs 25 to 29 of this Schedule.

- (z) There shall be free nasal air entry on both sides. There shall be no serious malformation nor serious, acute or chronic affection of the buccal cavity or upper respiratory tract. Cases of speech defects and stuttering shall be assessed as unfit.

14. **Physical and mental Class2** – The medical examination and assessment will be based on the following requirements of physical and mental fitness:

- (a) The applicant shall be required to be free from:
  - (i) any abnormality, congenital or acquired; or
  - (ii) any active, latent, acute or chronic disability; or
  - (iii) any wound, injury or sequelae from operation,

such as would entail a degree of functional incapacity which is likely to interfere with the safe performance of his duties at any altitude throughout a prolonged or difficult flight.

- (b) The medical examination will include a full inquiry into the family and personal history of the applicant. The information obtained shall be given in a statement made and signed by him and will be taken into consideration by the medical examiner.
- (c) The applicant shall not suffer from any disease or disability, which could render that applicant likely to become suddenly unable either to operate an aircraft safely or to perform assigned duties safely.
- (d) The applicant shall have no established medical history or clinical diagnosis of:
  - (i) a psychosis;
  - (ii) alcoholism;
  - (iii) drug dependence;
  - (iv) any personality disorder, particularly if severe enough to have repeatedly resulted in overt acts;
  - (v) a mental abnormality, or neurosis of a significant degree;

such as might render the applicant unable to safely exercise the privileges of the licence applied for or held, unless accredited medical conclusion indicates that in special circumstances, the applicant's failure to meet the requirement is such that exercise of the privileges of the licence applied for is not likely to jeopardize flight safety.

The applicant shall have no established medical history or clinical diagnosis of any mental abnormality, personality disorder or neurosis which, according to accredited medical conclusion, makes it likely that within two years of the examination the applicant will be unable to safely exercise the privileges of the licence or rating applied for or held. A history of acute toxic psychosis need not be regarded as disqualifying, provided that the applicant has suffered no permanent impairment.

- (e) The applicant shall have no established medical history or clinical diagnosis of any of the following:
  - (i) a progressive or non-progressive disease of the nervous system, the effects of which, according to accredited medical conclusion, are likely to interfere with the safe exercise of the applicant's licence and rating privileges;
  - (ii) epilepsy;
  - (iii) any disturbance of consciousness without satisfactory medical explanation of cause.
- (f) Cases of head injury, the effects of which, according to accredited medical conclusion, are likely to interfere with the safe exercise of the applicant's licence and rating privileges, shall be assessed as unfit.
- (g) The applicant shall not possess any abnormality of the heart, congenital or acquired, which is likely to interfere with the safe exercise of the applicant's licence and rating



privileges. An applicant indicated by accredited medical conclusion to have made a satisfactory recovery from myocardial infarction may be assessed as fit. Such commonly occurring conditions as respiratory arrhythmia, occasional extrasystoles which disappear on exercise, increase of pulse rate from excitement or exercise, or a slow pulse not associated with auriculoventricular dissociation may be regarded as being within "normal" limits.

- (h) Electrocardiography shall form part of the heart examination for the first issue of a licence and shall be included in re-examination of applicants no less frequently than every 5 years up to the age of 30, between the ages of 30 and 40 no less frequently than every 2 years, and thereafter no less frequently than annually. The purpose of routine electrocardiography is case finding. It does not provide sufficient evidence to justify disqualification without further thorough cardiovascular investigation.
- (i) The systolic and diastolic blood pressure shall be within normal limits. The use of drugs for control of high blood pressure is disqualifying except for those drugs, the use of which, according to accredited medical conclusion, is compatible with the safe exercise of the applicant's licence and rating privileges. There shall be no significant functional nor structural abnormality of the circulatory tree. The presence of varicosities does not necessarily entail unfitness.
- (j) There shall be no acute disability of the lungs nor any active disease of the structures of the lungs, mediastinum or pleura. In the case of an examination for the first grant of a licence, radiography shall form a part of the chest examination and shall be repeated periodically thereafter. Radiographic examinations shall be carried out in all doubtful clinical cases.
- (k) Any extensive mutilation of the chest wall with collapse of the thoracic cage and sequelae of surgical procedures resulting in decreased respiratory efficiency at altitude shall be assessed as unfit. Cases of pulmonary emphysema will be assessed as unfit only if the condition is causing symptoms.
- (l) Cases of active pulmonary tuberculosis, duly diagnosed, shall be assessed as unfit. Cases of quiescent or healed lesions which are known to be tuberculous, or are presumably tuberculous in origin, may be assessed as fit. Cases of doubt about the activity of a lesion, where symptoms of activity of the disease are lacking, clinically, will be assessed as temporarily unfit for a period of not less than 3 months from the date of the medical examination. At the end of the 3-month period, a further radiographic record shall be made and compared carefully with the original. If there is no sign of extension of the disease and there are no general symptoms nor symptoms referable to the chest, the applicant may be assessed as fit for 3 months. Thereafter, provided there continues to be no sign of extension of the disease as shown by radiographic examinations carried out at the end of each 3-month period, the validity of the licence will be restricted to consecutive periods of 3 months. When the applicant has been under observation under this scheme for a total period of at least 2 years and comparison of all the radiographic records shows no changes or only retrogression of the lesion, the lesion will be regarded as "quiescent" or "healed".
- (m) Cases of disabling disease with important impairment of function of the gastrointestinal tract and its adnexae shall be assessed as unfit.
- (n) The applicant shall be required to be completely free from those hernias that might give rise to incapacitating symptoms.

- (o) Any sequelae of disease or surgical intervention on any part of the digestive tract and its adnexae, likely to cause sudden incapacity in flight, in particular any obstructions due to stricture or compression, shall be assessed as unfit. An applicant who has undergone a major surgical operation on the biliary passages or the digestive tract or its adnexae, which has involved a total or partial excision or a diversion of any of these organs will be assessed as unfit until such time as the medical examiner designated by the Civil Aviation Authority and having access to the details of the operation concerned considers that the effects of the operation are not liable to cause sudden incapacity in the air.
- (p) Cases of metabolic, nutritional or endocrine disorders likely to interfere with the safe exercise of the applicant's licence and rating privileges shall be assessed as unfit.
- (q) Proven cases of diabetes mellitus shown to be satisfactorily controlled without the use of any anti-diabetic drug, shall be assessed as fit. The use of anti-diabetic drugs for the control of diabetes mellitus is disqualifying except for those oral drugs administered under conditions permitting appropriate medical supervision and control and which, according to accredited medical conclusion, are compatible with the safe exercise of the applicant's licence and rating privileges.
- (r) Cases of severe and moderate enlargement of the spleen persistently below the costal margin shall be assessed as unfit.
- (s) Cases of significant localised and generalised enlargement of the lymphatic glands and of diseases of the blood shall be assessed as unfit, except in cases where accredited medical conclusion indicates that the condition is not likely to affect the safe exercise of the applicant's licence and rating privileges. Cases due to a transient condition will be assessed as only temporarily unfit. Possession of the sickle cell trait should not be a reason for disqualification unless there is positive medical evidence to the contrary.
- (t) Cases presenting any signs of organic disease of the kidney shall be assessed as unfit; those due to a transient condition may be assessed as temporarily unfit. The urine shall contain no abnormal element considered by the medical examiner to be pathological. Cases of affections of the urinary passages and of the genital organs shall be assessed as unfit; those due to a transient condition may be assessed as temporarily unfit.
- (u) Any sequelae of disease or surgical procedures on the kidneys and the urinary tract liable to cause sudden incapacity, in particular any obstructions due to stricture or compression, shall be assessed as unfit. Compensated nephrectomy without hypertension or uraemia may be assessed as fit. An applicant who has undergone a major surgical operation on the urinary system, which has involved a total or partial excision or a diversion of any of its organs will be assessed as unfit until such time as the medical examiner designated by the Civil Aviation Authority and having access to the details of the operation concerned considers that the effects of the operation are not liable to cause sudden incapacity in the air.
- (v) An applicant for the first issue of a licence who has a personal history of syphilis shall be required to furnish evidence, satisfactory to the medical examiner, that the applicant has undergone adequate treatment.
- (w) Applicants who have a history of severe menstrual disturbances that have proven unnameable to treatment and that are likely to interfere with the safe exercise of the applicant's licence and rating privileges shall be assessed as temporarily unfit. Pregnancy shall be a cause of temporary unfitness. In the absence of significant abnormalities, accredited medical conclusion may indicate fitness during the middle months of pregnancy. After confinement or termination of pregnancy the applicant shall not be

permitted to exercise the privileges of her licence until she has undergone re-examination and has been assessed as fit. Those who have undergone gynaecological operations will be considered individually.

- (x) Any active disease of the bones, joints, muscles or tendons and all serious functional sequelae of congenital or acquired disease shall be assessed as unfit. Certain qualifying functional after-effects of lesions affecting the joints, bones, muscles or tendons and certain anatomical defects compatible with the safe exercise of the applicant's licence and rating privileges at any altitude and throughout a prolonged or difficult flight may be assessed as fit.
- (y) There shall be:
  - (i) no active pathological process, acute or chronic, of the internal ear or of the middle ear;
  - (ii) no unhealed (unclosed) perforation of the tympanic membranes except that a dry perforation need not render the applicant unfit. Licences shall not be issued or renewed in these circumstances unless the appropriate hearing requirements in paragraphs 25 to 29 of this Schedule are complied with;
  - (iii) no permanent obstruction of the Eustachian tubes;
  - (iv) no permanent disturbances of the vestibular apparatus; and transient conditions may be assessed as temporarily unfit.
- (z) There shall be free nasal air entry on both sides. There shall be no serious malformation nor serious, acute or chronic affection of the buccal cavity or upper respiratory tract. Applicants suffering from a serious degree of stuttering shall be assessed as unfit.

15. **Physical and mental Class3** – The medical examination and assessment shall be based on the following requirements of physical and mental fitness:

- (a) The applicant shall be required to be free from:
  - (i) any abnormality, congenital or acquired; or
  - (ii) any active, latent, acute or chronic disability; or
  - (iii) any wound, injury or sequelae from operation, such as would entail a degree of functional incapacity which is likely to interfere with the safe performance of duties.
- (b) The medical examination will include a full inquiry into the family and personal history of the applicant. The information obtained shall be given in a statement made and signed by him and will be taken into consideration by the medical examiner.
- (c) The applicant shall not suffer from any disease or disability, which could render that applicant likely to become suddenly unable to perform assigned duties safely.
- (d) The applicant shall have no established medical history or clinical diagnosis of:
  - (i) a psychosis;

- (ii) alcoholism;
- (iii) drug dependence;
- (iv) any personality disorder, particularly if severe enough to have repeatedly resulted in overt acts;
- (v) a mental abnormality, or neurosis of a significant degree;

such as might render the applicant unable to safely exercise the privileges of the licence applied for or held, unless accredited medical conclusion indicates that in special circumstances, the applicant's failure to meet the requirement is such that exercise of the privileges of the licence applied for is not likely to jeopardize flight safety.

The applicant shall have no established medical history or clinical diagnosis of any mental abnormality, personality disorder or neurosis which, according to accredited medical conclusion, makes it likely that within two years of the examination the applicant will be unable to safely exercise the privileges of the licence or rating applied for or held. A history of acute toxic psychosis need not be regarded as disqualifying, provided that the applicant has suffered no permanent impairment.

- (e) The applicant shall have no established medical history or clinical diagnosis of any of the following:
  - (i) a progressive or non-progressive disease of the nervous system, the effect of which, according to accredited medical conclusion, are likely to interfere with the safe exercise of the applicant's licence and rating privileges;
  - (ii) epilepsy;
  - (iii) any disturbance of consciousness without satisfactory medical explanation of cause.
- (f) Cases of head injury, the effects of which, according to accredited medical conclusion, are likely to interfere with the safe exercise of the applicant's licence and rating privileges, shall be assessed as unfit.
- (g) The applicant shall not possess any abnormality of the heart, congenital or acquired, which is likely to interfere with the safe exercise of the applicant's licence and rating privileges. An applicant indicated by *Accredited medical conclusion* to have made a satisfactory recovery from myocardial infarction may be assessed as fit. Such commonly occurring conditions as respiratory arrhythmia, occasional extrasystoles which disappear on exercise, increase of pulse rate from excitement or exercise, or a slow pulse not associated with auriculoventricular dissociation may be regarded as being within "normal" limits.
- (h) Electrocardiography shall form part of the heart examination for the first issue of a licence and shall be included in re-examination of applicants no less frequently than every 5 years up to the age of 30 and thereafter no less frequently than every 2 years. The purpose of routine electrocardiography is case finding. It does not provide sufficient evidence to justify disqualification without further thorough cardiovascular investigation.
- (i) The systolic and diastolic blood pressures shall be within normal limits. The use of drugs for control of high blood pressure is disqualifying except for those drugs, the use of which, according to accredited medical conclusion, is compatible with the safe exercise

of the applicant's licence privileges. There shall be no significant functional nor structural abnormality of the circulatory tree. The presence of varicosities does not necessarily entail unfitness.

