AIR NAVIGATION REGULATION OF MACAO

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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:

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

Acceptance checklist means a document used to assist in carrying out a check on the external appearance of packages of dangerous goods and their associated documents to determine that all appropriate requirements have been met;

Acrobatic flight means manoeuvres intentionally performed by an aircraft involving an abrupt change in its attitude, an abnormal attitude, or an abnormal variation in speed;

Acts of unlawful interference means acts or attempted acts such as to jeopardize the safety of civil aviation, including but not limited to:

- unlawful seizure of aircraft,
- destruction of an aircraft in service,
- hostage-taking on board aircraft or on aerodromes,
- forcible intrusion on board an aircraft, at an airport or on the premises of an aeronautical facility,
- introduction on board an aircraft or at an airport of a weapon or hazardous device or material intended for criminal purposes,
- use of an aircraft in service for the purpose of causing death, serious bodily injury, or serious damage to property or the environment,
- communication of false information such as to jeopardize the safety of an aircraft in flight or on the ground, of passengers, crew, ground personnel or the general public, at an airport or on the premises of a civil aviation facility;

ADS-C agreement means a reporting plan which establishes the conditions of ADS-C data reporting (i.e. data required by the air traffic services unit and frequency of ADS-C reports which have to be agreed to prior to using ADS-C in the provision of air traffic services);

Advisory airspace means an airspace of defined dimensions, or designated route, within which air traffic advisory service is available;

Advisory route means a designated route along which air traffic advisory service is available;

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

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;

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 certificate means a certificate issued by the appropriate authority under applicable regulations for the operation of an aerodrome;

Aerodrome control service means air traffic control service for aerodrome traffic;

Aerodrome control tower means a unit established to provide air traffic control service to aerodrome traffic;

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

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

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

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

Aerodrome traffic means all traffic on the manoeuvring area of an aerodrome and all aircraft flying in the vicinity of an aerodrome;

Aerodrome traffic zone means an airspace of defined dimensions established around an aerodrome for the protection of aerodrome traffic;

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

Aeronautical Information Publication (AIP) means a publication issued by or with the authority of a State or Region and containing aeronautical information of a lasting character essential to air navigation;

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

Aeronautical station (RR S1.81) means a land station in the aeronautical mobile service. In certain instances, an aeronautical station may be located, for example, on board ship or on a platform at sea;

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;

Agent means any person who undertakes the responsibilities or carries out any of the functions of an operator or a shipper, as the case may be, on behalf of the operator or shipper in relation to the carriage of dangerous goods;

Airborne collision avoidance system (ACAS) means an aircraft system based on secondary surveillance radar (SSR) transponder signals which operates independently of ground-based equipment to provide advice to the pilot on potential conflicting aircraft that are equipped with SSR transponders;

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 – category means classification of aircraft according to specified basic characteristics, e.g. aeroplane, helicopter, glider, free balloon;

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 definition;

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;

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;

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

Aircraft type means all aircraft of the same basic design including all modifications thereto except those modifications which result in a change in handling or flight characteristics;

Air-ground control radio station means an aeronautical telecommunication station having primary responsibility for handling communications pertaining to the operation and control of aircraft in a given area;

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

Airship means a power-driven lighter-than-air aircraft;

Air traffic means all aircraft in flight or operating on the manoeuvring area of an aerodrome;

Air traffic advisory service means a service provided within advisory airspace to ensure separation, in so far as practical, between aircraft which are operating on IFR flight plans;

Air traffic control clearance means authorization for an aircraft to proceed under conditions specified by an air traffic control unit;

Air traffic control service means a service provided for the purpose of:

(a) preventing collisions:

  (i) between aircraft, and

  (ii) on the manoeuvring area between aircraft and obstructions, and

(b) expediting and maintaining an orderly flow of air traffic.

Air traffic control unit generic term meaning variously, area control centre, approach control unit or aerodrome control tower;

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

Air traffic services reporting office means a unit established for the purpose of receiving reports concerning air traffic services and flight plans submitted before departure;

Air traffic services unit generic term meaning variously, air traffic control unit, flight information centre or air traffic services reporting office;

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

Airway means a control area or portion thereof established in the form of a corridor;

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

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

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

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

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

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

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

Take-off alternate means an alternate heliport at which a helicopter would be able to land should this become necessary shortly after take-off and it is not possible to use the heliport of departure;

En-route alternate means an alternate heliport at which a helicopter would be able to land in the event that a diversion becomes necessary while en route;

Destination alternate means an alternate heliport at which a helicopter would be able to land should it become either impossible or inadvisable to land at the heliport of intended landing.

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

Altitude means the vertical distance of a level, a point or an object considered as a point, measured from mean sea level (MSL);

Anticipated operating conditions mean those conditions which are known from experience or which can be reasonably envisaged to occur during the operational life of the aircraft taking into account the operations for which the aircraft is made eligible, the conditions so considered being relative to the meteorological state of the atmosphere, to the configuration of terrain, to the functioning of the aircraft, to the efficiency of personnel and to all the factors affecting safety in flight. Anticipated operating conditions do not include:

(a) those extremes which can be effectively avoided by means of operating procedures; and

(b) those extremes which occur so infrequently that to require the Standards to be met in such extremes would give a higher level of airworthiness than experience has shown to be necessary and practical.

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;

Approach and landing phase – helicopters means that part of the flight from 300 m (1 000 ft) above the elevation of the final approach and take-off area, if the flight is planned to exceed this height, or from the commencement of the descent in the other cases, to landing or to the balked landing point;

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 airworthiness requirements mean the comprehensive and detailed airworthiness codes established, adopted or accepted by a State or Region for the class of aircraft, engine or propeller under consideration;

Appropriate ATS authority means the relevant authority designated by the State or Region responsible for providing air traffic services in the airspace concerned;

Approval certificate means a certificate issued under paragraph 8 (1) of this Regulation;

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;

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;

Apron means a defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fuelling, parking or maintenance;

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

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

ATS route means a specified route designed for channelling the flow of traffic as necessary for the provision of air traffic services;

Automatic dependent surveillance – broadcast (ADS-B) means a means by which aircraft, aerodrome vehicles and other objects can automatically transmit and/or receive data such as identification, position and additional data, as appropriate, in a broadcast mode via a data link;

Automatic dependent surveillance – contract (ADS-C) means a means by which the terms of an ADS-C agreement will be exchanged between the ground system and the aircraft, via a data link, specifying under what conditions ADS-C reports would be initiated, and what data would be contained in the reports;

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;

Avionics means a term designating any electronic device – including its electrical part – for use in an aircraft, including radio, automatic flight control and instrument systems;

Balloon means a non-power-driven lighter-than-air aircraft;

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

Captive balloon means a balloon which when in flight is attached by a restraining device to the surface;

Cargo includes mail and animals;

Cargo aircraft means any aircraft, other than a passenger aircraft, which is carrying goods or property;

Category A helicopter means a multi-engined helicopter designed with engine and system isolation features specified in ICAO Annex 8, Part IVB, and capable of operations using take-off and landing data scheduled under a critical engine failure concept which assures adequate designated surface area and adequate performance capability for continued safe flight or safe rejected take-off;

Category B helicopter means a single engine or multi-engined helicopter which does not meet Category A standards. Category B helicopters have no guaranteed capability to continue safe flight in the event of an engine failure, and a forced landing is assumed;

Ceiling means the height above the ground or water of the base of the lowest layer of cloud below 6 000 metres (20 000 feet) covering more than half the sky;

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

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;

Certify as airworthy (to) means to certify that an aircraft or parts thereof comply with current airworthiness requirements after maintenance has been performed on the aircraft or parts thereof;

Changeover point means the point at which an aircraft navigating on an ATS route segment defined by reference to very high frequency omnidirectional radio ranges is expected to transfer its primary navigational reference from the facility behind the aircraft to the next facility ahead of the aircraft;

Civil Aviation **Authority** means Civil Aviation Authority, Macao – China;

COMAT means operator material carried on an operator's aircraft for the operator's own purposes;

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

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

Commercial air transport 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;

Competency means a combination of skills, knowledge and attitudes required to perform a task to the prescribed standard;

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

Configuration (as applied to the aeroplane) means a particular combination of the positions of the moveable elements, such as wing flaps and landing gear, etc., that affect the aerodynamic characteristics of the aeroplane.

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

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

Congested hostile environment means a hostile environment within a congested area;

Consignment means one or more packages of dangerous goods accepted by an operator from one shipper at one time and at one address, receipted for in one lot and moving to one consignee at one destination address;

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

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

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

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

Control area means a controlled airspace extending upwards from a specified limit above the earth;

Control zone means controlled airspace extending upwards from the surface of the earth to a specified upper limit;

Controlled aerodrome means an aerodrome at which air traffic control service is provided to aerodrome traffic;

Controlled airspace means an airspace of defined dimensions within which air traffic control service is provided in accordance with the airspace classification;

Controlled flight means any flight which is subject to an air traffic control clearance;

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

Credit means recognition of alternative means or prior qualification;

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

Critical engine(s) means any engine whose failure gives the most adverse effect on the aircraft characteristics relative to the case under consideration.

Note: On some aircraft there may be more than one equally critical engine. In this case, the expression "the critical engine" means one of those critical engines.

Cross-country flight means any flight during the course of which the aircraft is more than 4.8 km from the aerodrome of departure.

Cruise climb means an aeroplane cruising technique resulting in a net increase in altitude as the aeroplane mass decreases;

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

Cruise relief pilot rating means a rating limiting the privileges of a flight crew member to act as pilot only during the cruise phase of the flight;

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

Current flight plan means the flight plan, including changes, if any, brought about by subsequent clearances;

Danger area means an airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times;

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

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 or environmental damage;

Dangerous goods approval means a specific permission granted by an appropriate authority for:

(a) the transport of dangerous goods forbidden on passenger and/or cargo aircraft where the Technical Instruction state that such goods may be carried with an approval; or

(b) other purposes as provided in the Technical Instructions;

Note: In the absence of a specific reference in the Technical Instructions allowing the granting of a dangerous goods approval, a dangerous goods exemption may be sought.

Dangerous goods exemption means a specific permission, other than a dangerous goods approval, granted by an appropriate authority providing relief from the provisions of the Technical Instructions;

Dangerous goods exception means a provision in the ICAO Annex 18 and/or Technical Instructions which excludes a specific item of dangerous goods from the requirements normally applicable to that item;

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 or environmental damage, fire, breakage, spillage, leakage of fluid or radiation or other evidence that the integrity of the packaging has not been maintained. Any occurrence relating to the transport of dangerous goods which seriously jeopardizes the aircraft or its occupants is also deemed to constitute a dangerous goods incident;

Dangerous goods permit means a written permission granted by the Civil Aviation Authority for transport of dangerous goods by air;

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

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

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

Note 3: For convenience where both expressions are used they may be written in the form "decision altitude/ height" and abbreviated "DA/H".

Defined point after take-off (DPATO) means the point, within the take-off and initial climb phase, before which the helicopter's ability to continue the flight safely, with one engine inoperative, is not assured and a forced landing may be required;

Note: Defined points apply to helicopters operating in performance Class 2 only.

Defined point before landing (DPBL) means the point, within the approach and landing phase, after which the helicopter's ability to continue the flight safely, with one engine inoperative, is not assured and a forced landing may be required;

Note: Defined points apply to helicopters operating in performance Class 2 only.

Design change means a change to the type design of an aircraft, engine or propeller;

Designated Postal Operator means any governmental or non-governmental entity officially designated by a Universal Postal Union (UPU) member country to operate postal services and to fulfil the related obligations arising from the acts of the UPU Convention on its territory or area;

Dual instruction time means flight time during which a person is receiving flight instruction from a properly authorized pilot on board the aircraft;

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

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

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

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

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

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

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

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

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

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

Note: EVS does not include night vision imaging system (NVIS)

En-route phase means that part of the flight from the end of the take-off and initial climb phase to the commencement of the approach and landing phase;

Note: Where adequate obstacle clearance cannot be guaranteed visually, flights must be planned to ensure that obstacles can be cleared by an appropriate margin. In the event of failure of the critical engine, operators may need to adopt alternative procedures.

Error means an action or inaction by an operational person that leads to deviations from organisational or the operational person's intentions or expectations;

Error management means the process of detecting errors and responding to them with countermeasures that reduce or eliminate the consequences of errors and mitigate the probability of further errors or undesired states;

Estimated off-block time means the estimated time at which the aircraft will commence movement associated with departure;

Estimated time of arrival means for IFR flights, the time at which it is estimated that the aircraft will arrive over that designated point, defined by reference to navigation aids, from which it is intended that an instrument approach procedure will be commenced, or, if no navigation aid is associated with the aerodrome, the time at which the aircraft will arrive over the aerodrome. For VFR flights, the time at which it is estimated that the aircraft will arrive over the aerodrome;

Expected approach time means the time at which ATC expects that an arriving aircraft, following a delay, will leave the holding fix to complete its approach for a landing;

Extended range operation means any flight by an aeroplane with two turbine engines where the flight time at the one engine 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;

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

Filed flight plan means the flight plan as filed with an ATS unit by the pilot or a designated representative, without any subsequent changes;

Final approach and take-off area (FATO) means a defined area over which the final phase of the approach manoeuvre to hover or landing is completed and from which the take-off manoeuvre is commenced. Where the FATO is to be used by helicopters operating in performance Class 1, the defined area includes the rejected take-off area available;

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

Fireproof means the capability to withstand the application of heat by a flame for a period of 15 minutes;

Note: The characteristics of an acceptable flame can be found in ISO 2685.

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 data analysis means a process of analysing recorded flight data in order to improve the safety of flight operations;

Flight information region means an airspace of defined dimensions within which flight information service and alerting service are provided;

Flight information service means a service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights;

Flight level means a surface of constant atmospheric pressure which is related to a specific pressure datum, 1 013.2 hectopascals (hPa), and is separated from other such surfaces by specific pressure intervals;

Note: A pressure type altimeter calibrated in accordance with the Standard Atmosphere:

(a) when set to a QNH altimeter setting, will indicate altitude;

(b) when set to a QFE altimeter setting, will indicate height above the QFE reference datum;

(c) when set to a pressure of 1013.2 hPa, may be used to indicate flight levels

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

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

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

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

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

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

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

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

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

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

Free balloon means a balloon which when in flight is not attached by any form of restraining device to the surface;

Freight Forwarder means a person or organisation who offers the service of arranging the transport of cargo by air;

Glider means a non-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;

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

Ground visibility means the visibility at an aerodrome as reported by an accredited observer or by automatic systems;

Gyroplane means a heavier-than-air aircraft supported in flight by the reactions of the air on one or more rotors which rotate freely on substantially vertical axes;

Heading means the direction in which the longitudinal axis of an aircraft is pointed, usually expressed in degrees from North (true, magnetic, compass or grid);

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

Heavier-than-air aircraft means any aircraft deriving its lift in flight chiefly from aerodynamic forces;

Height means the vertical distance of a level, a point or an object considered as a point, measured from a specified datum;

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;

Helideck means a heliport located on a floating or fixed offshore structure;

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;

Note: Through this Regulation, when the term "heliport" is used for operations of helicopter, it is intended that the term also applies to aerodromes primarily meant for the use of aeroplanes.

Heliport operating minima means the limits of usability of a heliport for:

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

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

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

Hostile environment means an environment in which:

(a) a safe forced landing cannot be accomplished because the surface and surrounding environment are inadequate; or

(b) the helicopter occupants cannot be adequately protected from the elements; or

(c) search and rescue response/capability is not provided consistent with anticipated exposure; or

(d) there is an unacceptable risk of endangering persons or property on the ground;

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

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

ICAO means International Civil Aviation Organization;

IFR flight means a flight conducted in accordance with the instrument flight rules;

Indoors, in relation to any place, means any place that has a ceiling or roof and is completely enclosed by walls or closed windows, whether permanently or temporarily;

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

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

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

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

(a) *a ground-based radio navigation aid; or*

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

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

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

Note: Non-precision approach procedures may be flown using a continuous descent final approach technique (CDFA). CDFA with advisory VNAV guidance calculated by on-board equipment are considered 3D instrument approach operations. CDFA with manual calculation of the required rate of descent are considered 2D instrument approach operations.

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

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

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

Instrument ground time means time during which a pilot is practising, on the ground, simulated instrument flight in a flight simulation training device approved by the Civil Aviation Authority;

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

Instrument time means instrument flight time or instrument ground time;

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

To land in relation to aircraft includes alighting on water;

Landing area means a part of a movement area intended for the landing or take-off of aircraft;

Landing decision point (LDP) means the point used in determining landing performance from which, an engine failure occurring at this point, the landing may be safely continued or a balked landing initiated;

Note: LDP applies only to helicopters operating in performance Class 1.

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

Landing location means a marked or unmarked area that has the same physical characteristics as a visual heliport final approach and take-off area (FATO);

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

Level generic term relating to the vertical position of an aircraft in flight and meaning variously, height, altitude or flight level;

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 Region in which the licence is granted;

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

Lighter-than-air aircraft means any aircraft supported chiefly by its buoyancy in the air;

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;

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

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

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

Mail means dispatches of correspondence and other items tendered by, and intended for delivery to, postal services in accordance with the rules of the Universal Postal Union (UPU);

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

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

Manoeuvring area means a part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons;

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

Maximum 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;

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

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

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;

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

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

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

Note 3: For convenience when both expressions are used they may be written in the form "minimum descent altitude/height" and abbreviated "MDA/H".

Modification means the embodiment of the design change which is a maintenance task subject to a maintenance release;

Movement area means a part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and the apron(s);

Munition of war means any weapon or ammunition which is designed or made for use in warfare or against persons, including parts, whether components or accessories, for such weapon, or ammunition;

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

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

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

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

Note: The Performance-based Navigation (PBN) Manual (ICAO Doc 9613), Volume II, contains detailed guidance on navigation specifications.

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

Non-congested hostile environment means a hostile environment outside a congested area;

Non-hostile environment means an environment in which:

(a) a safe forced landing can be accomplished because the surface and surrounding environment are adequate;

(b) the helicopter occupants can be adequately protected from the elements;

(c) search and rescue response/capability is provided consistent with anticipated exposure; and

(d) the assessed risk of endangering persons or property on the ground is acceptable.

Note: Those parts of a congested area satisfying the above requirements are considered non-hostile.

Notified means shown in publications issued in Macao entitled NOTAM (Notices to Airmen), Aeronautical Information Circulars (AIC), Aeronautical Information Publications (AIP), Aeronautical Circulars (AC), 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;

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

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

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

Operating base means the location from which operational control is exercised;

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

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 in performance Class 1 means operations with performance such that, in the event of critical engine failure, performance is available to enable the helicopter to safely continue the flight to an appropriate landing area, unless the failure occurs prior to reaching the take-off decision point (TDP) or after passing the landing decision point (LDP), in which cases the helicopter must be able to land within the rejected take-off or landing area;

Operations in performance Class 2 means operations with performance such that, in the event of critical engine failure, performance is available to enable the helicopter to safely continue the flight to an appropriate landing area, except when the failure occurs early during the take-off manoeuvre or late in the landing manoeuvre, in which cases a forced landing may be required;

Operations in performance Class 3 means operations with performance such that, in the event of engine failure at any time during the flight, a forced landing will be required;

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

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

Operator means a person, organisation 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 in a controlled and satisfactory manner;

Organisation responsible for the type design means the organisation that holds the type certificate, or equivalent document, for an aircraft, engine or propeller type, issued by a State or Region;

Ornithopter means heavier-than-air aircraft supported in flight chiefly by the reactions of the air on planes to which a flapping motion is imparted.

Overpack means an enclosure used by a single shipper to contain one or more packages and to form one handling unit for convenience of handling and stowage;

Note: A unit load device is not included in this definition.

Package means the complete product of the packing operation, consisting of the packaging and its contents prepared for transport;

Packaging means one or more receptacles and any other components or materials necessary for the receptacles to perform their containment and other safety functions;

Passenger aircraft means an aircraft that carries any person other than a crew member, an operator's employee in an official capacity, an authorized representative of an appropriate authority or a person accompanying a consignment or other cargo;

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

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

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

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

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

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

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

Pilot-in-command under supervision means the co-pilot performing, under the supervision of the pilot-in-command, the duties and functions of a pilot-in-command, in accordance with a method of supervision acceptable to the Civil Aviation Authority;

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

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

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

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

Problematic use of substances means the use of psychoactive substances by aviation personnel in a way that:

(a) constitutes a direct hazard to the user or endangers the lives, health or welfare of others; and /or

(b) causes or worsens an occupational, social, mental or physical problem or disorder;

Prohibited area means an airspace of defined dimensions, above the land areas or territorial waters of a State or Region, within which the flight of aircraft is prohibited;

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

Quality system means documented organisational procedures and policies; internal audit of those policies and procedures; management review and recommendation for quality improvement;

Radiotelephony means a form of radio communication primarily intended for the exchange of information in the form of speech;

Rated air traffic controller means an air traffic controller holding a licence and valid ratings appropriate to the privileges to be exercised;

Rating means an authorization entered on or associated with a licence and forming part thereof, stating special conditions, privileges or limitations pertaining to such licence;

Registered owner means, in relation to aircraft registered in Macao, the person or persons in whose name the aircraft is registered;

Remotely piloted aircraft (RPA) means an unmanned aircraft which is piloted from a remote pilot station;

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

Repetitive flight plan (RPL) means a flight plan related to a series of frequently recurring, regularly operated individual flights with identical basic features, submitted by an operator for retention and repetitive use by ATS units;

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;

Reporting point means a specified geographical location in relation to which the position of an aircraft can be reported;

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

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

Restricted area means an airspace of defined dimensions, above the land areas or territorial waters of a State or Region, within which the flight of aircraft is restricted in accordance with certain specified conditions;

Rotorcraft means a power-driven heavier-than-air aircraft supported in flight by the reactions of the air on one or more rotors;

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

Runway means a defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft;

Runway-holding position means a designated position intended to protect a runway, an obstacle limitation surface, or an ILS/ MLS critical/sensitive area at which taxiing aircraft and vehicles shall stop and hold, unless otherwise authorized by the aerodrome control tower;

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;

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

Safety Management System means a systematic approach to managing safety, including the necessary organisational structures, accountabilities, policies and procedures;

Safety-sensitive personnel means persons who might endanger aviation safety if they perform their duties and functions improperly including, but not limited to, crew members, aircraft maintenance personnel and air traffic controllers;

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

Serious injury means an injury which is sustained by a person in an accident and which;

(a) requires hospitalization for more than 48 hours, commencing within seven days from the date injury was received; or

(b) results in a fracture of any bone (except simple fractures of fingers, toe or nose); or

(c) involves lacerations which cause severe haemorrhage, nerve, muscle or tendon damage; or

(d) involves injury to any internal organ; or

(e) involves second or third degree burns, or any burns affecting more than 5 per cent of the body surface, or

(f) involves verified exposure to infectious substances or injurious radiation;

Signal area means an area on an aerodrome used for the display of ground signals;

Solo flight time means flight time during which a student pilot is the sole occupant of an aircraft;

Special VFR flight means a VFR flight cleared by air traffic control to operate within a control zone in meteorological conditions below VMC;

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

Sporting weapon means any weapon or ammunition which is not a munition of war, including parts, whether components or accessories, for such weapon or ammunition;

Standard atmosphere means an atmosphere defined as follows:

(a) the air is a perfect dry gas;

(b) the physical constants are:

— Sea level mean molar mass:
$M_0 = 28.964\,420 \times 10^{-3}$ kg mol^{-1}
— Sea level atmospheric pressure:
$P_0 = 1\,013.250$ hPa
— Sea level temperature:
$t_0 = 15°C$
$T_0 = 288.15$ K
— Sea level atmospheric density:
$\rho_0 = 1.225\,0$ kg m^{-3}

— Temperature of the ice point:
$T_i = 273.15$ K
— Universal gas constant:
$R^* = 8.314\ 32\ JK^{-1}mol^{-1}$

(c) the temperature gradients are:

Geopotential altitude (km)		*Temperature gradient (Kelvin per standard geopotential kilometre)*
From	*To*	
–5.0	11.0	–6.5
11.0	20.0	0.0
20.0	32.0	+1.0
32.0	47.0	+2.8
47.0	51.0	0.0
51.0	71.0	–2.8
71.0	80.0	–2.0

Note 1: The standard geopotential metre has the value 9.80665 m^2s^{-2}.

Note 2: See Doc 7488 for the relationship between the variables and for tables giving the corresponding values of temperature, pressure, density and geopotential.

Note 3: Doc 7488 also gives the specific weight, dynamic viscosity, kinematic viscosity and speed of sound at various altitudes.

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

State of Design means the State or Region having jurisdiction over the organisation responsible for the type design;

State of Destination means the State or Region in the territory or area of which the consignment is finally to be unloaded from an aircraft;

State of Origin means the State or Region in the territory or area of which the consignment is first to be loaded on an aircraft;

State of Registry means the State or Region on whose register the aircraft is entered;

State of the Aerodrome means the State or Region in whose territory or area the aerodrome is located;

Note: State of the Aerodrome includes heliports and landing location.

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

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

Take-off and initial climb phase means that part of the flight from the start of take-off to 300 m (1 000 ft) above the elevation of the final approach and take-off area, if the flight is planned to exceed this height, or to the end of the climb in the other cases;

Take-off decision point (TDP) means the point used in determining take-off performance from which, an engine failure occurring at this point, either a rejected take-off may be made or a take-off safely continued;

Note: TDP applies only to helicopters operating in performance Class 1.

Taxiing means movement of an aircraft on the surface of an aerodrome under its own power, excluding take-off and landing;

Taxiway means a defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome and another, including:

(a) *Aircraft stand taxilane* - a portion of an apron designated as a taxiway and intended to provide access to aircraft stands only;
(b) *Apron taxiway* - a portion of a taxiway system located on an apron and intended to provide a through taxi route across the apron;
(c) *Rapid exit taxiway* - a taxiway connected to a runway at an acute angle and designed to allow landing aeroplanes to turn off at higher speeds than are achieved on other exit taxiways thereby minimizing runway occupancy times.

Technical Instructions mean the latest effective edition of the Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO Doc 9284), approved and issued periodically in accordance with the procedure established by the ICAO Council;

Threat means events or errors that occur beyond the influence of an operational person, increase operational complexity and must be managed to maintain the margin of safety;

Threat management means the process of detecting threats and responding to them with countermeasures that reduce or eliminate the consequences of threats and mitigate the probability of errors or undesired states;

Total estimated elapsed time means for IFR flights, the estimated time required from take-off to arrive over that designated point, defined by reference to navigation aids, from which it is intended that an instrument approach procedure will be commenced, or, if no navigation aid is associated with the destination aerodrome, to arrive over the destination aerodrome. For VFR flights, the estimated time required from take-off to arrive over the destination aerodrome;

Total mass, in relation to an unmanned aircraft, means the mass of the aircraft including the mass of any other object that may be attached to the unmanned aircraft during its operation, such as any payload, battery or fuel.

Track means the projection on the earth's surface of the path of an aircraft, the direction of which path at any point is usually expressed in degrees from North (true, magnetic or grid);

Transition altitude means the altitude at or below which the vertical position of an aircraft is controlled by reference to altitudes;

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

Note: In some Contracting States a document equivalent to a Type Certificate may be issued for an engine or propeller type.

Type Design means the set of data and information necessary to define an aircraft, engine or propeller type for the purpose of airworthiness determination.

UN number means the four-digit number assigned by the United Nations Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals to identify an article or substance or a particular group of articles or substances;

Unit load device means any type of freight container, aircraft container, aircraft pallet with a net or aircraft pallet with a net over an igloo;

Note 1: An overpack is not included in this definition.

Note 2: A freight container for radioactive material is not included in this definition.

Unmanned aircraft (UA) means an aircraft which is intended to operate with no pilot on board;

UA Activity permit means a permit issued by the Civil Aviation Authority to an applicant for a single activity or a block of repeated activities involving the operation of an unmanned aircraft taking into account the location(s) of operation, type(s) of operation to be conducted, date(s)/time(s) during which the operation(s) is to be conducted, operating altitude and mitigation measures to address location-specific circumstances;

UA operator permit means a permit issued by the Civil Aviation Authority, which authorises the holder of the permit to operate an unmanned aircraft of the type and model and for the purpose stated in the permit;

UA pilot, in relation to an unmanned aircraft, means the person who has operational control of that unmanned aircraft;

VFR flight means a flight conducted in accordance with the visual flight rules;

Visibility, for aeronautical purposes, means the greater of:
(a) the greatest distance at which a black object of suitable dimensions, situated near the ground, can be seen and recognized when observed against a bright background;
(b) the greatest distance at which lights in the vicinity of 1 000 candelas can be seen and identified against an unlit background.

Visual line-of-sight (VLOS) operation means an operation in which the operator maintains direct unaided visual contact with the remotely-piloted aircraft to manage its flight and meet separation and collision avoidance responsibilities.

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

(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 Regions, 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 Region in relation to which there is in force an agreement between the Government of Macao and the government of that State or Region which makes provision for the flight in Macao of aircraft registered in that State or Region.

(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 nationality and registration mark assigned to the aircraft by the Civil Aviation Authority;

(c) the name of the aircraft manufacturer and manufacturer's designation of the aircraft;

(d) the serial number of the aircraft;

(e) the name of the registered owner;

(f) the address of the registered owner;

(g) 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 issue, variation 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 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) The registered 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 or change in the expiry date 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 Region in which it is registered, the nationality 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 or Region in which it is not in fact registered; or

(b) that the aircraft is a state aircraft of a particular State or Region if it is not in fact such an aircraft, unless the appropriate competent authority of that State or Region 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 Region 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:

(a) flights beginning and ending in Macao without passing over territory of any other State or Region, of a Macao registered aircraft flying in accordance with the **"A" Conditions** or the **"B" Conditions** set out in the Second Schedule; and

(b) flights of an aircraft flying in accordance with the conditions of a permit to fly issued by the competent authority in respect of that aircraft.

(2) In the case of a Macao registered aircraft the Certificate of airworthiness referred to in sub-paragraph (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 the Civil Aviation Authority considers necessary for the airworthiness of the aircraft;

(b) the results of flying trials, and such other tests of the aircraft as it may require; and

(c) its compliance with the requirements prescribed by the Civil Aviation Authority pursuant to paragraph 89 of this Regulation.

(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 Region.

(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.

(9A) A modification or repair in order to be considered to be in a manner and with material of a type approved by the Civil Aviation Authority shall be based on:

(a) continuing airworthiness information disseminated by the organisation responsible for the type design;

(b) design change or repair design approved by the Civil Aviation Authority; or

(c) approval issued under an arrangement made by the Civil Aviation Authority with the competent authorities of another State or Region.

(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 renew 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 organisation, 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 organisation 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 shall, in respect of aeroplanes over 5,700 kg and helicopters over 3,175 kg maximum certificated take-off mass, transmit to the organisation 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. Whenever this information relates to an engine or propeller, the Civil Aviation Authority shall transmit such information to both the organisation responsible for engine or propeller type design and the organisation responsible for aircraft type design. Where a continuing airworthiness safety issue is associated with a modification, the Civil Aviation Authority shall also transmit to the organisation responsible for the design of the modification the above mentioned information.

Permit to fly

7A. (1) Subject to sub-paragraph (2) below, the Civil Aviation Authority may issue for any Macao registered aircraft a permit to fly if it is satisfied that the aircraft is fit to fly having regard to the airworthiness of the aircraft and the conditions to be attached to the permit.

(2) The Civil Aviation Authority may refuse to issue a permit to fly for a Macao registered aircraft if it appears to the Civil Aviation Authority that the aircraft is eligible for, and ought to fly under and in accordance with, a Certificate of airworthiness.

(3) The Civil Aviation Authority may issue a permit to fly subject to such conditions it deems appropriate relating to the airworthiness, operation or maintenance of the aircraft.

Export Certificate of Airworthiness

7B. (1) Where a Macao registered aircraft is to be exported to another State or Region, the Civil Aviation Authority may issue an Export certificate of airworthiness in respect of the aircraft if the aircraft meets the requirements under paragraph 7(1) of this Regulation for a Certificate of airworthiness.

(2) An Export certificate of airworthiness for an aircraft is not a Certificate of airworthiness for the purpose of this Regulation and does not authorise the operation of the aircraft.

(3) Subject to paragraph 59 of this Regulation, an Export certificate of airworthiness issued under this paragraph shall remain in force for such period as it may be specified therein.

(4) An Export Certificate of Airworthiness for an aircraft ceases to have effect when the aircraft is registered in another State or Region.

Approval certificate

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 an Approval certificate 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 an Approval certificate with respect to those activities.

(3) An authorised entity may, at any time, for the purpose of ascertaining whether the activities to which an Approval certificate 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 Approval certificate in connection with the activities to which the Approval certificate 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 Approval certificate 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 Approval certificate.

Maintenance programme and Certificate of maintenance review

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

(a) the aircraft (including in particular its engines 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 organisations 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:

(i) 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

(ii) 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 such person or entity 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:

(i) maintenance has been carried out on the aircraft in accordance with the Maintenance programme approved for that aircraft;

(ii) 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;

(iii) 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;

(iv) Certificates of release to service have been issued in accordance with paragraph 10; and

(v) the aircraft is in compliance with applicable airworthiness regulations and requirements.

(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 pilot-in-command 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 pilot-in-command of the aircraft,

the pilot-in-command 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) (e), 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.

(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 which entitles him to issue that certificate;

(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.

(4A) Notwithstanding sub-paragraph (4) above, a certificate of release to service issued under a maintenance arrangement made by the Civil Aviation Authority with the competent authorities of another State or Region shall be deemed to be a certificate of release to service issued for the purposes of this paragraph.

(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 organisation; and

(d) the identity of the person or persons signing the Certificate of release to service.

(7) In this paragraph, the word "repair" includes, in relation to a compass the adjustment and compensation thereof and the word "repaired" shall be construed accordingly.

Licensing of maintenance engineers

11. (1) The Civil Aviation Authority may grant aircraft maintenance engineer licences, subject to such conditions as it thinks fit, upon being satisfied that the applicant is a fit person to hold the licence and has furnished such evidence and passed such examinations and tests as the Civil Aviation Authority may require of him for the purpose of establishing that he has sufficient knowledge, experience, competence and skills in aeronautical engineering.

(2) A licence granted by the Civil Aviation Authority to a person who supposed 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) An aircraft maintenance engineer licence shall authorize the holder, subject to such conditions as may be specified in the licence, to issue:

(i) Certificates of release to service in respect of maintenance of such aircraft and such equipment as may be so specified;

(ii) Certificates of fitness for flight under "A" Conditions in respect of such aircraft as may be so specified.

(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.

(7) Without prejudice to any other provision of this Regulation, the Civil Aviation Authority may, for the purpose of this Article, either absolutely or subject to such conditions as it thinks fit:

(a) approve any course of training or instruction;

(b) authorize a person to conduct such examinations or tests as it may specify;

(c) approve a person to provide or conduct any course of training or instruction; and

(d) approve a person as qualified to furnish reports to it and to accept such reports.

(8) The holder of an aircraft maintenance engineer licence:

(a) shall not exercise the privileges of the licence if he knows or reasonably suspects that his physical or mental condition renders him unfit to exercise such privileges; and

(b) shall not, when exercising the privileges of the licence, be under the influence of psychoactive substances which may render him unable to safely and properly exercise such privileges.

(9) The holder of an aircraft maintenance engineer licence shall not engage in the use of psychoactive substances in a way that:

(a) constitutes a direct hazard to the holder or endangers the lives, health or welfare of others; or

(b) causes or worsens an occupational, social, physical or mental problem or disorder of the holder.

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 Region 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 communication, navigation and surveillance 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 provided individually for each passenger or 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:

(a) instructions on the brace position to be adopted in the event of an emergency landing;

(b) instructions on the method of use of the safety belts and safety harnesses as appropriate;

(c) information as to where emergency exits are to be found and instructions as to how they are to be used; and

(d) 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.

Communication, navigation and surveillance equipment of aircraft

13. (1) An aircraft shall not fly unless it is so equipped with communication, navigation and surveillance equipment as to comply with the law of the State or Region in which the aircraft is registered and to enable communications to be made, and the aircraft to be navigated, and surveillance of the aircraft to be effected, 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 communication, navigation and surveillance equipment in accordance with the Sixth Schedule. The equipment installation shall be such that the failure of any single unit required for communication, navigation or surveillance purposes or any combination thereof will not result in the failure of another unit required for communication, navigation or surveillance purposes.

(3) In any particular case the Civil Aviation Authority may direct that a Macao registered aircraft shall carry such additional or special communication, navigation and surveillance 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 communication, navigation and surveillance equipment provided in compliance with this paragraph shall always be maintained in serviceable condition.

(5) All communication, navigation and surveillance 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.

(6) The Civil Aviation Authority may issue in respect of any Macao registered aircraft an Aircraft station licence if it is satisfied that all radio transmitting equipment are of a type approved by the Civil Aviation Authority as suitable for the purpose for which it is to be used, and installed in a manner approved by 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 area of another State or Region, the authorities of the other State or Region 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 pilot-in-command of the aircraft or by the authority of the State or Region 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 a non-commercial air transport operation to an aerodrome at which it will be restored to an airworthy condition. In prescribing particular limiting conditions, the Civil Aviation Authority shall consider all limitations proposed by the authorities of the State or Region that had originally, in accordance with sub-paragraph (a) above, prevented the aircraft from resuming its flight;

(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 communication, navigation and surveillance 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 communication, navigation and surveillance 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;

(b) a separate Log book in respect of each engine 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 engine 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 Region 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 pilot-in-command 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 under the law of a Contracting State 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 pilot-in-command 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 licences

20. (1) The Civil Aviation Authority is the sole entity which may grant, validate or renew 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 renew 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 Eight Schedule shall not be renewed or granted to any person who has attained the age of 65 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, an aircraft rating or a flight instructor rating relates 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 or an aircraft rating, 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 or aircraft rating, either in flight or by means of a flight simulation training device 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 flight simulation training device approved by the Civil Aviation Authority in which flight conditions are simulated on the ground.

(3A) A person who has failed any test as mentioned in subparagraph (2)(c) above shall not perform the functions to which the rating relates, even if the rating is still valid.

(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 a medical certificate 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 pilot-in-command 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 flight simulation training device 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) Pilot 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);

(IVa) 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.

Limitation on privileges of pilots of 60 years of age and above

20A. The holder of a licence of the class referred to in paragraph 1. (d), (e), (f) or (g) of the Eighth Schedules shall not act as a pilot of an aircraft engaged in international commercial air transport operations if the licence holder has attained the age of 60 years or, in the cases of operations with more than one pilot, the age of 65 years.

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 flight simulation training device, including:

(i) the date of the test or examination;

(ii) the type of flight simulation training device;

(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 pilot-in-command 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 pilot-in-command 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) establish procedures and instructions for the safe operation for all types of operation on the ground and in flight;

(ii) make available for the use and guidance to each member of its Operating staff an Operations manual;

(iii) ensure that each copy of the Operations manual is kept up to date;

(iv) 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;

(v) ensure that the Operations manual complies with all applicable laws, regulations, air operator certification conditions and corresponding operations specifications; and

(vi) ensure that the Operations manual is complied with by all Operating staff.