- (j) There shall be no acute disability of the lungs nor any active disease of the structures of the lungs, mediastinum or pleura. In the case of an examination for the first grant of a licence, radiography shall form a part of the chest examination and shall be repeated periodically thereafter. Radiographic examinations shall be carried out in all doubtful clinical cases.
- (k) Cases of pulmonary emphysema will be assessed as unfit only if the condition is causing symptoms.
- (l) Cases of active pulmonary tuberculosis, duly diagnosed, shall be assessed as unfit. Cases of quiescent or healed lesions which are known to be tuberculous, or are presumably tuberculous in origin, may be assessed as fit. Cases of doubt about the activity of a lesion, where symptoms of activity of the disease are lacking, clinically, will be assessed as temporarily unfit for a period of not less than 3 months from the date of the medical examination. At the end of the 3-month period, a further radiographic record should be made and compared carefully with the original. If there is no sign of extension of the disease and there are no general symptoms nor symptoms referable to the chest, the applicant may be assessed as fit for 3 months. Thereafter, provided there continues to be no sign of extension of the disease as shown by radiographic examinations carried out at the end of each 3-month period, the validity of the licence will be restricted to consecutive periods of 3 months. When the applicant has been under observation under this scheme for a total period of at least two years and comparison of all the radiographic records shows no changes or only retrogression of the lesion, the lesion will be regarded as "quiescent" or "healed".
- (m) Cases of disabling disease with important impairment of function of the gastrointestinal tract and its adnexae shall be assessed as unfit.
- (n) The applicant shall be required to be free from hernia that might give rise to incapacitating symptoms. Cases in which the medical examiner is satisfied that a well-fitted truss will be worn may be assessed as fit.
- (o) Any sequelae of disease or surgical intervention on any part of the digestive tract and its adnexae, liable to cause sudden incapacity in flight, in particular any obstructions due to stricture or compression, shall be assessed as unfit. An applicant who has undergone a major surgical operation on the biliary passages or the digestive tract or its adnexae, which has involved a total or partial excision or a diversion of any of these organs will be assessed as unfit until such time as the medical examiner having access to the details of the operation concerned considers that the effects of the operation are not liable to cause sudden incapacity.
- (p) Cases of metabolic, nutritional or endocrine disorders likely to interfere with the safe handling of an aircraft may be assessed as unfit.
- (q) Proven cases of diabetes mellitus shown to be controllable, without the use of any anti-diabetic drug, shall be assessed as fit. The use of anti-diabetic drugs for the control of diabetes mellitus is disqualifying except for those oral drugs administered under conditions permitting appropriate medical supervision and control and which, according to accredited medical conclusion, are compatible with the safe exercise of the applicant's licence privileges.

- (r) Cases of significant localised and generalised enlargement of the lymphatic glands and of diseases of the blood shall be assessed as unfit, except in cases where accredited medical conclusion indicates that the condition is not likely to affect the safe exercise of the applicant's licence privileges. Cases due to a transient condition will be assessed as only temporarily unfit.
- (s) Cases presenting any signs of organic disease of the kidney shall be assessed as unfit; those due to a transient condition may be assessed as temporarily unfit. The urine shall contain no abnormal element considered by the medical examiner to be pathological. Cases of affections of the urinary passages and of the genital organs shall be assessed as unfit; those due to a transient condition may be assessed as temporarily unfit.
- (t) Any sequelae of disease or surgical procedures on the kidneys and the urinary tract liable to cause sudden incapacity, in particular any obstructions due to stricture or compression, shall be assessed as unfit. Compensated nephrectomy without hypertension or uraemia may be assessed as fit. An applicant who has undergone a major surgical operation on the urinary system, which has involved a total or partial excision or a diversion of any of its organs will be assessed as unfit until such time as the medical examiner having access to the details of the operation concerned considers that the effects of the operation are not liable to cause sudden incapacity.
- (u) An applicant for the first issue of a licence who has a personal history of syphilis shall be required to furnish evidence, satisfactorily to the medical examiner, that he has undergone adequate treatment.
- (v) Applicants who have a history of severe menstrual disturbances that have proven unnameable to treatment and that are likely to interfere with the safe performance of her duties shall be assessed as temporarily unfit. In the event of presumed pregnancy the applicant shall be assessed as temporarily unfit. After confinement or miscarriage the applicant shall not be permitted to exercise the privileges of her licence until she has undergone re-examination and has been assessed as fit. Those who have undergone gynaecological operations will be considered individually.
- (w) Any active disease of the bones, joints, muscles or tendons and all serious functional sequelae of congenital or acquired disease shall be assessed as unfit. Certain qualifying functional after-effects of lesion affecting the bones, joints, muscles or tendons and certain anatomical defects compatible with the safe exercise of the applicant's licence privileges may be assessed as fit.
- (x) There shall be:
  - (i) no active pathological process, acute or chronic, of the internal ear or of the middle ear; and
  - (ii) no permanent disturbances of the vestibular apparatus; and transient conditions may be assessed as temporarily unfit.

**Note:** The details of the hearing requirements are set out in paragraphs 25 to 29 of this Schedule.

- (y) There shall be no serious malformation nor serious, acute or chronic affection of the buccal cavity or upper respiratory tract. Cases of speech defects and stuttering shall be assessed as unfit.

### Visual requirements

16. Visual acuity for distance shall be measured by means of a series of optotypes of Snellen or Landolt, or other similar optotypes, illuminated at not less than 10 no more than 15 foot candles and placed at a distance of 6 metres from the applicant, or 5 metres as appropriate to the method of testing adopted.
17.
  - (1) For a visual acuity test in a lighted room, a test illumination level of approximately 50 lx, normally corresponding to a brightness of 30-60 cd per square meter shall be adopted. The light level of the room should be approximately one-fifth of the test illumination level.
  - (2) For a visual test in a darkened, or semi-darkened room, a test illumination level of approximately 15 lx, normally corresponding to a brightness of 10 cd per square meter, should be adopted.
18.
  - (1) Each eye of the applicant will be tested separately. The use of contact lenses will not be permitted during the test, and the expression "*correcting glasses*" shall not for the purpose of the following three visual standards include contact lenses.
  - (2) Applicants will not be permitted during the test to attempt to improve visual acuity by partially closing the eyelids so as to produce a stenopaeic effect.
19. **Visual Class 1**
  - (1) The function of the eye and their adnexae shall be normal. There shall be neither active pathological condition, acute or chronic, nor any sequelae of surgery or trauma of the eyes or their adnexa likely to reduce proper visual function to an extent that would interfere with the safe exercise of the applicant's licence and rating privileges.
  - (2) The applicant shall be required to have normal fields of vision.
  - (3) The applicant shall be required to have a distant visual acuity with or without correction of 6/9 or better in each eye separately and binocular visual acuity shall be 6/6 or better. No limits apply to uncorrected visual acuity. Where this standard of visual acuity can be obtained only with correcting lenses, the applicant may be assessed as fit provided that:
    - (a) Such correcting lenses are worn during the exercise of the privileges of the licence or rating applied for or held; and,
    - (b) In addition, pair of suitable correcting spectacles is kept readily available during the exercise of the privileges of the applicant's licence.

**Note:** An applicant accepted as meeting these provisions is deemed to continue to do so unless there is reason to suspect otherwise, in which case an ophthalmic report is required at the discretion of the Civil Aviation Authority. Both uncorrected and corrected visual acuity are normally measured and recorded at each re-examination. Conditions which indicate a need to obtain an ophthalmic report include: a substantial decrease in the uncorrected visual acuity, any decrease in best corrected visual acuity, and the occurrence of eye disease, eye injury or eye surgery.
  - (4) Applicants may use contact lenses to meet this requirement provided that:
    - (a) The lenses are monofocal and non-tinted;
    - (b) The lenses are well tolerated; and

- (c) A pair of suitable correcting spectacles is kept readily available during the exercise of the licence privileges.
- (5) Applicants who use contact lenses may not need to have their uncorrected visual acuity measured at each re-examination provided the history of their contact lens prescription is known.
- (6) Applicants with a large refractive error shall use contact lenses or high index spectacle lenses. If spectacles are used, high index lenses are needed to minimize peripheral field distortion.
- (7) Applicants whose uncorrected distant visual acuity in either eye is worse than 6/60 shall be required to provide a full ophthalmic report prior to initial Medical Assessment and every five years thereafter. The purpose of the required ophthalmic examination is:
  - (i) to ascertain normal visual performance, and
  - (ii) to identify any significant pathology.
- (8) Applicants who have undergone surgery affecting the refractive status of the eye shall be assessed as unfit unless they are free from those sequelae, which are likely to interfere with the safe exercise of their licence and rating privileges.
- (9) The applicant shall be required to have the ability to read, while wearing the correcting lenses, if any, the N5 chart or its equivalent at a distance selected by him in the range of 30 to 50 centimetres and the ability to read the N14 chart or its equivalent at a distance of 100 centimetres. If this requirement is met only by the use of near correction, the applicant may be assessed as fit provided that this near correction is added to the spectacle correction already prescribed in accordance with sub-paragraph (3); if no such correction is prescribed, a pair of spectacles for near use shall be kept readily available during the exercise of the privileges of the licence. When near correction is required, the applicant shall demonstrate that one pair of spectacles is sufficient to meet both distant and near visual requirements.

**Note 1.** — N5 and N14 refer to the size of type-face used.

**Note 2.** — An applicant who needs correction to meet this requirement will require "look-over", bifocal or perhaps trifocal lenses to enable him to read the instruments and a chart or manual held in hand, and also to make use of distant vision through the windscreen without removing his lenses. Single-vision near correction (full lenses of one power only, appropriate for reading) significantly reduces distant visual acuity. Whenever there is a requirement to obtain or renew correcting lenses, an applicant is expected to advise the refractionist of reading distances for the visual flight deck tasks relevant to the types of aircraft in which he/she is likely to function or to other aviation tasks.

- (10) When near correction is required in accordance with sub-paragraph (3), a second pair of near correction spectacles shall be kept available for immediate use. The applicant shall be required to have normal fields of vision. The applicant shall be required to have normal binocular function. Defective stereopsis, abnormal convergence not interfering with near vision, and ocular misalignment where the fusional reserves are sufficient to prevent asthenopia and diplopia may not be disqualifying.

**20. Visual Class 2**

- (1) The function of the eye and their adnexae shall be normal. There shall be neither active pathological condition, acute or chronic, nor any sequelae of surgery or trauma of the eyes or



their adnexa likely to reduce proper visual function to an extent that would interfere with the safe exercise of the applicant's licence and rating privileges.

- (2) The applicant shall be required to have normal fields of vision.
- (3) The applicant shall be required to have a distant visual acuity with or without correction of 6/12 or better in each eye separately and binocular visual acuity shall be 6/9 or better. No limits apply to uncorrected visual acuity. Where this standard of visual acuity can be obtained only with correcting lenses, the applicant may be assessed as fit provided that:
  - (a) Such correcting lenses are worn during the exercise of the privileges of the licence or rating applied for or held; and,
  - (b) In addition, pair of suitable correcting spectacles is kept readily available during the exercise of the privileges of the applicant's licence.

**Note:** An applicant accepted as meeting these provisions is deemed to continue to do so unless there is reason to suspect otherwise, in which case an ophthalmic report is required at the discretion of the Civil Aviation Authority. Both uncorrected and corrected visual acuity are normally measured and recorded at each re-examination. Conditions which indicate a need to obtain an ophthalmic report include: a substantial decrease in the uncorrected visual acuity, any decrease in best corrected visual acuity, and the occurrence of eye disease, eye injury or eye surgery.

- (4) Applicants may use contact lenses to meet this requirement provided that:
  - (a) the lenses are monofocal and non-tinted;
  - (b) the lenses are well tolerated; and
  - (c) a pair of suitable correcting spectacles is kept readily available during the exercise of the licence privileges.
- (5) Applicants who use contact lenses may not need to have their uncorrected visual acuity measured at each re-examination provided the history of their contact lens prescription is known.
- (6) Applicants with a large refractive error shall use contact lenses or high index spectacle lenses. If spectacles are used, high index lenses are needed to minimize peripheral field distortion.
- (7) Applicants whose uncorrected distant visual acuity in either eye is worse than 6/60 shall be required to provide a full ophthalmic report prior to initial Medical Assessment and every five years thereafter. The purpose of the required ophthalmic examination is:
  - (i) to ascertain normal visual performance, and
  - (ii) to identify any significant pathology.
- (8) Applicants who have undergone surgery affecting the refractive status of the eye shall be assessed as unfit unless they are free from those sequelae, which are likely to interfere with the safe exercise of their licence and rating privileges.
- (9) The applicant shall be required to have the ability to read, while wearing the correcting lenses, if any, the N5 chart or its equivalent at a distance selected by him in the range of 30 to 50

centimetres. If this requirement is met only by the use of near correction, the applicant may be assessed as fit provided that this near correction is added to the spectacle correction already prescribed in accordance with sub-paragraph (3); if no such correction is prescribed, a pair of spectacles for near use shall be kept readily available during the exercise of the privileges of the licence. When near correction is required, the applicant shall demonstrate that one pair of spectacles is sufficient to meet both distant and near visual requirements.

**Note 1.** — N5 and N14 refer to the size of type-face used.

**Note 2.** — An applicant who needs correction to meet this requirement will require "look-over", bifocal or perhaps trifocal lenses to enable him to read the instruments and a chart or manual held in hand, and also to make use of distant vision through the windscreen without removing his lenses. Single-vision near correction (full lenses of one power only, appropriate for reading) significantly reduces distant visual acuity. Whenever there is a requirement to obtain or renew correcting lenses, an applicant is expected to advise the refractionist of reading distances for the visual flight deck tasks relevant to the types of aircraft in which the applicant is likely to function or to other aviation tasks.

- (10) When near correction is required in accordance with sub-paragraph (3) above, a second pair of near correction spectacles shall be kept available for immediate use. The applicant shall be required to have normal fields of vision. The applicant shall be required to have normal binocular function. Defective stereopsis, abnormal convergence not interfering with near vision, and ocular misalignment where the fusional reserves are sufficient to prevent asthenopia and diplopia may not be disqualifying.

## 21. Visual Class 3

- (1) The function of the eyes and their adnexa shall be normal. There shall be no active pathological condition, acute or chronic, nor any sequelae of surgery or trauma of the eyes or their adnexa likely to reduce proper visual function to an extent that would interfere with the safe exercise of the applicant's licence and rating privileges.
- (2) The applicant shall be required to have normal fields of vision.
- (3) The distant visual acuity with or without correction shall be 6/9 or better in each eye separately and binocular visual acuity shall be 6/6 or better. No limits apply to uncorrected visual acuity. Where this standard of visual acuity can be obtained only with correcting lenses, the applicant may be assessed as fit provided that:
- (a) such correcting lenses are worn during the exercise of the privileges of the licence or rating applied for or held; and,
- (b) in addition, a pair of suitable correcting spectacles is kept readily available during the exercise of the privileges of the applicant's licence.