(b) Each Operations manual shall contain all such information, procedures and operating instructions as may be necessary to enable the Operating staff to perform their duties and responsibilities as such 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; and

(d) The operator of every aircraft to which this paragraph applies shall develop policies and procedures for third parties that perform work on its behalf.

(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 organisations 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 OPSM.905 of the Nineteenth 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 himself who performs those functions.

(6) 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.

(7) 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.

(8) The operator shall not operate an aircraft unless it is maintained and released to service by a maintenance organisation 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.

(9) 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 ensure that every flight is conducted in accordance with the provisions of the Operations manual and all Operating staff is properly instructed in their particular duties and responsibilities and the relationship of such duties to the operation as a whole.

(1A) The operator of a Macao registered 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. The operator shall ensure that all Operating staff when abroad know that they must comply with the laws, regulations and procedures of those States or Regions in which operations are conducted.

Note: Information for pilots and flight operations personnel on flight procedure parameters and operational procedures is contained in PANS-OPS (ICAO Doc 8168).

(1B) The operator of a Macao registered aircraft shall ensure that all flight crews comply with the requirements in PANS-ATM (ICAO Doc 4444), unless otherwise specified by the States or Regions in which operations are conducted.

(1C) 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 pilot-in-command 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 and their facilities at which it is intended to take off or land, and any alternate aerodrome 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 meteorological 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 firefighting, search, rescue or other services which are required only after the occurrence of an accident;

(d) 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.

(1D) The operator of a Macao registered aeroplane shall ensure that a flight will not commence or continue as planned unless it has been ascertained by every reasonable means available that the airspace containing the intended route from aerodrome of departure to aerodrome of arrival, including the intended take-off, destination and en-route alternate aerodromes, can be safely used

for the planned operation. When intending to operate over or near conflict zones, a risk assessment shall be conducted and appropriate risk mitigation measures taken to ensure a safe flight.

(1E) The operator of a Macao registered aeroplane shall:

(a) select a take-off alternate aerodrome to be specified in the Operational flight plan if either the meteorological conditions at the aerodrome of departure are below the operator's established aerodrome landing minima for that operation or if it would not be possible to return to the aerodrome of departure for other reasons. The take-off alternate aerodrome shall be located within the following flight time from the aerodrome of departure:

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

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

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 operator's established Aerodrome operating minima for that operation.

(b) select at least one destination alternate aerodrome to be specified in the Operational flight plan and Air Traffic Services (ATS) flight plan for a flight to be conducted in accordance with the Instrument Flight Rules (IFR), unless:

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

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

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

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

(ii) the aerodrome is isolated. Operations into isolated aerodromes do not require the selection of a destination alternate aerodrome(s) and shall be planned in accordance with Part E of the Ninth Schedule;

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

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

(c) select two destination alternate aerodromes to be specified in the Operational flight plan and Air Traffic Services (ATS) flight plan when, for the destination aerodrome:

(i) meteorological conditions at the estimated time of use will be below the operator's established Aerodrome operating minima for that operation; or

(ii) meteorological information is not available.

(d) select en-route alternate aerodromes, required for extended range operations by aeroplanes with two turbine engines (ETOPS), which shall be specified in the Operational flight plan and ATS flight plan.

(e) establish a margin of time, approved by the Civil Aviation Authority, for the estimated time of use of an aerodrome, and specify appropriate incremental values, acceptable to the Civil Aviation Authority, for height of cloud base and visibility to be added to the operator's established Aerodrome operating minima in order to ensure that an adequate margin of safety is observed in determining whether or not an approach and landing can be safely carried out at each alternate aerodrome.

(f) ensure that all flights are planned so that the diversion time to an aerodrome where a safe landing could be made does not exceed the cargo compartment fire suppression time capability of the aeroplane, when one is identified in the relevant aeroplane documentation, reduced by an operational safety margin of 15 minutes.

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

(g) assess the level of rescue and firefighting service (RFFS) protection available at any aerodrome intended to be used in order to ensure that an acceptable level of protection is available for the aeroplane intended to be used. Information related to the acceptable level of RFFS protection shall be contained in the operations manual.

(1F) The operator of a Macao registered helicopter shall:

(a) select a take-off alternate heliport to be specified in the Operational flight plan if the meteorological conditions at the heliport of departure are at or below the applicable heliport operating minima;

Provided that the heliport 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 heliport operating minima for that operation.

(b) select at least one destination alternate to be specified in the Operational flight plan and Air Traffic Services (ATS) flight plan for a flight to be conducted in accordance with the Instrument Flight Rules (IFR), 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

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

Provided that the heliport to be selected as a destination alternate, the available information shall indicate that, at the estimated time of use, the conditions will be at or above the heliport operating minima for that operation.

(c) select two destination alternates to be specified in the Operational flight plan and Air Traffic Services (ATS) flight plan when the meteorological conditions of the destination heliport are forecast to be below the heliport operating minima. The first destination alternate shall be at or above the heliport operating minima for destination and the second at or above the heliport operating minima for alternate.

(d) for the purpose of sub-paragraphs (a) to (c) above, offshore alternate heliport may be selected and specified in the flight plan, of which:

(i) offshore alternate heliports shall not be used when it is possible to carry enough fuel to have an onshore alternate, and shall not be used in a hostile environment;

(ii) the offshore alternate heliport shall be used only after a point of no return (PNR). Prior to a PNR, onshore alternate heliports shall be used;

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

(e) specify appropriate incremental values, acceptable to the Civil Aviation Authority, for height of cloud base and visibility to be added to the operator's established heliport or landing location operating minima in order to ensure that an adequate margin of safety is observed in determining whether or not an approach and landing can be safely carried out at each alternate heliport or landing location.

(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

In aeroplane which is equipped with a flight crew compartment door in accordance with Scale Q (iii) in paragraph 5 of the Fifth Schedule of this Regulation, the operator shall ensure that 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.

(b) Aircraft 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 aircraft for concealed weapons, explosives or other dangerous devices when a well-founded suspicion exists that the aircraft 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. In the case of aeroplane operations, the checklist shall also be supported by 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

(G) 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 pilot-in-command 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 Region;

(5) The operator of a Macao registered aircraft, or a designated representative, has the responsibility for Operational control. Responsibility for operational control shall be delegated only to the pilot-in-command and to a licensed flight operations officer if an operator's approved method of control and supervision of flight operations requires the use of flight operations officer personnel.

(6) The operator of a Macao registered aircraft shall ensure that the pilot-in-command 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) Safety Management System

(a) Operators shall implement a safety management system acceptable to the Civil Aviation Authority that, as a minimum:

(i) identifies safety hazards;

(ii) ensures that remedial action necessary to maintain an acceptable level of safety is implemented;

(iii) provides for continuous monitoring and regular assessment of the safety level achieved; and

(iv) aims to make continuous improvement to the overall level of safety.

(b) A safety management system shall clearly define lines of safety accountability throughout the operator's organisation, including a direct accountability for safety on the part of senior management.

Note: Guidance on Safety programmes and the definition of acceptable levels of safety are contained in the ICAO Safety Management Manual (DOC 9859).

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

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

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

Note 1: Guidance on flight data analysis programmes is contained in the the ICAO Safety Management Manual (DOC 9859).

Note 2: Legal guidance for the protection of information from safety data collection and processing systems is contained in Annex 13 to the Convention on International Civil Aviation.

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

(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 of a Macao registered aircraft shall issue operating instructions and provide information on aircraft climb performance with all engines operating to enable the pilot-in-command to determine the climb gradient that can be achieved during the departure phase for the existing take-off conditions, 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 of a Macao registered aircraft shall establish a fuel policy for the purpose of flight planning and in-flight re-planning to ensure that every flight carries sufficient amount of usable fuel and oil to complete the planned flight safely and to allow for deviations from the planned operation.

(12) The operator of a Macao registered aircraft shall ensure that the pre-flight calculation of usable fuel required for a flight includes:

(a) Taxi fuel;

(b) Trip fuel;

(c) Contingency fuel;

(d) Destination alternate fuel, if a destination alternate is required;

(e) Final reserve fuel;

(f) Additional fuel, if required by the type of operation; and

(g) Discretionary fuel, if required by the pilot-in command.

(13) The operator of a Macao registered aircraft shall ensure that the use of fuel after flight commencement for purpose other than originally intended during pre-flight planning shall require a re-analysis and, if applicable, adjustment of the planned operation. In-flight re-planning 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) Contingency fuel;

(c) Destination alternate fuel, if a destination alternate is required;

(d) Final reserve fuel;

(e) Additional fuel, if required by the type of operation; and

(f) Discretionary fuel, if required by the pilot-in command.

(14) The operator of a Macao registered aircraft shall determine one final reserve fuel value for each aircraft type and variant in their fleet rounded up to an easily recalled figure.

(15) The operator of a Macao registered aircraft shall establish policies and procedures, approved by the Civil Aviation Authority, to ensure that in-flight fuel checks and fuel management are performed.

(16) The operator of a Macao registered aircraft shall maintain fuel and oil records to enable the Civil Aviation Authority to ascertain that, for each flight, trends for fuel and oil consumption are such that an aircraft has sufficient fuel and oil to complete the flight and that the requirements referred in sub-paragraphs (11) to (15) above and Part E of the Ninth Schedule have been complied with. Fuel and oil records shall be retained by the operator for a period of three months.

(17) The operator of a Macao registered aeroplane shall not permit its aeroplanes to be refuelled when passengers are embarking, on board or disembarking unless it is properly attended by qualified personnel ready to initiate and direct an evacuation of the aeroplane by the most practical and expeditious means available; two-way communication shall be maintained by the aeroplane's inter-communication system or other suitable means between the ground crew supervising the refueling and the qualified personnel on board the aeroplane.

(18) The operator of a Macao registered helicopter shall not permit its helicopters to be refuelled, rotors stopped or turning, when passengers are embarking, disembarking or when oxygen is being replenished. Refuelling with passengers on board shall be carried out in accordance with procedures acceptable to the Civil Aviation Authority. The operator shall not permit its helicopter to be defuelled at any time when passengers are embarking, on board or disembarking or when oxygen is being replenished.

(19) (a) The operator of a Macao registered aeroplane flying for the purpose of commercial air transport shall:

(i) establish an aircraft tracking capability to track aeroplanes throughout its area of operations; and

(ii) establish procedures, approved by the Civil Aviation Authority, for the retention of aircraft tracking data to assist search and rescue in determining the last known position of the aeroplane;

(b) The operator of a Macao registered aeroplane of a maximum certificated take-off mass of over 27,000kg and a seating capacity greater than 19 flying for the purpose of commercial air transport shall track the position of the aeroplane through automated reporting at least every 15 minutes for the portion(s) of the in-flight operation(s), except where the aeroplane's position is able to be tracked by an ATS unit that is responsible for providing air traffic services for the aeroplane at the relevant time at least once every 15 minutes;

(c) Notwithstanding sub-paragraph (b) above, the Civil Aviation Authority may, based on the results of an approved risk assessment process implemented by the operator, allow for variations to automated reporting intervals. The process shall demonstrate how risks to the operation resulting from such variations can be managed and shall include at least the following:

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

(ii) overall capability of the aeroplane and its systems;

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

(iv) frequency and duration of gaps in automated reporting;

(v) human factors consequences resulting from changes to flight crew procedures; and

(vi) specific mitigation measures and contingency procedures.

Note: Guidance on aircraft tracking capabilities is contained in the Aircraft Tracking Implementation Guidelines (ICAO Circular 347).

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 pilot-in-command of the aircraft) submit the load sheet for examination by the pilot-in-command 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 pilot-in-command 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 nationality and registration mark of the aircraft to which the load sheet relates;

(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 pilot-in-command 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 a Macao registered aircraft 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.

(10) The operator of a Macao registered aeroplane shall establish policy and procedures for the transport of items in the cargo compartment, which include the conduct of a specific safety risk assessment and address the items to be transported in the cargo compartment. These shall ensure to a reasonable certainty that in the event of a fire involving those items, it can be detected and sufficiently suppressed or contained by the elements of the aeroplane design associated with cargo compartment fire protection, until the aeroplane makes a safe landing.

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. No Macao registered aircraft shall be operated under the Instrument Flight Rules or at night by a single pilot for the purpose of commercial air transport.

(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 pilot-in-command of the aircraft.

(3) The requirements specified in Part D of the Ninth Schedule in respect of the aerodrome or landing location operating minima and meteorological conditions required for take-off, approach 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 specific approval granted by the Civil Aviation Authority to the operator, a Macao aeroplane having two turbine engines 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 specific approval 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.

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

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

(10) A flight to be operated by helicopter to fly over water shall not be commenced unless the helicopter is certificated for ditching. Sea state shall be an integral part of ditching information.

Aerodrome or landing location operating minima – aircraft not registered in Macao

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 landing location operating minima specified by the operator in relation to a Macao aerodrome or landing location 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 meteorological 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 landing location 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 landing location in aerodrome or landing location operating minima less favourable than those so specified in relation to that aerodrome or landing location or in contravention of the instructions referred to in sub-paragraph (1) above. All aircraft operated in accordance with instrument flight rules shall comply with the instrument flight procedures approved and promulgated by the Civil Aviation Authority for instrument flight operations.

(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 or landing location if the Runway visual range at that aerodrome or landing location 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 pilot-in-command of the aircraft by or on behalf of the person in charge of the aerodrome as being the Runway visual range.

(5) Low visibility operations and PBN authorization required (AR) operations in Macao shall not be conducted by any aircraft not registered in Macao unless the operator of the aircraft has obtained authorization from the Civil Aviation Authority for such operations.

Preflight action by pilot-in-command of aircraft

30. The pilot-in-command 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 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;

(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;

(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) the instructions in the Operations manual relating to fuel and oil 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 usable 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 pilot-in-command and Passenger briefing

31. (1) The pilot-in-command 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 pilot-in-command 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 engine(s) used as primary propulsion units are shut down (or the rotor blades stopped for helicopters);

(2) The pilot-in-command of a Macao registered aircraft shall ensure that the checklists provided in accordance with paragraph 24 (2) (c) of this Regulation are complied with in detail;

(3) The pilot-in-command of a Macao registered aircraft shall be responsible for notifying the nearest 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;

(4) The pilot-in-command of a Macao registered aircraft 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.

Flight crew members at duty stations

32. (1) Take-off and landing. All flight crew members required to be on flight deck duty shall be at their stations.

(2) En route. All flight crew members required to be on flight deck duty shall remain at their stations except when their absence is necessary for the performance of duties in connection with the operations of the aircraft or for physiological needs.

(3) Seat belts. All fight crew members shall keep their seat belts fastened when at their stations.

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

(5) Use of oxygen. All fight crew members, when engaged in performing duties essential to the safe operation of an aircraft in flight, shall use breathing oxygen continuously whenever the circumstances prevail for which its supply has been required in Scale K in paragraph 5 of the Fifth Schedule.

Additional duties of pilot-in-command

33. (1) This paragraph shall apply to flights for the purpose of the commercial air transport by a Macao registered aircraft.

(2) In relation to every flight to which this paragraph applies, the pilot-in-command 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.

(f) while the aircraft is in flight,

(i) not continue from the point of in-flight re-planning unless the usable fuel on board meets the fuel policy requirements in Part E of the Ninth Schedule;

(ii) continually ensure that the amount of usable fuel remaining on board is not less that the fuel required to proceed to an aerodrome or landing location where a safe landing can be made with the planned final reserve fuel remaining upon landing;

(iii) request delay information from Air Traffic Control when unanticipated circumstances may result in landing at the destination aerodrome or landing location with less than the final reserve fuel plus any fuel required to proceed to an alternate aerodrome or the fuel required to operate to an isolated aerodrome or landing location;

(iv) advise Air Traffic Control of a minimum fuel state by declaring MINIMUM FUEL when, having committed to land at a specific aerodrome or landing location, the pilot calculates that any change to the existing clearance to that aerodrome or landing location, or other air traffic delays, may result in landing with less than the planned final reserve fuel;

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

(v) declare a situation of fuel emergency by broadcasting MAYDAY MAYDAY MAYDAY FUEL, when the calculated usable fuel predicted to be available upon landing at the nearest aerodrome or landing location, where a safe landing can be made is less than the planned final reserve fuel.

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 pilot-in-command in flight preparation and provide the relevant information;

(b) assist the pilot-in-command 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 pilot-in-command while in flight, by appropriate means, with information which may be necessary for the safe conduct of the flight;

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

(e) in the event of an emergency, initiate such procedures as outlined in the Operations manual while avoiding taking any action that would conflict with Air Traffic Control procedures and convey safety-related information to the pilot-in-command that may be necessary for the safe conduct of the flight, including information related to any amendments to the flight plan that become necessary in the course of the flight.

(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) 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 renewal period put forward in the Fourth Schedule of this Regulation, upon being satisfied that the applicant is a capable person and is qualified aforesaid.

(5) A flight operations officers shall not be assigned to duty unless that person has:

(a) satisfactorily completed an operator-specific training course that addresses all the specified components of its approved method of control and supervision of flight operations specified in paragraph 75 (2) of this Regulation;

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

(c) demonstrated to the operator a 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;

(d) demonstrated to the operator a knowledge of the following details concerning operations for which the officer is responsible and areas in which that individual is authorized to exercise flight supervision:

(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 operations; and

(iv) the aircraft loading instructions;

(e) demonstrated to the operator knowledge and skills related to human performance relevant to dispatch duties; and

(f) demonstrated to the operator the ability to perform the duties specified in sub-paragraph (1) above.

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

(7) A flight operations officer shall not be assigned to duty after 12 consecutive months of absence from such duty, unless the provisions of sub-paragraph (5) above are met.

(8) 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 pilot-in-command and, where applicable, 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 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.

(9) 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 pilot-in-command of the responsibility for obtaining an appropriate clearance from an ATS unit, if applicable, before making a change in flight plan.

(10) If an emergency situation which endangers that safety of the aircraft or persons becomes known first to the flight operations officer, action taken by that person in accordance with sub-paragraph (1) (d) above shall include, where necessary, notification to the appropriate authorities of the nature of the situation without delay, and requests for assistance if required.

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 Region 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.

Communication, navigation and surveillance performance

37. (1) An aircraft registered in Macao shall not fly unless it is equipped with communication, navigation and surveillance equipment in accordance with the Sixth Schedule and operated in compliance with the requirements of air traffic services.

(2) An aircraft registered in Macao shall not be operated in an airspace or on a route where an RCP specification for performance-based communication (PBC) has been prescribed unless:

(a) it is equipped with communication equipment which will enable it to operate in accordance with the prescribed RCP specification(s); and

(b) the operator of the aircraft has obtained an approval from the Civil Aviation Authority for such operations.

(3) An aircraft registered in Macao shall not be operated in an airspace or on a route where a navigation specification for performance-based navigation (PBN) has been prescribed unless:

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

(b) the operator of the aircraft has obtained a specific approval from the Civil Aviation Authority for such operations.

(4) An aircraft registered in Macao shall not be operated in an airspace where minimum navigation performance specifications (MNPS) have been prescribed unless:

(a) it is equipped with navigation equipment which will enable it to maintain the navigation performance capability specified in the Sixth and Sixteenth Schedules; and

(b) the operator of the aircraft has obtained an approval from the Civil Aviation Authority for such operations.

(5) An aircraft registered in Macao shall not be operated in an airspace where a reduced vertical separation minimum (RVSM) has been prescribed unless:

(a) it is equipped with navigation equipment which will enable it to maintain the navigation performance capability specified in the Sixth Schedule; and

(b) the operator of the aircraft has obtained a specific approval from the Civil Aviation Authority for such operations.

(6) An aircraft registered in Macao shall not be operated in an airspace or on a route where an RSP specification for performance-based surveillance (PBS) has been prescribed unless:

(a) it is equipped with surveillance equipment which will enable it to operate in accordance with the prescribed RSP specification(s); and

(b) the operator of the aircraft has obtained an approval from the Civil Aviation Authority for such operations.

Use of flight recorders 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) (l), (m), (n) and (o), 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) (t), (u) and (v), and Scale P 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) Flight recorders shall not be switched off during flight time.

(4) To preserve flight recorder records, flight recorders 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) The pilot-in-command, and/or the owner/operator, shall ensure, to the extent possible, in the event the aircraft becomes involved in an accident or incident, the preservation of all related flight recorder records, and if necessary the associated flight recorders, and their retention in safe custody pending their disposition as determined in accordance with Annex 13.

(6) Operational checks and evaluations of recordings from the flight recorders shall be conducted to ensure the continued serviceability of the recorders.

Use of electronic flight bags

38A. (1) The operator of a Macao registered aircraft shall not permit the use of electronic flight bags on board an aircraft for the purpose of commercial air transport except with the specific approval of the Civil Aviation Authority for the operational use of EFB functions to be used for the safe operation of aircraft.

(2) Where EFBs are used on board an aircraft, the operator of a Macao registered aircraft shall:

(a) ensure that the EFBs do not affect the performance of the aircraft systems, equipment or the ability to operate the aircraft;

(b) ensure that the EFB equipment and its associated installation hardware, including interaction with aircraft systems if applicable, meet the appropriate airworthiness certification requirements;

(c) assess the safety risks associated with the operations supported by the EFB function(s);

(d) establish requirements for redundancy of the information (if appropriate) contained in and displayed by the EFB function(s);

(e) ensure that, in the event of an EFB failure, sufficient information is readily available to the flight crew for the flight to be conducted safely;

(f) establish and document procedures for the management of the EFB function(s) including any database it may use; and

(g) establish and document the procedures for the use of, and training requirements for, the EFB and the EFB function(s).

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 pilot-in-command 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 meteorological 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 sporting weapons or munitions of war

40. (1) An aircraft shall not carry any munitions of war, unless:

(a) Such munition of war is:

(i) permitted for temporary import into Macau, according to the relevant laws and regulations;

(ii) a defence weapon carried by a member of the consulate corps accredited in Macau that have been duly authorized according to the relevant laws and regulations;

(iii) police equipment, such as defence weapons and restraining devices, carried on board by a law enforcement officer for the purpose of ensuring the safety of the aircraft or of persons on board; and

(b) such munition of war is carried with the written permission of the Civil Aviation Authority and in accordance with any conditions relating thereto; and

(c) the pilot in command of the aircraft is informed in writing by the operator before the flight commences of the type, weight or quantity and location of any such munition of war on board or suspended beneath the aircraft and any conditions of the permission of the Civil Aviation Authority.

(2) It shall be unlawful for an aircraft to carry any sporting weapon or munition of war in any compartment or apparatus to which passengers have access, unless such munition of war is carried on board by a law enforcement officer for the purpose of ensuring the safety of the aircraft or of persons on board;

(3) It shall be unlawful for any person to carry or have in his possession or take or cause to be taken on board an aircraft, to suspend or cause to be suspended beneath an aircraft or to deliver or cause to be delivered for carriage thereon, any sporting weapons or munition of war, unless:

(a) the sporting weapon or munition of war:

(i) is either part of the hold baggage of a passenger on the aircraft or consigned as cargo to be carried thereby;

(ii) is carried in a part of the aircraft, or in any apparatus attached to the aircraft inaccessible to passengers; and

(iii) in case of a firearm, is unloaded;

(b) particulars of the sporting weapon or munition of war have been furnished by that passenger or by the consignor to the operator before the flight commences; and

(c) the operator consents to the carriage of such sporting weapon or munition of war on the aircraft.

(4) Nothing in this paragraph shall apply to any munition of war taken or carried on board an aircraft registered outside of Macao, if the munition of war may under the law of the State or Region in which the aircraft is registered be lawfully taken or carried on board for the purpose of ensuring the safety of the aircraft or of persons on board. In this case, the operator is required to notify the Civil Aviation Authority in advance.

Carriage of dangerous goods

41. (1) This paragraph shall apply to the operator of an aircraft whether or not approved for the carriage of dangerous goods by air.

(2) Dangerous goods shall not be carried in an aircraft except in accordance with the Twentieth Schedule and 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 permission of the Civil Aviation Authority, and in accordance with any conditions to which such permission 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 Region in which the aircraft is registered, if there is in force in relation to such State or Region an agreement between the Macao Special Administrative Region and the government of the State or Region permitting the carriage of dangerous goods within Macao in aircraft registered in that State or Region.

(3) 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.

(4) The operator of an 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 appropriate authority of the State of the Operator for approval the programmes and syllabus of the training course; and

(d) as soon as practicable and before any flight begins, inform the pilot-in-command 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.

(5) 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.

(6) The operator of an aircraft shall as soon as practicable notify the Civil Aviation Authority of any dangerous goods occurrence.

(7) Where any dangerous goods occurrence occurs, the Civil Aviation Authority shall cause an investigation to be made in such manner as he thinks necessary.

(8) For the purposes of any investigation under sub-paragraph (7) 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.

(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 pilot-in-command 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 in capital letters and "出口" or "緊急出口" (as the case may be) in 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 no more than 2 m between adjacent markings.

(d) The words "CUT HERE IN EMERGENCY" in English in capital letters and "緊急情況時在此破開" in Chinese shall be marked 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 or yellow in colour and, in any case in which the colour of the adjacent background is such as to render red or yellow 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" and "出口" or "EMERGENCY EXIT" and "緊急出口" 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 in capital letters and " 此門不通" in red character written in 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 pilot-in-command of the aircraft.

Authority of pilot-in-command and members of the crew of an aircraft

48. Every person in a Macao registered aircraft shall obey all lawful commands which the pilot-in-command 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 pilot-in-command 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 or Region.

(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, flight duty period, duty period limitations and rest period requirements 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;

(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; and

(e) it has familiarized its personnel involved in managing fatigue with their responsibilities and the principles of fatigue management.

(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 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 time, flight duty periods, duty periods and rest periods; and

(b) brief particulars of the nature of the functions performed by him/her 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 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, flight duty periods, duty periods and rest periods 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 Region 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 pilot-in-command 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;

(d) such other documents as the aircraft is required by paragraph 55 of this Regulation to carry when in flight; and

(e) the Aircraft flight manual, which shall be updated by implementing changes made mandatory by the Civil Aviation Authority for Macao registered aircraft or by the State or Region 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, engine 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 continuing airworthiness records:

(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) shall be kept for the period specified in OPSM.920 of the Nineteenth Schedule.

(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 or of a medical certificate required under paragraph 20 (6) 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.

(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 the operator 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 the operator or its 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, licences 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 certificate 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

(c) 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 Region 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 pilot-in-command 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 Region 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.

Safety Management System

61A. (1) Air traffic services provider shall implement a safety management system acceptable to the Civil Aviation Authority that, as a minimum:

(a) identifies safety hazards;

(b) ensures that remedial action necessary to maintain an acceptable level of safety is implemented;

(c) provides for continuous monitoring and regular assessment of the safety level achieved; and

(d) aims to make continuous improvement to the overall level of safety.

(2) A safety management system shall clearly define lines of safety accountability throughout the air traffic services provider's organisation, including a direct accountability for safety on the part of senior management.

(3) Any significant safety-related change to the ATS system shall only be effected after a safety assessment has demonstrated that an acceptable level of safety will be met and users have been consulted. When appropriate, the air traffic service provider shall ensure that adequate provision is made for post-implementation monitoring to verify that the defined level of safety continues to be met.

Requirement for an air traffic control approval

61B. (1) A person in charge of the provision of an air traffic control service must not provide such a service for Macao airspace unless that person has been given and complies with the terms of an air traffic control approval granted by the Civil Aviation Authority.

(2) The Civil Aviation Authority may grant an air traffic control approval if it is satisfied that the applicant is competent to provide a service which is safe for use by aircraft, having regard to the applicant's organisation, staffing, equipment, maintenance and other arrangements.

(3) The air traffic service provider shall ensure that all requirements related to the air traffic services as prescribed by the Civil Aviation Authority are met.

(4) The continued validity of an air traffic control approval shall depend upon the approval holder maintaining the requirements of sub-paragraph (2) above, taking into account the compliance with the provisions related to the handling of findings and remedial actions as specified in paragraph 83A of this Regulation.

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. Appropriate measures shall be taken to ensure that student air traffic controllers do not constitute a hazard to air navigation.

(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.

(9) 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;

(c) approve a person to provide any course of training or instruction; and

(d) approve the use of a simulator for the purposes of air traffic control training.

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 in Macao unless:

(a) his/her licence includes that rating, and the rating is valid for the specified aerodrome(s); 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 specified aerodrome(s) 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.

Fatigue of air traffic controllers – air traffic services provider's responsibilities

63 A. The air traffic services provider to which this paragraph applies shall not permit that an air traffic controller performs its duties unless:

(a) it has established a scheme for the regulation of the working hours at the air traffic control tower;

(b) the scheme is approved by the Civil Aviation Authority subject to such conditions as it thinks fit;

Fatigue of air traffic controllers – responsibilities of air traffic controllers

63 B. A person shall not act as an air traffic controller if he/she knows or suspects that he/she is suffering from such fatigue as may endanger the safety of air traffic.

Air traffic services manual

64. (1) A person shall not provide air traffic services at the Macao aerodrome(s) unless:

(a) the services are provided in accordance with the standards and procedures specified in an air traffic services 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.

(d) the standards and procedures specified in an air traffic services manual shall meet all the air traffic management requirements as prescribed by the Civil Aviation Authority.

Approval of instrument flight procedures

64A. (1) An instrument flight procedure within the aerodrome traffic zone shall not be used unless that procedure has been approved and promulgated by the Civil Aviation Authority.

(2) Subject to sub-paragraphs (3) and (4) hereunder, the Civil Aviation Authority may approve an instrument flight procedure where an application for approval of the procedure has been made.

(3) An applicant for approval of an instrument flight procedure shall supply evidence and reports as the Civil Aviation Authority may require.

(4) An applicant for approval of an instrument flight procedure shall satisfy the Civil Aviation Authority that the procedure design service provider is competent having regard to the procedure design service provider's organisation, staffing, equipment, knowledge, experience, competence, skill and other arrangements to design the instrument flight procedure that is safe for use by aircraft.

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

(b) 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 aerodrome traffic zone, and an aircraft shall not fly in contravention of such regulations.

Restriction on unmanned aircraft operations in Macao air traffic control zone

67. A person shall not operate any unmanned aircraft, unless the operation is indoors, within the boundaries of a protected area, including:

(a) The airspace within 1000 metres of any aerodrome or landing location;

(b) Aircraft flight path area defined as the polygonal line with vertices at the points with the rectangular coordinates of Table A;

Table A

Point	M	P
1	26038.451	24906.876
2	29144.104	22888.330
3	28485.995	21875.789

4	32342.088	7075.049
5	36291.650	-4442.510
6	27532.351	-7446.220
7	24215.005	11014.644
8	23537.975	12356.480
9	23134.908	12400.086
10	22256.361	14221.424
11	22440.908	14514.153
12	21900.615	15576.520
13	20347.304	15549.861
14	19788.991	15262.521
15	19687.157	14701.886
16	19992.701	14754.202
17	20256.407	13774.381
18	21281.616	12622.158
19	21244.911	10206.530
20	21315.834	10139.713
21	21077.449	9981.782
22	21017.636	9794.337
23	21183.746	9659.076
24	21102.001	9300.494
25	20888.274	9075.150
26	20744.394	9478.497
27	20805.090	11676.842

28	20007.891	11631.482
29	18576.415	15816.005
30	21724.905	16670.138
31	21974.376	17353.046
32	21762.768	18489.247
33	22423.048	18706.979
34	22230.200	19462.231
35	22423.154	19592.330
36	21499.021	21575.119
37	24388.092	22367.702

Note: The above coordinates are defined according to GAUSS—KRUEGER coordinate system.

(c) The airspace within 50 meters of the Macao Government headquarters, the Legislative Assembly Building, the Court of Final Appeal Building, the official residences of the Chief Executive and principal officials of Macao, the Central People's Government institutions in Macao as defined by Administrative Regulation no. 22/2000, the Macao Prison, the youth Correctional Institution, the Ka Ho power station and electrical power substations, The Macao Water Supply Company headquarters and the Ka-Ho Fuel farm;

(d) The airspace above of the 22 classified immovable properties in the Historic Centre of Macao inscribed on the world heritage list, including: A-Ma Temple (Barra Temple), Headquarters Building of the Marine and Water Bureau (Former Moorish Barracks), Mandarin's House, St. Lawrence's Church and forecourt, St. Joseph's Seminary Building, St. Joseph's Seminary Church, forecourt and staircase, D. Pedro V Theatre, Sir Robert Ho Tung Library Building, St. Augustine's Church, Headquarters Building of the Municipal Affairs Bureau (Building of the Former Leal Senado), Sam Kai Vui Kun (Kuan Tai Temple), Headquarters Building of the Holy House of Mercy of Macao, Cathedral Church, Lou Kau Mansion, St. Dominic's Church, Ruins of St. Paul's College (Former Mater Dei Church, forecourt and staircase), Na Tcha Temple (nearby the Ruins of St. Paul's College), Old City Walls (Section in Calçada de S. Francisco Xavier), Mount Fortress, St. Anthony's Church and forecourt, Headquarters Building of the Orient Foundation (Former Garden House of the Camões Grotto), Protestant Cemetery, Guia Fortress, Chapel of Our Lady of Snow and Lighthouse; and

(e) Areas over which the Civil Aviation Authority has restricted or prohibited flying in accordance with paragraph 66 of this Regulation;

unless with the authorization in writing of the Civil Aviation Authority and in accordance with any conditions to which that authorization may be granted.

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 certified 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 certified or notified, or subject to which such permission may have been given.

Certification of aerodromes

69. (1) The Civil Aviation Authority may certify 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 certificate 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. As part of the certification process, an aerodrome manual, which must include all permanent information on the aerodrome site, facilities, services, equipment, security procedures, operational procedures, organisation, management and responsibilities, including a safety management system, shall be submitted by the applicant for approval.

(2) The aerodromes in Macao must display in a prominent place at the aerodrome a copy of the certificate and shall furnish to any person on request information concerning the terms of the certificate.

(3) The aerodromes in Macao must not cause or permit any condition of the certificate 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 certificate shall not cease to be valid by reason only of such a contravention.

(4) The Civil Aviation Authority will charge the aerodromes with the fees described in the Twelfth Schedule for the purpose of granting, renewing or changing those certificates mentioned in sub-paragraph (1) above.

(5) 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 aerodromes, 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 certified aerodromes

70. (1) The Civil Aviation Authority may, in relation to the aerodromes in Macao, 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 aerodromes in Macao, 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 aerodromes in Macao 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 certificate 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 any aerodrome in Macao that is open to public use 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 Region 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 aerodromes in Macao, 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 authorization of the Civil Aviation Authority and in accordance with any conditions subject to which the authorization may be granted.

(2) A person shall not alter the character of an aeronautical light within Macao except with the authorization 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.

Laser lights and sky-tracer searchlights

74A. A person shall not install or operate any outdoor laser lighting or sky-tracer searchlights without the authorization in writing of the civil Aviation Authority.

Aviation Fuel at Aerodromes

74B. (1) For safety reasons, the person(s) responsible for the management of an aviation fuel installation at an aerodrome shall ensure that on delivery fuel is of a grade appropriate to the installation to which it is supplied. Also they shall ensure that the installation is capable of storing and dispensing fuel in a state fit for use in aircraft and that the installation is properly marked to show the grade or grades of fuel it contains. The responsible person shall be satisfied by sampling and testing that the fuel is fit for use before it is delivered into an aircraft. Written records shall be kept, which show the dates, quantities and grades of all bulk deliveries with details of all samples taken and the results of tests. Details of maintenance and cleaning shall also be recorded. These records shall be preserved for twelve months or for a longer period as required by Civil Aviation Authority. On request such records shall be produced to an authorized person within a reasonable time.

(2) The person(s) responsible for the management of an aviation fuel installation at an aerodrome shall also follow the related regulations or circulars issued by Civil Aviation Authority.

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, safety management system, quality system, 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, taking into account the compliance with the provisions related to the handling of findings and remedial actions as specified in paragraph 83A of this Regulation.

(4) The Air operator certificate shall contain at least the following:

(a) the State of the Operator and the issuing authority;

(b) the air operator certificate number and its expiration date;

(c) the operator name, trading name (if different) and address of the principal place of business;

(d) the date of issue and the name, signature and title of the authority representative; and

(e) the location, in a controlled document carried on board, where the contact details of operational management can be found.

(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 pilot-in-command 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.

Means of compliance

82A. (1) The Civil Aviation Authority may publish acceptable means of compliance (AMC) that may be used to establish compliance with this Regulation or any regulations made there under.

(2) Alternative means of compliance (AltMC) may be proposed and used, subject to approval, by operators under the oversight of the Civil Aviation Authority to establish compliance with this Regulation or any regulations made there under.

(3) Published AMC are considered applicable to an operator, to whom the related regulation is applicable, from their respective effective date, unless the Civil Aviation Authority has approved an application from that operator to use an AltMC.

(4) The Civil Aviation Authority shall evaluate all AltMC proposed by an operator by analyzing the documentation provided and, if considered necessary, conducting further evaluation. When the Civil Aviation Authority finds that the proposed AltMC comply with this Regulation or any regulations made there under, it shall proceed with the approval and notify the applicant and, if applicable, amend any certificate, licence, approval, permission, authorization, exemption or other document previously issued or granted to the applicant accordingly.

(5) Operators shall establish a system to continuously evaluate whether the approved AltMC comply with this Regulation or any regulations made there under, and to notify the Civil Aviation Authority immediately when any AltMC non-compliance is identified.

(6) The Civil Aviation Authority may revoke, suspend or vary an approved AltMC, if the Civil Aviation Authority is not satisfied that that AltMC continuously comply with this Regulation or any regulations made there under.

Penalties

83. Notwithstanding paragraph 83A:

(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 pilot-in-command thereof, if the operator or, as the case may be, the pilot-in-command 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 notified in accordance with paragraph 89 of this Regulation, shall be liable on conviction to a penalty. The penalties are described in the Thirteenth Schedule of this Regulation.

Findings and remedial actions

83A. (1) When a contravention, or a potential deficiency which could lead to a contravention, with any provision of this Regulation, or a directive, procedure, requirement or any other type of regulation or circular issued by the Civil Aviation Authority notified in accordance with paragraph 89 of this Regulation, the Civil Aviation Authority may issue a finding to the concerned person in writing to address the matter in order to restore compliance, prevent recurrence and ensure continuous compliance.

(2) After receipt of notification of findings, the person shall, within a reasonable period acceptable to the Civil Aviation Authority:

(a) identify the root cause of the matter;

(b) define remedial action plan; and

(c) demonstrate remedial action implementation to the satisfaction of the Civil Aviation Authority.

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 69 and 71, 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 pilot-in-command of an aircraft registered in Macao; or

(b) is the operator or the pilot-in-command 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 Region in which such an aircraft operates.

Note: Any accident 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 AEROPLANE FLYING FOR PURPOSE OTHER THAN COMMERCIAL AIR TRANSPORT OR AERIAL WORK

Applicability

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

Compliance with laws, regulations and procedures

91. (1) The pilot-in-command of a Macao registered aeroplane shall comply with the laws, regulations and procedures of those States or Regions in which operations are conducted.

(2) The pilot-in-command of a Macao registered aeroplane shall be familiar with the laws, regulations and procedures, pertinent to the performance of his or her duties, prescribed for the areas to be traversed, the aerodromes to be used and the air navigation facilities relating thereto. The pilot-in-command shall ensure that other members of the flight crew are familiar with such of these laws, regulations and procedures as are pertinent to the performance of their respective duties in the operation of the aeroplane.

Note: Information for pilots on flight procedure parameters and operational procedures is contained in PANS-OPS (ICAO Doc 8168).

(3) The pilot-in-command of a Macao registered aeroplane shall have responsibility for operational control.

(4) The pilot-in-command of a Macao registered aeroplane shall notify the appropriate local authority without delay, if an emergency situation which endangers the safety or security of the aeroplane or persons necessitates the taking of action which involves a violation of local regulations or procedures. If required by the State or Region in which the incident occurs, the pilot-in-command shall submit a report on any such violation to the appropriate authority of such State or Region as soon as possible and normally within ten days; in that event, the pilot-in-command shall also submit a copy of it to the Civil Aviation Authority in accordance with paragraph 88 of this Regulation.

(5) The pilot-in-command of a Macao registered aeroplane shall have available on board the aeroplane the essential information concerning the search and rescue services in the area over which the aeroplane will be flown.

(6) The pilot-in-command of a Macao registered aeroplane shall ensure that flight crew members demonstrate the ability to speak and understand the language used for aeronautical radiotelephony communications as specified in ICAO Annex 1.

(7) The pilot-in-command of a Macao registered aeroplane shall ensure that all flight crews comply with the requirements in PANS-ATM (ICAO Doc 4444), unless otherwise specified by the States or Regions in which operations are conducted.

(8) The pilot-in-command of a Macao registered aeroplane shall not conduct operations for which a specific approval is required unless such approval has been obtained from the Civil Aviation Authority.

Carriage of dangerous goods

92. Dangerous goods shall not be carried in a Macao registered aeroplane except in accordance with paragraph 41 of this Regulation.

Use of psychoactive substances

93. (1) No member of a flight crew shall perform any function specified in the privileges applicable to his/her licence if he/she is under the influence of any psychoactive substances which may render him unable to perform such functions in a safe and proper manner.

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

Operating facilities

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

Operating instructions – general

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

(a) has been duly authorized by the operator;

(b) is fully competent to taxi the aeroplane;

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

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

Aerodrome operating minima

96. (1) The pilot-in-command of a Macao registered aeroplane shall establish aerodrome operating minima, in accordance with criteria specified by the Civil Aviation Authority, for each aerodrome to be used in operations. When establishing aerodrome operating minima, any conditions that may be prescribed in the list of specific approvals shall be observed. Such minima shall not be lower than any that may be established for such aerodromes by the State of the Aerodrome, except when specifically approved by that State or Region. The Civil Aviation Authority may authorize operational credit(s) for operations with aeroplanes equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS. Such authorizations shall not affect the classification of the instrument approach procedure. Where aeroplanes are equipped with automatic landing system, a HUD or equivalent displays, EVS, SVS, or CVS, or any combination of those systems into a hybrid system, the use of such systems for the safe operation of an aeroplane shall be approved by the Civil Aviation Authority.

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

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

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

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

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

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

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

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

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

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

(5) Low visibility operations shall not be conducted except with the specific approval of the Civil Aviation Authority. Instrument approach operations in low visibility and aerodrome or landing location operating minima below 800 m visibility shall only be conducted when RVR information or an accurate measurement or observation of visibility is provided.

Passengers

97. (1) The pilot-in-command of a Macao registered aeroplane shall ensure that passengers are made familiar with the location and use of:

(a) seat belts;

(b) emergency exits;

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

(d) oxygen dispensing equipment; and

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

(2) The pilot-in-command of a Macao registered aeroplane shall ensure that all persons on board are aware of the location and general manner of use of the principal emergency equipment carried for collective use.

(3) The pilot-in-command of a Macao registered aeroplane shall ensure that passengers are instructed in such emergency action as may be appropriate to the circumstances in an emergency during flight.

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

Flight preparation

98. (1) A flight shall not be commenced until the pilot-in-command of a Macao registered aeroplane is satisfied that:

(a) the aeroplane is airworthy, duly registered and that appropriate certificates as required under this Regulation are aboard the aeroplane;

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

(c) any necessary maintenance has been performed;

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

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

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

(2) The pilot-in-command of a Macao registered aeroplane 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.

Flight planning

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

(a) a study of available current weather reports and forecasts; and

(b) the planning of an alternative course of action to provide for the eventuality that the flight cannot be completed as planned, because of meteorological conditions.

Meteorological conditions

100. (1) 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 VFR will, at the appropriate time, be such as to enable compliance with these rules.

(2) A flight to be conducted in accordance with the instrument flight rules shall not:

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

(b) take off or continue beyond the point of in-flight re-planning unless at the aerodrome of intended landing or at each alternate aerodrome to be selected in compliance with paragraph 101 of this Regulation, current meteorological reports or a combination of current reports and forecasts indicate that the meteorological conditions will be, at the estimated time of use, at or above the aerodrome operating minima for that operation.

(3) The margin of time to be used for the estimated time of use of an aerodrome shall be at least one hour before and after the earliest and latest time of arrival.

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

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

Alternate aerodromes

101. A flight to be conducted in accordance with the instrument flight rules shall not be commenced without at least one destination alternate aerodrome selected and specified in the flight plans, unless:

(a) the duration of the flight from the departure aerodrome, or from the point of in-flight re-planning, to the destination aerodrome is such that, taking into account all meteorological conditions and operational information relevant to the flight, at the estimate time of use, a reasonable certainty exists that;

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

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

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

(b) the aerodrome of intended landing is isolated and:

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

(ii) a point of no return has been determined; and

(iii) a flight shall not be continued past the point of no return unless available current meteorological information indicates that the following meteorological conditions will exist at the estimated time of use:

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

(B) visibility of at least 5.5 km (3 NM) or of 4 km (2 NM) more than the minimum associated with the instrument approach procedure.

Fuel and oil requirements

102. (1) A flight shall not be commenced unless, taking into account both the meteorological conditions and any delays that are expected in flight, the aeroplane carries sufficient fuel and oil to ensure that it can safely complete the flight. The amount of fuel to be carried must permit:

(a) when the flight is conducted in accordance with the instrument flight rules and a destination alternate aerodrome is not required in accordance with paragraph 101 of this Regulation, or when the flight is to an isolated aerodrome, flight to the aerodrome of intended landing, and after that, have a final reserve fuel for at least 45 minutes at normal cruising altitude; or

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

(c) when the flight is conducted in accordance with day VFR, flight to the aerodrome of intended landing, and after that, have a final reserve fuel for at least 30 minutes at normal cruising altitude; or

(d) when the flight is conducted in accordance with night VFR, flight to the aerodrome of intended landing and thereafter have a final reserve fuel for at least 45 minutes at normal cruising altitude.

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

Refuelling with passengers on board

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

(2) When refuelling with passengers embarking, on board or disembarking, two-way communications shall be maintained by the aeroplane's intercommunication system or other suitable means between the ground crew supervising the refuelling and the pilot-in-command or other qualified personnel required by sub-paragraph (1) above.

Oxygen supply

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

In-flight procedures

105. (1) A flight shall not continue towards the aerodrome of intended landing, unless the latest available information indicates that at the expected time of arrival, a landing can be effected at that aerodrome or at least one destination alternate aerodrome, in compliance with the operating minima established in accordance with paragraph 96 of this Regulation.

(2) An instrument approach shall not be continued below 300 m (1 000 ft) above the aerodrome elevation or into the final approach segment unless the reported visibility or controlling RVR is at or above the aerodrome operating minima.

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

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

Weather reporting by pilots

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

Hazardous flight conditions

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

Flight crew members at duty stations

108. (1) Take-off and landing. All flight crew members required to be on flight deck duty shall be at their stations.

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

(3) Seat belts. All flight crew members shall keep their seat belts fastened when at their stations.

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

Use of oxygen

109. All flight crew members, when engaged in performing duties essential to the safe operation of an aeroplane in flight, shall use breathing oxygen continuously whenever the circumstances prevail for which its supply has been prescribed in paragraph 104 of this Regulation.

Use of electronic flight bags

109A. Electronic flight bags shall not be used on board an aeroplane registered in Macao except the pilot-in-command and/or the operator has:

(a) obtained a specific approval from the Civil Aviation Authority for the operational use of EFB functions to be used for the safe operation of aeroplane;

(b) ensured that the EFBs do not affect the performance of the aeroplane systems, equipment or the ability to operate the aeroplane;

(c) ensured that the EFB equipment and its associated installation hardware, including interaction with aeroplane systems if applicable, meet the appropriate airworthiness certification requirements;

(d) assessed the risks associated with the operations supported by the EFB function(s);

(e) established requirements for redundancy of the information (if appropriate) contained in and displayed by the EFB function(s);

(f) ensured that, in the event of an EFB failure, sufficient information is readily available to the flight crew for the flight to be conducted safely;

(g) established and documented procedures for the management of the EFB function(s) including any databases it may use; and

(h) established and documented the procedures for the use of, and training requirements for, the EFB function(s).

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

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

In-flight fuel management

110A. (1) The pilot-in-command of a Macao registered aeroplane shall monitor the amount of usable fuel remaining on board to ensure it is not less than the fuel required to proceed to an aerodrome where a safe landing can be made with the planned final reserve fuel remaining.

(2) The pilot-in-command of a Macao registered aeroplane shall advise Air Traffic Control of a minimum fuel state by declaring MINIMUM FUEL when, having committed to land at a specific aerodrome, the pilot calculates that any change to the existing clearance to that aerodrome, or other air traffic delays, may result in landing with less than the planned final reserve fuel.

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

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

Instrument approach procedures

111. Aeroplanes registered in Macao operated in accordance with the instrument flight rules shall comply with the instrument approach procedures approved and promulgated by the State or Region in which the aerodrome is located.

Duties of pilot-in-command

112. (1) The pilot-in-command of a Macao registered aeroplane shall be responsible for the operation, safety and security of the aeroplane and the safety of all crew members, passengers and cargo on board.

(2) The pilot-in-command of a Macao registered aeroplane 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 any psychoactive substances; 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 or lack of oxygen.

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

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

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

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

Cabin baggage (take-off and landing)

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

Aeroplane performance operating limitations

114. (1) An aeroplane registered in Macao shall be operated:

(a) in compliance with the terms of its airworthiness certificate or equivalent approved document;

(b) within the operating limitations as referred in the Seventeenth Schedule of this Regulation; and

(c) if applicable, within the mass limitations imposed by compliance with the applicable noise certification Standards in ICAO Annex 16, Volume I, unless otherwise authorized in exceptional circumstances for a certain aerodrome or a runway where there is no noise disturbance problem, by the competent authority of the State or Region in which the aerodrome is situated.

(2) Placards, listings, instrument markings, or combinations thereof, containing those operating limitations prescribed by the Civil Aviation Authority for visual presentation, shall be displayed in the aeroplane.

(3) The pilot-in-command of a Macao registered aeroplane shall determine that aeroplane performance will permit the take-off and departure to be carried out safely.

Marking of break-in points

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

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

Qualifications - Flight crew members

116. (1) The pilot-in-command of a Macao registered aeroplane shall:

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

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

(c) be satisfied that flight crew members have maintained competency.

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

Security of aircraft

117. The pilot-in-command of a Macao registered aeroplane shall be responsible for the security of the aircraft during its operation.

Reporting acts of unlawful interference

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

Communication, navigation and surveillance performance

118A. (1) An aeroplane registered in Macao shall not fly unless it is equipped with communication, navigation and surveillance equipment in accordance with the Sixth Schedule and operated in compliance with the requirements of air traffic services.

(2) An aeroplane registered in Macao shall not be operated in an airspace or on a route where an RCP specification for performance-based communication (PBC) has been prescribed unless:

(a) it is equipped with communication equipment which will enable it to operate in accordance with the prescribed RCP specification(s); and

(b) the operator of the aeroplane has obtained an approval from the Civil Aviation Authority for such operations.

(3) An aeroplane registered in Macao shall not be operated in an airspace or on a route where a navigation specification for performance-based navigation (PBN) has been prescribed unless:

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

(b) the operator of the aeroplane has obtained a specific approval from the Civil Aviation Authority for such operations.

(4) An aeroplane registered in Macao shall not be operated in an airspace where minimum navigation performance specifications (MNPS) have been prescribed unless:

(a) it is equipped with navigation equipment which will enable it to maintain the navigation performance capability specified in the Sixth and Sixteenth Schedules; and

(b) the operator of the aeroplane has obtained an approval from the Civil Aviation Authority for such operations.

(5) An aeroplane registered in Macao shall not be operated in an airspace where a reduced vertical separation minimum (RVSM) has been prescribed unless:

(a) it is equipped with navigation equipment which will enable it to maintain the navigation performance capability specified in the Sixth Schedule; and

(b) the operator of the aeroplane has obtained a specific approval from the Civil Aviation Authority for such operations.

(6) An aeroplane registered in Macao shall not be operated in an airspace or on a route where an RSP specification for performance-based surveillance (PBS) has been prescribed unless:

(a) it is equipped with surveillance equipment which will enable it to operate in accordance with the prescribed RSP specification(s); and

(b) the operator of the aeroplane has obtained an approval from the Civil Aviation Authority for such operations.

Part XIIIA

ADDITIONAL REQUIREMENTS FOR LARGE AND TURBOJET AEROPLANE FLYING FOR PURPOSE OTHER THAN COMMERCIAL AIR TRANSPORT OR AERIAL WORK

Applicability

119. Subject to paragraph 90 of this Regulation, this part specifies additional requirements for Macao registered aeroplane flying for purpose other than commercial air transport or aerial work, and shall apply in relation to:

(a) aeroplane with a maximum certified take-off mass exceeding 5 700kg; or

(b) aeroplane equipped with one or more turbojet engines; or

(c) aeroplane with a seating configuration of more than 9 passenger seats.

Compliance with laws, regulations and procedures

120. (1) An operator of a Macao registered aeroplane shall ensure that all employees know that they must comply with the laws, regulations and procedures of those States or Regions in which operations are conducted.

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

Note: Information for pilots on flight procedure parameters and operational procedures is contained in PANS-OPS (ICAO Doc 8168).

(3) The pilot-in-command of a Macao registered aeroplane shall be responsible for operational control. An operator of a Macao registered aeroplane shall describe the operational control system in the operations manual and identify the roles and responsibilities of those involved with the system.

(4) An operator of a Macao registered aeroplane shall ensure that the pilot-in-command has available on board the aeroplane all the essential information concerning the search and rescue services in the area over which the aeroplane will be flown.

(5) An operator of a Macao registered aeroplane shall ensure that flight crew members demonstrate the ability to speak and understand the language used for aeronautical radiotelephony communications as specified in ICAO Annex 1.

(6) An operator of a Macao registered aeroplane shall ensure that all flight crews comply with the requirements in PANS-ATM (ICAO Doc 4444), unless otherwise specified by the States or Regions in which operations are conducted.

Safety management system

121. (1) An operator of a Macao registered aeroplane shall establish and maintain a safety management system that is appropriate to the size and complexity of the operation.

(2) The safety management system shall as minimum include:

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

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

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

Operating facilities

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

Operator notification

123. If a Macao operator has an operating base in a State or Region other than Macao, the operator shall notify the State or Region in which the operating base is located. Upon such notification, the safety and security oversight shall be coordinated between the State or Region in which the operating base is located and the Civil Aviation Authority.

Operations manual

124. An operator of a Macao registered aeroplane shall provide, for the use and guidance of personnel concerned, an operations manual containing all the instructions and information necessary for operations personnel to perform their duties. The operations manual shall be amended or revised as is necessary to ensure that the information contained therein is kept up to date. All such amendments or revisions shall be issued to all personnel that are required to use this manual.

Operating instructions – general

125. (1) An operator of a Macao registered aeroplane shall ensure that all operations personnel are properly instructed in their particular duties and responsibilities and the relationship of such duties to the operation as a whole.

(2) An operator of a Macao registered aeroplane shall issue operating instructions and provide information on aeroplane climb performance to enable the pilot-in-command to determine the climb gradient that can be achieved during the departure phase for the existing take-off conditions and intended take-off technique. This information shall be included in the operations manual.

In-flight simulation of emergency situations

126. An operator of a Macao registered aeroplane shall ensure that when passengers are being carried, no emergency or abnormal situations shall be simulated.

Checklists

127. An operator of a Macao registered aeroplane shall provide checklists to be used by flight crews prior to, during and after all phases of operations, and in emergencies, to ensure compliance with the operating procedures contained in the aircraft operating manual and the aeroplane flight manual or other documents associated with the certificate of airworthiness and otherwise in the operations manual, are followed. The design and utilization of checklists shall observe Human Factors principles.

Minimum flight altitudes

128. An operator of a Macao registered aeroplane shall specify, for flights which are to be conducted in accordance with the instrument flight rules, the method of establishing terrain clearance altitudes.

Aerodrome operating minima

129. (1) An operator of a Macao registered aeroplane shall establish aerodrome operating minima, in accordance with criteria specified by the Civil Aviation Authority, for each aerodrome to be used in operations. When establishing aerodrome operating minima any conditions that may be prescribed in the list of specific approval shall be observed. Such minima shall not be lower than any that may be established for such aerodromes by the State of the Aerodrome, except when specifically approved by that State or Region. The Civil Aviation Authority may authorize operational credit(s) for operations with aeroplanes equipped with automatic landing system, a HUD or equivalent displays, EVS, SVS or CVS. Such authorizations shall not affect the classification of the instrument approach procedure. Where aeroplanes are equipped with automatic landing systems, a HUD or equivalent displays, or EVS, SVS or CVS, or any combination of those systems into a hybrid system, the use of such systems for the safe operation of an aeroplane shall be approved by the Civil Aviation Authority.

(2) An operator of a Macao registered aeroplane shall not permit its aeroplane to operate low visibility operations except with the specific approval of the Civil Aviation Authority.

Fatigue management programme

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

Passengers

131. (1) An operator of a Macao registered aeroplane shall ensure that passengers are made familiar with the location and use of:

(a) seat belts;

(b) emergency exits;

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

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

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

(2) An operator of a Macao registered aeroplane shall ensure that all persons on board are aware of the location and general manner of use of the principal emergency equipment carried for collective use.

(3) An operator of a Macao registered aeroplane shall ensure that in an emergency during flight, passengers are instructed in such emergency action as may be appropriate to the circumstances.

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

Flight preparation

132. (1) An operator of a Macao registered aeroplane shall develop procedures to ensure that a flight is not commenced unless:

(a) the aeroplane is airworthy, duly registered and that appropriate certificates as required under this Regulation are aboard the aeroplane;

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

(c) any necessary maintenance has been performed;

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

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

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

(2) An operator of a Macao registered aeroplane shall make available sufficient information on climb performance with all engines operating to enable determination of the climb gradient that can be achieved during the departure phase for the existing take-off conditions and intended take-off technique.

Operational flight planning

133. An operator of a Macao registered aeroplane shall specify flight planning procedures to provide for the safe conduct of the flight based on consideration of aeroplane performance, other operating limitations and relevant expected conditions on the route to be followed and at the aerodromes concerned. These procedures shall be included in the operations manual.

Alternate aerodromes

134. (1) A take-off alternate aerodrome shall be selected and specified in the flight plan if either the meteorological conditions at the aerodrome of departure are below the applicable aerodrome landing minima for that operation or if it would not be possible to return to the aerodrome of departure for other reasons.

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

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

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

(3) For an aerodrome to be selected as a take-off alternate the available information shall indicate that, at the estimated time of use, the conditions will be at or above the applicable aerodrome operating minima for that operation.

Fuel requirements

134A. (1) An aeroplane registered in Macao shall carry a sufficient amount of usable fuel to complete the planned flight safely and to allow for deviations from the planned operation.

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

(a) fuel consumption data:

(i) provided by the aeroplane manufacturer; or

(ii) if available, current aeroplane-specific data derived from a fuel consumption monitoring system; and

(b) the operating conditions for the planned flight including:

(i) anticipated aeroplane mass;

(ii) Notices to Airmen;

(iii) current meteorological reports or a combination of current reports and forecasts;

(iv) air traffic services procedures, restrictions and anticipated delays; and

(v) the effects of deferred maintenance items and/or configuration deviations.

(3) The pre-flight calculation of usable fuel required shall include:

(a) Taxi fuel, which shall be the amount of fuel expected to be consumed before take-off taking into account local conditions at the departure aerodrome and auxiliary power unit (APU) fuel consumption;

(b) Trip fuel, which shall be the amount of fuel required to enable the aeroplane to fly from take-off until landing at the destination aerodrome taking into account the operating conditions of sub-paragraph (2)(b) above;

(c) Contingency fuel, which shall be amount of fuel required to compensate for unforeseen factors. It shall be not less than 5% of the planned trip fuel;

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

(d) Destination alternate fuel, which shall be:

(i) where a destination alternate aerodrome is required, the amount of fuel required to enable the aeroplane to;

(A) perform a missed approach at the destination aerodrome;

(B) climb to the expected cruising altitude;

(C) fly the expected routing;

(D) descend to the point where the expected approach is initiated; and

(E) conduct the approach and landing at the destination alternate aerodrome; or

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

(iii) where the aerodrome of intended landing is an isolated aerodrome:

(A) for a reciprocating engine aeroplane, the amount of fuel required to fly for 45 minutes plus 15% of the flight time planned to be spent at cruising level, including final reserve fuel, or two hours, whichever is less, or

(B) for a turbine-engined aeroplane, the amount of fuel required to fly for two hours at normal cruise consumption above the destination aerodrome, including final reserve fuel;

(e) Final reserve fuel, which shall be the amount of fuel on arrival at the destination alternate aerodrome, or the destination aerodrome when no destination alternate aerodrome is required:

(i) for a reciprocating engine aeroplane, the amount of fuel required to fly for 45 minutes; or

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

(f) Additional fuel, which shall be the supplementary amount of fuel required to enable the aircraft to descend as necessary and proceed to land at an alternate aerodrome in the event of engine failure or loss of pressurization based on the assumption that such a failure occurs at the most critical point along the route.

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

(4) An operator of a Macao registered aeroplane shall determine one final reserve fuel value for each aeroplane type and variant in their fleet rounded up to an easily recalled figure.

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

In-flight fuel management

134B. (1) An operator of a Macao registered aeroplane shall establish policies and procedure to ensure that in-flight fuel checks and fuel management are performed.

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

(3) The pilot-in-command-of a Macao registered aeroplane shall request delay information from Air Traffic Control when unanticipated circumstances may result in landing at the destination aerodrome with less than the final reserve fuel plus any fuel required to proceed to an alternate aerodrome or the fuel required to operate to an isolated aerodrome.

(4) The pilot-in-command of a Macao registered aeroplane shall advise Air Traffic Control of a minimum fuel state by declaring MINIMUM FUEL when, having committed to land at a specific aerodrome, the pilot calculates that any change to the existing clearance to that aerodrome may result in landing with less than the planned final reserve fuel.

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

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

Refuelling with passengers on board

135. (1) An aeroplane registered in Macao shall not be refuelled when passengers are embarking, on board or disembarking unless it is properly attended by qualified personnel ready to initiate and direct an evacuation of the aeroplane by the most practical and expeditious means available.

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

Oxygen supply

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

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

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

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

Instrument approach procedures

137. An operator of a Macao registered aeroplane shall include operating procedures for conducting instrument approaches in the aircraft operating manual.

Use of oxygen

138. (1) All flight crew members, when engaged in performing duties essential to the safe operation of an aeroplane in flight, shall use breathing oxygen continuously whenever the circumstances prevail for which its supply has been required in paragraph 136 (1) or (2) of this Regulation.

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

Aeroplane operating procedures for noise abatement

139. Noise abatement procedures specified by an operator for any one aeroplane type registered in Macao shall be the same for all aerodrome utilized by that operator. Aeroplane operating procedures for noise abatement shall comply with the provisions of PANS-OPS (ICAO Doc 8168), Volume I.

Aeroplane operating procedures for rates of climb and descent

140. Unless otherwise specified in an air traffic control instruction, to avoid unnecessary airborne collision avoidance system (ACAS II) resolution advisories in aircraft at or approaching adjacent altitudes or flight levels, pilots shall consider using appropriate procedures to ensure that a rate of climb or descent of less than 8 m/sec or 1 500 ft/min (depending on the instrumentation available) is achieved throughout the last 300 m (1 000 ft) of climb or descent to the assigned altitude or flight level, when made aware of another aircraft at or approaching an adjacent altitude or flight level.

Duties of pilot-in-command

141. (1) The pilot-in-command of a Macao registered aeroplane shall ensure that the checklists specified in paragraph 127 of this Regulation are complied with in detail.

(2) The pilot-in-command of a Macao registered aeroplane shall be responsible for notifying the nearest appropriate authority by the quickest available means of any accident involving the aeroplane, resulting in serious injury or death of any person or substantial damage to the aeroplane or property. In the event that the pilot-in-command is incapacitated the operator shall take the forgoing action.

(3) The pilot-in-command of a Macao registered aeroplane shall be responsible for reporting all known or suspected defects in the aeroplane, to the operator, at the termination of flight.

(4) The pilot-in-command of a Macao registered aeroplane shall be responsible for the journey log book containing the information as prescribed by the Civil Aviation Authority.

Cabin baggage (take-off and landing)

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

Minimum Equipment List

143. (1) Where a master minimum equipment list (MMEL) is established for the aircraft type, the operator of a Macao registered aeroplane shall include in the operations manual a minimum equipment list (MEL) approved by the Civil Aviation Authority which will enable the pilot-in-command to determine whether a flight may be commenced or continued from any intermediate stop should any instrument, equipment or systems become inoperative.

(2) An operator of a Macao registered aeroplane shall provide operations staff and flight crew with an aircraft operating manual, for each aircraft type operated, containing the normal, abnormal and emergency procedures relating to the operation of the aircraft. The manual shall be consistent with the aircraft flight manual and checklists to be used. The design of the manual shall observe Human Factors principles.

Designation of pilot-in-command

144. For each flight, the operator of a Macao registered aeroplane shall designate a pilot to act as pilot-in-command.

Flight crew member emergency duties

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

Flight crew member training programmes

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

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

Qualifications - Flight crew members

147. (1) An operator of a Macao registered aeroplane shall:

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

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

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

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

(3) An operator of a Macao registered aeroplane shall not assign a pilot to act as pilot-in-command of an aeroplane unless that pilot has made at least three take-offs and landings within the preceding 90 days on the same type of aeroplane or in a flight simulator approved for the purpose.

(4) An operator of a Macao registered aeroplane shall not assign a co-pilot to operate at the flight controls of an aeroplane during take-off and landing unless the pilot has made at least three take-offs and landings within the preceding 90 days on the same type of aeroplane or in a flight simulator approved for the purpose.

(5) An operator of a Macao registered aeroplane shall ensure that piloting technique and the ability to execute emergency procedures is checked periodically in such a way as to demonstrate the pilot's competence. Where the operator may be conducted under the instrument flight rules, the operator shall ensure that the pilot's competence to comply with such rules is demonstrated to either a check pilot of the operator or a representative of the Civil Aviation Authority.

Flight dispatch and flight operations officer

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

Cabin crew member

149. (1) The requirement for cabin crew for each type of aeroplane shall be determined by the operator, based on seating capacity or the number of passengers carried, in order to effect a safe and expeditious evacuation of the aeroplane, and the necessary functions to be performed in an

emergency or a situation requiring emergency evacuation. The operator shall assign these functions for each type of aeroplane.

(2) Each cabin crew member assigned to emergency evacuation duties shall occupy a certified seat fitted with a safety harness during take-off and landing and whenever the pilot-in-command so directs.

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

(4) An operator of a Macao registered aeroplane shall ensure that a training programme is completed by all persons before being assigned as a cabin crew member.

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

Part XIV

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

Applicability

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

Compliance with laws, regulations and procedures

151. (1) The pilot-in-command of a Macao registered helicopter shall comply with the relevant laws, regulations and procedures of the States or Regions in which the helicopter is operated.

Note: Information for pilots on flight procedure parameters and operational procedures is contained in PANS-OPS (ICAO Doc 8168).

(2) The pilot-in-command of a Macao registered helicopter shall be responsible for the operation and safety of the helicopter and for the safety of all crew members, passengers and cargo on board, from the moment the engine(s) are started until the helicopter finally comes to rest at the end of the flight, with the engine(s) shut down and the rotor blades stopped.

(3) The pilot-in-command of a Macao registered helicopter shall notify the appropriate local authority without delay, if an emergency situation which endangers the safety of the helicopter or persons necessitates the taking of action which involves a violation of local regulations or procedures. If required by the State or Region in which the incident occurs, the pilot-in-command shall submit a report on any such violation to the appropriate authority of such State or Region as soon as possible and normally within ten days; in that event, the pilot-in-command shall also submit a copy of it to the Civil Aviation Authority in accordance with paragraph 88 of this Regulation.

(4) The pilot-in-command of a Macao registered helicopter shall be responsible for notifying the nearest appropriate authority by the quickest available means of any accident involving the helicopter, resulting in serious injury or death of any person or substantial damage to the helicopter or property.

(5) The pilot-in-command of a Macao registered helicopter shall have available on board the helicopter essential information concerning the search and rescue services in the areas over which it is intended the helicopter will be flown.

(6) The pilot-in-command of a Macao registered helicopter shall ensure that all flight crews comply with the requirements in PANS-ATM (ICAO Doc 4444), unless otherwise specified by the States or Regions in which operations are conducted.

(7) The pilot-in-command of a Macao registered helicopter shall not conduct operations for which a specific approval is required unless such approval has been obtained from the Civil Aviation Authority.

Carriage of dangerous goods

152. Dangerous goods shall not be carried in a Macao registered helicopter except in accordance with paragraph 41 of this Regulation.

Use of psychoactive substances

153. (1) No member of a flight crew shall perform any function specified in the privileges applicable to his/her licence if he/she is under the influence of any psychoactive substances which may render him unable to perform such functions in a safe and proper manner.

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

Operating facilities

154. The pilot-in-command of a Macao registered helicopter shall not commence a flight unless it has been ascertained by every reasonable means available that the ground and/or water facilities available and directly required for such flight and for the safe operation of the helicopter are adequate including communication facilities and navigation aids.

Heliport or landing location operating minima

155. (1) The pilot-in-command of a Macao registered helicopter shall establish operating minima in accordance with criteria specified by the Civil Aviation Authority for each heliport or landing location to be used in operations. When establishing aerodrome operating minima, any conditions that may be prescribed in the list of specific approval shall be observed. Such minima shall not be lower than any that may be established by the State of the Aerodrome, except when specifically approved by that State or Region. The Civil Aviation Authority may authorize operational credit(s) for operations with helicopters equipped with automatic landing system, a HUD or equivalent displays, EVS, SVS or CVS. Such authorizations shall not affect the classification of the instrument approach procedure. Where helicopters are equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS, or CVS, or any combination of those systems into a hybrid system, the use of such systems for the safe operation of a helicopter shall be approved by the Civil Aviation Authority.

(2) Low visibility operations shall not be conducted except with the specific approval of the Civil Aviation Authority.

Briefing

156. (1) The pilot-in-command of a Macao registered helicopter shall ensure that crew members and passengers are made familiar, by means of an oral briefing or by other means, with the location and the use of:

(a) seat belts or harnesses; and, as appropriate,

(b) emergency exits;

(c) life jackets;

(d) oxygen dispensing equipment; and

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

(2) The pilot-in-command of a Macao registered helicopter shall ensure that all persons on board are aware of the location and general manner of use of the principal emergency carried for collective use.

Flight preparation

157. A flight shall not be commenced until the pilot-in-command of a Macao registered helicopter is satisfied that:

(a) the helicopter is airworthy, duly registered and that appropriate certificates as required under this Regulation are aboard the helicopter;

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

(c) any necessary maintenance has been performed;

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

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

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

Flight planning

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

(a) a study of available current weather reports and forecasts; and

(b) the planning of an alternative course of action to provide for the eventuality that the flight cannot be completed as planned, because of meteorological conditions.

Meteorological conditions

159. (1) A flight, except one of purely local character in visual meteorological conditions, to be conducted in accordance with VFR shall not be commenced unless current meteorological current reports, or a combination of current reports and forecasts, indicate that the meteorological conditions along the route, or that part of the route to be flown under VFR, will, at the appropriate time, be such as to enable compliance with these rule.

(2) When an alternate is required. A flight to be conducted in accordance with IFR shall not be commenced unless the available information indicates that conditions, at the heliport of intended landing and at least one alternate heliport will, at the estimated time of arrival, be at or above the heliport operating minima.

(3) When no alternate is required. A flight to be conducted in accordance with IFR 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.

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

In-flight procedures

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

(2) An instrument approach shall not be continued below 300 m (1 000 ft) above the heliport elevation or into the final approach segment unless the reported visibility or controlling RVR is at or above the heliport operating minima.

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

Alternate heliports

161. (1) For a flight to be conducted in accordance with IFR, at least one alternate heliport or landing location shall be specified in the operational flight plan and the Air Traffic Services (ATS) flight plan, unless:

(a) the meteorological conditions in paragraph 159 (3) of this Regulation prevail; or

(b) (i) the heliport or landing location of intended landing is isolated and no alternate heliport or landing location 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 offshore destination.

(2) Offshore alternate heliport may be specified subject to the following:

(a) the offshore alternate heliport shall be used only after passing a PNR. Prior to a PNR, onshore alternate heliports 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 heliport(s);

(c) one engine inoperative performance capability shall be attainable prior to arrival at the alternate heliport;

(d) to the extent possible, deck availability shall be guaranteed; and

(e) weather information must be reliable and accurate.

(3) Offshore alternate heliports shall not be used when it is possible to carry enough fuel to have an onshore alternate. Offshore alternate heliports shall not be used in a hostile environment.

Fuel and oil requirements

162. (1) A flight shall not be commenced unless, taking into account both the meteorological conditions and any delays that are expected in flight, the helicopter 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.

(2) The usable fuel to be on board for departure shall be the sum of the following:

(a) Taxi fuel, which shall not be less than the amount, expected to be used prior to take-off taking into account local conditions at the departure heliport or landing location and APU consumption.

(b) Trip fuel, which shall include:

(i) fuel for take-off and climb from heliport or landing location 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 or landing location.

(c) Contingency fuel, which shall be:

(i) for IFR flights, or 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) Destination alternate fuel, which shall be sufficient for:

(i) a missed approach from the applicable MDA/DH at the destination heliport or landing location 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 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 heliport;

(e) Final reserve fuel, which shall 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 450 m (1500 ft) above the destination heliport or landing location in standard conditions calculated with the estimated mass on arrival above the alternate, or the destination, when no alternate is required;

(f) Additional fuel, if required by the type of operation;

(g) Discretionary fuel, which shall be at the discretion of the pilot-in-command.

(3) Isolated heliport or landing location IFR procedure. If a flight plans to fly to an isolated heliport or landing location 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 shall include:

(a) Taxi fuel;

(b) Trip fuel;

(c) Contingency fuel calculated in accordance with sub-paragraph (2)(c) above;

(d) Additional fuel to fly for two hours at holding speed including final reserve fuel; and

(e) Discretionary fuel at the discretion of the pilot-in-command.

(4) Sufficient fuel shall be carried at all times to ensure that following the failure of an engine occurring at the most critical point along the route, the helicopter is able to:

(a) descent as necessary and proceed to an adequate heliport or landing location;

(b) hold there for 15 minutes at 450 m (1 500 ft) above heliport or landing location elevation in standard conditions; and

(c) make an approach and landing.

(5) In computing the fuel and oil required in sub-paragraph (1) above, at least the following shall be considered:

(a) meteorological conditions forecast;

(b) expected air traffic control routings and traffic delays;

(c) for IFR flight, one instrument approach at the destination heliport, including a missed approach;

(d) the procedures for loss of pressurization, where applicable, or failure of one engine while en route; and

(e) any other conditions that may delay the landing of the helicopter or increase fuel and/or oil consumption.

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

In-flight fuel management

162A. (1) The pilot-in-command of a Macao registered helicopter shall monitor the amount of usable fuel remaining on board to ensure it is not less than the fuel required to proceed to a heliport or landing location where a safe landing can be made with the planned final reserve fuel remaining.

(2) The pilot-in-command of a Macao registered helicopter shall advise Air Traffic Control of a minimum fuel state by declaring MINIMUM FEUL when, having committed to land at a specific heliport or landing location, the pilot calculates that any change to the exiting clearance to that heliport or landing location, or other traffic delays, may result in landing with less than the planned final reserve fuel.

Note: The declaration of MINIMUM FUEL informs Air Traffic Control that all planned heliport or landing location options have been reduced to a specific heliport or landing location of intended landing, and any change to the existing clearance, or air traffic delays, may result in landing with less than the planned final reserve fuel. This is not an emergency situation but an indication that an emergency situation is possible should any additional delay occur.

(3) The pilot-in-command of a Macao registered helicopter shall declare a situation of fuel emergency by broadcasting MAYDAY MAYDAY MAYDAY FUEL, when the usable fuel estimated to be available upon landing at the nearest heliport or landing location where a safe landing can be made is less than the required final reserve fuel in compliance with paragraph 162 of this Regulation.

Oxygen supply

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

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

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

(2) A flight to be operated with a pressurized helicopter shall not be commenced unless a sufficient quantity of stored breathing oxygen is carried to supply all the crew members and a proportion of the passengers, as is appropriate to the circumstances of the flight being undertaken, in the event of pressurization, for any period that the atmospheric pressure in any compartment occupied by them would be less than 700 hPa.

Use of oxygen

164. All flight crew members, when engaged in performing duties essential to the safe operation of a helicopter in flight, shall use breathing oxygen continuously whenever the circumstances prevail for which its supply has been required in paragraph 163 (1) or (2) of this Regulation.

Use of electronic flight bags

164A. Electronic flight bags shall not be used on board a helicopter registered in Macao except the pilot-in-command and/or the operator has:

(a) obtained a specific approval from the Civil Aviation Authority for the operational use of EFB functions to be used for the safe operation of helicopters;

(b) ensured that the EFBs do not affect the performance of the helicopter systems, equipment or the ability to operate the helicopter;

(c) ensured that the EFB equipment and its associated installation hardware, including interaction with helicopter systems if applicable, meet the appropriate airworthiness certification requirements;

(d) assessed the risks associated with the operations supported by the EFB function(s);

(e) established requirements for redundancy of the information (if appropriate) contained and displayed by the EFB function(s);

(f) ensured that, in the event of an EFB failure, sufficient information is readily available to the flight crew for the flight to be conducted safely;

(g) established and documented procedures for the management of the EFB function(s) including any databases it may use; and

(h) established and documented the procedures for the use of, and training requirements for, the EFB function(s).