An applicant accepted as meeting these provisions is deemed to continue to do so unless there is reason to suspect otherwise, in which case an ophthalmic report is required at the discretion of the Civil Aviation Authority. Both uncorrected and corrected visual acuity are normally measured and recorded at each re-examination. Conditions which indicate a need to obtain an ophthalmic report include: a substantial decrease in the uncorrected visual acuity, any decrease in best corrected visual acuity, and the occurrence of eye disease, eye injury or eye surgery.

- (4) Applicants may use contact lenses to meet this requirement provided that:

- (a) the lenses are monofocal and non-tinted;
  - (b) the lenses are well tolerated; and
  - (c) a pair of suitable correcting spectacles is kept readily available during the exercise of the licence privileges.
- (5) Applicants who use contact lenses may not need to have their uncorrected visual acuity measured at each re-examination provided the history of their contact lens prescription is known.
- (6) Applicants with a large refractive error shall use contact lenses or high index spectacle lenses. If spectacles are used, high index lenses are needed to minimize peripheral field distortion.
- (7) Applicants whose uncorrected distant visual acuity in either eye is worse than 6/60 shall be required to provide a full ophthalmic report prior to initial Medical Assessment and every five years thereafter. The purpose of the required ophthalmic examination is (1) to ascertain normal vision performance, and (2) to identify any significant pathology.
- (8) Applicants who have undergone surgery affecting the refractive status of the eye shall be assessed as unfit unless they are free from those sequelae, which are likely to interfere with the safe exercise of their licence and rating privileges.
- (9) The applicant shall have the ability to read, while wearing the correcting lenses, if any, the N5 chart or its equivalent at a distance selected by that applicant in the range of 30 to 50 cm and the ability to read the N14 chart or its equivalent at a distance of 100 cm. If this requirement is met only by the use of near correction, the applicant may be assessed as fit provided that this near correction is added to the spectacle correction already prescribed in accordance with sub-paragraph (3) above; if no such correction is prescribed, a pair of spectacles for near use shall be kept readily available during the exercise of the privileges of the licence. When near correction is required, the applicant shall demonstrate that one pair of spectacles is sufficient to meet both distant and near visual requirements.

**Note 1.** — N5 and N14 refer to the size of type-face used.

**Note 2.** — An applicant who needs near correction to meet the requirement, will require “look-over”, bifocal or perhaps multifocal lenses in order to read radar screens, visual displays and written or printed material and also to make use of distant vision through the windows without removing the lenses. Single-vision near correction (full lenses of one power only, appropriate for reading) may be acceptable for certain air traffic control duties. However, it should be realized that single-vision near correction significantly reduces distant visual acuity.

**Note 3.** — Whenever there is a requirement to obtain or renew correcting lenses, an applicant is expected to advise the refractionist of the reading distances for the air traffic control duties the applicant is likely to perform.

- (10) When near correction is required in accordance with sub-paragraph (3) above, a second pair of near correction spectacles shall be kept available for immediate use. The applicant shall be required to have normal fields of vision. The applicant shall be required to have normal binocular function. Defective stereopsis, abnormal convergence not interfering with near vision, and ocular misalignment where the fusional reserves are sufficient to prevent asthenopia and diplopia may not be disqualifying.

***Colour perception requirements***

22. The applicant shall be required to demonstrate the ability to perceive readily those colours the perception of which is necessary for the safe performance of its duties. The methods of examinations should be such as to ensure a reliable testing of colour perception.
23. The applicant shall be required to demonstrate the ability to correctly identify a series of pseudoisochromatic plates (tables) in daylight or in artificial light of the same colour temperature such as that provided by CIE standards illuminants C or D<sub>65</sub> as specified by the International Commission on Illumination (CIE). The applicant must be able readily and accurately either to read the pseudoisochromatic plates or to identify the colours signal red, signal green, and white, when displayed by means of the colour perception lantern.
24. An applicant obtaining a satisfactory result as prescribed by the Civil Aviation Authority shall be assessed as fit. An applicant failing to obtain a satisfactory result in such a test shall be assessed as unfit unless able to readily distinguish the colours used in air navigation and correctly identify aviation coloured lights. Applicants who fail to meet these criteria shall be assessed as unfit except for **Class 2** assessment with the following restriction: **valid daytime only**. Sunglasses worn during the exercise of the privileges of the licence or rating held should be non-polarizing and of a neutral grey tint.

***Hearing requirements***

25. Hearing requirements are established in addition to the ear examinations conducted during the medical examination for the physical and mental requirements.
26. The applicant must be free from any hearing defect, which would interfere with the safe performance of duties in exercising the privileges of the licence for which he/she is being examined. Auditory acuity shall be measured by the following methods, either or both of which shall be employed according to the requirements of the relevant hearing standard:
- (a) by means of a standard pure tone audiometer in a room in which the intensity of the background noise does not exceed 50 dB;
  - (b) by a test of the applicant's ability to hear normal speech; and
  - (c) alternatively, other methods providing equivalent results to those specified in this paragraph can be used.

**27. Hearing Class 1**

The applicant, tested on a pure-tone audiometer at first issue of licence, not less than once every 5 years up to the age of 40 years, and thereafter not less than once every 3 years, shall not have a hearing loss, in either ear separately, of more than 35 dB at any of the frequencies 500, 1 000 or 2 000 Hz, or more than 50 dB at 3 000 Hz. However, an applicant with a hearing loss greater than the above may be declared fit provided that:

- (a) the applicant has a hearing performance in each ear separately equivalent to that of a normal person, against a background noise that will simulate the masking properties of flight deck noise upon speech and beacon signals; and
- (b) the applicant has an ability to hear an average conversational voice in a quiet room, using both ears, at a distance of 2 metres from the examiner, with the back turned to the examiner.

**28. Hearing Class 2**

The applicant shall be able to hear an average conversational voice in a quiet room, using both ears, at a distance of two metres from the examiner, with the back turned to the examiner.

**29. Hearing Class 3**

At the first issue of a licence, not less than once every 5 years up to the age of 40 years, and thereafter not less than once every 3 years, the applicant shall not have a hearing loss, when measured in the manner specified in paragraph 26 (a) of this Schedule, in either ear separately, of more than 35 dB at any of the frequencies 500, 1000 or 2000 Hz, or more than 50 dB at 3000 Hz. However, an applicant with a hearing loss greater than the above may be declared fit provided that:

- (a) the applicant has a hearing performance in each ear separately equivalent to that of a normal person, against a background noise that will simulate that experienced in a typical air traffic control working environment; and
- (b) the applicant has an ability to hear an average conversational voice in a quiet room, using both ears, at a distance of 2 metres from the examiner, with the back turned to the examiner.

## FIFTEENTH SCHEDULE

[Paragraph 18 (4)]

### DESIGNATED AREAS

1. Areas specified in connection with the carriage of flight navigators as members of the flight crews or approved navigational equipment on public transport aircraft.

The following areas are specified for the purposes of paragraph 18 (4) of the Regulation:

#### *Area A - Arctic*

All that area north of latitude 67° north, but excluding any part thereof lying within 300 nautical miles of Norway.

#### *Area B - Antarctic*

All that area south of latitude 55° south.

#### *Area C - Sahara*

All that area enclosed by rhumb lines joining successively the following points:

32° north latitude 03° west longitude

24° north latitude 14° west longitude

14° north latitude 14° west longitude

18° north latitude 28° east longitude

24° north latitude 28° east longitude

28° north latitude 23° east longitude

32° north latitude 03° west longitude

#### *Area D - Arabian Desert*

All that area enclosed by rhumb lines joining successively the following points:

22° north latitude 42° east longitude

16° north latitude 46° east longitude

20° north latitude 55° east longitude

24° north latitude 48° east longitude

22° north latitude 42° east longitude

***Area E - South America (Central)***

All that area enclosed by rhumb lines joining successively the following points:

04° north latitude 72° west longitude

04° north latitude 60° west longitude

08° south latitude 42° west longitude

18° south latitude 54° west longitude

18° south latitude 60° west longitude

14° south latitude 72° west longitude

05° south latitude 76° west longitude

04° north latitude 72° west longitude

***Area F - Pacific Ocean***

All that area enclosed by rhumb lines joining successively the following points:

55° south latitude 75° west longitude

20° south latitude 73° west longitude

05° south latitude 85° west longitude

05° north latitude 80° west longitude

15° north latitude 105° west longitude

30° north latitude 125° west longitude

55° north latitude 140° west longitude

67° north latitude 180° west longitude

60° north latitude 180° west longitude

20° north latitude 128° east longitude

04° north latitude 128° east longitude

00° north latitude 165° west longitude

55° south latitude 180° west longitude

55° south latitude 75° west longitude

***Area G - Australia***

All that area enclosed by rhumb lines joining successively the following points:

18° south latitude 123° east longitude

30° south latitude 118° east longitude

30° south latitude 135° east longitude

18° south latitude 123° east longitude

***Area H - Indian Ocean***

All that area enclosed by rhumb lines joining successively the following points:

35° south latitude 110° east longitude

20° south latitude 110° east longitude

13° south latitude 120° east longitude

10° south latitude 100° east longitude

13° north latitude 91° east longitude

13° north latitude 86° east longitude

00° north latitude 80° east longitude

20° north latitude 67° east longitude

20° north latitude 62° east longitude

05° south latitude 43° east longitude

20° south latitude 60° east longitude

25° south latitude 60° east longitude

40° south latitude 10° east longitude

55° south latitude 10° east longitude

55° south latitude 180° east longitude

35° south latitude 110° east longitude



***Area I - North Atlantic Ocean***

All that area enclosed by rhumb lines joining successively the following points:

55° north latitude 15° west longitude

67° north latitude 40° west longitude

67° north latitude 60° west longitude

45° north latitude 45° west longitude

40° north latitude 63° west longitude

40° north latitude 19° west longitude

55° north latitude 15° west longitude

***Area J - South Atlantic Ocean***

All that area enclosed by rhumb lines joining successively the following points:

40° north latitude 63° west longitude

19° north latitude 63° west longitude

05° south latitude 30° west longitude

55° south latitude 55° west longitude

55° south latitude 10° east longitude

05° south latitude 10° east longitude

02° north latitude 05° east longitude

02° north latitude 10° west longitude

15° north latitude 25° west longitude

40° north latitude 19° west longitude

40° north latitude 63° west longitude

***Area K - Northern Canada***

All that area enclosed by rhumb lines joining successively the following points:

67° north latitude 130° west longitude

55° north latitude 115° west longitude

55° north latitude 70° west longitude

67° north latitude 60° west longitude

67° north latitude 130° west longitude

## SIXTEENTH SCHEDULE

(Paragraph 37)

### MINIMUM NAVIGATION PERFORMANCE SPECIFICATIONS – SPECIFIED AIRSPACE AND NAVIGATION PERFORMANCE CAPABILITY

1. For the purpose of paragraph 37 of the Regulation, the following navigation performance capability is specified, that is to say, a capability to ensure that:

- (a) the standard deviation of lateral errors in the track of the aircraft is not more than 6.3 nautical miles;
- (b) the proportion of the flight time of the aircraft during which the actual track of the aircraft is 30 nautical miles or more off the track along which it has been given an air traffic control clearance to fly is less than  $5.3 \times 10^{-4}$ ; and
- (c) the proportion of the flight time of the aircraft during which the actual track of the aircraft is between 50 and 70 nautical miles off the track along which it has been given an air traffic control clearance to fly is less than  $13 \times 10^{-5}$ .

2. For the purposes of paragraph 37 of the Regulation, the following airspace is hereby prescribed as North Atlantic Minimum Navigation Performance Specification airspace, that is to say, the airspace from flight level 285 to flight level 420 within the area defined by rhumb lines joining successively the following points:

N3410.00 W01748.00	N8200.00 E03000.00	N4500.00 W05300.00
N3630.00 W01500.00	North Pole	N4336.00 W06000.00
N4200.00 W01500.00	N8200.00 W06000.00	N4152.00 W06700.00
N4300.00 W01300.00	N7800.00 W07500.00	N3900.00 W06700.00
N4500.00 W01300.00	N7600.00 W07600.00	N3835.00 W06853.00
N4500.00 W00800.00	N6500.00 W05745.00	N3830.00 W06915.00
N5100.00 W00800.00	N6500.00 W06000.00	N3830.00 W06000.00
N5100.00 W01500.00	N6400.00 W06300.00	N2700.00 W06000.00
N5400.00 W01500.00	N6100.00 W06300.00	N2700.00 W02500.00
N5434.00 W01000.00	N5700.00 W05900.00	N3000.00 W02500.00
N6100.00 W01000.00	N5300.00 W05400.00	N3000.00 W02000.00
N6100.00 00000.00	N4900.00 W05100.00	N3139.00 W01725.00
N8200.00 00000.00	N4500.00 W05100.00	

thence by that part of the arc of a circle radius 100 nautical miles centered on N3304.00 W01621.00 to N3410.00 W01748.00.