In-flight emergency instruction

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

Weather reporting by pilots

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

Hazardous flight conditions

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

Fitness of flight crew members

168. The pilot-in-command of a Macao registered helicopter 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 heliport when flight crew members' capacity to perform functions is significantly reduced by impairment of faculties from causes such as fatigue, sickness, lack of oxygen.

Flight crew members at duty stations

169. (1) Take-off and landing. All flight crew members required to be on flight deck duty shall be at their stations.

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

(3) Seat belts. All flight crew members shall keep their seat belts fastened when at their stations.

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

Instrument approach procedures

170. Helicopters registered in Macao operated in accordance with the instrument flight rules shall comply with the instrument approach procedures approved and promulgated by the State or Region in which the heliport is located, or by the State or Region which is responsible for the heliport when located outside the territory of any State or Region.

Operating instructions – general

171. A helicopter rotor shall not be turned under power for the purpose of flight without a qualified pilot at the controls.

Refuelling with passengers on board or rotors turning

172. (1) A helicopter registered in Macao shall not be refuelled when passengers are embarking, on board or disembarking or when the rotor is turning unless it is attended by the pilot-in-command or other qualified personnel ready to initiate and direct an evacuation of the helicopter by the most practical and expeditious means available.

(2) When refuelling with passengers embarking, on board or disembarking, two-way communication shall be maintained by the helicopter's intercommunication system or other suitable means between the ground crew supervising the refuelling and the pilot-in-command or other qualified personnel required by sub-paragraph (1) above.

Over-water flights

173. A flight to be operated by helicopter to fly over water shall not be commenced unless the helicopter is certificated for ditching.. Sea state shall be an integral part of ditching information.

Helicopter performance operating limitations

174. (1) A helicopter registered in Macao shall be operated:

(a) in compliance with the terms of its airworthiness certificate or equivalent approved document;

(b) within the operating limitations as referred in the Eighteenth Schedule of this Regulation; and

(c) within the mass limitations imposed by compliance with the applicable noise certification Standards in ICAO Annex 16 Volume I, unless otherwise authorized in exceptional circumstances for a certain operating site where there is no noise disturbance problem, by the competent authority of the State or Region in which the operating site is situated.

(2) Placards, listings, instrument markings, or combinations thereof, containing those operating limitations prescribed by the Civil Aviation Authority for visual presentation, shall be displayed in the helicopter.

Marking of break-in points

175. (1) If areas of the fuselage suitable for break-in by rescue crews in an emergency are marked on a helicopter, 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.

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

Qualifications - Flight crew members

176. The pilot-in-command of a Macao registered helicopter shall ensure that the licences of each flight crew member have been issued or rendered valid by the Civil Aviation Authority, and are properly rated and of current validity, and shall be satisfied that flight crew member have maintained competence.

Communication, navigation and surveillance performance

176A. (1) A helicopter registered in Macao shall not fly unless it is equipped with communication, navigation and surveillance equipment in accordance with the Sixth Schedule and operated in compliance with the requirements of air traffic services.

(2) A helicopter registered in Macao shall not be operated in an airspace or on a route where an RCP specification for performance-based communication (PBC) has been prescribed unless:

(a) it is equipped with communication equipment which will enable it to operate in accordance with the prescribed RCP specification(s); and

(b) the operator of the helicopter has obtained an approval from the Civil Aviation Authority for such operations.

(3) A helicopter registered in Macao shall not be operated in an airspace or on a route where a navigation specification for performance-based navigation (PBN) has been prescribed unless:

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

(b) the operator of the helicopter has obtained a specific approval from the Civil Aviation Authority for such operations.

(4) A helicopter registered in Macao shall not be operated in an airspace or on a route where an RSP specification for performance-based surveillance (PBS) has been prescribed unless:

(a) it is equipped with surveillance equipment which will enable it to operate in accordance with the prescribed RSP specification(s); and

(b) the operator of the helicopter has obtained an approval from the Civil Aviation Authority for such operations.

Part XV

REQUIREMENTS FOR HANDLING OF DANGEROUS GOODS

Applicability

177. (1) This part shall apply to a person whether or not consigns dangerous goods for carriage by air, being a shipper, freight forwarder or his agent, who offers the goods to an operator.

(2) This part shall apply also to a designated postal operator whether or not consigns dangerous goods for carriage by air.

(3) Dangerous goods for carriage by air shall not be handled by designated postal operator except with the written permission of the Civil Aviation Authority, and in accordance with the Twentieth Schedule.

Responsibilities of shipper and freight forwarder

178. (1) Before a shipper and freight forwarder offers any package or overpack of dangerous goods for transport by air, shall ensure that the dangerous goods are not forbidden for transport by air and are properly classified, packed, marked, labelled and accompanied by a properly executed dangerous goods transport documents, as specified in the ICAO Annex 18, the Technical Instructions and relevant provisions of the Twentieth Schedule.

(2) Unless otherwise provided for in the Technical Instructions, a shipper and freight forwarder who offers dangerous goods for transport by air shall complete, sign and provide to the operator a dangerous goods transport document, which shall contain the information required by Technical Instructions.

(3) The dangerous goods transport document shall bear a declaration signed by the shipper and freight forwarder who offers dangerous goods for transport by air indicating that the dangerous goods are fully and accurately described by their proper shipping names and that they are classified, packed, marked, labelled, and in proper condition for transport by air in accordance with the Technical Instructions.

(4) A shipper and freight forwarder shall establish and maintain initial and recurrent dangerous goods training programmes that meet the requirements of ICAO Annex 18, and in accordance with the Technical Instructions and the provisions of this Regulation.

(5) A shipper and freight forwarder shall comply with the relevant provisions of the Twentieth Schedule.

Responsibilities of designated postal operator

179. (1) The designated postal operator shall establish and maintain the procedures for controlling the introduction of dangerous goods in mail into air transport that meets the requirements of ICAO Annex 18, the applicable requirements of the Technical Instructions and the provisions of this Regulation, as appropriate. The procedures shall be approved by the Civil Aviation Authority.

(2) The designated postal operator shall establish and maintain initial and recurrent dangerous goods training programmes that meet the requirements of ICAO Annex 18, and in accordance with the Technical Instructions and the provisions of this Regulation. The dangerous goods training programmes shall be approved by the Civil Aviation Authority.

(3) The designated postal operator shall comply with the relevant provisions of the Twentieth Schedule.

Power to inspect, examine and obtain samples, etc.

180. (1) Where any dangerous goods occurrence, incidents or accident happens, the Civil Aviation Authority shall cause an investigation to be made in such manner as he thinks necessary.

(2) For the purposes of any investigation under sub-paragraph (1) 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.

(3) This part shall be additional to and not in derogation from paragraph 41.

Part XVI

Requirements for operating Unmanned Aircraft

Applicability

181. This Part does not apply in respect to the operations with unmanned aircraft having a total mass not exceeding 25 kg performed indoors or underground.

Operation of unmanned aircraft having a total mass exceeding 250 grams

182. A person intending to operate an unmanned aircraft having a total mass exceeding 250 grams must:

(a) affix a label at a conspicuous place on the unmanned aircraft with the name and telephone number of the owner in Chinese, Portuguese or English languages and the information must be easily legible to the reader;

(b) notify the Civil Aviation Authority immediately before the commencement of the operation.

Notification of operation

183. The notification of the commencement of operation must be made online on a website or by other means specified by the Civil Aviation Authority, in writing, and must be accompanied by the following information:

(i) the identity and contact address of the UA pilot;

(ii) the type and model, the manufacturer and the total mass of the unmanned aircraft;

(iii) the unique serial number of the unmanned aircraft (if available);

(iv) the photograph of the unmanned aircraft, where the label mentioned in subparagraph 182(a) is clearly visible;

(v) the area where the operation of the unmanned aircraft will take place;

(vi) any other information required by the Civil Aviation Authority.

Operation of unmanned aircraft having a total mass not exceeding 7 kg

184. (1) A person may operate an unmanned aircraft having a total mass not exceeding 7 kg under the following conditions:

(a) the unmanned aircraft does not fly within the boundaries of any protected area specified on paragraph 67. of this Regulation;

(b) the unmanned aircraft flies within the height limits specified on subparagraph (2) below;

(c) the operation takes place during day time;

(d) the unmanned aircraft is not carrying any dangerous substances, including weapons and ammunitions, corrosive, flammable or explosive substances, fireworks, firecrackers, any chemical or biological agent or toxin and any radioactive material or substance;

(e) the unmanned aircraft is not discharging anything whether gaseous, liquid or solid;

(f) the unmanned aircraft is not towing any object;

(g) the unmanned aircraft is not flying within 100 metres of a gathering of 100 persons or more;

(h) the UA pilot is on site within 100 metres and with direct control of the unmanned aircraft;

(i) the unmanned aircraft is operated under a Visual Line of Sight Operation (VLOS); and

(j) the UA pilot is reasonably satisfied that the flight can safely be made.

(2) The height limits referred to on subparagraph. (1) (b) above are as follows:

(a) 50 m above the surface within the area defined as the polygonal line with vertices at the points with the following rectangular or circular coordinates:

Point	**M**	**P**
1	22142.822	20196.909
2	21993.837	20255.783
3	21993.837	20158.765
4	22050.647	20116.922
5	22110.720	20057.809
6	22163.739	19977.828
7	22197.789	19916.973
8	22218.415	19844.417
9	22227.236	19794.763
10	22230.200	19759.675
11	22230.200	19462.231
12	22423.154	19592.330

Point	**M**	**P**
1	21672.369	17515.528
2	21650.898	17384.293

3	21329.949	17255.311
4	21322.395	17268.871
5	21286.756	17243.001
6	21283.840	17239.189
7	21266.528	17235.890
8	21238.857	17241.501
9	21250.228	17222.301
10	21218.517	17155.720
11	21218.816	17156.430
12	21141.090	16902.485
13	21124.750	16871.249
14	21056.158	16786.046
15	21001.857	16746.223
16	20933.534	16710.371
17	20785.745	16666.922
18	20238.723	16553.275
19	20051.632	16498.944
20	19999.381	16490.395
21	19825.145	16496.623
22	19823.864	16425.472

23	19621.706	16425.472
24	19621.706	16494.661
25	19243.607	16491.013
26	18997.873	16717.869
27	18855.541	17043.011
28	18161.584	17046.429
29	18483.285	16089.005
30	19251.702	16021.339
31	21724.905	16670.138
32	21974.376	17353.046
33	21955.572	17454.014

Point	**M**	**P**
1	21900.615	15576.520
2	20347.304	15549.861
3	19788.991	15262.521
4	19687.157	14701.886
5	21176.871	14959.318
6	21448.021	14986.726
7	21700.782	14969.081

8	21736.881	15004.336
9	21799.919	15004.336
10	21975.686	14980.420
11	22066.631	14954.312
12	22105.558	14866.670
13	22238.250	14912.070

Point	**M**	**P**
1	21237.010	14611.388
2	21226.255	14637.242
3	20975.997	14724.309
4	20974.557	14736.675
5	20766.325	14633.629
6	20583.256	14613.531
7	20545.221	14587.951
8	20561.816	14391.719
9	20339.686	14302.742
10	20311.209	14253.605
11	20367.255	14064.524
12	20659.407	14145.733

13	20779.299	14122.537
14	20834.765	14144.685
15	20844.524	14246.863
16	21113.209	14423.526

Point	**M**	**P**
1	23539.965	12352.851
2	23134.908	12400.086
3	23058.218	12095.973
4	22806.933	11807.104
5	22998.239	11195.447
6	23706.069	11161.997
7	23701.287	10536.005
8	23257.512	10076.791
9	23162.607	9581.006
10	23229.375	9479.762
11	23522.703	9451.948
12	23552.010	9427.004
13	23578.229	9132.740
14	24964.341	5106.452

15	23256.186	5104.774
16	22508.537	4349.305
17	23582.788	4071.339
18	27532.351	-7446.220
19	24215.005	11014.644

Point	**M**	**P**	**Radius**
1	22409.513	10224.938	404 m

(b) 250 m above the surface within the area defined as the polygonal line with vertices at the points with the following rectangular coordinates:

Point	**M**	**P**
1	19823.864	16619.616
2	19621.706	16619.616
3	19621.706	16425.472
4	19823.864	16425.472

(c) 150 m above the surface within the Macao Air Traffic Zone beyond the areas stated in subparagraphs (2)(a) and (2)(b) above and the protected areas prescribed in paragraph 67 of this Regulation.

(3) A person shall not operate an unmanned aircraft outside any conditions specified in this paragraph except under the authority of and in accordance with a UA activity permit.

Operation of unmanned aircraft having total mass exceeding 7 kg but not exceeding 25 kg

185. A person shall not operate an unmanned aircraft having a total mass exceeding 7 kg but not exceeding 25 kg, except:

(a) under the authority of and in accordance with:

(i) an UA operator permit; and

(ii) an UA activity permit;

(b) the intended unmanned aircraft activity is covered by third party insurance with minimum coverage of $10 000 000,00 (ten million patacas).

Operation of unmanned aircraft having total mass exceeding 25 kg

186. A person shall not operate an unmanned aircraft having a total mass exceeding 25 kg unless with the authorization in writing of the Civil Aviation Authority and in accordance with any conditions to which that authorization may be granted.

UA Activity permit

187. (1) An application for a UA activity permit shall be made in the form and manner required by the Civil Aviation Authority with the following information:

(a) the identity and contact address of the applicant;

(b) information regarding the unmanned aircraft to be operated, including:

(i) the type and model, the manufacturer and the total mass of the unmanned aircraft;

(ii) the unique serial number of the unmanned aircraft (if available);

(iii) the photograph of the unmanned aircraft, where the label mentioned in subparagraph 182(a) is clearly visible;

(c) description of the intended operation, including:

(i) the type of flying activity to be carried out involving the unmanned aircraft specified in the application;

(ii) the flight plan (operating time, take-off/landing, hover/flight path, height, speed, how the visual line of sight is to be maintained and number and position of pilots and observers);

(iii) the map or floor plan of the activity site with annotation of launch/recovery point(s) and any horizontal flight path of the unmanned aircraft; and

(iv) indication if the activity is conducted for, or within proximity of an organized event where more than 100 persons are expected (races, festivals, exhibitions, parades, events, etc.).

(d) completed risk assessment form;

(e) evidence of adequate insurance coverage for the intended activity, if required under this Regulation;

(f) if the unmanned aircraft is intended to fly within a protected area as defined on paragraph 67. of this Regulation, an official letter from the company or government entity which has engaged the services of the applicant, stating the purpose for conducting the operation;

(g) the UA operator permit, if required under this Regulation;

(h) any other documents or information required by the Civil Aviation Authority.

(2) A UA activity permit is valid for the period specified in the permit.

(3) In deciding whether an applicant should be granted an UA activity permit, and the conditions to impose or modify, the Civil Aviation Authority must be satisfied that the applicant is capable of ensuring the safe conduct of the activity specified, or to be specified, in the permit.

UA operator permit

188. (1) The Civil Aviation Authority may grant, vary or renew a UA operator permit to any person if it is satisfied that the person is competent to secure the safe operation of unmanned aircraft having regard, in particular to its equipment, organisation, staffing, method of control and supervision, training programme, maintenance arrangements and any other arrangements.

(2) The UA operator permit may be granted subject to such conditions and limitations as the Civil Aviation Authority thinks fit and is valid for the period specified in the permit.

Responsibilities of an UA operator permit holder

189. (1) An UA operator permit holder shall establish and implement systems, policies and procedures to ensure, support and facilitate the compliance, by the pilot of any unmanned aircraft operated by the UA operator permit holder, with every provision of this Regulation.

(2) An UA operator permit holder shall:

(a) ensure that every pilot engaged or employed, or to be engaged or employed, is a fit and qualified person to operate the unmanned aircraft type and model corresponding to that unmanned aircraft and for the purpose specified in the UA operator permit; and

(b) provide training to maintain the competency of its pilot(s) to operate the unmanned aircraft.

(3) An UA operator permit holder shall ensure that a flight of an unmanned aircraft does not commence unless:

(a) the unmanned aircraft is airworthy and is so equipped as to comply with requirements specified by the Civil Aviation Authority;

(b) the flight can safely be made; and

(c) the intended unmanned aircraft activity is covered by the required insurance according to paragraph 185 of this Regulation.

(4) An UA operator permit holder shall ensure that every pilot engaged or employed, or to be engaged or employed, by the UA operator permit holder to operate any unmanned aircraft is provided with:

(a) the UA operator permit and relevant activity permit;

(b) any technical manual and standard operating procedures related to the operation of that unmanned aircraft; and

(c) any other information as the pilot reasonably requires to carry out the flight of that unmanned aircraft safely and in accordance with the conditions specified in the UA operator permit and activity permit.

Unmanned aircraft pilot

190. (1) A person shall not operate an unmanned aircraft having a total mass exceeding 250 grams unless:

(a) the person is at least 14 years of age or the minimum operating age defined by the manufacturer of the unmanned aircraft, whichever is higher; or

(b) if the person is under 14 years of age or the minimum operating age defined by the manufacturer, whichever is higher, the operation of the unmanned aircraft is conducted under direct supervision of a person who is at least 18 years of age and who can operate the unmanned aircraft.

(2) A person shall not operate an unmanned aircraft having a total mass exceeding 7 kg unless:

(a) the person is at least 18 years of age; and

(b) the Civil Aviation Authority is satisfied that the person is fit and qualified to operate the unmanned aircraft type and model corresponding to that unmanned aircraft and for the purpose specified in the UA operator permit.

Prohibited use of psychoactive substances

191. A person shall not operate an unmanned aircraft, or be involved in the conduct of a flight involving an unmanned aircraft, if the person is under the influence of any psychoactive substance to such extent as to be unable to operate the unmanned aircraft in a safe and proper manner.

Responsibilities of the unmanned aircraft pilot

192. (1) A person shall not operate an unmanned aircraft unless the person:

(a) is aware of the performance specifications and operating limitations of the unmanned aircraft;

(b) is satisfied that the unmanned aircraft is airworthy and is so equipped as to comply with requirements specified by the Civil Aviation Authority; and

(c) is reasonably satisfied that the flight can safely be made.

(2) A person who operates an unmanned aircraft shall:

(a) comply with the performance specifications and operating limitations of the unmanned aircraft as specified by the manufacturer;

(b) ensure that the unmanned aircraft is within visual line of sight at all times unless the pilot is authorised by the Civil Aviation Authority to operate the unmanned aircraft beyond visual line of sight; and

(c) notify the Civil Aviation Authority by the quickest available means upon becoming aware of an accident associated with the operation of the unmanned aircraft resulting in serious injury to himself/herself, serious injury to or the death of any other person, or damage to any property.

FIRST SCHEDULE

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

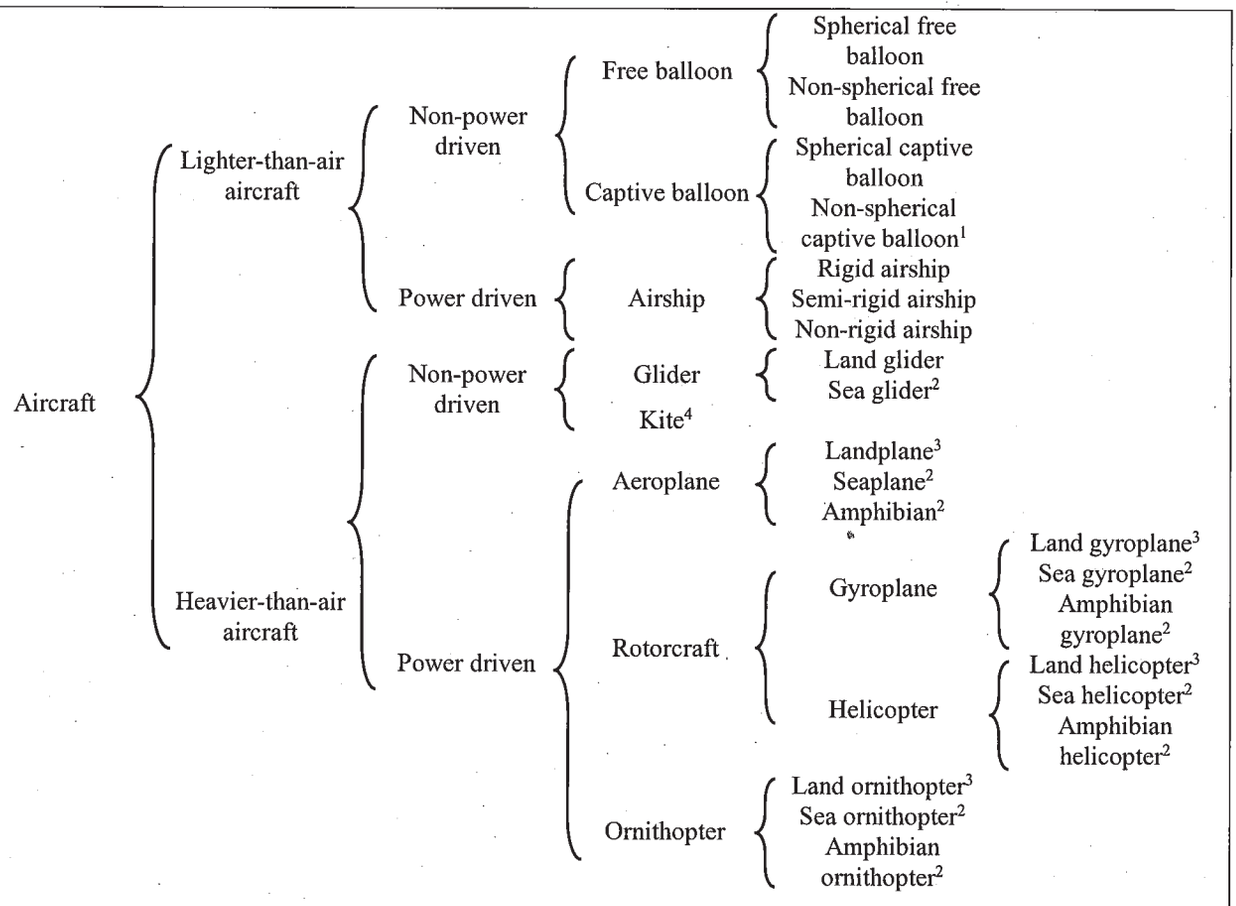
CLASSIFICATION AND REGISTRATION MARKS OF AIRCRAFT

Part A –GENERAL CLASSIFICATION OF AIRCRAFT

1. Aircraft shall be classified in accordance with Table 1.

2. An aircraft which is intended to be operated with no pilot on board shall be further classified as unmanned.

3. Unmanned aircraft shall include unmanned free balloons and remotely piloted aircraft.



1. Generally designated "kite-balloon".
2. "Float" or "boat" may be added as appropriate.
3. Includes aircraft equipped with ski-type landing gear (substitute "ski" for "land").
4. For the purpose of completeness only.

Table 1. Classification of aircraft

Part B – ORIGIN AND REGISTRATION MARKS OF AIRCRAFT REGISTERED IN MACAO

1. The nationality mark 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 nationality mark 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 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 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, or if the parts are too small to accommodate the marks described therein, the measurements of the marks shall be determined by the Civil Aviation Authority, taking account of the need of the aircraft to be identified readily.

(iv) The letters in each separate group of marks shall be of equal height.

(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 of not less than one-quarter of a character width. 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 (2), 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 (2), 4 (9), 6 (1) and 50 (2) of this 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 this 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 an aircraft maintenance engineer licence granted under this Regulation, being a licence which entitles him to issue that certificate or by a person approved by the Civil Aviation Authority for the purpose of issuing certificates under this Condition, and in accordance with that approval.

(4) The aircraft shall carry the minimum flight crew specified in any Certificate of airworthiness or validation which has previously been in force under this 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 this 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 Region referred to in paragraph 3 of this 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 this 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 this Regulation as qualified to furnish reports for the purposes of this 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 AND AIRCRAFT MAINTENANCE ENGINEERS

1. This Schedule establishes the various requirements, categories, ratings and privileges prescribed by the Civil Aviation Authority for granting, renewing and using licences related to personnel other than flight crew members and aircraft maintenance engineers in Macao. The Civil Aviation Authority may grant or renew a licence to any person other than those attributed to flight crew members provided that they apply for one of the following cases:

   (a) Reserved.

   (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 meet the language proficiency requirements of the Civil Aviation Authority;

   (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; and

(v) if a candidate fails an examination, an advice 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 have been met, a licence may be issued or renewed 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 State or Region.

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

6. Reserved.

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 for operational control and 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 engines, systems and instruments;

(c) operating limitations of aeroplanes and engines;

(d) minimum equipment list and configuration deviation list;

Flight performance calculation, planning procedures and loading

(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) take off performance including field length, climb and obstacle criteria and limitations;

(h) cruise performance including minimum altitudes, decompression/engine out/gear down scenario planning;

(i) landing performance including approach climb and field length criteria and limitations;

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

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

Human performance

(l) human performance relevant to operational control duties, including principles of threat and error management;

Note – Guidance material to design training programmes on human performance, including threat and error management, can be found in the Human Factors Training Manual (ICAO DOC 9683).

Meteorology

(m) 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;

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

Navigation

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

Operational procedures

(p) use of aeronautical documentation and standard operating procedures;

(q) operational procedures for the carriage of freight and dangerous goods;

(r) procedures relating to aircraft accidents and incidents; emergency flight procedures;

(s) procedures relating to unlawful interference and sabotage of aircraft;

Principles of flight

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

Radio communication

(u) 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 (iv) 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 flight crew member in air transportation; or

(ii) a meteorologist in an organisation providing operational control to aircraft in air transportation; or

(iii) an air traffic controller; or

(iv) 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) identify and to retrieve aeronautical data and other information relevant for the analysis of operational situations and risks;

(b) identify and evaluate the risk factors and the possible consequences for flight operations;

(c) identify and evaluate actions considering risk, the effect on flight safety and regularity of the operation;

(d) determine an appropriate course of action based on the responsibilities and policies described in the operation manuals;

(e) apply appropriate standard and non-standard procedures from the operations manual for the initiation, planning, continuation, diversion or termination of flights in the interest of safety of the aircraft and regularity and efficiency of the operation;

(f) make an accurate and operationally acceptable weather analysis; provide an operationally valid briefing on meteorological conditions of a specific air route; forecast weather trends pertinent to air transportation with particular reference to destinations and alternates;

(g) identify and apply operational limitations and minimums in relation to the weather, aircraft status and appropriate navigation procedures;

(h) determine the optimum flight path for a given segment, and create accurate manual and/or computer generated flight plans;

(i) provide operating supervision and all other assistance to a flight in actual or simulated adverse meteorological conditions, as appropriate to the duties of the holder of a flight operations officer licence; and

(j) recognize and manage threats and errors.

Note – Guidance material on the application of threat and error management is found in the Procedures for Air Navigation Services – Training (Doc 9868, PANS-TRG), Chapter 3, Attachment C, and in Part II, Chapter 2, of the Human Factors Training Manual (Doc 9683).

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 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, engines and systems; aircraft performances relevant to air traffic control operations;

Human performance

(d) human performance including principles of threat and error management;

Note – Guidance material to design training programmes on human performance, includind threat and error management, can be found in the Human Factors Training Manual (ICAO DOC 9683).

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 language 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

(a) The applicant shall have completed an approved training course and demonstrated the required competence, having accomplished not less than three months satisfactory service engaged in the actual control of air traffic under the supervision of an air traffic control on-the-job training instructor. 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;

(b) An air traffic controller acting as an air traffic control on-the-job training instructor shall hold an appropriate rating and be qualified as an air traffic control on-the-job training instructor.

(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

10. Reserved.

11. Reserved.

Flight operations officer

12. Flight operations officer licences issued by the Civil Aviation Authority may be, in principle, renewed for a periods not longer than 24 months. Before the expiry of the license, 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 licence, and the licence may be renewed, provided the applicant shall have exercised the appropriate privileges of the licence in the last 12 months preceding the expiry date of the license.

Aeronautical station operator

13. Aeronautical station operator licences issued by the Civil Aviation Authority may be, in principle, renewed for periods not longer than 24 months. If the licence holder applies for renewal, 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 renewal, 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.

16. Reserved.

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 this 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) demonstrated the required competence while providing an aerodrome control service, under the supervision of an air traffic control on-the-job training instructor for the aerodrome control rating, 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 application for a rating shall be made within six months from the completion of experience specified in sub-paragraph (1) (b) (ii).

(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 aerodrome(s) for which the rating is sought;

(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, including the recognition and management of threats and errors.

Note – Guidance material on the application of threat and error management is found in the Procedures for Air Navigation Services – Training (Doc 9868, PANS-TRG), Chapter 3, Attachment C, and in Part II, Chapter 2, of the Human Factors Training Manual (ICAO Doc 9683) and in Cir 314, Threat and Error Management (TEM) in Air Traffic Control.

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

20. Reserved.

21. Reserved.

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 for the aerodrome for which the licence holder is rated (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 that aerodrome 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 he/she has received proper authorization from the Civil Aviation Authority. The holder of an air traffic controller licence is required to 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:

   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 (vi).

   (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.

   (xiv) Universal Precaution Kit referred to in Scale FF.

4. **TABLE OF AIRCRAFT EQUIPMENT**

Aircraft and circumstances of flight	**Scale of equipment required**
(1) Aircraft flying for purpose <u>other</u> than commercial air transport category:	
(a) Minimum requirements on all flights	A, B (i) to (vii), B(ix), B(xiv), C, D, N and DD
(b) when flying under visual flight rules (VFR) within controlled airspace	E
(c) when flying under instrument flight rules (IFR)	E
(d) when flying at night	E and G
(e) when on flights over water	
(i) For aeroplanes	H
(ii) For helicopters	L
(f) when flying over designated land areas	S and W
(g) when flying in icing conditions	F
(h) when flying at a height of	
(i) 10,000 ft or more above mean sea level	K
(ii) 25,000 ft or more above mean sea level	CC
(i) when carrying out acrobatic flights	M
Requirements for aeroplanes only (other than commercial air transport category)	
(j) all seaplanes	I
(k) (i) all aeroplanes	P and U (ii)
(ii) all aeroplanes of maximum certificated take-off mass over 5,700 kg, or equipped with one or more turbine engine, or authorized to carry more than 9 passengers	O, B (xi) and (xii)

Aircraft and circumstances of flight	Scale of equipment required
(iii) all turbine-engined aeroplanes of maximum certificated take-off mass over 5,700kg or authorized to carry more than 19 passengers	Z
(l) Reserved.	
(m) Reserved.	
(n) Reserved.	
(o) when on long-range over-water flights in case of:	
(i) 50NM away from land suitable for making an emergency landing;	H
(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.	H and J
(p) when speed limitations are expressed in terms of Mach number	Y
Requirements for helicopters only (<u>other</u> than commercial air transport category)	
(q) all helicopters	L and P
(r) Reserved.	
(s) Reserved.	
(t) Reserved.	
(u) all helicopter required to operate with at least one cabin crew member after 18 November 2010	FF (i) and (v)
(2) Aircraft flying for the purpose of commercial air transport category:	
(a) minimum requirements:	
(i) all aircraft of maximum certificated take-off mass less than 1,150 kg on all flights	A, B (i) to (vii), B (ix), B (xi), B (xii), B (xiv), C, D, N and DD

Aircraft and circumstances of flight	Scale of equipment required
(ii) all aircraft of maximum certificated take-off mass over 1,150 kg up to and including 5,700 kg on all flights	A, B (i) to (vii), B (ix), B (xi), B (xii), B (xiv), C, D, N, V and DD
(iii) all aircraft of maximum certificated take-off mass over 5,700 kg on all flights	A, B, C, D, N, V and DD
(iv) all aircraft required to carry cabin crew as part of the operating crew after 18 November 2010	FF (i), (ii), (iii) and (iv) and DD
(b) when flying under visual flight rules (VFR) within controlled airspace	E
(c) when flying under instrument flight rules (IFR)	E
(d) when flying at night	E, G and BB
(e) when on flights over water	
(i) For aeroplanes	H and GG
(ii) For helicopters	L
(f) when flying over designated land areas	T
(g) flying in icing conditions	F
(h) when flying at a height of	
(i) 10,000 ft or more above mean sea level	
(A) un-pressurized aircraft	K
(B) pressurized aircraft	K and R
(ii) 25,000ft or more above mean sea level	CC
(iii) 49,000ft or more above mean sea level	X
(i) Reserved.	
Requirements for aeroplanes only (commercial air transport category)	

Aircraft and circumstances of flight	Scale of equipment required
(j) all seaplanes	I
(k) all aeroplanes of maximum certificated take-off mass over 5,700kg	O, Q and HH
(l) all aeroplanes	P and U (i)
(m) Reserved.	
(n) Reserved.	
(o) Reserved.	
(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: (i) 120 minutes at cruising speed or 400NM, whichever is the lesser, for aeroplanes capable of continuing the flight to an aerodrome with the critical engine(s) becoming inoperative at any point along the route or planned diversions; or (ii) 30 minutes at cruising speed or 100NM, whichever is the lesser, for all other aeroplanes.	J and DD
(r) when speed limitations are expressed in terms of Mach number	Y
Requirements for helicopters only (commercial air transport category)	
(s) all helicopters	L, O and P
(t) Reserved.	
(u) Reserved.	
(v) Reserved.	
(w) all helicopter required to operate with at least one cabin crew member.	FF (i) and (v)

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

(iii) (a) Subject to Scale B (ix), 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 (xi) 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) (a) 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.

(b) Any agent used in a built-in fire extinguisher for each lavatory disposal receptacle for towels, paper or waste in an aeroplane for which the individual certificate of airworthiness is first issued on or after 31 December 2011 and any extinguishing agent used in a portable fire extinguisher in an aeroplane for which the individual certificate of airworthiness is first issued on or after 31 December 2018 shall not be of a type listed in the 1987 *Montreal Protocol on Substances that Deplete the Ozone Layer* as it appears in the Eighth Edition of the *Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer*, Annex A, Group II.

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

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

Scale B.

(i) An aeroplane shall be equipped with accessible and adequate medical supplies including the following:

(a) one or more first-aid kits;

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

(ii) A helicopter shall be equipped with an accessible and adequate first-aid kit.

(iii) The number of first-aid kits should be appropriate to the number of passengers which the aeroplane is authorized to carry:

Number of Passenger	Number of First-aid kits
0 –100	1
101 – 200	2
201 – 300	3
301 – 400	4
401 – 500	5
More than 500	6

(iv) 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.

(v) The medical kit, when carried, should be stored in an appropriate secure location.

(vi) The first-aid kit required in sub-paragraphs (i)(a) and (ii) above shall include the following:

(a) List of contents of the first-aid-kit
(b) Antiseptic swabs (10/pack)
(c) Bandage: adhesive strips
(d) Bandage: gauze 7.5 cm × 4.5 m
(e) Bandage: triangular; safety pins
(f) Dressing: burn 10 cm × 10 cm
(g) Dressing: compress, sterile 7.5 cm × 12 cm
(h) Dressing: gauze, sterile 10.4 cm × 10.4 cm
(i) Tape: adhesive 2.5 cm (roll)
(j) Steri-strips (or equivalent adhesive strip)
(k) Hand cleanser or cleansing towelettes
(l) Pad with shield, or tape, for eye
(m) Scissors: 10 cm
(n) Tape: Adhesive, surgical 1.2 cm × 4.6 m
(o) Tweezers: splinter
(p) Disposable gloves (multiple pairs)
(q) Thermometers (non-mercury)
(r) Mouth-to-mouth resuscitation mask with one-way valve

(s) First-aid manual, current edition

(t) Incident record form

(vii) The medical kit required in sub-paragraph (i)(b) above shall include the following

(a) List of contents of the medical kit

(b) Stethoscope

(c) Sphygmomanometer (electronic preferred)

(d) Airways, oropharyngeal (three sizes)

(e) Syringes (appropriate range of sizes)

(f) Needles (appropriate range of sizes)

(g) Intravenous catheters (appropriate range of sizes)

(h) Antiseptic wipes

(i) Gloves (disposable)

(j) Needle disposal box

(k) Urinary catheter

(l) System for delivering intravenous fluids

(m) Venous tourniquet

(n) Sponge gauze

(o) Tape – adhesive

(p) Surgical mask

(q) Emergency tracheal catheter (or large gauge intravenous cannula)

(r) Umbilical cord clamp

(s) Thermometers (non-mercury)

(t) Basic life support cards

(u) Bag-valve mask

(v) Flashlight and batteries

(w) Drugs:

- Epinephrine 1:1 000
- Antihistamine – injectable
- Dextrose 50% (or equivalent) – injectable: 50 ml
- Nitroglycerin tablets, or spray
- Major analgesic
- Sedative anticonvulsant – injectable
- Antiemetic – injectable
- Bronchial dilator – inhaler
- Atropine – injectable
- Adrenocortical steroid – injectable

- Diuretic – injectable
- Medication for postpartum bleeding
- Sodium chloride 0.9% (minimum 250 ml)
- Acetyl salicylic acid (aspirin) for oral use
- Oral beta blocker

If a cardiac monitor is available (with or without an AED) add to the above list:

- Epinephrine 1:10 000 (can be a dilution of epinephrine 1:1 000)

(viii) 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.

(ix) 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. The safety harness shall incorporate a device which will automatically restrain the occupant's torso in the event of rapid deceleration or incapacitation of the occupant.

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

(x) If the pilot-in-command 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.

(xi) A forward or rearward facing (within 15° of the longitudinal axis of the aircraft) seat, fitted with a safety harness shall be provided for the use of each cabin crew member 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.

(xii) 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.

(xiii) For use by survivors, equipment for making pyrotechnical distress signals described in ICAO Annex 2.

(xiv) A seat or berth for each person of two years of age or more.

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) 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;

Note: Neither three-pointer nor drum-pointer altimeters satisfy the requirement in the above Scale E (iii).

(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);

Note: The requirements of the above Scale E (v), (vi) and (vii) 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.

(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) aeroplanes, fitted with electrical attitude indicating instruments, of which the maximum certificated take-off mass exceeds 5,700 kg and used for commercial air transport;

(b) aeroplanes, fitted with electrical attitude indicating instruments, of which the maximum certificated take-off mass exceeds 5,700 kg, or equipped with one or more turbine engine, or authorized to carry more than 9 passengers, and not used for commercial air transport;

(c) helicopters used for commercial air transport.

(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) 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.

(xiii) 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.

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 independent portable light for each member of the crew of the aircraft; or

(b) one independent portable light for each member of the flight crew of the aircraft and at least one independent portable light affixed adjacent to each floor level exit intended for the

disembarkation of passengers whether normally or in an emergency, provided that such independent portable lights 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.

(v) 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) One life jacket or an 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, equipped with a whistle and a means of electric illumination for the purpose of facilitating the location of persons;

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

(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;

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.

(i) A supply of oxygen and the associated equipment to meet the requirements set out in Part I of this Scale in the case of unpressurised aircraft and Part II of this Scale in the case of pressurised aircraft.

(ii) The duration for the purposes of this Scale is whichever is greater of:

(a) 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

(b) the period or periods during which the aircraft is actually flown in the circumstances specified in Parts I and II.

(iii) The aircraft:

(a) when flying above flight level 250;or

(b) when flying at or below flight level 250, being not capable of, at the time when a failure to maintain cabin pressurisation occurs, 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 flight level 130 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,

shall be equipped with automatically deployable oxygen equipment. The total number of oxygen dispensing units shall exceed the number of passenger and cabin crew member seats by at least 10 per cent.

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 120:

Supply for	**Duration**
(a) Members of the flight crew	Any period during which the aircraft flies above flight level 100.
(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 120, the duration shall be the period by which 30 minutes is exceeded.

(iii) When flying above flight level 120:

Supply for	**Duration**
(a) Members of the flight crew	Any period during which the aircraft flies above flight level 120
(b) Members of the cabin crew and all passengers	Any period during which the aircraft flies above flight level 120.

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:

Supply for	**Duration**
(a) Members of the flight crew	30 minutes or whenever the cabin pressure altitude exceeds 10,000 ft, whichever is the greater.
(b) Members of the cabin crew and 10% of 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 10,000ft, whichever is the greater.
	(B) When the aircraft is not so capable, whenever the cabin pressure altitude is greater than 10,000ft but is not more than 12,000 ft.

Supply for	Duration
(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 below, 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 12,000 ft, the duration shall be the period when the cabin pressure altitude exceeds 12,000 ft or 10 minutes, whichever is the greater.

(iii) When flying above flight level 250:

Supply for	Duration
(a) Members of the flight crew	2 hours or whenever the cabin pressure altitude exceeds 10,000ft, whichever is the greater.
(b) Members of the cabin crew	Whenever the cabin pressure altitude exceeds 10,000ft and a portable supply for 15 minutes.
(c) 10% of passengers	Whenever the cabin pressure altitude exceeds 10,000ft, but does not exceed 12,000 ft.
(d) 30% of passengers	Whenever the cabin pressure altitude exceeds 12,000 ft, but does not exceed 15,000 ft.
(e) All passengers	If the cabin pressure altitude exceeds 15,000 ft the duration shall be the period when the cabin pressure altitude exceeds 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 8,000 ft.

A 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 flight level 130 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.

Scale L.

(i) Means of flotation

(a) 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:

(A) flying over water at a distance from land corresponding to more than 10 minutes at normal cruise speed when operating in performance Class 1 or 2; or

(B) flying over water beyond autorotational or safe forced landing distance from land when operating in performance Class 3.

(ii) Emergency equipment

(a) Helicopters operating in performance Class 1 or 2 and operating in accordance with the provisions of sub-paragraph (i) shall be equipped with

(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. When two life-saving rafts are fitted, each should be able to carry all occupants in the overload state; and

Note.- The overload state is a design safety margin of 1.5 times the maximum capacity

(C) equipment for making the pyrotechnical distress signals.

(b) Helicopters operating in performance Class 3 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 flotation device, for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided.

(c) Helicopters operating in performance Class 3 when operating beyond the distance specified in sub-paragraph (ii) (b) shall be equipped as in sub-paragraph (ii) (a).

(d) When taking off or landing at a heliport where, 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 the discretion of the Civil Aviation Authority, the aircraft should carry the equipment mentioned in sub-paragraph (i) (a) and (ii) (a) (A), (B) and (C).

(e) 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.

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 meteorological 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.

Flight recorders which satisfies the requirements specified by the Civil Aviation Authority in the following aspects:

(a) capability of recording, by reference to a timescale, and retaining data;

(b) parameters or information to be recorded;

(c) type, construction, location and installation on aircraft;

(d) duration of the recording; and

(e) inspection requirements.

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) All passenger-carrying aeroplanes:

(a) of a maximum certificated take-off mass in excess of 54,500 kg; or

(b) of a maximum certificated take-off mass in excess of 45,500 kg with a passenger seating capacity greater than 19; or

(c) with a passenger seating capacity greater than 60 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) Requirements for aeroplanes operating for purpose of commercial air transport category

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

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

(A) excessive descent rate;

(B) excessive terrain closure rate;

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

(D) unsafe terrain clearance while not in landing configuration:

1) gear not locked down;

2) flaps not in a landing position; and

(E) excessive descent below the instrument glide path.

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

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

(e) All piston-engined aeroplanes of a maximum certificated take-off mass in excess of 5,700 kg or authorized to carry more than nine passengers shall be equipped with a ground proximity warning system which provides the warnings in (b) (A) and (C), warning of unsafe terrain clearance and a forward looking terrain avoidance function.

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

(ii) Requirements for aeroplanes operating for purpose of other than commercial air transport category

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

(b) A ground proximity warning system shall provide, at a minimum, warnings of at least the following circumstances:

(A) excessive descent rate;

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

(C) unsafe terrain clearance.

(c) A ground proximity warning system installed in turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than nine passengers for which the individual certificate of airworthiness was first issued after 1 January 2011 shall provide, as a minimum, warnings of at least the following circumstances:

(A) excessive descent rate;

(B) excessive terrain closure rate;

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

(D) unsafe terrain clearance while not in landing configuration;

1) gear not locked down;

2) flaps not in a landing position; and

(E) excessive descent below the instrument glide path.

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

(e) All turbine-engined aeroplanes of a maximum certificated take-off mass of 5,700 kg or less and authorized to carry more than five but not more than nine passengers should be equipped with a ground proximity warning system which has a forward-looking terrain avoidance function.

(f) All piston-engined aeroplanes of a maximum certificated take-off mass in excess of 5,700 kg or authorized to carry more than nine passengers should be equipped with a ground proximity warning system which has 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 pilot-in-command 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 5,700 kg or authorized to carry more than 19 passengers shall be equipped with an airborne collision avoidance system (ACAS II).

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

Scale AA.

Reserved.

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.

(ii) A device to provide positive warning to the flight crew of any dangerous loss of pressurization.

Scale DD.

(i) All 406 MHz ETLs installed or intended to be installed in a Macao registered aircraft shall be registered with the Civil Aviation Authority.

For aeroplane commercial air transport operations:

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

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

(iv) Except as provided for in (v) below, all aeroplanes authorized to carry 19 passengers or less shall be equipped with at least one ELT of any type.

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

(vi) ELT equipment carried to satisfy the requirements of (ii), (iii), (iv) and (v) above shall operate in accordance with the relevant provisions of ICAO Annex 10, Volume III.

For aeroplane other than commercial air transport operations:

(vii) Except as provided for in (viii) below, all aeroplanes shall be equipped with at least one ELT of any type.

(viii) All aeroplanes for which the individual certificate of airworthiness is first issued after 1 July 2008 shall be equipped with at least one automatic ELT.

(ix) ELT equipment carried to satisfy the requirements of (vii) and (viii) above shall operate in accordance with the relevant provisions of ICAO Annex 10, Volume III.

For helicopter:

(x) All helicopters operating in performance Class 1 and 2, as prescribed in paragraph 1 of the Eighteenth Schedule, shall be equipped with at least one automatic ELT and, when operating on flights over water in a hostile environment at a distance from land corresponding to more than 10 minutes at normal cruise speed when operating in performance class 1 and 2 shall be equipped with at least one automatic ELT and one ELT(S) in a raft or life jacket.

(xi) All helicopters operating in performance Class 3, as prescribed in paragraph 1 of the Eighteenth Schedule, shall be equipped with at least one automatic ELT and, when operating on flights over water beyond autorotational or safe forced landing distance from land when operation in performance class 3 shall be equipped with at least one automatic ELT and one ELT(S) in a raft or life jacket.

(xii) ELT equipment carried to satisfy the requirements of (x) and (xi) above shall operate in accordance with the relevant provisions of ICAO Annex 10, Volume III.

Scale EE.

Reserved.

Scale FF.

(i) Contents of Universal Precaution Kits

(a) Dry powder that can convert small liquid spill into a sterile granulated gel;

(b) Germicidal disinfectant for surface cleaning;

(c) Skin wipes;

(d) Face/eye mask (separate or combined);

(e) Gloves (disposable);

(f) Protective apron;

(g) Large absorbent towel;

(h) Pick-up scoop with scraper;

(i) Bio-hazard disposal waste bag;

(j) Instructions.

For aeroplanes under commercial air transport operations:

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

(iii) Additional kit(s) should be made available at times of increased public health risk, such as during an outbreak of a serious communicable disease having pandemic potential. Such kits may be used to clean up any potentially infectious body contents such as blood, urine, vomit and faeces and to protect the cabin crew who are assisting potentially infectious cases of suspected communicable disease.

(iv) Universal precaution kits should be distributed as evenly as practicable throughout the passenger cabins. They should be readily accessible to cabin crew members.

For helicopters:

(v) A universal precaution kit shall be carried on a helicopter that is required to operate with at least one cabin crew member. Such a kit may be used to clean up any potentially infectious body contents such as blood, urine, vomit and faeces and to protect the cabin crew who are assisting potentially infectious cases of suspected communicable disease.

Scale GG.

From 1 January 2018, all aeroplanes of a maximum certificated take-off mass of over 27,000 kg shall be equipped with a securely attached underwater locating device operating at a frequency of 8.8 kHz. This automatically activated underwater locating device shall operate for a minimum of 30 days and shall not be installed in wings or empennage.

Scale HH.

(i) All aeroplanes of a maximum certificated take-off mass of over 5,700 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2023, shall be equipped with robust and automatic means to autonomously transmit information from which a position can be determined by the operator at least once every minute when in distress.

(ii) An aeroplane in distress shall automatically activate the transmission of information from which its position can be determined by the operator and the position information shall contain a time stamp. It shall also be possible for this transmission to be activated manually. The system used for the autonomous transmission of position information shall be capable of transmitting that information in the event of aircraft electrical power loss, at least for the expected duration of the entire flight.

(iii) An aircraft is in a distress condition when it is in a state that, if the aircraft behaviour event is left uncorrected, can result in an accident. Autonomous transmission of position information shall be active when an aircraft is in a distress condition. This will provide a high probability of locating an accident site to within a 6 NM radius. The operator shall be alerted when an aircraft is in a distress condition with an acceptable low rate of false alerts. In case of a triggered transmission system, initial transmission of position information shall commence immediately or no later than five seconds after the detection of the activation event.

Note 1: Aircraft behaviour events can include, but are not limited to, unusual attitudes, unusual speed conditions, collision with terrain and total loss of thrust/propulsion on all engines and ground proximity warnings.

Note 2: A distress alert can be triggered using criteria that may vary as a result of aircraft position and phase of flight. Further guidance regarding in-flight event detection and triggering criteria may be found in the EUROCAE ED-237, Minimum Aviation System Performance Specification (MASPS) for Criteria to Detect In-Flight Aircraft Distress Events to Trigger Transmission of Flight Information.

(iv) When autonomous transmission of position information has been activated, it shall only be able to be deactivated using the same mechanism that activated it.

(v) The accuracy of position information shall, as a minimum, meet the position accuracy requirements established for ELTs.

SIXTH SCHEDULE

(Paragraph 13)

COMMUNICATION, NAVIGATION AND SURVEILLANCE 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 communication, navigation and surveillance equipment to be carried in aircraft set forth in paragraph 2, with the scales of equipment respectively indicated in that Table:

   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 COMMUNICATION, NAVIGATION AND SURVEILLANCE EQUIPMENT TO BE CARRIED IN AIRCRAFT**

Aircraft and circumstances of flight	**Scale of equipment required**									
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
(1) All aircraft within Macao:										
(a) when flying under Instrument Flight Rules (IFR) within controlled air space	**A**	**B** (c) only			**E**		G (a), (b) only			
(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***	**B*** (c) only			**E**		G (a), (b) only			
(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***						G (a), (b) only			
(d) when making an approach to landing at an aerodrome notified for the purpose of this sub-paragraph						**F***	G (a), (b) only			

Aircraft and circumstances of flight	Scale of equipment required									
(e) when flying at night	**A**						G (a), (b) only			
(f) on extended flights over water or on flights over designated land areas	**A**						G (a), (b) only			
(2) All aircraft registered in Macao:										
(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**						
(ii) on all other occasions	**A**	**B**	**C**							
(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**								
(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**								
(ii) over water, beyond gliding distance from any land	**A**									
(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 Reduced Vertical Separation Minimum (RVSM) of 300 m (1000 ft) is applied between FL 290 and FL 410 inclusive									**I**	

Aircraft and circumstances of flight	Scale of equipment required									
(f) for flights on an ATS route, on an approach procedure, or in a designated airspace, when PBC or PBS applies										**J**
(3) In respect of:										
(a) all helicopters	**A**	**B**	**C**		**E**		G (a), (b) only			
(b) all aeroplanes flying for the purpose other than commercial air transport category	**A**	**B**	**C****	**D** ***	**E**		G (a), (b) only			
(c) all aeroplanes flying for the purpose of commercial air transport category	**A**	**B**	**C**		**E**		G (a), (c) only			

* 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.

** Only for aeroplanes with a maximum certified take-off mass exceeding 5 700kg; or equipped with one or more turbojet engines; or with a seating configuration of more than 9 passenger seats.

*** When flying under Instrument Flight Rules (IFR) while making an approach to landing.

3. SCALES

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

Scale A.

(a) Radio equipment capable of maintaining two-way communication with the appropriate aeronautical radio stations.

(b) The radio communication equipment required in accordance with sub-paragraph (a) 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.

(c) 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:

(a) In accordance with its operational flight plan;

(b) In accordance with prescribed navigation specifications; and

(c) 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.

(d) 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 (a), (b) and (c).

(e) 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.

(f) A Macao AOC holder and an operator of a Macao registered aeroplane (with a maximum certified take-off mass exceeding 5 700kg; or equipped with one or more turbojet engines; or with a seating configuration of more than 9 passenger seats) shall not employ electronic navigation data products that have been processed for application in the air and on the ground unless the AOC holder has written procedures that are approved by the Civil Aviation Authority for ensuring:

(i) the process applied and the products delivered meet acceptable standards of integrity;

(ii) the products are compatible with the intended function of the equipment that will use them;

(iii) the timely distribution and insertion of current and unaltered electronic navigation data to all aircraft that require it; and

(iv) the continued monitoring of process and products in service.

Note: Guidance relating to the processes that data suppliers may follow is contained in RTCA DO-200A/EUROCAE ED-76 and RTCA DO-201A/EUROCAE ED-77.

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 at which a visual landing can be effected. This equipment shall be capable of providing such guidance at each

aerodrome at which it is intended to land in instrument meteorological conditions and at any designated alternate aerodrome.

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.

(a) Pressure-altitude transponder shall operate in accordance with the relevant provisions of ICAO Annex 10, Volume IV.

(b) Secondary surveillance radar equipment which includes a pressure altitude reporting transponder capable of operating in Mode A and Mode C and of being operated in accordance with such instructions as may be given to the aircraft by the appropriate air traffic control unit.

(c) Secondary surveillance radar equipment which includes a pressure altitude reporting transponder capable of operating in Mode S and with a data source that provides pressure altitude information with a resolution of 7.62 m (25 ft) or better, and of being operated in accordance with such instructions as may be given to the aircraft by the appropriate air traffic control unit. The Mode S Transponder should be provided with the airborne/on-the-ground status if the aeroplane is equipped with an automatic means of detecting such status.

Scale H.

Radio navigation equipment which is capable of:

(a) Continuously provides indications to the flight crew of adherence to or departure from track to the required degree of accuracy at any point along that track; and

(b) Has been authorized by the Civil Aviation Authority for MNPS operations concerned.

Scale I.

(a) Radio navigation equipment which is capable of:

(i) Indicating to the flight crew the flight level being flown;

(ii) automatically maintaining a selected flight level;

(iii) providing an alert to the flight crew when a deviation occurs from the selected flight level. The threshold for the alert shall not exceed ± 90 m (300 ft); and

(iv) automatically reporting pressure-altitude;

(b) The aircraft shall be authorized by the Civil Aviation Authority for operation in the airspace concerned;

(c) The aircraft shall demonstrate a vertical navigation performance in accordance with ICAO Annex 6 Part I Appendix 4 (or Part II Appendix 2, whichever is applicable); and

(d) 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 (a)(i), (ii), (iii) and (iv) above.

Scale J.

Such equipment capable of:

(a) meeting the applicable RCP specifications when PBC applies; and

(b) meeting the applicable RSP specification when PBS applies.

4. In this Schedule:

"Mode A" means the mode in which equipment is capable of replying to an interrogation from secondary surveillance radar units on the surface to elicit transponder replies for identity and surveillance with identity provided in the form of a 4 digit identity code;

"Mode C" means the mode in which equipment is capable of replying to an interrogation from secondary surveillance radar units on the surface to elicit transponder replies for automatic pressure-altitude transmission and surveillance;

"secondary surveillance radar equipment" means such type of radio equipment as may be notified as being capable of:

(i) replying to an interrogation from secondary surveillance radar units on the surface; and

(ii) being operated in accordance with such instructions as may be given to the aircraft by the appropriate air traffic control unit.

SEVENTH SCHEDULE

(Paragraph 15)

AIRCRAFT, ENGINE AND PROPELLER LOG BOOKS

1. **Aircraft Log book.**

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

(a) the name of the manufacturer, the type of the aircraft, the number assigned to it by the manufacturer 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 engine or variable pitch propeller.

2. **Engine Log book.**

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

(a) the name of the manufacturer, the type of the engine, the number assigned to it by the manufacturer and the date of the construction of the engine;

(b) the nationality and registration marks of each aircraft in which the engine 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 engine is run in flight, or, if the engine is run on more than one occasion on one day, the number of occasions and the total duration of the running of the engine on that day;

(e) particulars of all maintenance work done on the engine;

(f) particulars of any defects occurring in the engine, 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 engine 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 manufacturer, the type of the propeller, the number assigned to it by the manufacturer 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 engine, 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 this 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, renewing and using licences related to flight crew of aircraft in Macao. The Civil Aviation Authority may grant, validate or renew 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 meet the language proficiency requirements of the Civil Aviation Authority;

(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; and

(v) 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 renewed 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/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.

5. The holder of a pilot licence granted, validated or renewed 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 at a pilot station of an aircraft certified for operation by a single pilot but required by the Civil Aviation Authority 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. The Civil Aviation Authority may authorize that flight time be credited in full towards the total flight time required if the aircraft is equipped to be operated by a co-pilot and the aircraft is operated in a multi-crew operation;

(c) the holder of a pilot licence, when acting as co-pilot at a pilot station of an aircraft certified to be operated with a co-pilot, 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; and

(d) the holder of a pilot licence, when acting as pilot-in-command under supervision, 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 flight simulation training device for performing any manoeuvre required during the demonstration of skill for the grant, validation or renewal of a licence or rating in Macao shall be previously approved by the Civil Aviation Authority. The flight simulation training device 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. The privileges conferred by, and any ratings issued in any licence shall only be exercised when the licence, the appropriated ratings and the medical certificate are within their periods of validities, the language proficiency requirement referred in paragraph 2 (1) (c) of this Schedule is met, and the holder of the licence is not involved in any conditions which may forbid the holder from exercising the privileges of such licence or ratings.

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; altimeter setting procedures; appropriate air traffic services practices and procedures;

Aircraft general knowledge

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

(c) operating limitations of aeroplanes and engines; relevant operational information from the flight manual or other appropriate document;

Flight performance, planning and loading

(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 including principles of threat and error management;

Note: Guidance material to design training programmes on human performance, including threat and error management, can be found in the Human Factors Training Manual (ICAO Doc 9683).

Meteorology

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

Navigation

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

Operational procedures

(j) application of threat and error management principles to operational performance;

Note: Material on the application of threat and error management is found in Part II, Chapter 2 of the Human Factors Training Manual (ICAO Doc 9683).

(k) altimeter setting procedures;

(l) use of aeronautical documentation such as AIP, NOTAM, aeronautical codes and abbreviations;

(m) appropriate precautionary and emergency procedures, including action to be taken to avoid hazardous weather, wake turbulence and other operating hazards;

Principles of flight

(n) principles of flight relating to aeroplanes;

Radiotelephony

(o) communication 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, or 35 hours if completed during a course of approved training, as a pilot of aeroplanes appropriate to the class rating sought. The Civil Aviation Authority shall determine whether experience as a pilot under instruction in a flight simulation training device is acceptable as part of the total flight time of

40 hours or 35 hours, as the case may be. 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 extend 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;

(xi) operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures,

(xii) communication procedures and phraseology; and

(xiii) recognize and manage threats and errors.

Note: Material on the application of threat and error management is found in Part II, Chapter 2 of the Human Factors Training Manual (ICAO Doc 9683).

(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;

(e) maintain control of the aeroplane at all times in a manner such that the successful outcome of a procedure or manoeuvre is assured; and

(f) recognize and manage threats and errors.

Note: Material on the application of threat and error management is found in Part II, Chapter 2 of the Human Factors Training Manual (ICAO Doc 9683).

(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; altimeter setting procedures; appropriate air traffic services practices and procedures;

Aircraft general knowledge

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

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

Flight performance, planning and loading

(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 including principles of threat and error management;

Note: Guidance material to design training programmes on human performance, including threat and error management, can be found in the Human Factors Training Manual (ICAO Doc 9683).

Meteorology

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

Navigation

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

Operational procedures

(j) application of threat and error management principles to operational performance;

Note: Material on the application of threat and error management is found in Part II, Chapter 2 of the Human Factors Training Manual (ICAO Doc 9683).

(k) altimeter setting procedures;

(l) use of aeronautical documentation such as AIP, NOTAM, aeronautical codes and abbreviations;

(m) appropriate precautionary and emergency procedures, including action to be taken to avoid hazardous weather and wake turbulence; settling with power, ground resonance, retreating blade stall; dynamic roll-over and operating hazards, safety procedures, associated with flight in VMC;

Principles of flight

(n) principles of flight relating to helicopters;

Radiotelephony

(o) communication 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 or 35 hours if completed during a course of approved training, as pilot of helicopters. The Civil Aviation Authority shall determine whether experience as a pilot under instruction in a flight simulation training device is acceptable as part of the total flight time of 40 hours or 35 hours, as the case may be. 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 time with at least one 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;

(ix) operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures;

(x) communication procedures and phraseology; and

(xi) recognize and manage threats and errors.

Note: Material on the application of threat and error management is found in Part II, Chapter 2 of the Human Factors Training Manual (ICAO Doc 9683).

(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;

(e) maintain control of the helicopter at all times in a manner such that the successful outcome of a procedure or manoeuvre is assured; and

(f) recognize and manage threats and errors.

Note: Material on the application of threat and error management is found in Part II, Chapter 2 of the Human Factors Training Manual (ICAO Doc 9683).

(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 engines, systems and instruments;

(c) operating limitations of appropriate aeroplanes and engines; 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 engines of appropriate aeroplanes;

Flight performance, planning and loading

(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 commercial 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 including principles of threat and error management;

Note: Guidance material to design training programmes on human performance, including threat and error management, can be found in the Human Factors Training Manual (ICAO Doc 9683).

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;

(l) causes, recognition and effects of icing; frontal zone penetration procedures; hazardous weather avoidance;

Navigation

(m) 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

(n) application of threat and error management principles to operational performance;

Note: Material on the application of threat and error management is found in Part II, Chapter 2 of the Human Factors Training Manual (ICAO Doc 9683).

(o) use of aeronautical documentation such as AIP, NOTAM, aeronautical codes and abbreviations;

(p) altimeter setting procedures;

(q) appropriate precautionary and emergency procedures;

(r) operational procedures for carriage of freight; potential hazards associated with the carriage of dangerous goods;

(s) requirements and practices for safety briefing to passengers, including precautions to be observed when embarking and disembarking from aeroplanes;

Principles of flight

(t) principles of flight relating to aeroplanes;

Radiotelephony

(u) communication 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 flight simulation training device, 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 20 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 extend 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 with asymmetrical power for multi-engine class or type ratings;

(vi) flight at critically high airspeeds; recognition of, and recovery from, spiral dives;

(vii) normal and cross-wind take-offs and landings;

(viii) maximum performance (short field and obstacle clearance) take-offs; short-field landings;

(ix) basic flight manoeuvres and recovery from unusual attitudes by reference solely to basic flight instruments;

(x) cross-country flying using visual reference, dead-reckoning and radio navigation aids; diversion procedures;

(xi) abnormal and emergency procedures and manoeuvres including simulated aeroplane equipment malfunctions;

(xii) operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures;

(xiii) communication procedures and phraseology; and

(xiv) recognize and manage threats and errors.

Note: Material on the application of threat and error management is found in Part II, Chapter 2 of the Human Factors Training Manual (ICAO Doc 9683).

(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) (ix) 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;

(e) maintain control of the aeroplane at all times in a manner such that the successful outcome of a procedure or manoeuvre is assured; and

(f) recognize and manage threats and errors.

Note: Material on the application of threat and error management is found in Part II, Chapter 2 of the Human Factors Training Manual (ICAO Doc 9683).

(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 engines, transmission (power - trains), systems and instruments;

(c) operating limitations of appropriate helicopters and engines; relevant operational information from the flight manual or other appropriate document;

(d) use and serviceability checks of equipment and systems of appropriate helicopters;

(e) maintenance procedures for airframes, systems and engines of appropriate helicopters as well as transmission where applicable;

Flight performance, planning and loading

(f) effects of loading and mass distribution 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 commercial operations under VFR; preparation and filing of air traffic services flight plans; appropriate air traffic services procedures; altimeter setting procedures;

(i) effects of external loading on handling;

Human performance

(j) human performance relevant to the commercial pilot - helicopter including principles of threat and error management;

Note: Guidance material to design training programmes on human performance, including threat and error management, can be found in the Human Factors Training Manual (ICAO Doc 9683).

Meteorology

(k) interpretation and application of aeronautical meteorological reports, charts and forecasts; use of, and procedures for obtaining, meteorological information, pre-flight and in-flight; altimetry;

(l) 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;

(m) causes, recognition and effects of icing; frontal zone penetration procedures; hazardous weather avoidance;

Navigation

(n) 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

(o) application of threat and error management principles to operational performance;

Note: Material on the application of threat and error management is found in Part II, Chapter 2 of the Human Factors Training Manual (ICAO Doc 9683).

(p) use of aeronautical documentation such as AIP, NOTAM, aeronautical codes and abbreviations;

(q) altimeter setting procedures;

(r) appropriate precautionary and emergency procedures; settling with power, ground resonance, roll-over and other operating hazards; safety procedures, associated with flight in VMC;

(s) operational procedures for carriage of freight, including external loads; potential hazards associated with dangerous goods;

(t) requirements and practices for safety briefing to passengers, including precautions to be observed when embarking and disembarking from helicopters;

Principles of flight

(u) principles of flight relating to helicopters;

Radiotelephony

(v) communication 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 flight simulation training device, 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;

(xi) operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures;

(xii) communication procedures and phraseology; and

(xiii) recognize and manage threats and errors.

Note: Material on the application of threat and error management is found in Part II, Chapter 2 of the Human Factors Training Manual (ICAO Doc 9683).

(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) for the flight instruction 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;

(e) maintain control of the helicopter at all times in a manner such that the successful outcome of a procedure or manoeuvre is assured; and

(f) recognize and manage threats and errors.

Note: Material on the application of threat and error management is found in Part II, Chapter 2 of the Human Factors Training Manual (ICAO Doc 9683).

(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 an airline transport pilot licence - aeroplane, in at least the following subjects:

Air law

(a) rules and regulations relevant to the holder of an airline transport 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 engines; 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 in accordance with the relevant operational information from the flight manual;

(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 and electronic display units;

(g) maintenance procedures for airframes, systems and engines of appropriate aeroplanes;

Flight performance, planning and loading

(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 including principles of threat and error management;

Note: Guidance material to design training programmes on human performance, including threat and error management, can be found in the Human Factors Training Manual (ICAO Doc 9683).

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 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 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) application of threat and error management principles to operational performance;

Note: Material on the application of threat and error management is found in Part II, Chapter 2 of the Human Factors Training Manual (ICAO Doc 9683).

(u) 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;

(v) precautionary and emergency procedures; safety practices associated with flight under IFR;

(w) operational procedures for carriage of freight and dangerous goods;

(x) requirements and practices for safety briefing to passengers, including precautions to be observed when embarking and disembarking from aeroplanes;

Principles of flight

(y) 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

(z) communication procedures and phraseology; action to be taken in case of communication failure.

In addition to the above subjects, the applicant for an airline transport pilot licence – aeroplane shall have met the knowledge requirements for the instrument rating in paragraph 48.

(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 flight simulation training device, 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) 500 hours as pilot-in-command under supervision or 250 hours, either as pilot-in-command, or made up by not less than 70 hours as pilot-in-command and the necessary additional flight time as pilot-in-command under supervision, 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 pilot-in-command under supervision, 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 extend 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) (d) 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) abnormal and emergency procedures and manoeuvres related to failures and malfunctions of equipment, such as engine, system and airframe;

(iv) procedures for crew incapacitation and crew co-ordination, including allocation of pilot tasks, crew co-operation and use of checklists; and

(v) procedures and manoeuvres for instrument flight described in paragraph 48 (2) (c) to (d), including simulated engine failure.

(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 - aeroplanes, and to:

(i) recognize and manage threats and errors;

Note: Material on the application of threat and error management is found in Part II, Chapter 2 of the Human Factors Training Manual (ICAO Doc 9683).

(ii) smoothly and accurately manually control the aeroplane within its limitations at all times, such that the successful outcome of a procedure or manoeuvre is assured;

(iii) operate the aeroplane in the mode of automation appropriate to the phase of flight and to maintain awareness of the active mode of automation;

(iv) perform, in an accurate manner, normal, abnormal and emergency procedures in all phases of flight;

(v) exercise good judgement and airmanship, to include structured decision making and the maintenance of situational awareness; and

(vi) communicate effectively with the other flight crew members and demonstrate the ability to effectively perform procedures for crew incapacitation, crew coordination, including allocation of pilot tasks, crew cooperation, adherence to standard operating procedures (SOPs) and use of checklists.

(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, pressurization and other helicopter systems; flight control systems, including autopilot and stability augmentation;

(c) principles of operation, handling procedures and operating limitations of helicopter engines; transmission (power - trains); 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 helicopters; effects of atmospheric conditions on helicopter performance in accordance with the 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 and electronic display units;

(g) maintenance procedures for airframes, systems and engines of appropriate helicopters; transmission (power-trains) where applicable;

Flight performance, planning and loading

(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 including principles of threat and error management;

Note: Guidance material to design training programmes on human performance, including threat and error management, can be found in the Human Factors Training Manual (ICAO Doc 9683).

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 icing; frontal zone penetration procedures; 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) application of threat and error management principles to operational performance;

Note: Material on the application of threat and error management is found in Part II, Chapter 2 of the Human Factors Training Manual (ICAO Doc 9683).

(t) interpretation and use of aeronautical documentation such as AIP, NOTAM, aeronautical codes and abbreviations;

(u) precautionary and emergency procedure;

(v) operational procedures for carriage of freight, including external loads, and dangerous goods;

(w) requirements and practices for safety briefing to passengers, including precautions to be observed when embarking and disembarking from helicopters;

(x) settling with power; ground resonance; retreating blade stall; dynamic roll-over and other operation hazards; safety procedures, associated with flight in VMC;

Principles of flight

(y) principles of flight relating to helicopters;

Radiotelephony

(z) communication procedures and phraseology; action to be taken in case of communication failure.

In addition to the above subjects, the applicant for an airline transport pilot licence applicable to helicopter, shall have met the knowledge requirements for the instrument rating in paragraph 49.

(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 flight simulation training device, 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 70 hours as pilot-in-command and the necessary additional flight time as pilot-in-command under supervision, 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 pilot-in command under supervision, 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 plan;

(ii) normal flight procedures and manoeuvres during all phases of flight;

(iii) abnormal and emergency procedures and manoeuvres related to failures and malfunctions of equipment, such as engine, 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) recognize and manage threats and errors;

Note: Material on the application of threat and error management is found in Part II, Chapter 2 of the Human Factors Training Manual (ICAO Doc 9683).

(ii) smoothly and accurately manually control the helicopter within its limitations at all times, such that the successful outcome of a procedure or manoeuvre is assured;

(iii) operate the helicopter in the mode of automation appropriate to the phase of flight and to maintain awareness of the active mode of automation;

(iv) perform, in an accurate manner, normal, abnormal and emergency procedures in all phases of flight;

(v) exercise good judgement and airmanship, to include structured decision making and the maintenance of situational awareness; and

(vi) communicate effectively with the other flight crew members and demonstrate the ability to effectively perform procedures for crew incapacitation, crew coordination, including allocation of pilot tasks, crew cooperation, adherence to standard operating procedures (SOPs) and use of checklists.

(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, planning and loading

(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 including principles of threat and error management;

Note: Guidance material to design training programmes on human performance, including threat and error management, can be found in the Human Factors Training Manual (ICAO Doc 9683).

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) communication 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;

(d) communicate effectively with the other flight crew members; and

(e) recognize and manage threats and errors.

Note: Material on the application of threat and error management is found in Part II, Chapter 2 of the Human Factors Training Manual (ICAO Doc 9683).

(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 engines, 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 engines; 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, planning and loading

(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 including principles of threat and error management;

Note: Guidance material to design training programmes on human performance, including threat and error management, can be found in the Human Factors Training Manual (ICAO Doc 9683).

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) communication 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 assured;

(v) communicate effectively with the other flight crew members; and

(vi) recognize and manage threats and errors.

Note: Material on the application of threat and error management is found in Part II, Chapter 2 of the Human Factors Training Manual (ICAO Doc 9683).

(b) the use of a flight simulation training device 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 flight simulation training device 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.

(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 issued in Macao by the Civil Aviation Authority will remain in force for a period of 5 years, except the licences referred in paragraph 1 (h), (i) and (j) of this Schedule which 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. An instrument rating or an aircraft rating issued in the licence will be valid for 6 months including the remainder of the month. An instructor rating issued in the licence will be valid for 24 months. 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 met 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 65 years of age.

19. In the process of renewal of flight crew licences and ratings issued 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 or a rating which has expired cannot be back-dated and consequently any exercise of privileges in the intervening period would be illegal;

(b) a licence or a rating will be renewed for a period specific in paragraph 18 of this schedule, provided the requirements for the applicable licence or rating renewal established in this Schedule are met;

(c) it is essential that the application for renewal is received by the Civil Aviation Authority within two months before the date of expiry of the licence or the rating; and

(d) to renew a licence or a rating which has lapsed, an applicant may be required to complete a number and type of examinations and/or training which the Civil Aviation Authority deems

necessary and sufficient to ascertain the competency of the holder. The number and type of the examinations and/or training are dependent upon the nature of employment, the recent flight experience of the holder and the time elapsed since the licence or the rating has expired.

20. The Civil Aviation Authority, having issued, validated or renewed 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 checks completed under the supervision of the Civil Aviation Authority or any other authorised person;

(b) maintenance of competency of the ratings shall be satisfactorily recorded in the certificates as required by paragraphs 20 (2) (c) of Part IV to this regulation; and

(c) flight crew members may, to the extend deemed feasible by the Civil Aviation Authority, demonstrate their continuing competency in flight simulation training devices approved by the Civil Aviation Authority.

Requirements to renew a private pilot licence - Aeroplanes and helicopters

21. The holder of a valid private pilot licence (aeroplanes or helicopters) issued in Macao may apply for his/her renewal to the Civil Aviation Authority and such renewal 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 renewal, 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 hold a valid medical certificate obtained 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-renewed qualifications.

22. Whenever a holder of a private pilot licence (aeroplanes or helicopters) issued in Macao by the Civil Aviation Authority, let the privileges of his/her licence to expiry and wishes to apply for the renewal 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, and a valid aircraft rating issued or renewed by the Civil Aviation Authority according to the requirements established in this Schedule;

(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) complete any examination which the Civil Aviation Authority deems necessary for the holder to demonstrate that he/she still has the aeronautical knowledge required for the issuing of such licence; 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 in Macao may apply for his/her renewal to the Civil Aviation Authority and such renewal 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 renewal, 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 hold a valid medical certificate obtained 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-renewed qualifications.

24. Whenever a holder of a commercial pilot licence (aeroplanes or helicopters) issued in Macao by the Civil Aviation Authority, let the privileges of his/her licence to expiry and wishes to apply for the renewal 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, and a valid aircraft rating issued or renewed by the Civil Aviation Authority according to the requirements establish in this Schedule;

(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) complete any examination which the Civil Aviation Authority deems necessary for the holder to demonstrate that he/she still has the aeronautical knowledge required for the issuing of such licence; 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 in Macao may apply for his/her renewal to the Civil Aviation Authority and such renewal 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 renewal, 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 renewal, 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) or 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 hold a valid medical certificate obtained 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-renewed qualifications.

26. Whenever a holder of an airline transport pilot licence (aeroplanes or helicopters) issued in Macao by the Civil Aviation Authority, let the privileges of his/her licence to expiry and wishes to apply for the renewal 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, a valid aircraft rating and, in the case of an aeroplane licence, a valid instrument rating issued or renewed by the Civil Aviation Authority according to the requirements established in this Schedule;

(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) complete any examination which the Civil Aviation Authority deems necessary for the holder to demonstrate that he/she still has the aeronautical knowledge required for the issuing of such licence; 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 renewal to the Civil Aviation Authority and such renewal 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 renewal, 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 specified in 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-renewed 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 renewal 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 renewal to the Civil Aviation Authority and such renewal 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 renewal, 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-renewed 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 renewal 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 renewal to the Civil Aviation Authority and such renewal 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 renewal, 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-renewed 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 renewal 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 in Macao may apply for his/her renewal to the Civil Aviation Authority and such renewal may be granted if the following requirements are met:

(a) the applicant shall hold a valid pilot licence, including a valid aircraft rating of the type (or class) on which the flying instructor privilege to be exercised, issued or renewed by the Civil Aviation Authority according to the requirements established in this Schedule;

(b) the flight instructor rating - aeroplane and (or) helicopter may be, in principle, renewed 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) hold as part of the privileges of his/her licence. For the purpose of this type of rating renewal, 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-renewed qualifications.

34. Whenever a holder of a flight instructor rating - aeroplane and (or) helicopter issued in Macao by the Civil Aviation Authority, let the privileges of his/her licence rating to expiry and wishes to apply for the renewal of the rating, the applicant shall meet the following requirements:

(a) the applicant shall hold a valid pilot licence, including a valid aircraft rating of the type (or class) on which the flying instructor privilege to be exercised, issued or renewed by the Civil Aviation Authority according to 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 and aircraft rating – Aeroplanes and (or) helicopters

35. The holder of a valid instrument rating - aeroplane and (or) helicopter, or a valid aircraft rating – aeroplane and (or) helicopter, issued in Macao may apply for his/her rating renewal to the Civil Aviation Authority and such renewal may be granted if the following requirements are met:

(a) the applicant shall hold a valid pilot licence, including a valid aircraft rating in the case of an instrument rating renewal, issued or renewed by the Civil Aviation Authority according to the requirements established in this Schedule;

(b) for aircraft rating renewal, the applicant must demonstrate the proficiency towards the type (or class) of aircraft as endorsed in the aircraft rating by having completed satisfactorily a proficiency check for the aircraft rating, performed by the Civil Aviation Authority or a person so authorized by the Civil Aviation Authority;

(c) for instrument rating renewal, 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 renewal, 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 a proficiency check for the instrument rating, performed by the Civil Aviation Authority or a person so authorized by the Civil Aviation Authority. The proficiency checks for renewing the instrument rating and for the aircraft rating as stated in proviso (b) in this paragraph may be combined or performed separately;

(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-renewed qualifications.