## SEVENTEENTH SCHEDULE

[Paragraph 26 (1) (g)]

### AEROPLANE PERFORMANCE OPERATING LIMITATIONS

1. The operator of a Macao registered aeroplane shall not permit an aeroplane of a *maximum certificated take-off mass* exceeding 5.700 kg to operate for the purpose of commercial air transport without a comprehensive and detailed code of performance approved by the Civil Aviation Authority in compliance with the applicable provisions of this Schedule.
  - (1) Single-engined 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.
2. Applicable to Macao registered aeroplanes holding a *Certificate of airworthiness* in accordance with paragraph 7 of this Regulation. The level of performance defined by the appropriate parts of the comprehensive and detailed national code referred to in paragraph 1 for the aeroplanes shall be at least substantially equivalent to the over-all level embodied in the minimum specifications of this Schedule. The general level of safety contemplated by these minimum specifications shall be maintained under all expected operating conditions, including those not covered specifically by the provisions of this Schedule.
  - (1) An aeroplane shall be operated in compliance with the terms of its *Certificate of airworthiness* and within the approved operating limitations contained in its *Aircraft flight manual*. A flight shall not be commenced unless the performance information provided in the *Aircraft flight manual* indicates that the provisions of sub-paragraphs (2) to (7) can be complied with for the flight to be undertaken.
  - (2) In applying the provisions of this Schedule, account shall be taken of all factors that significantly affect the performance of the aeroplane (such as: mass, operating procedures, the pressure-altitude appropriate to the elevation of the aerodrome, temperature, wind, runway gradient and condition of runway, i.e. presence of slush, water and/or ice, for landplanes, water surface condition for seaplanes). Such factors shall be taken into account directly as operational parameters or indirectly by means of allowances or margins, which may be provided in the scheduling of performance data or in the comprehensive and detailed code of performance in accordance with which the aeroplane is being operated.
  - (3) Mass limitations
    - (a) The mass of the aeroplane at the start of take-off shall not exceed the mass at which sub-paragraph (4) is complied with, nor the mass at which sub-paragraphs (5), (6) and (7) are complied with, allowing for expected reductions in mass as the flight proceeds, and for such fuel jettisoning as is envisaged in applying sub-paragraphs (5) and (6) and, in respect of alternate aerodromes, sub-paragraphs (4) (c) and (7).
    - (b) In no case shall the mass at the start of take-off exceed the *maximum certificated take-off mass* specified in the *Aircraft flight manual* for the pressure-altitude appropriate to the elevation of the aerodrome, and, if used as a parameter to determine the *maximum certificated 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 certificated*

*landing mass* specified in the *Aircraft flight manual* for the pressure-altitude appropriate to the elevation of those aerodromes, and if used as a parameter to determine the *maximum certificated 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 provisions contained in ICAO Annex 16 – *Environmental protection*, Volume I – *Aircraft noise*, unless otherwise authorized in exceptional circumstances for a certain aerodrome or a runway where there is no noise disturbance problem, by the competent authority of the State or Territory in which the aerodrome is situated.
- (4) **Take-off.** The aeroplane shall be able, in the event of a critical power-unit failing at any point in the take-off, either to discontinue the take-off and stop within the accelerate-stop distance available, or 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 sub-paragraph (5).
- (5) **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 provisions of sub-paragraph (7) can be met, without flying below the minimum flight altitude at any point.
- (6) **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 provisions of this Schedule 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.
- (7) **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.

### 3. Obstacle data

- (1) Obstacle data shall be provided to enable the operator to develop procedures to comply with the provisions of sub-paragraph (4).
- (2) The operator shall take account of charting accuracy when assessing compliance with the provisions of sub-paragraph (4).

## EIGHTEENTH SCHEDULE

[Paragraph 26 (1) (g)]

### HELICOPTER PERFORMANCE OPERATING LIMITATIONS

1. For the purpose of this Schedule the following definitions apply:

**Performance Class 1 helicopter** means a helicopter with performance such that, in case of critical power-unit failure, it is able to land on the rejected take-off area or safely continue the flight to an appropriate landing area, depending on when the failure occurs.

**Performance Class 2 helicopter** means a helicopter with performance such that, in case of critical power-unit failure, it is able to safely continue the flight, except when the failure occurs prior to a defined point after take-off or after a defined point before landing, in which cases a forced landing may be required.

**Performance Class 3 helicopter** means a helicopter with performance such that, in case of power-unit failure at any point in the flight profile, a forced landing must be performed.

2. The operator of a Macao registered shall not permit to operate a helicopter for the purpose of commercial air transport without a having comprehensive and detailed code of performance approved by the Civil Aviation Authority in compliance with the applicable provisions of this Schedule.
- (1) *Performance Class 3* helicopters 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. The conditions of this paragraph apply also to *Performance Class 2* helicopters prior to the defined point after take-off and after the defined point before landing.
  - (2) Only *Performance Class 1* helicopters shall be permitted to operate from elevated heliports in congested areas.
  - (3) *Performance Class 3* helicopters should not be permitted to operate from elevated heliports or helidecks.
3. Applicable to Macao registered helicopters holding a *Certificate of airworthiness* in accordance with paragraph 7 of this Regulation.
- (1) The level of performance defined by the appropriate parts of the comprehensive and detailed code of performance referred to in paragraph 2 above for the helicopters shall be at least substantially equivalent to the over-all level embodied in the minimum specifications of this Schedule.
  - (2) A helicopter shall be operated in compliance with the terms of its *Certificate of airworthiness* and within the approved operating limitations contained in its *Aircraft flight manual*.
  - (3) The general level of safety contemplated by these minimum specifications shall be maintained under all expected operating conditions, including those not covered specifically by the provisions of this Schedule.

- (4) A flight shall not be commenced unless the performance information provided in the *Aircraft flight manual* indicates that the minimum specifications contained in sub-paragraphs (5) and (6) hereunder can be complied with for the flight to be undertaken.
- (5) In applying the minimum specifications of this Schedule, account shall be taken of all factors that significantly affect the performance of the helicopter (such as: mass, operating procedures, the pressure-altitude appropriate to the elevation of the operating site, temperature, wind and condition of the surface). 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 helicopter is being operated.
- (6) Mass limitations
- (a) The mass of the helicopter at the start of take-off shall not exceed the mass at which sub-paragraph (7) hereunder is complied with, nor the mass at which sub-paragraphs (8) and (9) hereunder are complied with, allowing for expected reductions in mass as the flight proceeds, and for such fuel jettisoning as is envisaged in applying sub-paragraph (8) hereunder and in respect of alternates mentioned in sub-paragraphs (6) (c) and (9) hereunder.
- (b) In no case shall the mass at the start of take-off exceed the maximum take-off mass specified in the *Aircraft flight manual* for the pressure-altitude and temperature appropriate to the elevation of the operating site, 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 destination and at any alternate, exceed the maximum landing mass specified in the *Aircraft flight manual* for the pressure-altitude and temperature appropriate to the elevation of those operating sites, 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 destination and at any alternate, exceed the relevant maximum mass at which compliance has been demonstrated with the applicable noise certification Standards in ICAO Annex 16 – *Environmental protection*, Volume I – *Aircraft noise*, unless otherwise authorized by the Civil Aviation Authority in exceptional circumstances for a certain operating site where there is no noise disturbance problem.
- (7) Take-off and initial climb phase
- (a) *For performance Class 1 helicopters.* The helicopter shall be able, in the event of the critical power-unit failing at or before the take-off decision point, to discontinue the take-off and stop within the rejected take-off area available, or, in the event of the failure occurring at or past the take-off decision point, to continue the take-off and then climb, clearing all obstacles along the flight path by an adequate margin until the helicopter is in a position to comply with sub-paragraph (8) (a) hereunder.
- (b) *For performance Class 2 helicopters.* The helicopter shall be able, with all engines operating, to clear all obstacles along its flight path by an adequate margin until it is in a position to comply with sub-paragraph (8) (a) hereunder. The helicopter shall be able, in the event of the critical power-unit becoming inoperative at any time after reaching a defined point after take-off, to continue the take-off and initial climb and clear all obstacles along its flight path by an adequate margin until it is in a position to comply with sub-paragraph (8) (a) hereunder. Before the defined point, failure of a critical power-unit may cause the helicopter to force land, therefore the conditions stated in paragraph 2 (1) of this Schedule shall apply before the defined point.

- (c) *For performance Class 3 helicopters.* The helicopter shall be able, with all engines operating, to clear all obstacles along its flight path by an adequate margin until it is in a position to comply with sub-paragraph (8) (b) hereunder. At any point of the flight path, failure of a power-unit will cause the helicopter to force land, therefore the conditions stated in paragraph 2 (1) of this Schedule shall apply.

(8) En-route phase

- (a) *For performance Class 1 and Class 2 helicopters.* The helicopter shall be able, in the event of the critical power-unit becoming inoperative at any point in the en-route phase, to continue the flight to an operating site at which the minimum specifications contained in sub-paragraphs (9) (a) hereunder for Class 1 helicopters, or the minimum specifications contained in sub-paragraphs (9) (b) hereunder for Class 2 helicopters can be met, without flying below the appropriate minimum flight altitude at any point. In the case of helicopters having three or more power-units, on any part of the route where the location of suitable inter-mediate operating sites 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 minimum specifications contained of this Schedule is to be maintained, the helicopter shall be able, in the event of any two power-units becoming inoperative, to continue the flight to a suitable operating site and make a landing thereat.
- (b) *For performance Class 3 helicopters.* The helicopter shall be able, with all power-units operating, to continue along its intended route or planned diversions without flying at any point below the appropriate minimum flight altitude. At any point of the flight path, failure of a power-unit will cause the helicopter to force land, therefore the conditions stated in paragraph 2 (1) of this Schedule shall apply.

(9) Approach and landing phase

- (a) *For performance Class 1 helicopters.* In the event of the critical power-unit becoming inoperative at any point during the approach and landing phase, before the landing decision point, the helicopter shall, at the destination and at any alternate, after clearing all obstacles in the approach path by a safe margin, be able to land and stop within the landing distance available or to perform a bailed landing and clear all obstacles in the flight path by an adequate margin equivalent to that specified in sub-paragraph (7) (a) above. In case of the failure occurring after the landing decision point, the helicopter shall be able to land and stop within the landing distance available.
- (b) *For performance Class 2 helicopters.* With all engines operating, the helicopter shall, at the destination and at any alternate, after clearing all obstacles in the approach path by a safe margin, be able either to land and stop within the landing distance available or to perform a bailed landing and clear all obstacles in the flight path by an adequate margin equivalent to that specified in sub-paragraph (7) (b). In the event of the critical power-unit becoming inoperative before the defined point before landing, the same specifications are applicable. After the defined point, failure of a power-unit may cause the helicopter to force land, therefore the conditions stated in paragraph 2 (1) of this Schedule shall apply.
- (c) *For performance Class 3 helicopters.* With all engines operating, the helicopter shall, at the destination and at any alternate, after clearing all obstacles in the approach path by a safe margin, be able to land and stop within the landing distance available or to perform a bailed landing and clear all obstacles in the flight path by an adequate margin equivalent to that specified in sub-paragraph (7) (c). At any point of the flight path, failure of a power-unit will cause the helicopter to force land, therefore the conditions stated in paragraph 2 (1) of this Schedule shall apply.

4. Obstacle data

- (1) Obstacle data shall be provided to enable the operator to develop procedures to comply with the provisions of sub-paragraphs (7) and (9) above.
- (2) The operator shall take account of charting accuracy when assessing compliance with the provisions of sub-paragraphs (7) and (9) above.

## NINETEENTH SCHEDULE

### OPERATOR'S MAINTENANCE RESPONSIBILITY

#### PART A – REQUIREMENTS

1. This Part A contains the requirements regarding operator's maintenance responsibility:

#### ***OPSM.875 General***

(See IEM OPSM.875)

- (a) An operator shall not operate an aircraft unless it is maintained and released to service by an organisation appropriately approved/accepted in accordance with MAR-145 except that pre-flight inspections need not necessarily be carried out by the MAR-145 organisation.
- (b) This Schedule prescribes aircraft maintenance requirements needed to comply with the operator certification requirements.

#### ***OPSM.880 Terminology***

The following definitions shall apply to this Schedule:

*Preflight inspection* – means the inspection carried out before flight to ensure that the aircraft is fit for the intended flight. It does not include defect rectification.

*Approved standard* – means a manufacturing/design/maintenance/quality standard approved by the Civil Aviation Authority.

*Approved by the Civil Aviation Authority* – means approved by the Civil Aviation Authority directly or in accordance with a procedure approved by the Civil Aviation Authority.

#### ***OPSM.885 Application for and Approval of the Operator's Maintenance System***

- (a) In respect of the operator's maintenance system only, the following information must be included in the initial application for an AOC and, when applicable, any variation or renewal applied for, and for each aircraft type to be operated:
  - (1) The operator's Maintenance Management Exposition;
  - (2) The operator's aircraft maintenance programme(s);
  - (3) The aircraft technical log;
  - (4) Where appropriate, the technical specification(s) of the maintenance contract(s) between the operator and any MAR-145 approved maintenance organisation;
  - (5) The number of aircraft. (See IEM OPSM.885(a).)
- (b) An applicant for the initial issue, variation and renewal of an AOC who meets the requirements of this Schedule, in conjunction with an appropriate MAR-145 approved/accepted maintenance



organisation's exposition, is entitled to approval of the maintenance system by the Civil Aviation Authority. (See IEM OPSM.885(b).)

### ***OPSM.890 Maintenance Responsibility***

- (a) An operator shall ensure the airworthiness of the aircraft and the serviceability of both operational and emergency equipment by (See AMC OPSM.890(a)):
- (1) The accomplishment of preflight inspections (See AMC OPSM.890(a)(1));
  - (2) The rectification to an approved standard of any defect and damage affecting safe operation, taking into account the minimum equipment list and configuration deviation list if available for the aircraft type (See AMC OPSM.890(a)(2));
  - (3) The accomplishment of all maintenance in accordance with the approved operator's aircraft maintenance programme specified in OPSM.910 (See AMC OPSM.890(a)(3));
  - (4) The analysis of the effectiveness of the operator's approved aircraft maintenance programme (See AMC OPSM.890(a)(4));
  - (5) The accomplishment of any operational directive, airworthiness directive and any other continued airworthiness requirement made mandatory by the Civil Aviation Authority; and
  - (6) The accomplishment of modifications in accordance with an approved standard and, for non-mandatory modifications, the establishment of an embodiment policy. (See AMC OPSM.890(a)(6).)
- (b) An operator shall ensure that the Certificate of Airworthiness for each aircraft operated remains valid in respect of:
- (1) The requirements in sub-paragraph (a) above;
  - (2) Any calendar expiry date specified in the Certificate; and
  - (3) Any other maintenance condition specified in the Certificate.
- (c) The requirements specified in sub-paragraph (a) above must be performed in accordance with procedures acceptable to the Civil Aviation Authority.