36. Whenever a holder of an instrument rating - aeroplane and (or) helicopter, or an aircraft rating – aeroplane and (or) helicopter, issued in Macao by the Civil Aviation Authority, let the privileges of his/her licence rating to expiry and wishes to apply for the renewal of the rating, the applicant shall meet the following requirements:

(a) the applicant shall hold a valid pilot licence, including a valid aircraft rating in the case of an instrument rating renewal, issued or renewed 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) for instrument rating renewal, 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, skills and competence required for the issuing of such rating by completing any training and passing any test deemed necessary by the Civil Aviation Authority; 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 – a collective terms for class rating and type rating, shall entitle the holder of the licence to act as pilot only of aircraft of the types (or class) specified in the aircraft rating and different types (or class) 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:

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 (or class) as may be specified in the rating for that purpose.

Cruise relief pilot rating – shall entitle the holder of the licence to act as a pilot only during the cruise phase of the flight.

(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.

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 renewed 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 renewed 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 renewed 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.

Aircraft Rating (Class Rating or Type Rating)

41. The Civil Aviation Authority establishes the following class ratings to be incorporated in the pilots licences issued or validated in Macao, for aeroplanes certificated for single-pilot operation:

(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 pilot 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 renewed 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, or limiting the privileges to act as a pilot only during the cruise phase of the flight such limitations shall be endorsed on the rating.

Class rating and type rating

43A. 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 or type for which the rating is sought.

Specific requirement for type rating

44. The requirements established by the Civil Aviation Authority for the issue, validation or renewal 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 engine, 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) for the issue of an aeroplane category type rating, upset prevention and recovery training;

(v) procedures for crew incapacitation and crew co-ordination including allocation of pilot tasks; and

(vi) 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 flight simulation training devices for demonstrations of skill

The use of a flight simulation training device 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 flight simulation training device used is appropriate to the task. However, for the issue of a type rating, the applicant shall have demonstrated certain skills in flight in an aircraft of the type for which the rating is sought.

45. The Civil Aviation Authority, having issued, validated or renewed 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 renewed 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, including flight simulation training device as appropriate;

(j) analysis and correction of student errors;

(k) human performance relevant to flight instruction including principles of threat and error management; and

Note: Guidance material to design training programmes on human performance, including threat and error management, can be found in the Human Factors Training Manual (ICAO Doc 9683).

(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, electronic devices and instruments necessary for the control and navigation of aeroplanes under IFR and in instrument meteorological conditions; use and limitations of automation;

(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 including principles of threat and error management;

Note: Guidance material to design training programmes on human performance, including threat and error management, can be found in the Human Factors Training Manual (ICAO Doc 9683).

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 navigation systems;

(j) use, accuracy and reliability of navigation systems used in departure, en-route, approach and landing phases of flight; identification of navigation sources;

Operational procedures

(k) application of threat and error management to operational performance;

(l) 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;

(m) precautionary and emergency procedures; safety practices associated with flight under IFR; obstacle clearance criteria; and

Note: Information for pilots and flight operations personnel on flight procedure parameters and operational procedures is contained in PANS-OPS, volume I – Flight Procedures (ICAO Doc 8168). Procedures used in certain States or Regions may differ from PANS-OPS, and knowledge of these differences is important for safety reasons.

Radiotelephony

(n) communication 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 by reference solely 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) recognize and manage threats and errors;

Note: Guidance material to design training programmes on human performance, including threat and error management, can be found in the Human Factors Training Manual (ICAO Doc 9683).

(ii) operate the aeroplane within its limitations;

(iii) complete all manoeuvres with smoothness and accuracy;

(iv) exercise good judgement and airmanship;

(v) apply aeronautical knowledge; and

(vi) maintain control of the aeroplane at all times in a manner such that the successful outcome of a procedure or manoeuvre is assured;

(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 flight simulation training devices 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 including principles of threat and error management;

Note: Guidance material to design training programmes on human performance, including threat and error management, can be found in the Human Factors Training Manual (ICAO Doc 9683).

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) application of threat and error management to operational performance;

(l) 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;

(m) precautionary and emergency procedures; safety practices associated with flight under IFR; obstacle clearance criteria; and

Note: Information for pilots and flight operations personnel on flight procedure parameters and operational procedures is contained in PANS-OPS, volume I – Flight Procedures (ICAO Doc 8168). Procedures used in certain States or Regions may differ from PANS-OPS, and knowledge of these differences is important for safety reasons.

Radiotelephony

(n) communication 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, taxing 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 the privileges of the instrument rating are to be exercised on multi-engined helicopters, the applicant shall have received dual instrument flight instruction in such a helicopter from an authorized flight instructor. The instructor shall ensure that the applicant has operational experience in the operation of the helicopter 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 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:

(i) recognize and manage threats and errors.

Note: Guidance material to design training programmes on human performance, including threat and error management, can be found in the Human Factors Training Manual (ICAO Doc 9683).

(ii) operate the helicopter within its limitations;

(iii) complete all manoeuvres with smoothness and accuracy;

(iv) exercise good judgement and airmanship;

(v) apply aeronautical knowledge; and

(vi) maintain control of the helicopter at all times in a manner such that the successful outcome of a procedure or manoeuvre is assured;

(b) the applicant shall have demonstrated the ability to operate multi-engine helicopters 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 helicopters.

Note: Attention is called to paragraph 6 of this Schedule on the use of flight simulation training devices 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.

Cruise relief pilot rating

49A. (1) The Civil Aviation Authority requires an applicant in Macao for the incorporation of a cruise relief pilot rating in his/her pilot licence to undergo comprehensive type training that includes normal type technical ground training/examinations and flight training/test in a flight simulator approved by the Civil Aviation Authority for such purposes.

(2) The holder of a cruise relief pilot rating is restricted to operations above 20,000 ft only.

(3) The cruise relief pilot rating will be only available on approved aircraft type.

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 Macao SAR and any Contracting State concerned.

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 renewed 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 (or classes) 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 renewed 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 (or class) 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 proceeding 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 renewed 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 renewed 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 renewed 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.

Aircraft rating - Aeroplanes and (or) helicopters

56A. 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 aircraft rating - aeroplane and (or) helicopter, granted or renewed in Macao by the Civil Aviation Authority, are to act as a pilot on the class or type of aircraft specified in the aircraft rating.

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 renewed 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 renewed 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 renewed 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

Organisation

1. An operations manual, which may be issued in separate parts corresponding to specific aspects of operations, shall be organized with the following structure:

   (1) General;

   (2) Aircraft operating information;

   (3) Areas, routes and aerodromes; and

   (4) Training.

Contents

2. The operations manual shall contain at the least the following:

   (1) General

      (a) Administration and control of the operations manual;

      (b) Organisation and responsibilities;

      (c) Method of control and supervision of flight operations;

      (d) Information and policy relating to fatigue management including polices pertaining to flight time, flight duty period, duty period limitations and rest period requirements for flight and cabin crew members as required by regulations;

      (e) A list of the navigational equipment to be carried including any requirements relating to operations where performance-based navigation is prescribed;

      (f) Where relevant to the operations, the long-range navigation procedures, engine failure procedure for ETOPS and the nomination and utilization of diversion aerodromes;

      (g) The circumstances in which a radio listening watch is to be maintained;

      (h) The methods for determining minimum flight altitudes;

      (i) The methods for determining aerodrome operating minima;

      (j) Safety precautions during refueling with passengers on board;

(k) Ground handling arrangements and procedures;

(l) Procedures, as prescribed in ICAO Annex 12, for pilots-in-command observing an accident;

(m) The flight crew for each type of operation including the designation of the succession of command;

(n) Specific instructions for the computation of the quantities of fuel and oil to be carried, taking into account all circumstances of the operation including the possibility of loss of pressurization and the failure of one or more engines while en route;

(o) The conditions under which oxygen shall be used and the amount of oxygen determined in accordance with the regulations;

(p) Instructions for mass and balance control;

(q) Instructions for the conduct and control of ground de/anti-icing operations;

(r) The specifications for the operational flight plan;

(s) Standard operating procedures (SOPs) for each phase of flight;
Note: Guidance materials on the design and use of SOPs can be found in PANS-OPS (ICAO Doc 8168), Part III, Section 5.

(t) Instructions on the use of normal checklists and the timing of their use;

(u) Departure contingency procedures;

(v) Instructions on the maintenance of altitude awareness and the use of automated or flight crew altitude call-out;

(w) Instructions on the use of autopilots and auto-throttles in IMC;

(x) Instructions on the clarification and acceptance of air traffic control clearances, particularly where terrain clearance is involved;

(y) Departure and approach briefings;

(z) Procedures for familiarization with areas, routes and aerodromes;

(aa) Stabilized approach procedure (not applicable to helicopter operations);

(bb) Limitation on high rates of descent near the surface (not applicable to helicopter operations);

(cc) Conditions required to commence or to continue an instrument approach;

(dd) Instructions for the conduct of precision and non-precision instrument approach procedures;

(ee) Allocation of flight crew duties and procedures for the management of crew workload during night and IMC instrument approach operations;

(ff) 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);

(gg) Policy, instructions, procedures and training requirements for the avoidance of collisions and the use of the airborne collision avoidance system (ACAS);
Note: Procedures for the operation of ACAS are contained in PANS-OPS (ICAO Doc 8168), Volume I, and PANS-ATM (ICAO Doc 4444), Chapters 12 and 15.

(hh) 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.

(ii) 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:

1) the necessity of giving the appropriate ATS unit prior warning of the situation and of obtaining a provisional descent clearance; and

2) the action to be taken in the event that communication with the ATS unit cannot be established or is interrupted;
Note: Guidance material on the information to be provided is contained in ICAO Circular 126 – Guidance Material on SST Aircraft Operations.

(jj) Details of the safety management system (SMS) provided in accordance with regulations;

(kk) Information and instructions on the carriage of dangerous goods, including action to be taken in the event of an emergency;
Note: Guidance material on the development of policies and procedures for dealing with dangerous goods incidents on board aircraft is contained in Emergency Response Guidance for Aircraft Incidents involving Dangerous Goods (ICAO Doc 9481).

(ll) Security instructions and guidance;

(mm) The search procedure checklist;
Note: 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 aeroplane.

(nn) Instructions and training requirements for the use of head-up displays (HUD) and enhanced vision systems (EVS) equipment as applicable;

(oo) Instructions and training requirements for the use of the Electronic Flight Bag (EFB), as applicable;

(pp) Procedures for suspected communicable diseases.

(2) Aircraft operating information

(a) Certification limitations and operating limitations;

(b) The normal, abnormal and emergency procedures to be used by the flight crew, the checklists relating thereto and aircraft systems information as required;
Note: The Civil Aviation Authority generally accepts aircraft checklists from credible source, e.g. the aircraft manufacturer.

(c) Operating instructions and information on climb performance with all engines operating;

(d) Flight planning data for pre-flight and in-flight planning with different thrust/power and speed settings;

(e) The maximum crosswind and tailwind components for each aeroplane type operated and the reductions to be applied to these values having regard to gusts, low visibility, runway surface conditions, crew experience, use of autopilot, abnormal or emergency circumstances, or any other relevant operational factors;

(f) Instructions and data for mass and balance calculations;

(g) Instructions for aircraft loading and securing of load;

(h) Aircraft systems, associated controls and instructions for their use;

(i) The minimum equipment list and configuration deviation list for the aircraft types operated and specific operations authorized, including any requirements relating to operations where performance-based navigation is prescribed;

(j) Checklist of emergency and safety equipment and instructions for its use;

(k) Emergency evacuation procedures, including type-specific procedures, crew coordination, assignment of crew's emergency positions and the emergency duties assigned to each crew member;

(l) The normal, abnormal and emergency procedures to be used by the cabin crew, the checklists relating thereto and aircraft systems information as required, including a statement related to the necessary procedures for the coordination between flight and cabin crew;

(m) Survival and emergency equipment for different routes and the necessary procedures to verify its normal functioning before take-off, including procedures to determine the required amount of oxygen and the quantity available;

(n) The ground-air visual signal code for use by survivors, as contained in ICAO Annex 12.

(3) Routes and aerodromes

(a) A route guide to ensure that the flight crew will have, for each flight, information relating to communication facilities, navigation aids, aerodromes, instrument approaches, instrument arrivals and instrument departures as applicable for the operation, and such other information as the operator may deem necessary for the proper conduct of flight operations;

(b) The minimum flight altitudes for each route to be flown;

(c) Aerodrome operating minima for each of the aerodromes that are likely to be used as aerodromes of intended landing or as alternate aerodromes;

(d) The increase of aerodrome operating minima in case of degradation of approach or aerodrome facilities;

(e) Instructions for determining aerodrome operating minima for instrument approaches using HUD and EVS;

(f) The necessary information for compliance with all flight profiles required by regulations, including but not limited to, the determination of:

(i) take-off runway length requirements for dry, wet and contaminated conditions, including those dictated by system failures which affect the take-off distance;

(ii) take-off climb limitations;

(iii) en-route climb limitations;

(iv) approach climb limitations and landing climb limitations;

(v) landing runway length requirements for dry, wet and contaminated conditions, including systems failures which affect the landing distance; and

(vi) supplementary information, such as tire speed limitations.

(4) Training

(a) Details of the flight crew training program;

(b) Details of the cabin crew duties training program;

(c) Details of the flight operations officer/flight dispatcher training program when employed in conjunction with a method of flight supervision.

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 lifesaving 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 organisation 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 simulation training device.

(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 of intended landing and any alternate aerodrome, 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 simulation training device; 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 or in an approved flight simulation training device for the purpose within the preceding 90 days.

(f) Every pilot who acts in the capacity of cruise relief pilot shall have within the preceding 90 days:

(i) operated as a pilot-in-command, co-pilot or cruise relief pilot on the same type of aeroplane; or

(ii) carried out flying skill refresher training including normal, abnormal and emergency procedures specific to cruise flight on the same type of aeroplane or in a flight simulation training device approved for the purpose, and has practiced approach and landing procedures, where the approach and landing procedure practice may be performed as the pilot who is not flying the aeroplane.

(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 pilot-in-command

(a) The pilot designated as pilot-in-command 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 of take-off and landing, and any alternate aerodromes, 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 pilot-in-command 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 of take-off and intended landing and at alternate aerodromes;

(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 of intended landing and any alternate aerodromes;

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

(a) the approach to the aerodrome is not over difficult terrain and the instrument approach procedures and aids available are similar to those with which the pilot is familiar, and a margin to be approved by the Civil Aviation Authority is added to the normal operating minima, or there is reasonable certainty that approach and landing can be made in visual meteorological conditions; or

(b) the descent from the initial approach altitude can be made by day in visual meteorological conditions; or

(c) the operator qualifies the pilot-in-command to land at the aerodrome concerned by means of an adequate pictorial presentation; or

(d) the aerodrome concerned is adjacent to another aerodrome at which the pilot-in-command is currently qualified to land.

(7) For the purposes of this paragraph:

Instrument flight conditions mean meteorological 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), (2) (d) (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 pilot-in-command 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)

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 LANDING LOCATION OPERATING MINIMA

[Paragraph 28 (3)]

Aerodrome or landing location operating minima for take-off, approach and landing by commercial air transport aircraft registered in Macao.

(1) In compliance with paragraph 24 (2) of this Regulation, the operator of every aircraft to which this Schedule applies shall establish and specify in the Operations manual relating to the aircraft particulars of aerodrome or landing location operating minima appropriate to every aerodrome or landing location of intended departure or landing and every alternate aerodrome.

Provided that:

(a) in respect of aerodromes or landing locations 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 landing location operating minima can be calculated by the pilot-in-command of the aircraft; and

(b) in respect of aerodromes or landing locations at which meteorological observations cannot be communicated to the pilot-in-command of an aircraft in flight, it shall be sufficient to include in the approved Operations manual, general directions to pilots concerning aerodrome or landing location operating minima for safe operation.

(2) The method of determination of aerodrome or landing location operating minima shall be approved by the Civil Aviation Authority. Such minima shall not be lower than any that may be established for such aerodromes or landing locations by the State of the Aerodrome except when specifically approved by that State or Region.

(3) In establishing the operating minima for each aerodrome or landing location which will apply to any particular operation, the operator shall take full account of:

(a) the type, performance and handling characteristics of the aircraft and any conditions or limitations stated in the flight manual;

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

(c) the dimensions and characteristics of the runways which may be selected for use for aeroplanes or the physical characteristics of the heliport and direction of approach 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 acquisition of visual references and/or control of the flight path during the approach landing and the missed approach;

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

(g) the means used to determine and report meteorological conditions;

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

(i) the conditions prescribed in the operations specifications; and

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

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

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

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

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

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

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

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

operation or an operation with a DH in the range of CAT II but with an RVR in the range of CAT I would be considered a CAT II operation).

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

(5) Low visibility operations shall not be conducted except with the specific approval of the Civil Aviation Authority. Instrument approach operations in low visibility and aerodrome or landing location operating minima below 800 m visibility shall only be conducted when RVR information or an accurate measurement or observation of visibility is provided.

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

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

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

(9) 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 or in the intended area of operations under VFR will, at the appropriate time, be such as to enable compliance with these rules.

(10) A flight to be conducted in accordance with the instrument flight rules (IFR):

Applicable to aeroplanes only

(a) shall not take off from the departure aerodrome unless the meteorological conditions, at the time of use, are at or above the operator's established aerodrome operating minima for that operation; and

(b) shall not take off or continue beyond the point of in-flight re-planning unless at the aerodrome of intended landing or at each alternate aerodrome to be selected in compliance with paragraph 26 (1C) of this Regulation, current meteorological reports or a combination of current reports and forecasts indicate that the meteorological conditions will be, at the estimated time of use, at or above the operator's established aerodrome operating minima for that operation.

Applicable to helicopters only

(c) shall not be commenced unless information is available which indicates that conditions at the destination heliport or landing location or, when an alternate is required, at least one alternate heliport will, at the estimated time of arrival, be at or above the heliport operating minima.

(11) A flight shall not be continued towards the aerodrome of intended landing, unless the latest available information indicates that at the expected time of arrival, a landing can be effected at that

aerodrome or at least one destination alternate aerodrome, in compliance with the operating minima established in accordance with sub-paragraphs (1) to (8) above.

(12) An instrument approach shall not be continued below 300 m (1 000 ft) above the aerodrome elevation or into the final approach segment unless the reported visibility or controlling RVR is at or above the aerodrome operating minima.

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

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

(14) All aircraft registered in Macao operated in accordance with instrument flight rules (IFR) shall comply with the instrument flight procedures approved and promulgated by the State or Region in which the aerodrome is located.

(15) Noise abatement procedures specified by an operator for any one aircraft type registered in Macao should be the same for all aerodromes utilized by that operator.

Note. – Aeroplane operating procedures for noise abatement should comply with the provisions of PANS-OPS (ICAO Doc 8168), Volume I.

PART E – FUEL POLICY REQUIREMENTS

Paragraph 26 (11)

Fuel Policy – Commercial Air Transportation (Aeroplanes)

1. (1) In establishing fuel policy for the purpose of flight planning and in-flight re-planning, the amount of usable fuel to be carried shall, as a minimum, be based on:

(a) the following data:

(i) current aeroplane-specific data derived from a fuel consumption monitoring system, if available; or

(ii) if current aeroplane-specific data are not available, data provided by the aeroplane manufacturer;

(b) the procedure contained in or derived from the Operations Manual; and

(c) the operating conditions for the planned flight including:

(i) anticipated aeroplane mass;

(ii) Notices to Airmen;

(iii) current meteorological reports or a combination of current reports and forecasts;

(iv) air traffic services procedures, restrictions and anticipated delays; and

(v) the effects of deferred maintenance items and/or configuration deviations.

(2) The usable fuel to be on board for departure shall be the sum of the following:

(a) Taxi fuel, which shall be the amount of fuel expected to be consumed before take-off, taking into account local conditions at the departure aerodrome and auxiliary power unit (APU) fuel consumption;

(b) Trip fuel, which shall be the amount of fuel required to enable the aeroplane to fly from take-off or the point of in-flight re-planning until landing at the destination aerodrome taking into account the operating conditions of sub-paragraph (1) (c) above;

(c) Contingency fuel, which shall be the amount of fuel required to compensate for unforeseen factors. It shall be 5 % of the planned trip fuel or of the fuel required from the point of in-flight re-planning based on the consumption rate used to plan the trip fuel but in any case shall not be lower than the amount required to fly for five minutes at holding speed at 450 m (1 500 ft) above the destination aerodrome in standard conditions;

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

(d) Destination alternate fuel, which shall be:

(i) where a destination alternate aerodrome is required, the amount of fuel required to enable the aeroplane to:

(A) perform a missed approach at the destination aerodrome;
(B) climb to the expected cruising altitude;
(C) fly the expected routing;
(D) descend to the point where the expected approach is initiated; and
(E) conduct the approach and landing at the destination alternate aerodrome; or

(ii) where two destination alternate aerodromes are required, the amount of fuel, as calculated in sub-paragraph (2) (d) (i) above, required to enable the aeroplane to proceed to the destination alternate aerodrome which requires the greater amount of alternate fuel; or

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

(iv) where the aerodrome of intended landing is an isolated aerodrome:

(A) for a reciprocating engine aeroplane, the amount of fuel required to fly for 45 minutes plus 15 % of the flight time planned to be spent at cruising level, including final reserve fuel, or two hours, whichever is less; or

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

(e) Final reserve fuel, which shall be the amount of fuel calculated using the estimated mass on arrival at the destination alternate aerodrome, or the destination aerodrome when no destination alternate aerodrome is required:

(i) for a reciprocating engine aeroplane, the amount of fuel required to fly for 45 minutes, under speed and altitude conditions specified by the Civil Aviation Authority; or

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

(f) Additional fuel, which shall be the supplementary amount of fuel required if the minimum fuel calculated in accordance with sub-paragraphs (2) (b) to (e) above is not sufficient to:

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

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

(B) make an approach and landing;

(ii) allow an aeroplane engaged in extended range operations by aeroplanes with two turbine engines (ETOPS) to comply with the ETOPS critical fuel scenario as established by the Civil Aviation Authority;

(iii) meet additional requirements not covered above;

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

(3) Notwithstanding the provisions in sub-paragraphs (2) (a) to (d) and (f) above, the Civil Aviation Authority may, based on the results of a specific safety risk assessment conducted by the operator which demonstrates how an equivalent level of safety will be maintained, approve variations to the pre-flight fuel calculation of taxi fuel, trip fuel, contingency fuel, destination alternate fuel, and additional fuel. The specific safety risk assessment shall include at least the:

(a) flight fuel calculations;

(b) capabilities of the operator to include:

(i) a data-driven method that includes a fuel consumption monitoring programme; and/or

(ii) the advanced use of alternate aerodromes; and

(c) specific mitigation measures.

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

Fuel Policy - Commercial Air Transportation (Helicopters)

2. (1) In establishing fuel policy for the purpose of flight planning and in-flight re-planning, the fuel and oil to be carried shall consider at least the following:

(a) meteorological conditions forecast:

(b) expected air traffic control routings and traffic delays;

(c) for IFR flight, one instrument approach at the destination heliport, including a missed approach;

(d) the procedures prescribed in the operations manual for loss of pressurization, where applicable, or failure of one engine while en route; and

(e) any other conditions that may delay the landing of the helicopter or increase fuel and/or oil consumption.

(2) The usable fuel to be on board for departure shall be the sum of the following:

(a) Taxi fuel, which shall not be less than the amount, expected to be used prior to take-off. Local conditions at the departure heliport or landing location and APU consumption shall be taken into account.

(b) Trip fuel, which shall include:

(iii) fuel for take-off and climb from heliport or landing location elevation to initial cruising level/altitude, taking into account the expected departure routing;

(iv) fuel from top of climb to top of descent, including any step climb/descent;

(v) fuel from top of descent to the point where the approach procedure is initiated, taking into account the expected arrival procedure; and

(vi) fuel for approach and landing at the destination heliport or landing location.

(c) Contingency fuel, which shall 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) Destination alternate fuel, which shall be sufficient for:

(i) a missed approach from the applicable MDA/DH at the destination heliport or landing location 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 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 heliport;

(e) Final reserve fuel, which shall 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 450 m (1 500 ft) above the destination heliport or landing location in standard conditions calculated with the estimated mass on arrival above the alternate, or the destination, when no alternate is required;

(f) Additional fuel, if required by the type of operation;

(g) Discretionary fuel, which shall be at the discretion of the pilot-in-command.

(3) Isolated heliport or landing location IFR procedure. If an operator's fuel policy includes planning to an isolated heliport or landing location 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 shall include:

(a) Taxi fuel;

(b) Trip fuel;

(c) Contingency fuel calculated in accordance with sub-paragraph (2)(c) above;

(d) Additional fuel to fly for two hours at holding speed including final reserve fuel; and

(e) Discretionary fuel at the discretion of the pilot-in-command.

(4) Sufficient fuel shall be carried at all times to ensure that following the failure of an engine occurring at the most critical point along the route, the helicopter is able to:

(a) descent as necessary and proceed to an adequate heliport or landing location;

(b) hold there for 15 minutes at 450 m (1 500 ft) above heliport or landing location elevation in standard conditions; and

(c) make an approach and landing.

PART F – MINIMUM EQUIPMENT LIST

[Paragraphs 14 (2) (b) and 30 (b) (i) (ii)]

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 pilot-in-command to determine whether a flight may be commenced or continued from any intermediate stop should any instrument, equipment or systems become inoperative. Where the 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 Region 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 organisation 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 Region 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 pilot-in-command 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 55 and 58)

1. DOCUMENTS TO BE CARRIED BY AIRCRAFT REGISTERED IN MACAO

Documents to be carried on board	Types of document
1. On a flight for the purpose of commercial air transport.	**A, B, C, D, E, F, H, J and O**
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, J, L, M, N and O**
3. On a flight for the purpose of aerial work.	**A, B, C, D, E, F, J and O**
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, J, M, N and O**
5. On a flight, being international air navigation, for a purpose **other** than commercial air transport or aerial work.	**A, B, C, G, H, I, J, M, N and O**
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 and O**

2. For the purposes of this Schedule:

Document A means the Aircraft station licence in force in respect of that aircraft referred to in paragraph 13(6) of this Regulation.

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 (3) 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, as prescribed in ICAO Annex 2, to be followed by the pilot-in-command of an intercepted aircraft, and the notified visual signals, as contained in ICAO Annex 2, for use by intercepting and intercepted aircraft:

Document J means the 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.

Document L means a certified true copy of the AOC and its operations specifications.

Document M means a list of passenger names and places of embarkation and destination, if the aircraft carries passengers.

Document N means a manifest and detailed declarations of the cargo, if the aircraft carries cargo.

Document O means a Journey Log accepted by the Civil Aviation Authority.

Note: International air navigation means any flight which includes passage over the territory of any State or Region other than Macao.

ELEVENTH SCHEDULE

(Paragraph 61)

RULES OF THE AIR AND AIR TRAFFIC CONTROL

PART I – APPLICABILITY OF THE RULES OF THE AIR

Application of the rules of the air

1. (1) This Schedule, insofar as they are applicable in relation to aircraft, shall, subject to rule 13 (1), apply in relation to:

(a) all aircraft whilst in Macao; and

(b) all Macao aircraft, wherever they may be, to the extent that they do not conflict with the rules published by the State or Region having jurisdiction over the area overflown.

(2) For purposes of flight over those parts of the high seas where a State has accepted, pursuant to a regional air navigation agreement, the responsibility of providing air traffic services, the "appropriate ATS authority" referred to in this Schedule is the relevant authority designated by the State responsible for providing those services.

Compliance with the rules of the air

2. The operation of an aircraft either in flight or on the movement area of an aerodrome shall be in compliance with the general rules and, in addition, when in flight, either with:

(a) the visual flight rules; or

(b) the instrument flight rules.

Responsibility for compliance with the rules of the air

3. (1) Responsibility of pilot-in-command

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

(2) Pre-flight action

Before beginning a flight, the pilot-in-command of an aircraft shall become familiar with all available information appropriate to the intended operation. Pre-flight action for flights away from the vicinity of an aerodrome, and for all IFR flights, shall include a careful study of available current weather reports and forecasts, taking into consideration fuel requirements and an alternative course of action if the flight cannot be completed as planned.

Authority of pilot-in-command of an aircraft

4. The pilot-in-command of an aircraft shall have final authority as to the disposition of the aircraft while in command.

Problematic use of psychoactive substances

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

PART II – GENERAL RULES

Protection of persons and property

6. (1) Negligent or reckless operation of aircraft

An aircraft shall not be operated in a negligent or reckless manner so as to endanger life or property of others.

(2) Minimum heights

Except when necessary for take-off or landing, or except by permission from the Civil Aviation Authority, aircraft shall not be flown over the congested areas of cities, towns or settlements or over an open-air assembly of persons, unless at such a height as will permit, in the event of an emergency arising, a landing to be made without undue hazard to persons or property on the surface.

(3) Cruising levels

The cruising levels at which a flight or a portion of a flight is to be conducted shall be in terms of:

(a) flight levels, for flights at or above the lowest usable flight level or, where applicable, above the transition altitude;

(b) altitudes, for flights below the lowest usable flight level or, where applicable, at or below the transition altitude.

(4) Dropping or spraying

Nothing shall be dropped or sprayed from an aircraft in flight except under conditions prescribed by the Civil Aviation Authority and as indicated by relevant information, advice and/or clearance from the appropriate air traffic services unit.

(5) Towing

No aircraft or other object shall be towed by an aircraft, except in accordance with requirements prescribed by the Civil Aviation Authority and as indicated by relevant information, advice and/or clearance from the appropriate air traffic services unit.

(6) Parachute descents

Parachute descents, other than emergency descents, shall not be made except under conditions prescribed by the Civil Aviation Authority and as indicated by relevant information, advice and/or clearance from the appropriate air traffic services unit.

(7) Acrobatic flight

No aircraft shall be flown acrobatically except under conditions prescribed by the Civil Aviation Authority and as indicated by relevant information, advice and/or clearance from the appropriate air traffic services unit.

(8) Formation flights

Aircraft shall not be flown in formation except by pre-arrangement among the pilots-in-command of the aircraft taking part in the flight and, for formation flight in controlled airspace, in accordance with the conditions prescribed by the Civil Aviation Authority. These conditions shall include the following:

(a) the formation operates as a single aircraft with regard to navigation and position reporting;

(b) separation between aircraft in the flight shall be the responsibility of the flight leader and the pilots-in-command of the other aircraft in the flight and shall include periods of transition when aircraft are manoeuvring to attain their own separation within the formation and during join-up and breakaway; and

(c) a distance not exceeding 1 km (0.5 NM) laterally and longitudinally and 30 m (100 ft) vertically from the flight leader shall be maintained by each aircraft.

(9) Remotely piloted aircraft

A remotely piloted aircraft shall be operated in such a manner as to minimize hazards to persons, property or other aircraft and in accordance with the conditions prescribed by the Civil Aviation Authority.

(10) Prohibited areas and restricted areas

Aircraft shall not be flown in a prohibited area, or in a restricted area, the particulars of which have been duly published, except in accordance with the conditions of the restrictions or by permission of the State or Region over whose territory the areas are established.

Avoidance of collisions

7. (1) Nothing in these rules shall relieve the pilot-in-command of an aircraft from the responsibility of taking such action, including collision avoidance manoeuvres based on resolution advisories provided by ACAS equipment, as will best avert collision.

(a) Proximity

An aircraft shall not be operated in such proximity to other aircraft as to create a collision hazard.

(b) Right-of-way

The aircraft that has the right-of-way shall maintain its heading and speed.

(i) An aircraft that is obliged by the following rules to keep out of the way of another shall avoid passing over, under or in front of the other, unless it passes well clear and takes into account the effect of aircraft wake turbulence.

(ii) Approaching head-on. When two aircraft are approaching head-on or approximately so and there is danger of collision, each shall alter its heading to the right.

(iii) Converging. When two aircraft are converging at approximately the same level, the aircraft that has the other on its right shall give way, except as follows:

(A) power-driven heavier-than-air aircraft shall give way to airships, gliders and balloons;

(B) airships shall give way to gliders and balloons;

(C) gliders shall give way to balloons;

(D) power-driven aircraft shall give way to aircraft which are seen to be towing other aircraft or objects.

(iv) Overtaking. An overtaking aircraft is an aircraft that approaches another from the rear on a line forming an angle of less than 70 degrees with the plane of symmetry of the latter, i.e. is in such a position with reference to the other aircraft that at night it should be unable to see either of the aircraft's left (port) or right (starboard) navigation lights. An aircraft that is being overtaken has 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 its heading to the right, and no subsequent change in the relative positions of the two aircraft shall absolve the overtaking aircraft from this obligation until it is entirely past and clear.

(v) Landing

(A) An aircraft in flight, or operating on the ground or water, shall give way to aircraft landing or in the final stages of an approach to land.

(B) When two or more heavier-than-air aircraft are approaching an aerodrome for the purpose of landing, aircraft at the higher level shall give way to aircraft at the lower level, but the latter shall not take advantage of this rule to cut in in front of another which is in the final stages of an approach to land, or to overtake that aircraft. Nevertheless, power-driven heavier-than-air aircraft shall give way to gliders.

(C) 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.

(D) When the pilot-in-command 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.

(vi) Taking off. An aircraft taxiing on the manoeuvring area of an aerodrome shall give way to aircraft taking off or about to take off.

(vii) Surface movement of aircraft

(A) In case of danger of collision between two aircraft taxiing on the movement area of an aerodrome the following shall apply:

I. when two aircraft are approaching head on, or approximately so, each shall stop or where practicable alter its course to the right so as to keep well clear;

II. when two aircraft are on converging courses, the one which has the other on its right shall give way;

III. an aircraft which is being overtaken by another aircraft shall have the right-of-way and the overtaking aircraft shall keep well clear of the other aircraft.

(B) An aircraft taxiing on the manoeuvring area shall stop and hold at all runway-holding positions unless otherwise authorized by the aerodrome control tower.

(C) An aircraft taxiing on the manoeuvring area shall stop and hold at all lighted stop bars and may proceed further when the lights are switched off.

(2) Lights to be displayed by aircraft

(a) Except as provided by sub-paragraph (2) (g), from sunset to sunrise or during any other period which may be prescribed by the Civil Aviation Authority all aircraft in flight shall display:

(i) anti-collision lights intended to attract attention to the aircraft; and

(ii) navigation lights intended to indicate the relative path of the aircraft to an observer and other lights shall not be displayed if they are likely to be mistaken for these lights.

(b) Navigation lights to be displayed in the air

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

(i) a red light projected above and below the horizontal plane through angle of coverage L;

(ii) a green light projected above and below the horizontal plane through angle of coverage R;

(iii) a white light projected above and below the horizontal plane rearward through angle of coverage A.

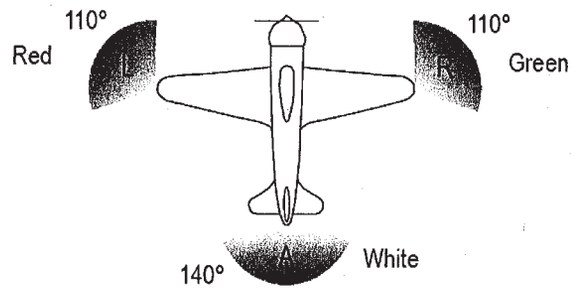


Figure 1

Note 1. - Angle of coverage A is formed by two intersecting vertical planes making angles of 70 degrees to the right and 70 degrees to the left respectively, looking aft along the longitudinal axis to a vertical plane passing through the longitudinal axis.

Note 2. - Angle of coverage L is formed by two intersecting vertical planes, one parallel to the longitudinal axis of the aeroplane, and the other 110 degrees to the left of the first, when looking forward along the longitudinal axis.

Note 3. - Angle of coverage R is formed by two intersecting vertical planes, one parallel to the longitudinal axis of the aeroplane, and the other 110 degrees to the right of the first, when looking forward along the longitudinal axis.

(c) Navigation lights to be displayed on the water

(i) General

Different lights are required to be displayed in each of the following circumstances:

(A) when under way;

(B) when towing another vessel or aeroplane;

(C) when being towed;

(D) when not under command and not making way;

(E) when making way but not under command;

(F) when at anchor;

(G) when aground.

The lights required by aeroplanes in each case are described below.

(ii) When under way

As illustrated in Figure 2, the following appearing as steady unobstructed lights:

(A) a red light projected above and below the horizontal through angle of coverage L;

(B) a green light projected above and below the horizontal through angle of coverage R;

(C) a white light projected above and below the horizontal through angle of coverage A; and

(D) a white light projected through angle of coverage F.

The lights described in sub-paragraphs (2) (c) (ii) (A), (B) and (C) should be visible on a dark night with a clear atmosphere at a distance of at least 3.7 km (2 NM). The light described in sub-paragraph (2) (c) (ii) (D) should be visible on a dark night with a clear atmosphere at a distance of 9.3 km (5 NM) when fitted to an aeroplane of 20 m or more in length or visible on a dark night with a clear atmosphere at a distance of 5.6 km (3 NM) when fitted to an aeroplane of less than 20 m in length.

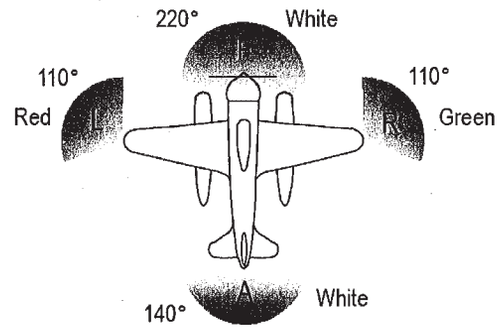


Figure 2

Note 1. - Angle of coverage A is formed by two intersecting vertical planes making angles of 70 degrees to the right and 70 degrees to the left respectively, looking aft along the longitudinal axis to a vertical plane passing through the longitudinal axis.

Note 2. - Angle of coverage F is formed by two intersecting vertical planes making angles of 110 degrees to the right and 110 degrees to the left respectively, looking forward along the longitudinal axis to a vertical plane passing through the longitudinal axis.

Note 3. - Angle of coverage L is formed by two intersecting vertical planes, one parallel to the longitudinal axis of the aeroplane, and the other 110 degrees to the left of the first, when looking forward along the longitudinal axis.

Note 4. - Angle of coverage R is formed by two intersecting vertical planes, one parallel to the longitudinal axis of the aeroplane, and the other 110 degrees to the right of the first, when looking forward along the longitudinal axis.

(iii) When towing another vessel or aeroplane

As illustrated in Figure 3, the following appearing as steady, unobstructed lights:

(A) the lights described in sub-paragraph (2) (c) (ii);

(B) a second light having the same characteristics as the light described in sub-paragraph (2) (c) (ii) (D) and mounted in a vertical line at least 2 m above or below it; and

(C) a yellow light having otherwise the same characteristics as the light described in sub-paragraph (2) (c) (ii) (C)and mounted in a vertical line at least 2 m above it.

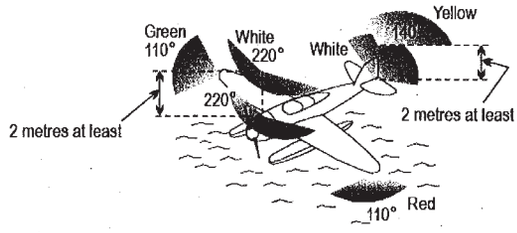


Figure 3

(iv) When being towed

The lights described in sub-paragraph (2) (c) (ii) (A), (B) and (C) appearing as steady, unobstructed lights.

(v) When not under command and not making way

As illustrated in Figure 4, two steady red lights placed where they can best be seen, one vertically over the other and not less than 1 m apart, and of such a character as to be visible on a dark night with a clear atmosphere all around the horizon at a distance of at least 3.7 km (2 NM).

(vi) When making way but not under command

As illustrated in Figure 5, the lights described in sub-paragraph (2) (c) (v) plus the lights described in sub-paragraphs (2) (c) (ii) (A), (B) and (C).

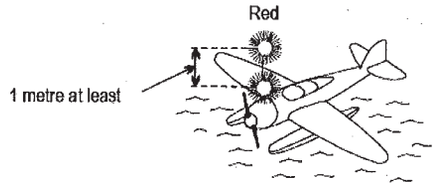


Figure 4

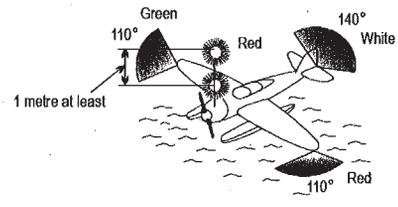


Figure 5

(vii) When at anchor

(A) If less than 50 m in length, where it can best be seen, a steady white light (Figure 6), visible on a dark night with a clear atmosphere all around the horizon at a distance of at least 3.7 km (2 NM).

(B) If 50 m or more in length, where they can best be seen, a steady white forward light and a steady white rear light (Figure 7) both visible on a dark night with a clear atmosphere all around the horizon at a distance of at least 5.6 km (3 NM).

(C) If 50 m or more in span a steady white light on each side (Figure 8 and Figure 9) to indicate the maximum span and visible on a dark night with a clear atmosphere, so far as practicable, all around the horizon at a distance of at least 1.9 km (1 NM).

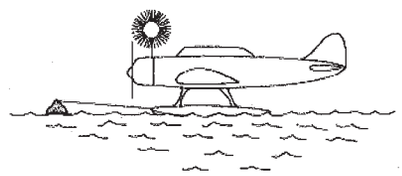


Figure 6

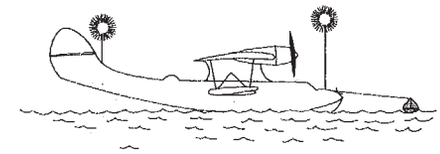
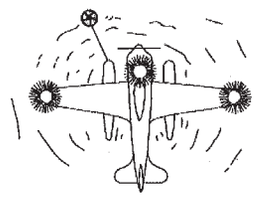
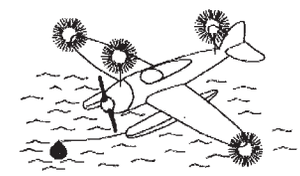


Figure 7



Less than 50 metres in length; 50 metres or more in span

Figure 8



50 metres or more in length; 50 metres or more in span

Figure 9

(viii) When aground

The lights prescribed in sub-paragraph (2) (c) (vii) and in addition two steady red lights in vertical line, at least 1 m apart so placed as to be visible on a dark night with a clear atmosphere all around the horizon.

(d) Except as provided by sub-paragraph (2) (g), from sunset to sunrise or during any other period prescribed by the Civil Aviation Authority:

(i) all aircraft moving on the movement area of an aerodrome shall display navigation lights intended to indicate the relative path of the aircraft to an observer and other lights shall not be displayed if they are likely to be mistaken for these lights;

(ii) unless stationary and otherwise adequately illuminated, all aircraft on the movement area of an aerodrome shall display lights intended to indicate the extremities of their structure;

(iii) all aircraft operating on the movement area of an aerodrome shall display lights intended to attract attention to the aircraft; and

(iv) all aircraft on the movement area of an aerodrome whose engines are running shall display lights which indicate that fact.

(e) Except as provided by sub-paragraph (2) (g), all aircraft in flight and fitted with anti-collision lights to meet the requirement of sub-paragraph (2) (a) (i) shall display such lights also outside the period specified in sub-paragraph (2) (a).

(f) Except as provided by sub-paragraph (2) (g), all aircraft:

(i) operating on the movement area of an aerodrome and fitted with anti-collision lights to meet the requirement of sub-paragraph (2) (d) (iii); or

(ii) on the movement area of an aerodrome and fitted with lights to meet the requirement of sub-paragraph (2) (d) (iv);

shall display such lights also outside the period specified in sub-paragraph (2) (d).

(g) A pilot shall be permitted to switch off or reduce the intensity of any flashing lights fitted to meet the requirements of sub-paragraph (2) (a), (d), (e) and (f) if they do or are likely to:

(i) adversely affect the satisfactory performance of duties; or

(ii) subject an outside observer to harmful dazzle.

(h) Failure of navigation lights

In Macao, in the event of the failure of any light which is required by this rule 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 pilot-in-command of the aircraft it can safely do so, unless authorised by the appropriate air traffic control unit to continue its flight.

(3) Simulated instrument flights

An aircraft shall not be flown under simulated instrument flight conditions unless:

(a) fully functioning dual controls are installed in the aircraft; and

(b) a qualified pilot occupies a control seat to act as safety pilot for the person who is flying under simulated instrument conditions. The safety pilot shall have adequate vision forward and to each side of the aircraft, or a competent observer in communication with the safety pilot shall occupy a position in the aircraft from which the observer's field of vision adequately supplements that of the safety pilot.

(4) Practice instrument approaches

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, a competent observer 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.

(5) Operation on and in the vicinity of an aerodrome

An aircraft operated on or in the vicinity of an aerodrome shall, whether or not within an aerodrome traffic zone:

(a) observe other aerodrome traffic for the purpose of avoiding collision;

(b) conform with or avoid the pattern of traffic formed by other aircraft in operation;

(c) make all turns to the left, when approaching for a landing and after taking off, unless otherwise instructed;

(d) land and take off into the wind unless safety, the runway configuration, or air traffic considerations determine that a different direction is preferable.

Flight Plan

8. (1) Submission of a flight plan

(a) Information relative to an intended flight or portion of a flight, to be provided to air traffic services units, shall be in the form of a flight plan.

(b) A flight plan shall be submitted prior to operating:

(i) any flight or portion thereof to be provided with air traffic control service;

(ii) any IFR flight within advisory airspace;

(iii) any flight within or into designated areas, or along designated routes, when so required by the appropriate ATS authority to facilitate the provision of flight information, alerting and search and rescue services;

(iv) any flight within or into designated areas, or along designated routes, when so required by the appropriate ATS authority to facilitate coordination with appropriate military units or with air traffic services units in adjacent States or Regions in order to avoid the possible need for interception for the purpose of identification;

(v) any flight across international borders.

(c) A flight plan shall be submitted, before departure, to an air traffic services reporting office or, during flight, transmitted to the appropriate air traffic services unit or air-ground control radio station, unless arrangements have been made for submission of repetitive flight plans.

(d) Unless otherwise prescribed by the appropriate ATS authority, a flight plan for a flight to be provided with air traffic control service or air traffic advisory service shall be submitted at least sixty minutes before departure, or, if submitted during flight, at a time which will ensure its receipt by the appropriate air traffic services unit at least ten minutes before the aircraft is estimated to reach:

(i) the intended point of entry into a control area or advisory area; or

(ii) the point of crossing an airway or advisory route.

(2) Contents of a flight plan

A flight plan shall comprise information regarding such of the following items as are:

(a) Aircraft identification

(b) Flight rules and type of flight

(c) Number and type(s) of aircraft and wake turbulence category

(d) Equipment

(e) Departure aerodrome

(f) Estimated off-block time

(g) Cruising speed(s)

(h) Cruising level(s)

(i) Route to be followed

(j) Destination aerodrome and total estimated elapsed time

(k) Alternate aerodrome(s)

(l) Fuel endurance

(m) Total number of persons on board

(n) Emergency and survival equipment

(o) Other information.

(3) Completion of a flight plan

(a) Whatever the purpose for which it is submitted, a flight plan shall contain information, as applicable, on relevant items up to and including "Alternate aerodrome(s)" regarding the whole route or the portion thereof for which the flight plan is submitted.

(b) It shall, in addition, contain information, as applicable, on all other items when so prescribed by the appropriate ATS authority or when otherwise deemed necessary by the person submitting the flight plan.

(4) Changes to a flight plan

Subject to the provisions of rule 11 (2) (b), all changes to a flight plan submitted for an IFR flight, or a VFR flight operated as a controlled flight, shall be reported as soon as practicable to the appropriate air traffic services unit. For other VFR flights, significant changes to a flight plan shall be reported as soon as practicable to the appropriate air traffic services unit.

(5) Closing a flight plan

(a) Unless otherwise prescribed by the appropriate ATS authority, a report of arrival shall be made in person, by radiotelephony or via data link at the earliest possible moment after landing, to the appropriate air traffic services unit at the arrival aerodrome, by any flight for which a flight plan has been submitted covering the entire flight or the remaining portion of a flight to the destination aerodrome.

(b) When a flight plan has been submitted only in respect of a portion of a flight, other than the remaining portion of a flight to destination, it shall, when required, be closed by an appropriate report to the relevant air traffic services unit.

(c) When no air traffic services unit exists at the arrival aerodrome, the arrival report, when required, shall be made as soon as practicable after landing and by the quickest means available to the nearest air traffic services unit.

(d) When communication facilities at the arrival aerodrome are known to be inadequate and alternate arrangements for the handling of arrival reports on the ground are not available, the following action shall be taken. Immediately prior to landing the aircraft shall, if practicable, transmit to the appropriate air traffic services unit, a message comparable to an arrival report, where such a report is required. Normally, this transmission shall be made to the aeronautical station serving the air traffic services unit in charge of the flight information region in which the aircraft is operated.

(e) Arrival reports made by aircraft shall contain the following elements of information:

(i) aircraft identification;

(ii) departure aerodrome;

(iii) destination aerodrome (only in the case of a diversionary landing);

(iv) arrival aerodrome;

(v) time of arrival.

Signals

9. (1) Upon observing or receiving any of the signals given in PART V, aircraft shall take such action as may be required by the interpretation of the signal given in that Part.

(2) The signals of PART V shall, when used, have the meaning indicated therein. They shall be used only for the purpose indicated and no other signals likely to be confused with them shall be used.

(3) A signalman shall be responsible for providing standard marshalling signals to aircraft in a clear and precise manner using the signals shown in PART V.

(4) No person shall guide an aircraft unless trained, qualified and approved by the Civil Aviation Authority to carry out the functions of a signalman.

(5) The signalman shall wear a distinctive fluorescent identification vest to allow the flight crew to identify that he or she is the person responsible for the marshalling operation.

(6) Daylight-fluorescent wands, table-tennis bats or gloves shall be used for all signaling by all participating ground staff during daylight hours. Illuminated wands shall be used at night or in low visibility.

Time

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

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

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

Air traffic control service

11. (1) Air traffic control clearances

(a) An air traffic control clearance shall be obtained prior to operating a controlled flight, or a portion of a flight as a controlled flight. Such clearance shall be requested through the submission of a flight plan to an air traffic control unit.

(b) Whenever an aircraft has requested a clearance involving priority, a report explaining the necessity for such priority shall be submitted, if requested by the appropriate air traffic control unit.

(c) Potential reclearance in flight. If prior to departure it is anticipated that depending on fuel endurance and subject to reclearance in flight, a decision may be taken to proceed to a revised destination aerodrome, the appropriate air traffic control units shall be so notified by the insertion in the flight plan of information concerning the revised route (where known) and the revised destination.

(d) An aircraft operated on a controlled aerodrome shall not taxi on the manoeuvring area without clearance from the aerodrome control tower and shall comply with any instructions given by that unit.

(2) Adherence to current flight plan

(a) Except as provided for in sub-paragraph (2) (d), an aircraft shall adhere to the current flight plan or the applicable portion of a current flight plan for a controlled flight within the tolerances defined in sub-paragraphs (2) (a) (i) to (2) (b) unless a request for a change has been made and clearance obtained from the appropriate air traffic control unit, or unless an emergency situation arises which necessitates immediate action by the aircraft, in which event as soon as circumstances permit, after such emergency authority is exercised, the appropriate air traffic services unit shall be notified of the action taken and that this action has been taken under emergency authority.

(i) Unless otherwise authorized by the appropriate ATS authority, or directed by the appropriate air traffic control unit, controlled flights shall, in so far as practicable:

(A) when on an established ATS route, operate along the defined center line of that route; or

(B) when on any other route, operate directly between the navigation facilities and/or points defining that route.

(ii) Subject to the overriding requirement in sub-paragraph (2) (a) (i), an aircraft operating along an ATS route segment defined by reference to very high frequency omnidirectional radio ranges shall change over for its primary navigation guidance from the facility behind the aircraft to that ahead of it at, or as close as operationally feasible to, the changeover point, where established.

(iii) Deviation from the requirements in sub-paragraph (2) (a) (i) shall be notified to the appropriate air traffic services unit.

(b) Deviation from the current flight plan. In the event that a controlled flight deviates from its current flight plan, the following action shall be taken:

(i) Deviation from track: if the aircraft is off track, action shall be taken forthwith to adjust the heading of the aircraft to regain track as soon as practicable.

(ii) Deviation from ATC assigned Mach number/indicated airspeed: the appropriate air traffic services unit shall be informed immediately.

(iii) Deviation from Mach number/true airspeed: if the sustained Mach number/true airspeed at cruising level varies by plus or minus Mach 0.02 or more, or plus or minus 19 km/h (10 kt) true airspeed or more from the current flight plan, the appropriate air traffic services unit shall be so informed.

(iv) Change in time estimate: except where ADS-C is activated and serviceable in airspace where ADS-C services are provided, if the time estimate for the next applicable reporting point, flight information region boundary or destination aerodrome, whichever comes first, changes in excess of 2 minutes from that previously notified to air traffic services, or such other period of time as is prescribed by the appropriate ATS authority or on the basis of regional air

navigation agreements, the flight crew shall notify the appropriate air traffic services unit as soon as possible.

(A) When ADS-C services are provided and ADS-C is activated, the air traffic services unit shall be informed automatically via data link whenever changes occur beyond the threshold values stipulated by the ADS event contract.

(c) Change Requests. Requests for current flight plan changes shall include information as indicated hereunder:

(i) Change of cruising level: aircraft identification; requested new cruising level and cruising Mach number/true airspeed at this level; revised time estimates (when applicable) at subsequent reporting points or flight information region boundaries.

(ii) Change of Mach number/true airspeed: aircraft identification; requested Mach number/true airspeed.

(iii) Change of route:

(A) Destination unchanged: aircraft identification; flight rules; description of new route of flight including related flight plan data beginning with the position from which requested change of route is to commence; revised time estimates; any other pertinent information.

(B) Destination changed: aircraft identification; flight rules; description of revised route of flight to revised destination aerodrome including related flight plan data, beginning with the position from which requested change of route is to commence; revised time estimates; alternate aerodrome(s); any other pertinent information.

(d) Weather deterioration below the VMC. When it becomes evident that flight in VMC in accordance with its current flight plan will not be practicable, a VFR flight operated as a controlled flight shall:

(i) request an amended clearance enabling the aircraft to continue in VMC to destination or to an alternative aerodrome, or to leave the airspace within which an ATC clearance is required; or

(ii) if no clearance in accordance with (i) can be obtained, continue to operate in VMC and notify the appropriate ATC unit of the action being taken either to leave the airspace concerned or to land at the nearest suitable aerodrome; or

(iii) if operated within a control zone, request authorization to operate as a special VFR flight; or

(iv) request clearance to operate in accordance with the instrument flight rules.

(3) Position reports

(a) Unless exempted by the appropriate ATS authority or by the appropriate air traffic services unit under conditions specified by that authority, a controlled flight shall report to the appropriate air traffic services unit, as soon as possible, the time and level of passing each designated compulsory reporting point, together with any other required information. Position reports shall similarly be made in relation to additional points when requested by the appropriate air traffic services unit. In the absence of designated reporting points, position reports shall be made at intervals prescribed by the appropriate ATS authority or specified by the appropriate air traffic services unit.

(i) Controlled flights providing position information to the appropriate air traffic services unit via data link communications shall only provide voice position reports when requested.

(4) Termination of control

A controlled flight shall, except when landing at a controlled aerodrome, advise the appropriate ATC unit as soon as it ceases to be subject to air traffic control service.

(5) Communications

(a) An aircraft operated as a controlled flight shall maintain continuous air-ground voice communication watch on the appropriate communication channel of, and establish two-way communication as necessary with, the appropriate air traffic control unit, except as may be prescribed by the appropriate ATS authority in respect of aircraft forming part of aerodrome traffic at a controlled aerodrome.

Note 1. - SELCAL or similar automatic signaling devices satisfy the requirement to maintain an air-ground voice communication watch.

Note 2. - The requirement for an aircraft to maintain an air-ground voice communication watch remains in effect after CPDLC has been established.

(b) Communication failure. If a communication failure precludes compliance with sub-paragraph (5) (a), the aircraft shall comply with the voice communication failure procedures in sub-paragraphs (5) (b) (i), (ii) and (iii), and with such of the following procedures in sub-paragraphs (5) (b) (iv), (v) as are appropriate. The aircraft shall attempt to establish communications with the appropriate air traffic control unit using all other available means. In addition, the aircraft, when forming part of the aerodrome traffic at a controlled aerodrome, shall keep a watch for such instructions as may be issued by visual signals.

(i) Air-ground

(A) When an aircraft station fails to establish contact with the aeronautical station on the designated channel, it shall attempt to establish contact on the previous channel used and, if not successful, on another channel appropriate to the route. If these attempts fail, the aircraft station shall attempt to establish communication with the appropriate aeronautical station, other aeronautical stations or other aircraft using all available means and advise the aeronautical station that contact on the assigned channel could not be established. In addition, an aircraft operating within a network shall monitor the appropriate VHF channel for calls from nearby aircraft.

(B) If the attempts specified under sub-paragraph (5) (b) (i) (A) fail, the aircraft station shall transmit its message twice on the designated channel(s), preceded by the phrase "TRANSMITTING BLIND" and, if necessary, include the addressee(s) for which the message is intended.

In network operation, a message which is transmitted blind shall be transmitted twice on both primary and secondary channels. Before changing channel, the aircraft station shall announce the channel to which it is changing.

(C) Receiver failure. When an aircraft station is unable to establish communication due to receiver failure, it shall transmit reports at the scheduled times, or positions, on the channel in use, preceded by the phrase "TRANSMITTING BLIND DUE TO REVEIVER FAILURE. The aircraft station shall transmit the intended message, following this by a complete repetition. During this procedure, the aircraft shall also advise the time of its next intended transmission.

An aircraft which is provided with air traffic control or advisory service shall also transmit information regarding the intention of the pilot-in-command with respect to the continuation of the flight of the aircraft.

When an aircraft is unable to establish communication due to airborne equipment failure it shall, when so equipped, select the appropriate SSR code to indicate radio failure.

(ii) Ground-to-air

(A) When an aeronautical station has been unable to establish contact with an aircraft station after calls on the frequencies on which the aircraft is believed to be listening, it shall:

I. request other aeronautical station to render assistance by calling the aircraft and relaying traffic, if necessary;

II. request aircraft on the route to attempt to establish communication with the aircraft and relay traffic, if necessary.

(B) The provisions of sub-paragraph (5) (b) (ii) (A) shall also be applied:

I. on request of the air traffic service unit concerned;

II. when an expected communication from an aircraft has not been received within a time period such that the occurrence of a communication failure is suspected.

(C) If the attempts specified in sub-paragraph (5) (b) (ii) (A) fail, the aeronautical station shall transmit messages addressed to the aircraft, other than messages containing air traffic control clearances, by blind transmission on the frequency(ies) on which the aircraft is believed to be listening.

(D) Blind transmission of air traffic control clearances shall not be made to aircraft, except at the specific request of the originator.

(iii) Notification of communication failure

(A) The air-ground control radio station shall notify the appropriate air traffic services unit and the aircraft operating agency, as soon as possible, of any failure in air-ground communication.

(iv) If in visual meteorological conditions, the aircraft shall:

(A) continue to fly in visual meteorological conditions; land at the nearest suitable aerodrome; and report its arrival by the most expeditious means to the appropriate air traffic services unit;

(B) if considered advisable, complete an IFR flight in accordance with sub-paragraph (5) (b) (v).

(v) If in instrument meteorological conditions or when the pilot of an IFR flight considers it inadvisable to complete the flight in accordance with sub-paragraph (5) (b) (iv) (A), the aircraft shall:

(A) unless otherwise prescribed on the basis of regional air navigation agreement, in airspace where radar is not used in the provision of air traffic control, maintain the last assigned speed and level, or minimum flight altitude if higher, for a period of 20 minutes following the aircraft's failure to report its position over a compulsory reporting point and thereafter adjust level and speed in accordance with the filed flight plan;

(B) in airspace where radar is used in the provision of air traffic control, maintain the last assigned speed and level, or minimum flight altitude if higher, for a period of 7 minutes following:

I. the time the last assigned level or minimum flight altitude is reached; or

II. the time the transponder is set to Code 7600; or

III. the aircraft's failure to report its position over a compulsory reporting point;

whichever is later, and thereafter adjust level and speed in accordance with the filed flight plan;

(C) when being radar vectored or having been directed by ATC to proceed offset using area navigation (RNAV) without a specified limit, rejoin the current flight plan route no later than the next significant point, taking into consideration the applicable minimum flight altitude;

(D) proceed according to the current flight plan route to the appropriate designated navigation aid or fix serving the destination aerodrome and, when required to ensure compliance with sub-paragraph (5) (b) (v) (E) below, hold over this aid or fix until commencement of descent;

(E) commence descent from the navigation aid or fix specified in sub-paragraph (5) (b) (v) (D) at, or as close as possible to, the expected approach time last received and acknowledged; or, if no expected approach time has been received and acknowledged, at, or as close as possible to, the estimated time of arrival resulting from the current flight plan;

(F) complete a normal instrument approach procedure as specified for the designated navigation aid or fix; and

(G) land, if possible, within 30 minutes after the estimated time of arrival specified in sub-paragraph (5) (b) (v) (E) or the last acknowledged expected approach time, whichever is later.

Reporting hazardous conditions

12. The pilot-in-command 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.

Aerodrome traffic rules

13. (1) Application of aerodrome traffic rules

The rules in this section which are expressed to apply to power-driven heavier-than-air aircraft shall also be observed, so far as practicable, in relation to all other aircraft.

(2) Access to and movement on the manoeuvring area and other parts of the aerodrome

(a) 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.

(b) 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.

(c) 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.

(3) Right of way on the ground

(a) This rule shall apply to:

(i) power-driven heavier-than-air aircraft; and

(ii) 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.

(b) Notwithstanding any air traffic control clearance it shall remain the duty of the pilot-in-command of an aircraft to take all possible measures to ensure that his aircraft does not collide with any other aircraft or with any vehicle.

(c) (i) power-driven heavier-than-air aircraft and vehicles shall give way to aircraft which are taking off or landing.

(ii) vehicles and power-driven heavier-than-air aircraft which are not taking off or landing shall give way to vehicles towing aircraft.

(iii) Vehicles which are not towing aircraft shall give way to aircraft.

(d) Subject to sub-paragraph (3) (c) (ii) a vehicle shall:

(i) overtake another vehicle so that the other vehicle is on the left of the overtaking vehicle; and

(ii) keep to the left when passing another vehicle which is approaching head-on or approximately so.

(4) Dropping of tow ropes, etc.

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 designated area and the ropes, banners or similar articles shall be dropped when the aircraft is flying in the direction appropriate for landing.

(5) Aerodromes not having air traffic control units

(a) An aircraft shall not fly within a zone which the pilot-in-command 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.

(b) (i) An aircraft shall not land on a runway at such an aerodrome unless the runway is clear of other aircraft.

(ii) Where take-offs and landings are not confined to a runway:

(A) an aircraft 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 heavier than air power driven aircraft is obliged to turn, it shall turn to the left after the pilot-in-command of the aircraft has satisfied himself that such action will not interfere with other traffic movements; and

(B) a heavier than air power driven aircraft 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.

(c) An aircraft after landing shall move clear of the landing area in use as soon as it is possible to do so.

(6) Aerodromes having air traffic control units

(a) An aircraft shall not fly within a zone which the pilot-in-command 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.

(b) The pilot-in-command 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:

(i) 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;

(ii) not taxi, take off or land except with the permission of the air traffic control unit; and

(iii) comply with paragraph (5), 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.

(c) 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.

(7) Special rules for certain aerodromes

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 Schedule.

Unlawful interference

14. (1) An aircraft which is being subjected to unlawful interference shall endeavour to notify the appropriate ATS unit of this fact, any significant circumstances associated therewith and any deviation from the current flight plan necessitated by the circumstances, in order to enable the ATS unit to give priority to the aircraft and to minimize conflict with other aircraft.

(2) If an aircraft is subjected to unlawful interference, the pilot-in-command shall attempt to land as soon as practicable at the nearest suitable aerodrome or at a dedicated aerodrome assigned by the appropriate authority unless considerations aboard the aircraft dictate otherwise.

Interception

15. The pilot-in-command of a civil aircraft, when intercepted, shall comply with the Standards in PART VII, interpreting and responding to visual signals as specified in PART V paragraphs 31 (1) and 31 (2).

VMC visibility and distance from cloud minima

16. VMC visibility and distance from cloud minima are contained in Table 1.

Altitude band	Airspace class	Flight visibility	Distance from cloud
At and above 3 050 m (10 000 ft) AMSL	A*** B C D E F G	8 km	1 500 m horizontally 300 m (1 000 ft) vertically
Below 3 050 m (10 000 ft) AMSL and above 900 m (3 000 ft) AMSL, or above 300 m (1 000 ft) above terrain, whichever is the higher	A***B C D E F G	5 km	1 500 m horizontally 300 m (1 000 ft) vertically
At and below 900 m (3 000 ft) AMSL, or 300 m (1 000 ft) above terrain, whichever is the higher	A***B C D E	5 km	1 500 m horizontally 300 m (1 000 ft) vertically
	F G	5 km**	Clear of cloud and with the surface in sight

* When the height of the transition altitude is lower than 3 050 m (10 000 ft) AMSL, FL 100 should be used in lieu of 10 000 ft.

** When so prescribed by the appropriate ATS authority:

a) flight visibilities reduced to not less than 1 500 m may be permitted for flights operating:

1) at speeds that, in the prevailing visibility, will give adequate opportunity to observe other traffic or any obstacles in time to avoid collision; or

2) in circumstances in which the probability of encounters with other traffic would normally be low, e.g. in areas of low volume traffic and for aerial work at low levels.

b) HELICOPTERS may be permitted to operate *in less than 1 500 m* flight visibility, if manoeuvred at a speed that will give adequate opportunity to observe other traffic or any obstacles in time to avoid collision.

*** The VMC minima in Class A airspace are included for guidance to pilots and do not imply acceptance of VFR flights in Class A airspace.

Table 1

PART III – VISUAL FLIGHT RULES

17. Except when operating as a special VFR flight, VFR flights shall be conducted so that the aircraft is flown in conditions of visibility and distance from clouds equal to or greater than those specified in Table 1.

18. VFR flights between sunset and sunrise, or such other period between sunset and sunrise, shall be operated in accordance with conditions as may be prescribed by Civil Aviation Authority.

19. Unless authorized by the appropriate ATS authority, VFR flights shall not be operated:

(a) above FL 200;

(b) at transonic and supersonic speeds.

20. Authorization for VFR flights to operate above FL290 shall not be granted in areas where a vertical separation minimum of 300 m (1000 ft) is applied above FL290.

21. Except when necessary for take-off or landing, or except by permission from the Civil Aviation Authority, a VFR flight shall not be flown:

(a) over the congested areas of cities, towns or settlements or over an open-air assembly of persons at a height less than 450 m (1 500 ft) above the highest obstacle within a radius of 600 m from the aircraft;

(b) elsewhere than as specified in sub-paragraph 21 (a), at a height less than 150m (500 feet) above the ground or water, or closer than 500 feet to any person, vessel, vehicle or structure.

22. Except where otherwise indicated in air traffic control clearances or specified by the appropriate ATS authority, VFR flights in level cruising flight when operated above 900 m (3000 ft) from the ground or water, or a higher datum as specified by the appropriate ATS authority, shall be conducted at a cruising level appropriate to the track as specified in the tables of cruising levels in PART VI.

23. VFR flights shall comply with the provisions of paragraphs 11 (1), 11 (2), 11 (3), 11 (4) and 11 (5).

(a) when operated within Classes B, C and D airspace;

(b) when forming part of aerodrome traffic at controlled aerodromes; or

(c) when operated as special VFR flights.

24. A VFR flight operating within or into areas, or along routes, designated by the appropriate ATS authority in accordance with sub-paragraphs 8 (1) (b) (iii) or 8 (1) (b) (iv) shall maintain continuous air-ground voice communication watch on the appropriate communication channel of, and report its position as necessary to, the air traffic services unit providing flight information service.

25. An aircraft operated in accordance with the visual flight rules which wishes to change to compliance with the instrument flight rules shall:

(a) if a flight plan was submitted, communicate the necessary changes to be effected to its current flight plan; or

(b) when so required by sub-paragraph 8 (1) (b) submit a flight plan to the appropriate air traffic services unit and obtain a clearance prior to proceeding IFR when in controlled airspace.

PART IV – INSTRUMENT FLIGHT RULES

Rules applicable to all IFR flights

26. (1) Aircraft equipment

Aircraft shall be equipped with suitable instruments and with navigation equipment appropriate to the route to be flown.

(2) Minimum levels

Except when necessary for take-off or landing, or except when specifically authorized by the Civil Aviation Authority, an IFR flight shall be flown at a level which is not below the minimum flight altitude established by the State or Region whose area is overflown, or, where no such minimum flight altitude has been established:

(a) over high terrain or in mountainous areas, at a level which is at least 600 m (2000 ft) above the highest obstacle located within 8 km of the estimated position of the aircraft;

(b) elsewhere than as specified in sub-paragraph (a), at a level which is at least 300 m (1 000 ft) above the highest obstacle located within 8 km of the estimated position of the aircraft.

(3) Change from IFR flight to VFR flight

(a) An aircraft electing to change the conduct of its flight from compliance with the instrument flight rules to compliance with the visual flight rules shall, if a flight plan was submitted, notify the appropriate air traffic services unit specifically that the IFR flight is cancelled and communicate thereto the changes to be made to its current flight plan.

(b) When an aircraft operating under the instrument flight rules is flown in or encounters visual meteorological conditions it shall not cancel its IFR flight unless it is anticipated, and intended, that the flight will be continued for a reasonable period of time in uninterrupted visual meteorological conditions.

Rules applicable to all IFR flights within controlled airspace

27. (1) IFR flights shall comply with the provisions of paragraphs 11 (1), 11 (2), 11 (3), 11 (4) and 11 (5) when operated in controlled airspace.

(2) An IFR flight operating in cruising flight in controlled airspace shall be flown at a cruising level, or, if authorized to employ cruise climb techniques, between two levels or above a level, selected from:

(a) the tables of cruising levels in PART VI; or

(b) a modified table of cruising levels, when so prescribed in accordance with PART VI for flight above FL410;

except that the correlation of levels to track prescribed therein shall not apply whenever otherwise indicated in air traffic control clearances or specified in Aeronautical Information Publications.

Rules applicable to all IFR flights outside controlled airspace

28. (1) Cruising levels

An IFR flight operating in level cruising flight outside of controlled airspace shall be flown at a cruising level appropriate to its track as specified in:

(a) the tables of cruising levels in PART VI, except when otherwise specified by the appropriate ATS authority for flight at or below 900 m (3000 ft) above mean sea level; or

(b) a modified table of cruising levels, when so prescribed in accordance with PART VI for flight above FL410.

(2) Communications

An IFR flight operating outside controlled airspace but within or into areas, or along routes, designated by the appropriate ATS authority in accordance with sub-paragraphs 8 (1) (b) (iii) or 8 (1) (b) (iv) shall maintain an air-ground voice communication watch on the appropriate communication channel and establish two-way communication, as necessary, with the air traffic services unit providing flight information service.

(3) Position reports

An IFR flight operating outside controlled airspace and required by the appropriate ATS authority to:

(a) submit a flight plan,

(b) maintain an air-ground voice communication watch on the appropriate communication channel and establish two-way communication, as necessary, with the air traffic services unit providing flight information service,

shall report position as specified in paragraph 11 (3) for controlled flights.

PART V – SIGNALS

Distress signals

29. The following signals, used either together or separately, mean that grave and imminent danger threatens, and immediate assistance is requested:

(a) a signal made by radiotelegraphy or by any other signaling method consisting of the group SOS (••• – – – ••• in the Morse Code);

(b) a radiotelephony distress signal consisting of the spoken word MAYDAY;

(c) a distress message sent via data link which transmits the intent of the word MAYDAY;

(d) rockets or shells throwing red lights, fired one at a time at short intervals;

(e) a parachute flare showing a red light.

Urgency signals

30. (1) The following signals, used either together or separately, mean that an aircraft wishes to give notice of difficulties which compel it to land without requiring immediate assistance:

(a) the repeated switching on and off of the landing lights; or

(b) the repeated switching on and off of the navigation lights in such manner as to be distinct from flashing navigation lights.

(2) The following signals, used either together or separately, mean that an aircraft has a very urgent message to transmit concerning the safety of a ship, aircraft or other vehicle, or of some person on board or within sight:

(a) a signal made by radiotelegraphy or by any other signaling method consisting of the group XXX;

(b) a radiotelephony urgency signal consisting of the spoken words PAN, PAN;

(c) an urgency message sent via data link which transmits the intent of the words PAN, PAN.

Signal for use in the event of interception

31. (1) Signals initiated by intercepting aircraft and responses by intercepted aircraft

Series	INTERCEPTING Aircraft Signals	Meaning	INTERCEPTED Aircraft Responds	Meaning
1	DAY or NIGHT — Rocking aircraft and flashing navigational lights at irregular intervals (and landing lights in the case of a helicopter) from a position slightly above and ahead of, and normally to the left of, the intercepted aircraft (or to the right if the intercepted aircraft is a helicopter) and, after acknowledgement, a slow level turn, normally to the left (or to the right in the case of a helicopter) on the desired heading.	You have been intercepted. Follow me.	DAY or NIGHT — Rocking aircraft, flashing navigational lights at irregular intervals and following. *Note.— Additional action required to be taken by intercepted aircraft is prescribed in rule 15.*	Understood, will comply.

	Note 1.— Meteorological conditions or terrain may require the intercepting aircraft to reverse the positions and direction of turn given above in Series 1. *Note 2.— If the intercepted aircraft is not able to keep pace with the intercepting aircraft, the latter is expected to fly a series of racetrack patterns and to rock the aircraft each time it passes the intercepted aircraft.*			
2	DAY or NIGHT — An abrupt breakaway manoeuvre from the intercepted aircraft consisting of a climbing turn of 90 degrees or more without crossing the line of flight of the intercepted aircraft.	You may proceed.	DAY or NIGHT — Rocking the aircraft.	Understood, will comply.
3	DAY or NIGHT — Lowering landing gear (if fitted), showing steady landing lights and overflying runway in use or, if the intercepted aircraft is a helicopter, overflying the helicopter landing area. In the case of helicopters, the intercepting helicopter makes a landing approach, coming to hover near to the landing area.	Land at this aerodrome.	DAY or NIGHT — Lowering landing gear, (if fitted), showing steady landing lights and following the intercepting aircraft and, if, after overflying the runway in use or helicopter landing area, landing is considered safe, proceeding to land.	Understood, will comply.

(2) Signals initiated by intercepted aircraft and responses by intercepting aircraft

Series	INTERCEPTED Aircraft Signals	Meaning	INTERCEPTING Aircraft Responds	Meaning
4	DAY or NIGHT — Raising landing gear (if fitted) and flashing landing lights while passing over runway in use or helicopter landing area at a height exceeding 300 m (1 000 ft) but not exceeding 600 m (2 000 ft) (in the case of a helicopter, at a height exceeding 50 m (170 ft) but not exceeding 100 m (330 ft)) above the aerodrome level, and continuing to circle runway in use or helicopter landing area. If unable to flash landing lights, flash any other lights available.	Aerodrome you have designated is inadequate.	DAY or NIGHT — If it is desired that the intercepted aircraft follow the intercepting aircraft to an alternate aerodrome, the intercepting aircraft raises its landing gear (if fitted) and uses the Series 1 signals prescribed for intercepting aircraft. If it is decided to release the intercepted aircraft, the intercepting aircraft uses the Series 2 signals prescribed for intercepting aircraft.	Understood, follow me. Understood, you may proceed.
5	DAY or NIGHT — Regular switching on and off of all available lights but in such a manner as to be distinct from flashing lights.	Cannot comply.	DAY or NIGHT — Use Series 2 signals prescribed for intercepting aircraft.	Understood.
6	DAY or NIGHT — Irregular flashing of all available lights.	In distress.	DAY or NIGHT — Use Series 2 signals prescribed for intercepting aircraft.	Understood.

Visual signals used to warn an unauthorized aircraft flying in, or about to enter a restricted, prohibited or danger area

32. By day and by night, a series of projectiles discharged from the ground at intervals of 10 seconds, each showing, on bursting, red and green lights or stars will indicate to an unauthorized aircraft that it is flying in or about to enter a restricted, prohibited or danger area, and that the aircraft is to take such remedial action as may be necessary.