### ***OPSM.895 Maintenance Management***

- (a) An operator must be appropriately approved in accordance with MAR-145 to carry out the requirements specified in OPSM.890(a)(2), (3), (5) and (6) except when the Civil Aviation Authority is satisfied that the maintenance can be contracted to an appropriate MAR-145 approved/accepted organisation. (See AMC OPSM.895(a).)
- (b) An operator must employ a person or group of persons acceptable to the Civil Aviation Authority to ensure that all maintenance is carried out on time to an approved standard such that the maintenance responsibility requirements prescribed in OPSM.890 are satisfied. The operator must nominate a person, or a senior person as appropriate, acceptable to the Civil Aviation Authority, who is responsible for the management and supervision of the maintenance system. The Nominated Postholder for Maintenance is also responsible for any corrective action resulting from the quality monitoring of OPSM.900(a). (See AMC OPSM.895(b).)

- (c) The Nominated Postholder for Maintenance should not be employed by a MAR-145 approved/accepted Organisation under contract to the Operator, unless specifically agreed by the Civil Aviation Authority. (See AMC OPSM.895(c)).
- (d) When an operator is not appropriately approved in accordance with MAR-145, arrangements must be made with such an organisation to carry out the requirements specified in OPSM.890(a)(2), (3), (5) and (6). Except as otherwise specified in paragraphs (e), (f) and (g) below, the arrangement must be in the form of a written maintenance contract between the operator and the MAR-145 approved/accepted maintenance organisation detailing the functions specified in OPSM.890(a)(2), (3), (5) and (6) and defining the support of the quality functions of OPSM.900. Aircraft base and scheduled line maintenance and engine maintenance contracts, together with all amendments, must be acceptable to the Civil Aviation Authority. The Civil Aviation Authority does not require the commercial elements of a maintenance contract. (See AMC OPSM.895(d). )
- (e) Notwithstanding paragraph (d) above, the operator may have a contract with an organisation that is not MAR-145 approved/accepted, provided that :
  - (1) for aircraft or engine maintenance contracts, the contracted organisation is a Operator of the same type of aircraft,
  - (2) all maintenance is ultimately performed by MAR-145 approved/accepted organisations,
  - (3) such a contract details the functions specified in OPSM.890(a)(2), (3), (5) and (6) and defines the support of the quality functions of OPSM.900,
  - (4) the contract, together with all amendments, is acceptable to the Civil Aviation Authority. The Civil Aviation Authority does not require the commercial elements of a maintenance contract. (See AMC OPSM.895(e).)
- (f) Notwithstanding paragraph (d) above, in the case of an aircraft needing occasional line maintenance, the contract may be in the form of individual work orders to the Maintenance Organisation.(See IEM OPSM.895(f&g))
- (g) Notwithstanding paragraph (d) above, in the case of aircraft component maintenance, including engine maintenance, the contract may be in the form of individual work orders to the Maintenance Organisation.(See IEM OPSM.895(f&g))
- (h) An operator must provide suitable office accommodation at appropriate locations for the personnel specified in sub-paragraph (b) above. (See AMC OPSM.895(h).)

### ***OPSM.900 Quality System***

(See AMC OPSM.900 & IEM OPSM.900)

- (a) For maintenance purposes, the operator shall establish a quality system acceptable to the Civil Aviation Authority, to perform at least the following functions:
  - (1) Monitoring that the activities of OPSM.890 are being performed in accordance with the accepted procedures;
  - (2) Monitoring that all contracted maintenance is carried out in accordance with the contract; and
  - (3) Monitoring the continued compliance with the requirements of this Schedule.

- (b) Where the operator is approved in accordance with MAR-145, the quality system may be combined with that required by MAR-145.

### ***OPSM.905 Operator's Maintenance Management Exposition***

- (a) An operator must provide an operator's Maintenance Management Exposition containing details of the organisation structure (See AMC OPSM.905(a)) including:
- (1) The nominated postholder responsible for the maintenance system and the person, or group of persons, referred to in OPSM.895(b);
  - (2) The procedures that must be followed to satisfy the maintenance responsibility of OPSM.890 and the quality functions of OPSM.900, except that where the operator is appropriately approved as a maintenance organisation in accordance with MAR-145, such details may be included in the MAR-145 exposition.
- (b) An operator's maintenance management exposition and any subsequent amendment must be approved by the Civil Aviation Authority.

### ***OPSM.910 Operator's Aircraft Maintenance Programme***

- (a) An operator must ensure that the aircraft is maintained in accordance with the operator's aircraft maintenance programme. The programme must contain details, including frequency, of all maintenance required to be carried out. The programme will be required to include a reliability programme when the Civil Aviation Authority determines that such a reliability programme is necessary. (See AMC OPSM.910(a).)
- (b) An operator's aircraft maintenance programme and any subsequent amendment must be approved by the Civil Aviation Authority. (See AMC OPSM.910(b).)

### ***OPSM.915 Operator's Aircraft Technical Log***

(See AMC OPSM.915)

- (a) An operator must use an aircraft technical log system containing the following information for each aircraft:
- (1) Information about each flight necessary to ensure continued flight safety;
  - (2) The current aircraft certificate of release to service;
  - (3) The current maintenance statement giving the aircraft maintenance status of what scheduled and out of phase maintenance is next due except that the Civil Aviation Authority may agree to the maintenance statement being kept elsewhere;
  - (4) All outstanding deferred defects that affect the operation of the aircraft; and
  - (5) Any necessary guidance instructions on maintenance support arrangements.
- (b) The aircraft technical log system and any subsequent amendment must be approved by the Civil Aviation Authority.

***OPSM.920 Maintenance Records***

(See AMC OPSM.920)

- (a) An operator shall ensure that the aircraft technical log is retained for 24 months after the date of the last entry.
- (b) An operator shall ensure that a system has been established to keep, in a form acceptable to the Civil Aviation Authority, the following records for the periods specified:
  - (1) All detailed maintenance records in respect of the aircraft and any aircraft component fitted thereto – 24 months after the aircraft or aircraft component was released to service;
  - (2) The total time and flight cycles as appropriate, of the aircraft and all life-limited aircraft components – 12 months after the aircraft has been permanently withdrawn from service;
  - (3) The time and flight cycles as appropriate, since last overhaul of the aircraft or aircraft component subjected to an overhaul life – Until the aircraft or aircraft component overhaul has been superseded by another overhaul of equivalent work scope and detail;
  - (4) The current aircraft inspection status such that compliance with the approved operator's aircraft maintenance programme can be established – Until the aircraft or aircraft component inspection has been superseded by another inspection, of equivalent work scope and detail;
  - (5) The current status of airworthiness directives applicable to the aircraft and aircraft components – 12 months after the aircraft has been permanently withdrawn from service; and
  - (6) Details of current modifications and repairs to the aircraft, engine(s), propeller(s) and any other aircraft component vital to flight safety – 12 months after the aircraft has been permanently withdrawn from service. (See IEM OPSM.920(b)(6))
- (c) An operator shall ensure that when an aircraft is permanently transferred from one operator to another operator the records specified in paragraphs (a) and (b) are also transferred and the time periods prescribed will continue to apply to the new operator. (See AMC OPSM.920(c))

***OPSM.930 Continued Validity of the Air Operator Certificate in Respect of the Maintenance System***

(See IEM OPSM.930)

An operator must comply with this Schedule to ensure continued validity of the air operator's certificate in respect of the maintenance system.

***OPSM.935 Equivalent Safety Case***

(See IEM OPSM.935)

An operator shall not introduce alternative procedures to those prescribed in this Schedule unless needed and an equivalent safety case has first been approved by the Civil Aviation Authority.

## **PART B – ACCEPTABLE MEANS OF COMPLIANCE AND INTERPRETATIVE / EXPLANATORY MATERIAL (AMC & IEM)**

### **1 General**

- 1.1 This Section contains Acceptable Means of Compliance and Interpretative / Explanatory Material that has been agreed by the Civil Aviation Authority.
- 1.2 Where a particular requirement does not have an Acceptable Means of Compliance or any Interpretative/Explanatory Material, it is considered that no supplementary material is required.

### **2 Presentation**

- 2.2 A numbering system has been used in which the Acceptable Means of Compliance or Interpretative/Explanatory Material uses the same number as the requirement paragraph in PART A to which it refers. The number is introduced by the letters AMC or IEM to distinguish the material in PART A.

- 2.3 The acronyms AMC and IEM also indicate the nature of the material and for this purpose the two types of material are defined as follows:

Acceptable Means of Compliance (AMC) illustrate a means, or several alternative means, but not necessarily the only possible means by which a requirement can be met. It should however be noted that where a new AMC is developed, any such AMC (which may be additional to an existing AMC) will be amended into the Schedule.

Interpretative/Explanatory Material (IEM) helps to illustrate the meaning of a requirement.

- 2.4 Explanatory Notes not forming part of the AMC or IEM text appear in a smaller typeface.

### ***IEM OPSM.875 Introduction***

(See OPSM.875)

1. Reference to aircraft includes the components fitted to or intended to be fitted to the aircraft.
2. The performance of de-icing and anti-icing activities does not require a MAR-145 approval.

### ***IEM OPSM.885(a) Application for and approval of the Operator's Maintenance***

(See OPSM.885(a))

- 1 The Civil Aviation Authority does not expect the documents listed in OPSM.885(a) to be submitted in a completed state with the initial application for grant or variation since each will require approval in its own right and may be subject to amendment as a result of Civil Aviation Authority assessment during the technical investigations. Draft documents should be submitted at the earliest opportunity so that investigation of the application can begin. Grant or variation cannot be achieved until the Civil Aviation Authority is in possession of completed documents.
- 2 This information is required to enable the Civil Aviation Authority to conduct its investigation into the application, to assess the volume of maintenance work necessary and the locations at which it will be accomplished.

- 3 The applicant should inform the Civil Aviation Authority where base and scheduled line maintenance is to take place and give details of any contracted maintenance which is in addition to that provided in response to OPSM.895(a) or (c).
- 4 At the time of application, the Operator should have arrangements for all base and scheduled line maintenance in place for an appropriate period of time, as acceptable to the Civil Aviation Authority. The operator should establish further arrangements in due course before the maintenance is due.

Base maintenance contracts for high-life time checks may be based on one time contracts, when the Civil Aviation Authority considers that this is compatible with the operator's fleet size.

### ***IEM OPSM.885(b) Application for and Approval of the Operator's Maintenance System***

(See OPSM.885(b))

- 1 The approval of an operator's maintenance system will be indicated by means of a statement containing the following information
  - a. Air Operator Certificate number;
  - b. Name of the Operator;
  - c. Type(s) of aircraft for which the maintenance system has been accepted;
  - d. Reference identification of the operator's approved aircraft maintenance programme(s) related to (c) above;
  - e. Reference identification of the operators approved maintenance management exposition; and
  - f. Any limitations imposed by the Civil Aviation Authority on the grant or variation.

NOTE: Approval may be limited to specified aircraft types, to specific locations or by other means like operational limitations if considered necessary by the Civil Aviation Authority in the interests of safe operation.

### ***AMC OPSM.890(a) Maintenance Responsibility***

(See OPSM.890(a))

- 1 The requirement means that the operator is responsible for determining what maintenance is required, when it has to be performed and by whom and to what standard, in order to ensure the continued airworthiness of the aircraft being operated.
- 2 An operator should therefore have adequate knowledge of the design status (type specification, customer options, AD's, modifications, operational equipment) and required and performed maintenance. Status of aircraft design and maintenance should be adequately documented to support the performance of the quality system (See OPSM.900).
- 3 An operator should establish adequate co-ordination between flight operations and maintenance to ensure that both will receive all information on the condition of the aircraft necessary to enable both to perform their tasks.
- 4 The requirement does not mean that an operator himself performs the maintenance (this is to be done by a MAR-145 Approved Maintenance Organisation (See OPSM.895) but that the operator carries the responsibility for the airworthy condition of aircraft it operates and thus should be satisfied before the intended flight that all required maintenance has been properly carried out.
- 5 When an operator is not appropriately approved in accordance with MAR-145, the operator should provide a clear work order to the maintenance contractor. The fact that an operator has contracted a

MAR-145 Approved Maintenance Organisation should not prevent him from checking at the maintenance facilities on any aspect of the contracted work if he wishes to do so to satisfy his responsibility for the airworthiness of the aircraft.

**AMC OPSM.890(a)(1)      *Maintenance Responsibility***

(See OPSM.890(a)(1))

- 1 With regard to the pre-flight inspection it is intended to mean all of the actions necessary to ensure that the aircraft is fit to make the intended flight. These should typically include but are not necessarily limited to:
  - a. A walk-around type inspection of the aircraft and its emergency equipment for condition including, in particular, any obvious signs of wear, damage or leakage. In addition, the presence of all required emergency equipment should be established.
  - b. Inspection of the Technical log to ensure that the intended flight is not adversely affected by any outstanding deferred defects and that no required maintenance action shown in the maintenance statement is overdue or will become due during the flight.
  - c. That consumable fluids, gases etc. uplifted prior to flight are of the correct specification, free from contamination, and correctly recorded.
  - d. That all doors are securely fastened.
  - e. Control surface and landing gear locks, pitot/static covers, restraint devices and engine/aperture blanks have been removed.
  - f. That all the aircraft's external surfaces and engines are free from ice, snow, sand, dust etc.
- 2 Tasks such as oil and hydraulic fluid uplift and tyre inflation may be considered as part of the preflight inspection, if acceptable to the Civil Aviation Authority. The related pre-flight inspection instructions should address the procedures to determine where the necessary uplift or inflation results from an abnormal consumption and possibly requires additional maintenance action by the MAR-145 approved/accepted Maintenance Organisation.
- 3 An operator should publish guidance to maintenance and flight personnel and any other personnel performing pre-flight inspection tasks, as appropriate, defining responsibilities for these actions and, where tasks are contracted to other organisations, how their accomplishment is subject to the quality system of OPSM.900. It should be demonstrated to the Civil Aviation Authority that preflight inspection personnel have received appropriate training for the relevant preflight inspections tasks. The training standard for personnel performing the preflight inspection should be described in the Operator's Maintenance Management Exposition.

**IEM OPSM.890(a)(1)      *Maintenance Responsibility***

(See OPSM.890(a)(1))

The fact that the performance of pre flight inspections is an Operator's maintenance responsibility does not necessarily mean that such personnel performing pre-flight inspection tasks report to the Nominated Postholder for Maintenance, but that the Nominated postholder for Maintenance is responsible for determining the content of the pre flight inspection and setting the qualification standard of the involved personnel. In addition, compliance with the qualification standard should be monitored by the Operator's Quality System.

**AMC OPSM.890(a)(2)      *Maintenance Responsibility***

(See OPSM.890(a)(2))

The Operator should have a system to ensure that all defects affecting the safe operation of the aircraft are rectified within the limits prescribed by the approved MEL or CDL as appropriate and that no postponement of such a defect rectification can be permitted unless with the Operator's agreement and in accordance with a procedure approved by the Civil Aviation Authority.

***AMC OPSM.890(a)(3) Maintenance Responsibility***

(See OPSM.890(a)(3))

The Operator should have a system to ensure that all aircraft maintenance checks are performed within the limits prescribed by the approved aircraft maintenance programme and that, whenever a maintenance check cannot be performed within the required time limit, its postponement is allowed with the Operator's agreement and in accordance with a procedure approved by the Civil Aviation Authority.

***AMC OPSM.890(a)(4) Maintenance Responsibility***

(See OPSM.890(a)(4))

An operator should have a system to analyse the effectiveness of the maintenance programme, with regard to spares, established defects, malfunctions and damage, and to amend the maintenance programme (this amendment will involve the approval of the Civil Aviation Authority unless the operator has been approved to amend the maintenance programme without direct involvement of the Civil Aviation Authority).

***IEM OPSM.890(a)(5) Maintenance Responsibility***

(See OPSM.890(a)(5))

"Any other continued airworthiness requirement made mandatory by the Civil Aviation Authority" includes Type Certification related requirements such as: Certification Maintenance Requirements (CMR's), Life Limited Parts, Airworthiness Limitations, etc...

***AMC OPSM.890(a)(6) Maintenance Responsibility***

(See OPSM.890(a)(6))

An operator should establish a policy, and work to that policy, to assess non-mandatory information related to the airworthiness of the aircraft, such as Service Bulletins, Service Letters and other information on the aircraft and its components from the design organisation, the manufacturer or the related airworthiness authorities.

***AMC OPSM.895(a) Maintenance Management***

(See OPSM.895(a))

- 1 The requirement is intended to provide for the possibility of the following three alternative options:
  - a. An operator to be approved in accordance with MAR-145 to carry out all maintenance of the aircraft and aircraft components;
  - b. An operator to be approved in accordance with MAR-145 to carry out some of the maintenance of the aircraft and aircraft components. This, at minimum, could be limited line maintenance but may be considerably more but still short of option (a);
  - c. An operator not approved in accordance with MAR-145 to carry out any maintenance.
- 2 An operator or prospective operator may apply for any one of these options but it will be for the Civil Aviation Authority to determine which option may be accepted in each particular case.
  - 2.1 To make this determination the Civil Aviation Authority will apply the primary criteria of relevant operator experience if carrying out some or all maintenance on comparable aircraft. Therefore where an operator applies for option (a) – all maintenance – the Civil Aviation



Authority will need to be satisfied that the operator has sufficient experience of carrying out all maintenance on a comparable type. For example, assuming that the experience is judged satisfactory, then it is reasonable from the maintenance viewpoint to add a different wide bodied aircraft to an existing wide bodied fleet. If the experience is not satisfactory or too limited the Civil Aviation Authority may choose either to require more experienced management and/or more experienced release to service staff or may refuse to accept the new wide bodied aircraft if extra experienced staff cannot be found. Option (b) or (c) may be possible alternatives.

- 2.2 Where an operator applies for option (b) – some maintenance, or the Civil Aviation Authority has been unable to accept an application for option (a) – then satisfactory experience is again the key but in this case the satisfactory experience is related to the reduced maintenance of this option. If the experience is not satisfactory or too limited the Civil Aviation Authority may choose to require more experienced staff or may refuse to accept the application if such staff cannot be found. Option (c) may be the possible alternative. Option (c) accepts that the operator either does not have satisfactory experience or has only limited experience of some maintenance.
- 2.3 The Civil Aviation Authority will require an operator to enter into a contract with an appropriately approved MAR-145 organisation except that in some cases where the Civil Aviation Authority believes that it is possible to obtain sufficient satisfactorily experienced staff to provide the minimal maintenance support for option (b), in which case option (b) would apply.
- 2.4 In respect of this paragraph, ‘experience’ means staff who have proven evidence that they were directly involved with at least line maintenance of similar aircraft types for not less than 12 months. Such experience should be demonstrated to be satisfactory. An operator is required to have enough personnel meeting the requirement of OPSM.895(b) to manage the maintenance responsibility whichever option is used.

### ***AMC OPSM.895(b) Maintenance Management***

(See OPSM.895(b))

- 1 The person or group of persons employed should represent the maintenance management structure of the operator (for maintenance) and be responsible for all maintenance functions. Dependent on the size of the operation and the organisational set-up, the maintenance functions may be divided under individual managers or combined in nearly any number of ways. This includes combining the functions of ‘accountable manager’, the ‘nominated postholder’ and the quality monitoring function so long as the quality monitoring function remains independent of the functions to be monitored. In the smallest organisation this may lead to the quality monitoring function being performed by the accountable manager if suitably qualified. Consequently the smallest organisation consists of at least two persons except that the Civil Aviation Authority may agree to the quality monitoring function being sub-contracted to another operator’s quality monitoring department or a suitably qualified independent person acceptable to the Civil Aviation Authority.
- 2 The actual number of persons to be employed and their necessary qualifications is dependent upon the tasks to be performed and thus dependent on the size and complexity of the operation (route network, line or charter, ETOPS, number of aircraft and the aircraft types, complexity of the aircraft and their age), number and locations of maintenance facilities and the amount and complexity of maintenance contracting. Consequently, the number of persons needed, and their qualifications, may differ greatly from one operator to another and a simple formula covering the whole range of possibilities is not feasible.
- 3 To enable the Civil Aviation Authority to accept the number of persons and their qualifications, an operator should make an analysis of the tasks to be performed, the way in which he intends to divide and/or combine these tasks, indicate how he intends to assign responsibilities and establish the number of

man/hours and the qualifications needed to perform the tasks. With significant changes in the aspects relevant to the number and qualifications of persons needed, this analysis should be updated.

- 4 The Civil Aviation Authority does not necessarily expect that the credential of each person of the Maintenance Management Group of Persons are individually submitted to the Civil Aviation Authority for their acceptance. However, the Manager of the Maintenance Management Group of Persons, and any manager reporting directly to him should be individually acceptable to the Civil Aviation Authority.

#### ***AMC OPSM.895(c) Maintenance Management***

(See OPSM.895(c))

The Civil Aviation Authority should only accept that the proposed person be employed by the MAR-145 Organisation when it is manifest that he/she is the only available competent person in a position to exercise this function, within a practical working distance from the Operator's offices.

#### ***IEM OPSM.895(c) Maintenance Management***

(See OPSM.895(c))

This paragraph only applies to contracted maintenance and therefore does not affect situations where the MAR-145 approved/accepted Organisation and the Operator are the same organisation.

#### ***AMC OPSM.895(d) Maintenance Management***

(See OPSM.895(d))

- 1 Where an operator is not approved to MAR-145 or an operator's maintenance organisation is an independent organisation, a contract should be agreed between the operator and the MAR-145 Approved Maintenance Organisation that specifies, in detail, the work to be performed by the MAR-145 Approved Maintenance Organisation.
- 2 Both the specification of work and the assignment of responsibilities should be clear, unambiguous and sufficiently detailed to ensure that no misunderstanding should arise between the parties concerned (operator, maintenance organisation and the Civil Aviation Authority) that could result in a situation where work that has a bearing on the airworthiness or serviceability of aircraft is not or will not be properly performed.
- 3 Special attention should be paid to procedures and responsibilities to ensure that all maintenance work is performed, service bulletins are analysed and decisions taken on accomplishment, airworthiness directives are completed on time and that all work, including non-mandatory modifications is carried out to approved data and to the latest standards.
- 4 For the actual lay out of the contract the IATA Standard Ground Handling Agreement may be used as a basis, but this does not preclude the Civil Aviation Authority from ensuring that the content of the contract is acceptable to them, and especially that the contract allows the Operator to properly exercise its maintenance responsibility. Those parts of a contract that have no bearing on the technical or operational aspects of airworthiness are outside the scope of this paragraph.

#### ***AMC OPSM.895(e) Maintenance Management***

(See OPSM.895(e))

- 1 In the case of a contract with an organisation that is not MAR-145 approved/accepted, the Operator's Maintenance Management Exposition should include appropriate procedures to ensure that all this contracted maintenance is ultimately performed on time by MAR-145 approved/accepted organisations in accordance with data acceptable to the Civil Aviation Authority. In particular the Quality System

procedures should place great emphasis on monitoring compliance with the above. The list of MAR-145 approved/accepted contractors, or a reference to this list, should be included in the Operator's Maintenance Management Exposition.

- 2 Such a maintenance arrangement does not absolve the Operator from its overall Maintenance responsibility. Specifically, in order to accept the maintenance arrangement, the Civil Aviation Authority should be satisfied that such an arrangement allows the Operator to ensure full compliance with OPSM.890 Maintenance Responsibility.

### ***IEM OPSM.895(e) Maintenance Management***

(See OPSM.895(e))

The purpose of OPSM.895(e) is to authorise a primary maintenance arrangement with an organisation which is not a MAR-145 approved/accepted Maintenance Organisation, when it proves that such an arrangement is in the interest of the Operator by simplifying the management of its maintenance, and the Operator keeps an appropriate control of it. Such an arrangement should not preclude the Operator from ensuring that all maintenance is performed by a MAR-145 approved/accepted organisation and complying with the OPSM.890 maintenance responsibility requirements. Typical examples of such arrangements follow:

*- Component maintenance :*

The Operator may find it more appropriate to have a primary contractor, that would despatch the components to appropriately approved organisations, rather than himself sending different types of components to various MAR-145 approved/accepted maintenance organisations. The benefit for the operator is that the management of maintenance is simplified by having a single contact point for component maintenance. The Operator remains responsible for ensuring that all maintenance is performed by MAR-145 approved/accepted Organisations and in accordance with the approved standard.

*- Aircraft, engine and component maintenance :*

The operator may wish to have a maintenance contract with another non MAR-145 approved operator of the same type of aircraft. A typical case is that of a dry-leased aircraft between operators, where the parties, for consistency or continuity reasons (especially for short term lease agreements), find it appropriate to keep the aircraft under the current maintenance arrangement. Where this arrangement involves various MAR-145 approved/accepted contractors, it might be more manageable for the lessee Operator to have a single contract with the lessor Operator. Such an arrangement should not be understood as a transfer of responsibility to the lessor Operator : the lessee Operator approved under this Schedule, remains responsible for the maintenance of the aircraft in performing the OPSM.890 functions, and employing the OPSM.895 Maintenance Management Group of Persons.

In essence, OPSM.895(e) does not alter the intent of OPSM.895(a), (b) and (d) in that it also requires that the Operator has to establish a written maintenance contract acceptable to the Civil Aviation Authority and, whatever type of acceptable arrangement is made, the Operator is required to exercise the same level of control on contracted maintenance, particularly through the OPSM.895(b) Maintenance Management Group of Persons and OPSM.900 Quality System.

### ***IEM OPSM.895(f&g) Maintenance Management***

(See OPSM.895(f&g))

The intent of this paragraph is that maintenance contracts are not necessary when the Operator's maintenance system, as approved by the Civil Aviation Authority, specifies that the relevant maintenance activity may be ordered through one time work orders. This includes for obvious reasons occasional line maintenance and may also include aircraft component maintenance up to engines, so long as the Civil Aviation Authority considers that the maintenance is manageable through work orders, both in term of volume and complexity. It should be noted that this paragraph implies that even where base maintenance is ordered on a case by case basis, there must be a written maintenance contract.

**AMC OPSM.895(h) Maintenance Management**

(See OPSM.895(h))

Office accommodation in this case means office accommodation such that the incumbents, whether they be maintenance management, planning, technical records or quality staff, can carry out their designated tasks in a manner that contributes to good maintenance standards. In the smaller operators, the Civil Aviation Authority may agree to these tasks being conducted from one office subject to being satisfied that there is sufficient space and that each task can be carried out without undue disturbance. Office accommodation should also include an adequate technical library and room for document consultation.

**AMC OPSM.900 Quality system**

(See OPSM.900))

- 1 An operator should establish a plan acceptable to the Civil Aviation Authority to show when and how often the activities as required by OPSM.890 will be monitored. In addition, reports should be produced at the completion of each monitoring investigation and include details of discrepancies of non compliance with procedures or requirements.
- 2 The feedback part of the system should address who is required to rectify discrepancies and non compliance in each particular case and the procedure to be followed if rectification is not completed within appropriate timescales. The procedure should lead to the Accountable Manager.
- 3 To ensure effective compliance with OPSM.900 the following elements have been shown to work well:
  - a. Product sampling – the part inspection of a representative sample of the aircraft fleet;
  - b. Defect sampling – the monitoring of defect rectification performance;
  - c. Concession sampling – the monitoring of any concession to not carry out maintenance on time;
  - d. On time maintenance sampling – the monitoring of when (flying hours/calendar time/flight cycles etc) aircraft and their components are brought in for maintenance;
  - e. Sampling reports of unairworthy conditions and maintenance errors.

Note that OPSM.900 includes other self-explanatory monitoring elements.

**IEM OPSM.900 Quality system**

(See OPSM.900)

The primary purpose of the Quality System is to monitor compliance with the approved procedures specified in an operator's Maintenance Management Exposition to ensure compliance with this Schedule and thereby ensure the maintenance aspects of the operational safety of the aircraft. In particular, this part of the Quality System provides a monitor of the effectiveness of maintenance, reference OPSM.890, and should include a feedback system to ensure that corrective actions are both identified and carried out in a timely manner.

**AMC OPSM.905(a) Maintenance Management exposition**

(See OPSM.905(a))

- 1 The purpose of the Maintenance Management Exposition is to set forth the procedures, means and methods of the operator. Compliance with its contents will assure compliance with this Schedule, which in conjunction with an appropriate MAR-145 Approved Maintenance Organisation Exposition, is a prerequisite for obtaining an acceptance of the operator's maintenance system by the Civil Aviation Authority.

- 2 Where an operator is appropriately approved as a MAR-145 Approved Maintenance Organisation the Exposition of the maintenance organisation may form the basis of the Operator's Maintenance Management Exposition in a combined document as follows:

*MAR-145 Exposition*

- Part 1 Management
- Part 2 Maintenance Procedures
- Part L2 Additional Line Maintenance Procedures
- Part 3 Quality System Procedures
- Part 4 Contracted JAA Operators
- Part 5 Appendices (sample of documents)

Part 3 must also cover the functions specified by OPSM.900, Quality System.

Additional parts should be introduced covering the following:

- Part 0 General Organisation
- Part 6 Operator's Maintenance Procedures

- 3 Where an operator is not approved in accordance with MAR-145 but has a maintenance contract with a MAR-145 Approved Maintenance Organisation, the Maintenance Management Exposition should comprise:
- Part 0 General Organisation
  - Part 1 Operator's Maintenance Procedures
  - Part 2 Quality System
  - Part 3 Contracted Maintenance
- 4 Personnel are expected to be familiar with those parts of the Exposition that are relevant to the maintenance and airworthiness co-ordination work they carry out.
- 5 The operator will need to specify in the Exposition who should amend the document, particularly where there are several parts.
- 6 The person responsible for the management of the Quality System should be responsible for monitoring and amending the Exposition unless otherwise agreed by the Civil Aviation Authority, including associated procedures manuals, and the submission of proposed amendments to the Civil Aviation Authority for approval. The Civil Aviation Authority may agree a procedure, which will be stated in the amendment control section of the Exposition, defining the class of amendments which can be incorporated without the prior consent of the Civil Aviation Authority.
- 7 The operator may use Electronic Data Processing (EDP) for publication of the maintenance management exposition. The maintenance management exposition should be made available to the Civil Aviation Authority in a form acceptable to the Civil Aviation Authority. Attention should be paid to the compatibility of EDP publication systems with the necessary dissemination of the maintenance management exposition, both internally and externally.
- 8 Part 0 "General Organisation" of the Maintenance Management Exposition should include a corporate commitment by the operator, signed by the Accountable Manager confirming that the Maintenance Management Exposition and any associated manuals define the organisation compliance with this Schedule and will be complied with at all times.

- 9 The accountable manager's exposition statement should embrace the intent of the following paragraph and in fact this statement may be used without amendment. Any modification to the statement should not alter the intent:

“This exposition defines the organisation and procedures upon which the Civil Aviation Authority Operator’s Maintenance System Approval is based.

These procedures are approved by the undersigned and must be complied with, as applicable, in order to ensure that all maintenance of .....(quote Operator’s name)..... fleet of aircraft is carried out on time to an approved standard.

It is accepted that these procedures do not override the necessity of complying with any new or amended regulation published by the Civil Aviation Authority from time to time where these new or amended regulations are in conflict with these procedures .

It is understood that the Civil Aviation Authority will approve this organisation whilst the Civil Aviation Authority is satisfied that the procedures are being followed and the work standard maintained. It is understood that the Civil Aviation Authority reserves the right to suspend, vary or revoke the maintenance system approval of the organisation, as applicable, if the Civil Aviation Authority has evidence that the procedures are not followed and the standards not upheld.

It is further understood that suspension or revocation of the approval of the maintenance system would invalidate the AOC.

Signed .....

Dated .....

Accountable Manager and ...(quote position).....

For and on behalf of .....(quote organisation's name)..... ”

- 10 Whenever the accountable manager is changed it is important to ensure that the new accountable manager signs the para 9. statement at the earliest opportunity as part of the acceptance by the Civil Aviation Authority.

Failure to carry out this action invalidates the Operator’s Maintenance System approval.

PART C of this Schedule contains examples of Exposition lay-outs.

### ***AMC OPSM.910(a) Operator’s Aircraft Maintenance Programme***

(See OPSM.910(a))

- 1 The aircraft maintenance programme should be managed and presented by the operator to the Civil Aviation Authority.
- 2 Where implementation of the content of an approved operator’s aircraft maintenance programme is accomplished by an appropriately approved MAR-145 Approved Maintenance Organisation, it therefore follows that the MAR - 145 Approved Maintenance Organisation should have access to the relevant parts of the approved operator’s aircraft maintenance programme when the organisation is not the author. Implementation means preparation and planning of the maintenance tasks in accordance with the approved maintenance programme.
- 3 The aircraft should only be maintained to one approved operator’s aircraft maintenance programme at a given point in time. Where an operator wishes to change from one approved operator’s aircraft

maintenance programme to another such approved programme, a transfer Check/Inspection may need to be performed, as agreed with the Civil Aviation Authority, in order to implement the change.

- 4 The operator's aircraft maintenance programme should contain a preface which will define the maintenance programme contents, the inspection standards to be applied, permitted variations to task frequencies and, where applicable, any procedure to escalate established check/inspection intervals. PART D of this Schedule provides detailed guidance on the content of an approved operator's aircraft maintenance programme.
- 5 Where an operator wishes to use an aircraft with the initial operator's aircraft maintenance programme based upon the Maintenance Review Board Report (MRBR) process, any associated programme for the continuous surveillance of the reliability, or health monitoring of the aircraft should be considered as part of the aircraft maintenance programme.
- 6 Where an aircraft type has been subjected to the MRBR process, an operator should normally develop the initial operator's aircraft maintenance programme based upon the MRBR.
- 7 The documentation supporting the development of operator's aircraft maintenance programmes for aircraft types subjected to the MRBR process should contain identification cross reference to the MRBR tasks such that it is always possible to relate such tasks to the current approved operator's aircraft maintenance programme. This does not prevent the approved operator's aircraft maintenance programme from being developed in the light of service experience to beyond the MRBR recommendations but will show the relationship to such recommendations.
- 8 Some approved operator's aircraft maintenance programmes, not developed from the MRB Process, utilise reliability programmes. Such reliability programmes should be considered as a part of the approved maintenance programme.
- 9 Reliability programmes should be developed for aircraft maintenance programmes based upon MSG logic or those that include condition monitored components or that do not contain overhaul time periods for all significant system components.
- 10 Reliability programmes need not be developed for aircraft maintenance programmes of aircraft of 5700 kg and below or that do contain overhaul time periods for all significant system components.
11. The purpose of a reliability programme is to ensure that the aircraft maintenance programme tasks are effective and their periodicity is adequate. It therefore follows that the actions resulting from the reliability programme may be not only to escalate or delete maintenance task, but also to de-escalate or add maintenance tasks, as necessary.
12. A reliability programme provides an appropriate means of monitoring the effectiveness of the maintenance programme.

### ***AMC OPSM.910(b) Operator's Aircraft Maintenance Programme***

(See OPSM.910(b))

- 1 The documentation issued by the Civil Aviation Authority to approve the operator's aircraft maintenance programme may include details of who may issue certificates of release to service in a particular situation and may define which tasks are considered as base maintenance activity. Development of the approved operator's aircraft maintenance programme is dependent upon sufficient satisfactory in-service experience which has been properly processed. In general, the task being considered for escalation beyond the MRB limits should have been satisfactorily repeated at the existing frequency several times before being proposed for escalation. PART D of this Schedule gives further guidance.

- 2 The Civil Aviation Authority may approve a part of or an incomplete operator's aircraft maintenance programme at the start of operation of a new aircraft type or a new operator, subject to the limitation that the approved operator's aircraft maintenance programme is only valid for a period that does not exceed any required maintenance not yet approved. The following examples illustrate just two possibilities:
  - 2.1 A new aircraft type may not have completed the acceptance process for structural inspection or corrosion control. It therefore follows that the operator's aircraft maintenance programme cannot be approved as a complete programme but it is reasonable to approve for a limited period, say, 3000 hrs or 1 year;
  - 2.2 A new operator may not have established suitable maintenance arrangements for the high-life time checks. It therefore follows that the Civil Aviation Authority may be unable to approve the complete operator's aircraft maintenance programme, preferring to opt for a limited period.
  
- 3 If the Civil Aviation Authority is no longer satisfied that a safe operation can be maintained, the approval of an operator's aircraft maintenance programme or part of it may be suspended or revoked. Events giving rise to such action include:
  - 3.1 An operator suspending the operation of that aircraft type for at least one year;
  - 3.2 Periodic review of the approved operator's aircraft maintenance programme by the Civil Aviation Authority shows that the operator has failed to ensure that the programme reflects the maintenance needs of the aircraft such that safe operation can be assured.

**AMC OPSM.915      *Operator's aircraft technical log***

(See OPSM.915)

- 1 The operator's aircraft technical log is a system for recording defects and malfunctions discovered during the operation and for recording details of all maintenance carried out on the particular aircraft to which the operator's aircraft technical log applies whilst that aircraft is operating between scheduled visits to the base maintenance facility. In addition, it is used for recording operating information relevant to flight safety and should contain maintenance data that the operating crew need to know. Where a means of recording defects or malfunctions in the cabin or galleys that affect the safe operation of the aircraft or the safety of its occupants, separate from the aircraft technical log, is used, this should be regarded as forming part of the aircraft technical log system.
  
- 2 The operators aircraft technical log system may range from a simple single section document to a complex system containing many sections but in all cases it should include the information specified for the example used here which happens to use a 5 section document / computer system:

**Section 1** should contain details of the registered name and address of the operator, the aircraft type and the complete international registration marks of the aircraft.

**Section 2** should contain details of when the next scheduled maintenance is due, including, if relevant any out of phase component changes due before the next maintenance check. In addition this Section should contain the current Certificate of Release to Service, for the complete aircraft, issued normally at the end of the last maintenance check.

NOTE: The flight crew does not need to receive such details if the next scheduled maintenance is controlled by other means acceptable to the Civil Aviation Authority.

**Section 3** should contain details of all information considered necessary to ensure continued flight safety. Such information includes:



- i. The aircraft type and registration mark.
- ii. The date and place of take-off and landing.
- iii. The times at which the aircraft took off and landed.
- iv. The running total of flying hours, such that the hours to the next schedule maintenance can be determined. The flight crew does not need to receive such details if the next scheduled maintenance is controlled by other means acceptable to the Civil Aviation Authority.
- v. Details of any failure, defect or malfunction to the aircraft affecting airworthiness or safe operation of the aircraft including emergency systems, and any failure, defect or malfunctions in the cabin or galleys that affect the safe operation of the aircraft or the safety of its occupants that are known to the commander. Provision should be made for the commander to date and sign such entries, including, where appropriate, the nil defect state for continuity of the record. Provision should be made for a Certificate of Release to Service or, if agreed by the Civil Aviation Authority, the alternate abbreviated Certificate of Release to Service following rectification of a defect or any deferred defect or maintenance check carried out. Such a certificate appearing on each page of this section should readily identify the defect(s) to which it relates or the particular maintenance check as appropriate.

The alternate abbreviated certificate of release to service consists of the following statement "MAR 145.50 release to service" in place of the full certification statement specified in AMC 145.50(b) para 1.

When the Civil Aviation Authority agrees to the use of the alternate abbreviated certificate of release to service, the introductory section of the technical log should include an example of the full certification statement from AMC 145.50(b) para 1 together with a note stating; "The alternate abbreviated certificate of release to service used in this technical log satisfies the intent of MAR 145.50(a) only. All other aspects of MAR 145.50(b) shall be complied with".

- vi. The quantity of fuel and oil uplifted and the quantity of fuel available in each tank, or combination of tanks, at the beginning and end of each flight; provision to show, in the same units of quantity, both the amount of fuel planned to be uplifted and the amount of fuel actually uplifted; provision for the time when ground de-icing and/or anti-icing was started and the type of fluid applied, including mixture ratio fluid/water.
- vii. The pre-flight inspection signature.

In addition to the above it may be necessary to record the following supplementary information:

The time spent in particular engine power ranges where use of such engine power affects the life of the engine or engine module. Maximum or Inter Contingency Power are two examples.

The number of landings where landings affect the life of an aircraft or aircraft component.

Flight cycles or flight pressure cycles where such cycles affect the life of an aircraft or aircraft component.

NOTE 1: Where Section 3 is of the multisector 'part removable' type then such 'part removable' sections should contain all of the foregoing information where appropriate.

NOTE 2: Section 3 should be designed such that one copy of each page may remain on the aircraft and one other copy may be retained on the ground until completion of the flight to which it relates.

NOTE 3: Section 3 lay-out should be divided to show clearly what is required to be completed after flight and what is required to be completed in preparation for the next flight.

**Section 4** should contain details of all deferred defects that affect or may affect the safe operation of the aircraft and should therefore be known to the aircraft commander. Each page of this section should be pre-printed with the operator's name and page serial number and make provision for recording the following:

- i. A cross reference for each deferred defect such that the original defect can be identified in the particular Section 3 Sector Record Page.
- ii. The original date of occurrence of the defect deferred.
- iii. Brief details of the defect.
- iv. Details of the eventual rectification carried out and its Certificate of Release to Service or a clear cross-reference back to the document that contains details of the eventual rectification.

**Section 5** should contain any necessary maintenance support information that the aircraft commander needs to know. Such information would include data on how to contact maintenance engineering if problems arise whilst operating the routes etc.

The Aircraft Technical Log System can be either a paper or computer system or any combination of both methods.

### **AMC OPSM.920      *Maintenance Records***

(See OPSM.920)

- 1      The operator should ensure that he always receives a complete MAR-145 Certificate of Release to Service such that the required records can be retained. The system to keep the maintenance records should be described in the operator's maintenance management exposition or in the relevant MAR-145 exposition.
- 2      When an operator arranges for the relevant maintenance organisation to retain copies of the maintenance records on his behalf, he will nevertheless continue to be responsible for the records under OPSM.920(b) relating to the preservation of records. If he ceases to be the operator of the aircraft, he also remains responsible for transferring the records to any other person who becomes the operator of the aircraft.
- 3      Keeping maintenance records in a form acceptable to the Civil Aviation Authority normally means in paper form or on a computer database or a combination of both methods. Records stored in microfilm or optical disc form are also acceptable.
- 4      Paper systems should use robust material which can withstand normal handling and filing. The record should remain legible throughout the required retention period.
- 5      Computer systems should have at least one backup system which should be updated at least within 24 hours of any maintenance. Each terminal is required to contain programme safeguards against the ability of unauthorised personnel to alter the database.
- 6      Microfilming or optical storage of maintenance records may be carried out at any time. The records should be as legible as the original record and remain so for the required retention period.

- 7 Information on times, dates, cycles etc. as required by OPSM.920 hereafter referred to as 'summary maintenance records' are those records that give an overall picture on the state of maintenance of the aircraft and any life-limited aircraft component. The current status of all life-limited aircraft components should indicate the component life limitation, total number of hours, accumulated cycles or calendar time and the number of hours/cycles/time remaining before the required retirement time of the component is reached.
- 8 The current status of Airworthiness Directives (AD) should identify the applicable AD's including revision or amendment numbers. Where an AD is generally applicable to the aircraft or component type but is not applicable to the particular aircraft or component, then this should be identified. The AD status includes the date when the AD was accomplished, and where the AD is controlled by flight hours or flight cycles it should include the aircraft or engine or component total flight hours or cycles, as appropriate. For repetitive AD's, only the last application should be recorded in the AD status. The status should also specify which part of a multi-part directive has been accomplished and the method, where a choice is available in the AD.
- 9 Details of current modification and repairs means the substantiating data supporting compliance with the airworthiness requirements. This can be in the form of a Supplemental Type Certificate, Service Bulletin, Structural Repair Manual or similar approved document. If the airworthiness data for modification and repair is produced by the MAR-145 organisation in accordance with existing national regulations all detailed documentation necessary to define the change and its approval should be retained.
- 10 The substantiating data may include:
  - a. Compliance programme;
  - b. Master drawing or drawing list, production drawings, installation instructions;
  - c. Engineering reports (static strength, fatigue, damage tolerance, fault analysis, etc.);
  - d. Ground and flight test programme and results;
  - e. Mass and balance change data;
  - f. Maintenance and repair manual supplements;
  - g. Maintenance programme changes and instructions for continuing airworthiness; and
  - h. Aircraft flight manual supplement.
- 11 Maintenance records should be stored in a safe way with regard to fire, flood, theft and alteration.
- 12 Computer backup discs, tapes etc., should be stored in a different location from that containing the current working discs, tapes, etc. and in a safe environment.

***IEM OPSM.920(b)(6)******Maintenance Records***

(See OPSM.920(b)(6))

For the purpose of this paragraph, a "component vital to flight safety" means a component that includes Life Limited Parts or is subject to Airworthiness Limitations or a major component such as, undercarriage and flight controls.

***AMC OPSM.920(c) Maintenance Records***

(See OPSM.920(c))

- 1 Where an operator terminates his operation, all retained maintenance records should be passed on to the new operator or, if there is no operator, stored as required by the Civil Aviation Authority.
- 2 A “permanent transfer“ does not generally include the dry lease-out of an aircraft when the duration of the lease agreement is less than 6 months. However the Civil Aviation Authority should be satisfied that all maintenance records necessary for the duration of the lease agreement are transferred to the lessee or made accessible to them.

***IEM OPSM.930 Continued Validity of the Air Operator Certificate in Respect of the Maintenance System***

(See OPSM.930)

This paragraph covers scheduled changes to the maintenance system. This paragraph is included to ensure that operators remain aware that there is a requirement which may affect continued acceptance of the maintenance arrangement.

***IEM OPSM.935 Equivalent Safety Case***

(See OPSM.935)

- 1 This paragraph is intended to provide the necessary flexibility to the Civil Aviation Authority such that it may accept alternate means of compliance with any requirement specified in this Schedule, particularly in the case of advancement of technology.
- 2 Once agreed by the Civil Aviation Authority the alternative means of compliance will be proposed for inclusion in this Schedule.

## **PART C – MAINTENANCE MANAGEMENT EXPOSITION (SEE AMC OPSM.905(a))**

### **1. Maintenance Management Exposition for an Operator who is also approved in accordance with MAR-145**

The Exposition may be put together in any subject order and subjects combined so long as all applicable subjects are covered.

#### **PART 0 GENERAL ORGANISATION**

##### **0.1 Corporate commitment by the Operator;**

##### **0.2 General information:**

- Brief description of organisation
- Relationship with other organisations
- Fleet composition – Type of operation
- Line station locations;

##### **0.3 Maintenance Management personnel:**

- Accountable Manager
- Nominated postholder
- Maintenance co-ordination
- Duties and responsibilities
- Organisation chart(s)
- Manpower resources and training policy;

##### **0.4 Notification procedure to the Civil Aviation Authority regarding changes to the Operator's maintenance arrangements/locations/ personnel/activities/approval**

##### **0.5 Exposition amendment procedures.**

#### **\*PART 1 MANAGEMENT**

#### **\*PART 2 MAINTENANCE PROCEDURES**

#### **\*PART L2 ADDITIONAL LINE MAINTENANCE PROCEDURES**

#### **\*PART 3 QUALITY SYSTEM PROCEDURES**

Qualifying operator's maintenance personnel not covered by MAR-145.

NOTE: The Quality System procedures shown in Paragraph 2. (Maintenance Management Exposition for an Operator who is NOT approved in accordance with MAR-145) must also be taken into account.

#### **\*PART 4 CONTRACTED MACAO OPERATORS**

#### **\*PART 5 APPENDICES (Sample of Documents)**

(\* ) These Parts comprise the Exposition of the MAR-145 approved maintenance organisation.

#### **PART 6 OPERATOR'S MAINTENANCE PROCEDURES**

- 6.1 Aircraft technical log utilisation and MEL application;**
- 6.2 Aircraft maintenance programme – Development and amendment;**
- 6.3 Time and maintenance records, Responsibilities, Retention, Access;**
- 6.4 Accomplishment and control of Airworthiness Directives;**

6.5 Analysis of the effectiveness of the maintenance programme;

6.6 Non-mandatory modification embodiment policy;

6.7 Major modification standards;

6.8 Defect reports:

– Analysis

– Liaison with manufacturers and Regulatory Authorities

– Deferred defect policy;

6.9 Engineering activity;

6.10 Reliability programmes

– Airframe

– Propulsion

– Components;

6.11 Pre-flight Inspection:

– Preparation of aircraft for flight

– Sub-contracted Ground Handling functions

– Security of Cargo and Baggage loading

– Control of refuelling, Quantity/Quality

– Control of snow, ice, dust and sand contamination to an approved standard;

6.12 Aircraft weighing;

6.13 Flight test procedures; \*\*

6.14 Sample of documents, Tags and Forms used;

(\*\*) could be covered in Part 2, Maintenance Procedures.

## 2. Maintenance Management Exposition for an Operator who is NOT approved in accordance with MAR-145

The Exposition may be put together in any subject order so long as all applicable subjects are covered.

### PART 0 GENERAL ORGANISATION

(as shown in Paragraph 1)

### PART 1 OPERATOR'S MAINTENANCE PROCEDURES

(as shown in Paragraph 1, Part 6 entitled – Operator's Maintenance procedures)

### PART 2 QUALITY SYSTEM

- 2.1 Maintenance quality policy, plan and audit procedures;
- 2.2 Monitoring of maintenance management activities;
- 2.3 Monitoring the effectiveness of the maintenance programme;
- 2.4 Monitoring that all maintenance is carried out by an appropriate MAR-145 organisation:
  - Aircraft maintenance
  - Engines
  - Components;
- 2.5 Monitoring that all contracted maintenance is carried out in accordance with the contract, including sub-contractors used by the maintenance contractor;
- 2.6 Quality audit personnel.

### PART 3 CONTRACTED MAINTENANCE

- 3.1 Maintenance contractor selection procedure;
- 3.2 Detailed list of maintenance contractors;
- 3.3 Relevant technical procedures identified in the maintenance contract(s).

## **PART D - GENERAL REQUIREMENTS OF OPERATOR'S AIRCRAFT MAINTENANCE PROGRAMME**

1 The maintenance programme should contain the following basic information.

- 1.1 The type/model and registration number of the aircraft, engines and, where applicable, auxiliary power units and propellers.
- 1.2 The name and address of the operator.
- 1.3 The operator's reference identification of the programme document; the date of issue and issue number.
- 1.4 A statement signed by the operator to the effect that the specified aircraft will be maintained to the programme and that the programme will be reviewed and updated as required by paragraph 5.
- 1.5 Contents/list of effective pages of the document.
- 1.6 Check periods which reflect the anticipated utilisation of the aircraft. Such utilisation should be stated and include a tolerance of not more than 25%. Where utilisation cannot be anticipated, calendar time limits should also be included.
- 1.7 Procedures for the escalation of established check periods, where applicable and acceptable to the Civil Aviation Authority.
- 1.8 Provision to record date and reference to approved amendments incorporated in the programme.
- 1.9 Details of pre-flight maintenance tasks which are accomplished by maintenance staff and not included in the Operations Manual for action by flight crew.
- 1.10 The tasks and the periods (intervals/frequencies) at which each part of the aircraft, engines, APU's, propellers, components, accessories, equipment, instruments, electrical and radio apparatus, and associated systems and installations should be inspected, together with the type and degree of inspection.
- 1.11 The periods at which items as appropriate, should be checked, cleaned, lubricated, replenished, adjusted and tested.
- 1.12 Details of specific structural inspections or sampling programmes.
- 1.13 Details of the corrosion control programme, when applicable.
- 1.14 The periods and procedures for the collection of engine health monitoring data.
- 1.15 The periods at which overhauls and/or replacements by new or overhauled parts should be made.
- 1.16 A cross-reference to other documents approved by the Civil Aviation Authority which contain the details of maintenance tasks related to mandatory life limitations, Certification Maintenance Requirements (CMR's) and Airworthiness Directives (AD's).

Note: To prevent inadvertent variations to such tasks or intervals these items should not be included in the main portion of the maintenance programme document, or any planning control system, without specific identification of their mandatory status.

- 1.17 Details of, or cross-reference to, any required Reliability Programme or statistical methods of continuous Surveillance.
- 1.18 A statement that practices and procedures to satisfy the Programme should be to the standards specified in the Type Certificate Holder's Maintenance Instructions. When practices and procedures are included in a customised Operator's Maintenance Manual approved by the Civil Aviation Authority, the statement should refer to this Manual.
- 1.19 Each maintenance task quoted should be defined in a definition section of the Programme.

2 Programme basis



- 2.1 Operator's Aircraft Maintenance programmes should normally be based upon the Maintenance Review Board Report, where available, and the Type Certificate holder's Maintenance Planning Document or Chapter 5 of the Maintenance Manual, (i.e. the Manufacturer's recommended Maintenance Programme). The structure and format of these maintenance recommendations may be re-written by the operator to better suit his operation and control of the particular maintenance programme.
- 2.2 For a newly type-certificated aircraft, where no previously approved Maintenance Programme exists, it will be necessary for the operator to comprehensively appraise the manufacturer's recommendations (and the MRB Report where applicable), together with other airworthiness information, in order to produce a realistic Programme for approval.
- 2.3 For existing aircraft types it is permissible for the operator to make comparisons with maintenance programmes previously approved. It should not be assumed that a Programme approved for another operator will automatically be approved for the operator. Evaluation is to be made of aircraft/fleet utilisation, landing rate, equipment fit and, in particular, the experience of the maintenance organisation must be assessed. Where the Civil Aviation Authority is not satisfied that the proposed maintenance programme can be used as is by the Operator, the Civil Aviation Authority should request the Operator to introduce appropriate changes to it, such as additional maintenance tasks or de-escalation of check frequencies, or to develop the aircraft initial maintenance programme based upon the Manufacturer's recommendations.

### 3 Amendments

- 3.1 Amendments (revisions) to the approved Programme should be raised by the operator, to reflect changes in the type certificate holder's recommendations, modifications, service experience, or as required by the Civil Aviation Authority. Reliability programmes form one important method of updating approved programmes.

### 4 Permitted variations to maintenance periods

- 4.1 The Operator may only vary the periods prescribed by the Programme with the approval of the Civil Aviation Authority.

### 5 Periodic review of maintenance programme contents

- 5.1 Operator's approved aircraft Maintenance Programmes should be subject to periodic review to ensure that they reflect current Type Certificate holder's recommendations, revisions to the Maintenance Review Board Report, mandatory requirements and maintenance needs of the aircraft.
- 5.2 The Operator should review the detailed requirements at least annually for continued validity in the light of operating experience.



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