Signals for aerodrome traffic

33. (1) Light and pyrotechnic signals

(a) Instructions

Light		*From Aerodrome Control to:*	
		Aircraft in flight	*Aircraft on the ground*
Directed towards aircraft concerned (see Figure 10).	Steady green	Cleared to land	Cleared for take-off
	Steady red	Give way to other aircraft and continue circling	Stop
	Series of green flashes	Return for landing*	Cleared to taxi
	Series of red flashes	Aerodrome unsafe, do not land	Taxi clear of landing area in use
	Series of white flashes	Land at this aerodrome and proceed to apron*	Return to starting point on the aerodrome
Red pyrotechnic		Notwithstanding any previous instructions, do not land for the time being	
* *Clearances to land and to taxi will be given in due course.*			

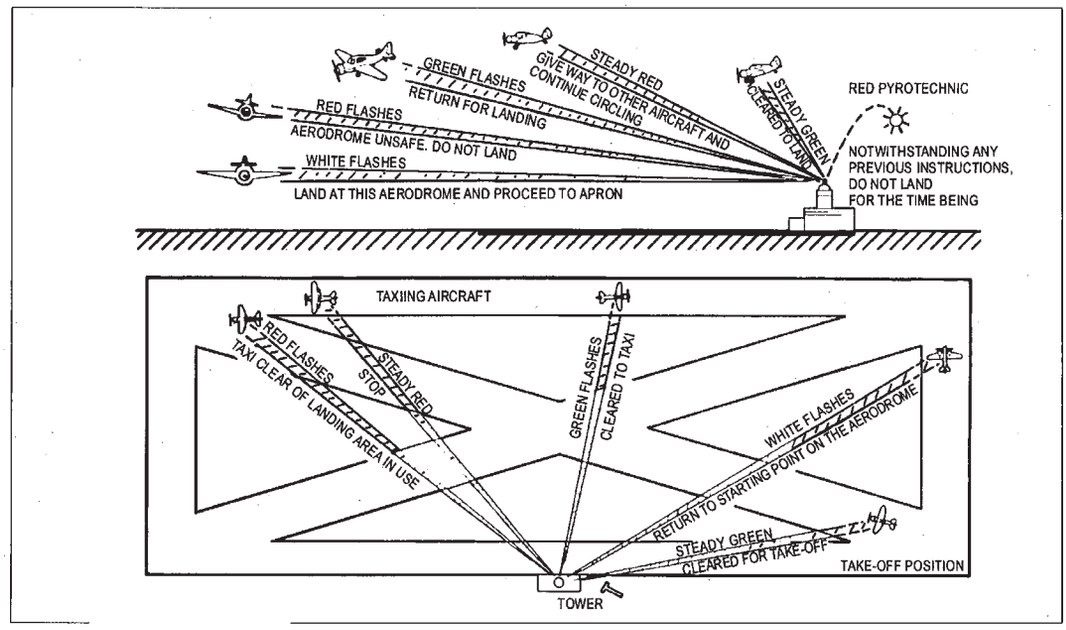


Figure 10

(b) Acknowledgement by an aircraft

(i) When in flight:

(A) during the hours of daylight: by rocking the aircraft's wings;

(B) during the hours of darkness: by flashing on and off twice the aircraft's landing lights or, if not so equipped, by switching on and off twice its navigation lights.

(ii) When on the ground:

(A) during the hours of daylight: by moving the aircraft's ailerons or rudder;

(B) during the hours of darkness: by flashing on and off twice the aircraft's landing lights or, if not so equipped, by switching on and off twice its navigation lights.

(2) Visual ground signals

(a) Prohibition of landing

A horizontal red square panel with yellow diagonals (Figure **11**) when displayed in a signal area indicates that landings are prohibited and that the prohibition is liable to be prolonged.



Figure 11

(b) Need for special precautions while approaching or landing

A horizontal red square panel with one yellow diagonal (Figure 12) when displayed in a signal area indicates that owing to the bad state of the manoeuvring area, or for any other reason, special precautions must be observed in approaching to land or in landing.



Figure 12

(c) Use of runways and taxiways

(i) A horizontal white dumb-bell (Figure 13) when displayed in a signal area indicates that aircraft are required to land, take off and taxi on runways and taxiways only.



Figure 13

(ii) The same horizontal white dumb-bell as in sub-paragraph (i) but with a black bar placed perpendicular to the shaft across each circular portion of the dumb-bell (Figure 14) when displayed in a signal area indicates that aircraft are required to land and take off on runways only, but other manoeuvres need not be confined to runways and taxiways.



Figure 14

(d) Closed runways or taxiways

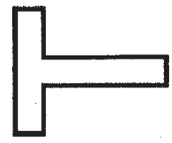
Crosses of a single contrasting colour, yellow or white (Figure 15), displayed horizontally on runways and taxiways or parts thereof indicate an area unfit for movement of aircraft.



Figure 15

(e) Directions for landing or take-off

(i) A horizontal white or orange landing T (Figure 16) indicates the direction to be used by aircraft for landing and take-off, which shall be in a direction parallel to the shaft of the T towards the cross arm.



(ii) A set of two digits (Figure 17) displayed vertically at or near the aerodrome control tower indicates to aircraft on the manoeuvring area the direction for take-off, expressed in units of 10 degrees to the nearest 10 degrees of the magnetic compass.



Figure 17

(f) Right-hand traffic

When displayed in a signal area, or horizontally at the end of the runway or strip in use, a right-hand arrow of conspicuous colour (Figure 18) indicates that turns are to be made to

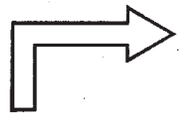


Figure 18

the right before landing and after take-off.

(g) Air traffic services reporting office

The letter C displayed vertically in black against a yellow background (Figure 19) indicates the location of the air traffic services reporting office.

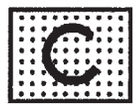


Figure 19

(h) Glider flights in operation

A double white cross displayed horizontally (Figure 20) in the signal area indicates that

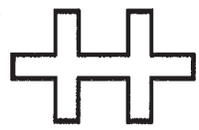


Figure 20

the aerodrome is being used by gliders and that glider flights are being performed.

Marshalling signals

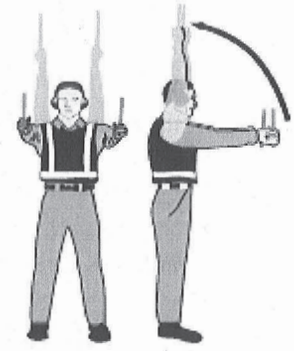
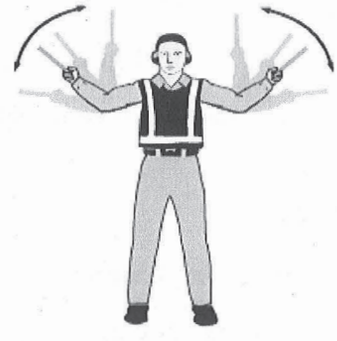
34. (1) From a signalman to an aircraft

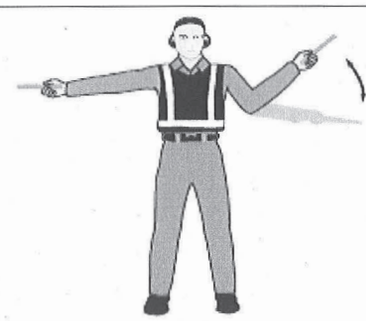
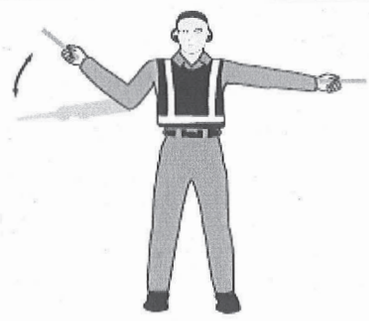
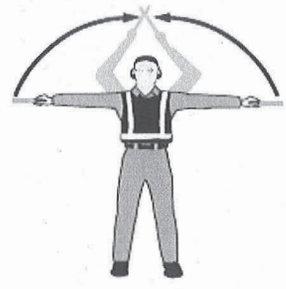
(a) Marshalling signals are the signals designed for use by the signalman, with hands illuminated as necessary to facilitate observation by the pilot, and facing the aircraft in a position:

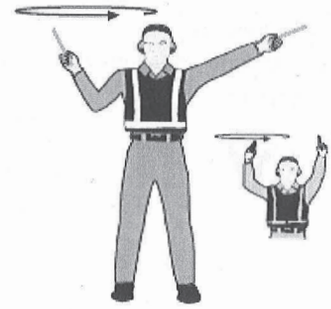
(i) for fixed wing aircraft, on left side of the aircraft, where best seen by the pilot; and

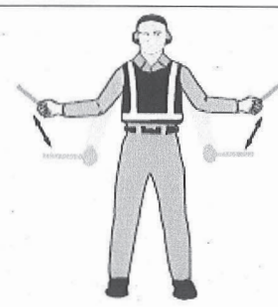
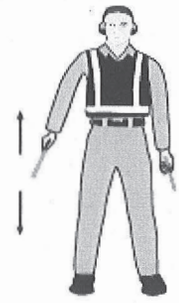
(ii) for helicopters, where the signalman can best be seen by the pilot.

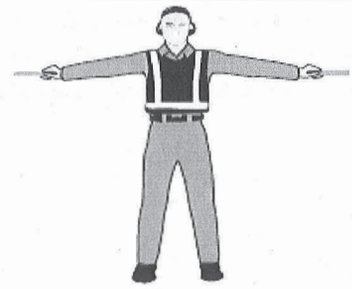
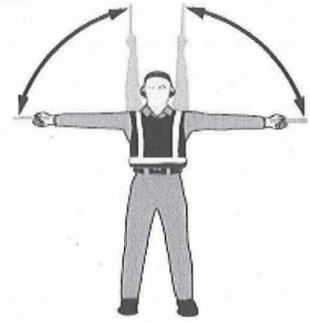
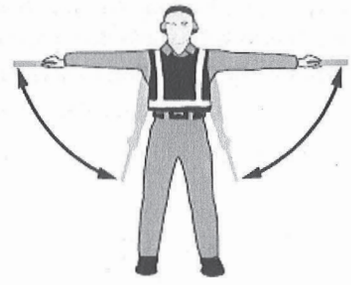
(b) Prior to using the following signals, the signal man shall ascertain that the area within which an aircraft is to be guided is clear of objects which the aircraft, in complying with paragraph 9 (1), might otherwise strike.

1. Wingwalker/guide Raise right hand above head level with wand pointing up; move left-hand wand pointing down toward body. Note: This signal provides an indication by a person positioned at the aircraft wing tip, to the pilot/marshaller/push-back operator, that the aircraft movement on/off a parking position would be unobstructed.	
2. Identify gate Raise fully extended arms straight above head with wands pointing up.	
3. Proceed to next signalman or as directed by tower/ground control Point both arms upward; move and extend arms outward to sides of body and point with wands to direction of next signalman or taxi area.	
4. Straight ahead Bend extended arms at elbows and move wands up and down from chest height to head.	

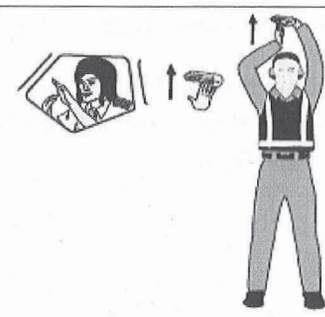
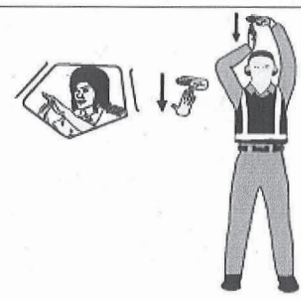
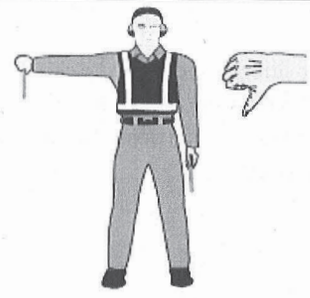
5.	a). Turn left (from pilot's point of view) With right arm and wand extended at a 90-degree angle to body, make "come ahead" signal with left hand. The rate of signal motion indicates to pilot the rate of aircraft turn.	
5.	b). Turn right (from pilot's point of view) With left arm and wand extended at a 90-degree angle to body, make "come ahead" signal with right hand. The rate of signal motion indicates to pilot the rate of aircraft turn.	
6.	a). Normal stop Fully extend arms and wands at a 90-degree angle to sides and slowly move to above head until wands cross.	
6.	b). Emergency stop Abruptly extend arms and wands to top of head, crossing wands.	
7.	a). Set brakes Raise hand just above shoulder height with open palm. Ensuring eye contact with flight crew, close hand into a fist. Do not move until receipt of "thumbs up" acknowledgement from flight crew.	

7.	b). Release brakes Raise hand just above shoulder height with hand closed in a fist. Ensuring eye contact with flight crew, open palm. Do not move until receipt of "thumbs up" acknowledgement from flight crew.	
8.	a). Chocks inserted With arms and wands fully extended above head, move wands inward in a "jabbing" motion until wands touch. Ensure acknowledgement is received from flight crew.	
8.	b). Chocks removed With arms and wands fully extended above head, move wands outward in a "jabbing" motion. Do not remove chocks until authorized by flight crew.	
9.	Start engine(s) Raise right arm to head level with wand pointing up and start a circular motion with hand; at the same time, with left arm raised above head level, point to engine to be started.	
10.	Cut engines Extend arm with wand forward of body at shoulder level; move hand and wand to top of left shoulder and draw wand to top of right shoulder in a slicing motion across throat.	

11. Slow down Move extended arms downwards in a "patting" gesture, moving wands up and down from waist to knees.	
12. Slow down engine(s) on indicated side With arms down and wands toward ground, wave either right or left wand up and down indicating engine(s) on left or right side respectively should be slowed down.	
13. Move back With arms in front of body at waist height, rotate arms in a forward motion. To stop rearward movement, use signal 6 a) or 6 b).	
14. a). Turns while backing (for tail to starboard) Point left arm with wand down and bring right arm from overhead vertical position to horizontal forward position, repeating right-arm movement.	
14. b). Turns while backing (for tail to port) Point right arm with wand down and bring left arm from overhead vertical position to horizontal forward position, repeating left-arm movement.	

15. Affirmative/all clear Raise right arm to head level with wand pointing up or display hand with "thumbs up"; left arm remains at side by knee. Note: This signal is also used as a technical/ servicing communication signal.	
*16. Hover Fully extend arms and wands at a 90-degree angle to sides.	
*17. Move upwards Fully extend arms and wands at a 90-degree angle to sides and, with palms turned up, move hands upwards. Speed of movement indicates rate of ascent.	
*18. Move downwards Fully extend arms and wands at a 90-degree angle to sides and, with palms turned down, move hands downwards. Speed of movement indicates rate of descent.	
*19 a). Move horizontally left (from pilot's point of view) Extend arm horizontally at a 90-degree angle to right side of body. Move other arm in same direction in a sweeping motion.	

*19 b). Move horizontally right (from pilot's point of view) Extend arm horizontally at a 90-degree angle to left side of body. Move other arm in same direction in a sweeping motion.	
*20. Land Cross arms with wands downwards and in front of body.	
21. Hold position/stand by Fully extend arms and wands downwards at a 45-degree angle to sides. Hold position until aircraft is clear for next manoeuvre.	
22. Dispatch aircraft Perform a standard salute with right hand and/or wand to dispatch the aircraft. Maintain eye contact with flight crew until aircraft has begun to taxi.	
23. Do not touch controls (technical/servicing communication signal) Extend right arm fully above head and close fist or hold wand in horizontal position; left arm remains at side by knee.	

24.	Connect ground power (technical/servicing communication signal) Hold arms fully extended above head; open left hand horizontally and move finger tips of right hand into and touch open palm of left hand (forming a "T"). At night, illuminated wands can also be used to form the "T" above head.	
25.	Disconnect power (technical/servicing communication signal) Hold arms fully extended above head with finger tips of right hand touching open horizontal palm of left hand (forming a "T"); then move right hand away from the left. Do not disconnect power until authorized by flight crew. At night, illuminated wands can also be used to form the "T" above head.	
26.	Negative (technical/servicing communication signal) Hold right arm straight out at 90 degrees from shoulder and point wand down to ground or display hand with "thumbs down"; left hand remains at side by knee.	
27.	Establish communication via interphone (technical/servicing communication signal) Extend both arms at 90 degrees from body and move hands to cup both ears.	
28.	Open/close stairs (technical/servicing communication signal) With right arm at side and left arm raised above head at a 45-degree angle, move right arm in a sweeping motion towards top of left shoulder. Note: This signal is intended mainly for aircraft with the set of integral stairs at the front.	

Note. - Signals marked with an asterisk (*) are designed for use to hovering helicopters.

(2) From the pilot of an aircraft to a signalman

(a) Brakes

(i) Brakes engaged: raise arm and hand, with fingers extended, horizontally in front of face, then clench fist.

(ii) Brakes released: raise arm, with fist clenched, horizon-tally in front of face, then extend fingers.

(b) Chocks

(i) Insert chocks: arms extended, palms outwards, move hands inwards to cross in front of face.

(ii) Remove chocks: hands crossed in front of face, palms outwards, move arms outwards.

(c) Ready to start engine(s)

Raise the appropriate number of fingers on one hand indicating the number of the engine to be started.

(3) Technical/servicing communication signals

(a) Manual signals shall only be used when verbal communication is not possible with respect to technical/servicing communication signals.

(b) Signalmen shall ensure that an acknowledgement is received from the flight crew with respect to technical/servicing communication signals.

Standard emergency hand signals

35. The following hand signals are established as the minimum required for emergency communication between the aircraft rescue and firefighting (ARFF) incident commander/ARFF firefighters and the cockpit and/or cabin crews of the incident aircraft. ARFF emergency hand signals should be given from the left front side of the aircraft for the flight crew.

	**1. Recommend evacuation** Evacuation recommended based on ARFF and incident commander's assessment of external situation. Arm extended from body and held horizontal with hand upraised at eye level. Execute beckoning arm motion angled backward. Non-beckoning arm held against body. Night — same with wands.

	**2.Recommended stop** Recommend evacuation in progress be halted. Stop aircraft movement or other activity in progress. Arms in front of head, crossed at wrists. Night — same with wands.
	**3. Emergency contained** No outside evidence of dangerous conditions or "all-clear." Arms extended outward and down at a 45-degree angle. Arms moved inward below waistline simultaneously until wrists crossed, then extended outward to starting position (umpire's "safe" signal). Night — same with wands.
	**4.Fire** Move right-hand in a "fanning" motion from shoulder to knee, while at the same time pointing with left hand to area of fire. Night — same with wands.

PART VI – TABLES OF CRUISING LEVELS

36. The cruising levels to be observed when so required by this Schedule are as follows:

RVSM — FEET

(1) In areas where feet are used for altitude and where, in accordance with regional air navigation agreements, a vertical separation minimum of 1000 ft is applied between FL 290 and FL 410 inclusive:*

TRACK**											
From 000 degrees to 179 degrees***						From 180 degrees to 359 degrees***					
IFR Flights			VFR Flights			IFR Flights			VFR Flights		
Level			Level			Level			Level		
FL	Feet	Metres	FL	Feet	Metres	FL	Feet	Metres	FL	Feet	Metres
010	1 000	300	–	–	–	020	2 000	600	–	–	–
030	3 000	900	035	3 500	1 050	040	4 000	1 200	045	4 500	1 350
050	5 000	1 500	055	5 500	1 700	060	6 000	1 850	065	6 500	2 000
070	7 000	2 150	075	7 500	2 300	080	8 000	2 450	085	8 500	2 600
090	9 000	2 750	095	9 500	2 900	100	10 000	3 050	105	10 500	3 200
110	11 000	3 350	115	11 500	3 500	120	12 000	3 650	125	12 500	3 800
130	13 000	3 950	135	13 500	4 100	140	14 000	4 250	145	14 500	4 400
150	15 000	4 550	155	15 500	4 700	160	16 000	4 900	165	16 500	5 050
170	17 000	5 200	175	17 500	5 350	180	18 000	5 500	185	18 500	5 650
190	19 000	5 800	195	19 500	5 950	200	20 000	6 100	205	20 500	6 250
210	21 000	6 400	215	21 500	6 550	220	22 000	6 700	225	22 500	6 850
230	23 000	7 000	235	23 500	7 150	240	24 000	7 300	245	24 500	7 450
250	25 000	7 600	255	25 500	7 750	260	26 000	7 900	265	26 500	8 100
270	27 000	8 250	275	27 500	8 400	280	28 000	8 550	285	28 500	8 700
290	29 000	8 850				300	30 000	9 150			
310	31 000	9 450				320	32 000	9 750			
330	33 000	10 050				340	34 000	10 350			
350	35 000	10 650				360	36 000	10 950			
370	37 000	11 300				380	38 000	11 600			
390	39 000	11 900				400	40 000	12 200			
410	41 000	12 500				430	43 000	13 100			
450	45 000	13 700				470	47 000	14 350			
490	49 000	14 950				510	51 000	15 550			
etc.	etc.	etc.				etc.	etc.	etc.			

* Except when, on the basis of regional air navigation agreements, a modified table of cruising levels based on a nominal vertical separation minimum of 1 000 ft (300 m) is prescribed for use, under specified conditions, by aircraft operating above FL 410 within designated portions of the airspace.

** Magnetic track, or in polar areas at latitudes higher than 70 degrees and within such extensions to those areas as may be prescribed by the appropriate ATS authorities, grid tracks as determined by a network of lines parallel to the Greenwich Meridian superimposed on a polar stereographic chart in which the direction towards the North Pole is employed as the Grid North.

***Except where, on the basis of regional air navigation agreements, from 090 to 269 degrees and from 270 to 089 degrees is prescribed to accommodate predominant traffic directions and appropriate transition procedures to be associated therewith are specified.

(2) In areas where metres are used for altitude and where, in accordance with regional air navigation agreements, a verticalseparation minimum of 300 m is applied between 8 900 m and 12 500 m inclusive:*

TRACK**											
From 000 degrees to 179 degrees***						From 180 degrees to 359 degrees***					
IFR Flights			VFR Flights			IFR Flights			VFR Flights		
Level			Level			Level			Level		
Standard Metric	Metres	Feet	Standard Metric	Metres	Feet	Standard Metric	Metres	Feet	Standard Metric	Metres	Feet
0030	300	1 000	–	–	–	0060	600	2 000	–	–	–
0090	900	3 000	0105	1 050	3 500	0120	1 200	3 900	0135	1 350	4 400
0150	1 500	4 900	0165	1 650	5 400	0180	1 800	5 900	0195	1 950	6 400
0210	2 100	6 900	0225	2 250	7 400	0240	2 400	7 900	0255	2 550	8 400
0270	2 700	8 900	0285	2 850	9 400	0300	3 000	9 800	0315	3 150	10 300
0330	3 300	10 800	0345	3 450	11 300	0360	3 600	11 800	0375	3 750	12 300
0390	3 900	12 800	0405	4 050	13 300	0420	4 200	13 800	0435	4 350	14 300
0450	4 500	14 800	0465	4 650	15 300	0480	4 800	15 700	0495	4 950	16 200
0510	5 100	16 700	0525	5 250	17 200	0540	5 400	17 700	0555	5 550	18 200
0570	5 700	18 700	0585	5 850	19 200	0600	6 000	19 700	0615	6 150	20 200
0630	6 300	20 700	0645	6 450	21 200	0660	6 600	21 700	0675	6 750	22 100
0690	6 900	22 600	0705	7 050	23 100	0720	7 200	23 600	0735	7 350	24 100
0750	7 500	24 600	0765	7 650	25 100	0780	7 800	25 600	0795	7 950	26 100
0810	8 100	26 600	0825	8 250	27 100	0840	8 400	27 600	0855	8 550	28 100
0890	8 900	29 100				0920	9 200	30 100			
0950	9 500	31 100				0980	9 800	32 100			
1010	10 100	33 100				1040	10 400	34 100			
1070	10 700	35 100				1100	11 000	36 100			
1130	11 300	37 100				1160	11 600	38 100			
1190	11 900	39 100				1220	12 200	40 100			
1250	12 500	41 100				1310	13 100	43 000			
1370	13 700	44 900				1430	14 300	46 900			
1490	14 900	48 900				1550	15 500	50 900			
etc.	etc.	etc.				etc.	etc.	etc.			

* Except when, on the basis of regional air navigation agreements, a modified table of cruising levels based on a nominal vertical separation minimum of 1 000 ft (300 m) is prescribed for use, under specified conditions, by aircraft operating above FL 410 within designated portions of the airspace.

** Magnetic track, or in polar areas at latitudes higher than 70 degrees and within such extensions to those areas as may be prescribed by the appropriate ATS authorities, grid tracks as determined by a network of lines parallel to the Greenwich Meridian superimposed on a polar stereographic chart in which the direction towards the North Pole is employed as the Grid North.

*** Except where, on the basis of regional air navigation agreements, from 090 to 269 degrees and from 270 to 089 degrees is prescribed to accommodate predominant traffic directions and appropriate transition procedures to be associated therewith are specified.

(3) In other areas where feet are the primary unit of measurement for altitude:

TRACK*											
From 000 degrees to 179 degrees**						From 180 degrees to 359 degrees**					
IFR Flights			VFR Flights			IFR Flights			VFR Flights		
Level			Level			Level			Level		
FL	Feet	Metres	FL	Feet	Metres	FL	Feet	Metres	FL	Feet	Metres
010	1 000	300	–	–	–	020	2 000	600	–	–	–
030	3 000	900	035	3 500	1 050	040	4 000	1 200	045	4 500	1 350
050	5 000	1 500	055	5 500	1 700	060	6 000	1 850	065	6 500	2 000
070	7 000	2 150	075	7 500	2 300	080	8 000	2 450	085	8 500	2 600
090	9 000	2 750	095	9 500	2 900	100	10 000	3 050	105	10 500	3 200
110	11 000	3 350	115	11 500	3500	120	12 000	3 650	125	12 500	3 800
130	13 000	3 950	135	13 500	4 100	140	14 000	4 250	145	14 500	4 400
150	15 000	4 550	155	15 500	4 700	160	16 000	4 900	165	16 500	5 050
170	17 000	5 200	175	17 500	5 350	180	18 000	5 500	185	18 500	5 650
190	19 000	5 800	195	19 500	5 950	200	20 000	6 100	205	20 500	6 250
210	21 000	6 400	215	21 500	6 550	220	22 000	6 700	225	22 500	6 850
230	23 000	7 000	235	23 500	7 150	240	24 000	7 300	245	24 500	7 450
250	25 000	7 600	255	25 500	7 750	260	26 000	7 900	265	26 500	8 100
270	27 000	8 250	275	27 500	8 400	280	28 000	8 550	285	28 500	8 700
290	29 000	8 850	300	30 000	9 150	310	31 000	9 450	320	32 000	9 750
330	33 000	10 050	340	34 000	10 350	350	35 000	10 650	360	36 000	10 950
370	37 000	11 300	380	38 000	11 600	390	39 000	11 900	400	40 000	12 200
410	41 000	12 500	420	42 000	12 800	430	43 000	13 100	440	44 000	13 400
450	45 000	13 700	460	46 000	14 000	470	47 000	14 350	480	48 000	14 650
490	49 000	14 950	500	50 000	15 250	510	51 000	15 550	520	52 000	15 850
etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.

* Magnetic track, or in polar areas at latitudes higher than 70 degrees and within such extensions to those areas as may be prescribed by the appropriate ATS authorities, grid tracks as determined by a network of lines parallel to the Greenwich Meridian superimposed on a polar stereographic chart in which the direction towards the North Pole is employed as the Grid North.

** Except where, on the basis of regional air navigation agreements, from 090 to 269 degrees and from 270 to 089 degrees is prescribed to accommodate predominant traffic directions and appropriate transition procedures to be associated therewith are specified.

(4) in other areas where metres are the primary unit of measurement for altitude:

TRACK*											
From 000 degrees to 179 degrees**						From 180 degrees to 359 degrees**					
IFR Flights			VFR Flights			IFR Flights			VFR Flights		
Level			Level			Level			Level		
Standard Metric	Metres	Feet	Standard Metric	Metres	Feet	Standard Metric	Metres	Feet	Standard Metric	Metres	Feet
0030	300	1 000	–	–	–	0060	600	2 000	–	–	–
0090	900	3 000	0105	1 050	3 500	0120	1 200	3 900	0135	1 350	4 400
0150	1 500	4 900	0165	1 650	5 400	0180	1 800	5 900	0195	1 950	6 400
0210	2 100	6 900	0225	2 250	7 400	0240	2 400	7 900	0255	2 550	8 400
0270	2 700	8 900	0285	2 850	9 400	0300	3 000	9 800	0315	3 150	10 300
0330	3 300	10 800	0345	3 450	11 300	0360	3 600	11 800	0375	3 750	12 300
0390	3 900	12 800	0405	4 050	13 300	0420	4 200	13 800	0435	4 350	14 300
0450	4 500	14 800	0465	4 650	15 300	0480	4 800	15 700	0495	4 950	16 200
0510	5 100	16 700	0525	5 250	17 200	0540	5 400	17 700	0555	5 550	18 200
0570	5 700	18 700	0585	5 850	19 200	0600	6 000	19 700	0615	6 150	20 200
0630	6 300	20 700	0645	6 450	21 200	0660	6 600	21 700	0675	6 750	22 100
0690	6 900	22 600	0705	7 050	23 100	0720	7 200	23 600	0735	7 350	24 100
0750	7 500	24 600	0765	7 650	25 100	0780	7 800	25 600	0795	7 950	26 100
0810	8 100	26 600	0825	8 250	27 100	0840	8 400	27 600	0855	8 550	28 100
0890	8 900	29 100	0920	9 200	30 100	0950	9 500	31 100	0980	9 800	32 100
1010	10 100	33 100	1040	10 400	34 100	1070	10 700	35 100	1100	11 000	36 100
1130	11 300	37 100	1160	11 600	38 100	1190	11 900	39 100	1220	12 200	40 100
1250	12 500	41 100	1280	12 800	42 100	1310	13 100	43 000	1370	13 400	44 000
1370	13 700	44 900	1400	14 000	46 100	1430	14 300	46 900	1460	14 600	47 900
1490	14 900	48 900	1520	15 200	49 900	1550	15 500	50 900	1580	15 800	51 900
etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.	etc.

* Magnetic track, or in polar areas at latitudes higher than 70 degrees and within such extensions to those areas as may be prescribed by the appropriate ATS authorities, grid tracks as determined by a network of lines parallel to the Greenwich Meridian superimposed on a polar stereographic chart in which the direction towards the North Pole is employed as the Grid North.

** Except where, on the basis of regional air navigation agreements, from 090 to 269 degrees and from 270 to 089 degrees is prescribed to accommodate predominant traffic directions and appropriate transition procedures to be associated therewith are specified.

PART VII – INTERCEPTION OF CIVIL AIRCRAFT

Action by intercepted aircraft

37. (1) An aircraft which is intercepted by another aircraft shall immediately:

(a) follow the instructions given by the intercepting aircraft, interpreting and responding to visual signals in accordance with the specifications in PART V;

(b) notify, if possible, the appropriate air traffic services unit;

(c) attempt to establish radio communication with the intercepting aircraft or with the appropriate intercept control unit, by making a general call on the emergency frequency 121.5 MHz, giving the identity of the intercepted aircraft and the nature of the flight; and if no contact has been established and if practicable, repeating this call on the emergency frequency 243 MHz;

(d) if equipped with SSR transponder, select Mode A, Code 7700, unless otherwise instructed by the appropriate air traffic services unit. .

(e) If equipped with ADS-B or ADS-C, select the appropriate emergency functionality, if available, unless otherwise instructed by the appropriate air traffic services unit.

(2) If any instructions received by radio from any sources conflict with those given by the intercepting aircraft by visual signals, the intercepted aircraft shall request immediate clarification while continuing to comply with the visual instructions given by the intercepting aircraft.

(3) If any instructions received by radio from any sources conflict with those given by the intercepting aircraft by radio, the intercepted aircraft shall request immediate clarification while continuing to comply with the radio instructions given by the intercepting aircraft.

Radio communication during interception

38. If radio contact is established during interception but communication in a common language is not possible, attempts shall be made to convey instructions, acknowledgement of instructions and essential information by using the phrases and pronunciations in Table 2 and transmitting each phrase twice:

Table 2

Phrases for use by INTERCEPTING aircraft			*Phrases for use by INTERCEPTED aircraft*		
Phrase	*Pronunciation*[1]	*Meaning*	*Phrase*	*Pronunciation*[1]	*Meaning*
CALL SIGN	KOL SA-IN	What is your call sign?	CALL SIGN (call sign)[2]	KOL SA-IN (call sign)	My call sign is (call sign)
FOLLOW	FOL-LO	Follow me	WILCO Will comply	VILL-KO	Understood
DESCEND	DEE-SEND	Descend for landing	CAN NOT	KANN NOTT	Unable to comply
YOU LAND	YOU LAAND	Land at this aerodrome	REPEAT	REE-PEET	Repeat your instruction
PROCEED	PRO-SEED	You may proceed	AM LOST	AM LOSST	Position unknown
			MAYDAY	MAYDAY	I am in distress
			HIJACK[3]	HI-JACK	I have been hijacked
			LAND (place name)	LAAND (place name)	I request to land at (place name)
			DESCEND	DEE-SEND	I require descent

1. *In the second column, syllables to be emphasized are underlined.*

2. *The call sign required to be given is that used in radiotelephony communications with air traffic services units and corresponding to the aircraft identification in the flight plan.*

3. *Circumstances may not always permit, nor make desirable, the use of the phrase "HIJACK".*

TWELFTH SCHEDULE

(Paragraph 80)

FEES

The contents of this Schedule is published in a separate regulation.

THIRTEENTH SCHEDULE

(Paragraph 83)

PENALTIES

1. According to paragraph 1 of article 20 of the Administrative Regulation n.° 10/2004, as amended by the Administrative Regulation n.° 18/2008, if a person contravenes any provision of this Administrative Regulation and any other legislation or regulations made there under, may be liable on conviction to:

   (a) written warning;

   (b) fine from 1 000 patacas to 1 000 000 patacas;

   (c) suspension or revocation of any certificate or licence that he or she may hold.

2. Considering the above, if a person is liable on conviction to a fine for contravening any provision of the ANRM, the decision regarding the amount of the fine applicable shall take in consideration the following:

   (1) If any person contravenes any provision of this Regulation, or any regulations made there under, not being a provision referred to in sub-paragraphs (2) or (3) of this paragraph the fine shall not exceed 50 000 patacas or in the case of a second or subsequent conviction for the like offence the fine shall not exceed 100 000 patacas.

   (2) If any person contravenes any provision of this Regulation specified in this sub-paragraph the fine shall not exceed 100 000 patacas or in the case of a second or subsequent conviction for the like offence the fine shall not exceed 200 000 patacas:

Provision	**Subject Matter**
Paragraph 3.	**Aircraft flying unregistered**
Paragraph 5.	**Aircraft flying without markings or with incorrect markings**
Paragraph 10 (5).	**Preserve the certificate of release to service**
Paragraph 15.	**Requirement to keep log books**
Paragraph 16 (3).	**Requirement to keep weight schedule**
Paragraph 24.	**Operations manual requirements**
Paragraph 27 (5).	**Preserve the load sheets**
Paragraph 35. [Except (2)]	**Requirement for radio station in aircraft to be licenced and for operation of radio in aircraft**

Paragraph 50.	**Aircraft noise requirement**
Paragraph 52 (3).	**Operator's obligation to obtain flight time records of flight crew**
Paragraph 58.	**Preservation of documents**
Paragraph 61A.	**Safety Management System**
Paragraph 63A.	**Fatigue of air traffic controllers – air traffic services provider's responsibilities**
Paragraph 64.	**Air traffic services manual**
Paragraph 71.	**Use of aerodromes by aircraft of Contracting States**

(3) If any person contravenes any provision of this Regulation specified in this sub-paragraph the fine shall not exceed 500 000 patacas or in the case of a second or subsequent conviction for the like offence the fine shall not exceed 1 000 000 patacas:

Paragraph 6.	**Flight without a Certificate of airworthiness**
Paragraph 9 (1).	**Maintenance programme and certificate of maintenance review**
Paragraph 10. [Except (5)]	**Inspection, overhaul, repair, replacement and modification**
Paragraph 12.	**Equipment of aircraft**
Paragraph 13.	**Communication, navigation and surveillance 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 recorders and preservation of records**
Paragraph 39.	**Dropping of persons, animals and articles by aircraft**
Paragraph 40.	**Carriage of sporting 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 61B.	**Requirement for an air traffic control approval**
Paragraph 68.	**Requirement for certified aerodrome**
Paragraph 69 (3)	**Contravention of condition of aerodrome certificate**
Paragraph 78.	**Obstruction of persons performing duties under ANRM**
Paragraph 79.	**Contravention of Civil Aviation Authority's direction**

3. Notwithstanding the above-mentioned penalties, if any aeronautical licence holder contravenes any provision of this Regulation, or any regulations made there under, 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 hold, or be eligible for the grant of, a medical certificate issued by the Civil Aviation Authority as an evidence of satisfying those requirements. To apply for the issuance or renewal of such medical certificate, the person shall 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 and in other regulations issued by the Civil Aviation Authority 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 of the individual medical examiner. The evaluation must, therefore, be based on a medical examination conducted throughout in accordance with the highest standards of medical practice. The examination will be based upon the requirements specified by the Civil Aviation Authority, 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) The prescribed re-examination of a licence holder operating in an area distant from designated medical examination facilities may be deferred at the discretion of the Civil Aviation Authority, provided that such deferment shall only be made as an exception and shall not exceed:

      (a) a single period of six months in the case of a flight crew member of an aircraft engaged in non-commercial operations; or

      (b) two consecutive periods each of three months in the case of a flight crew member of an aircraft engaged in commercial operations provided that in each case a favourable medical report is obtained after examination by a designated medical examiner of the area concerned, or, in cases where such a designated medical examiner is not available, by a physician legally qualified to practise medicine in that area. A report of the medical examination shall be sent to the Civil Aviation Authority where the licence was issued; 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 level of medical fitness to be met for the renewal of a Medical Assessment shall be the same as that 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.

Likely means with a probability of occurring that is unacceptable to the Medical Assessor.

Medical assessment means the evidence issued by the Civil Aviation Authority that the licence holder meets specific requirements of medical fitness.

Medical assessor means a physician, appointed by the Civil Aviation Authority, qualified and experienced in the practice of aviation medicine and competent in evaluating and assessing medical conditions of flight safety significance

Note 1: Medical assessors evaluate medical reports submitted to the Civil Aviation Authority by medical examiners.

Note 2: Medical assessors are expected to maintain the currency of their professional knowledge.

Medical examiner means a physician with training in aviation medicine and practical knowledge and experience of the aviation environment, who is designated by the Civil Aviation Authority to conduct medical examinations of fitness of applicants for licences or ratings for which medical requirements are prescribed.

Significant means to a degree or of a nature that is likely to jeopardize flight safety.

3. (1) Medical examinations must be performed on a routine timely basis for the purpose of renewing the medical certificates of the licence holder. The period of validity of a medical assessment shall begin on the day the medical examination is performed. The period of validity of a medical assessment may be extended, at the discretion of the Civil Aviation Authority, up to 45 days. Except as provided in sub-paragraphs (2), (3) and (4) to this paragraph, medical assessment issued in accordance with paragraph 4 shall be valid from the date of the medical examination for a period not greater than:

- Student pilot licence (aeroplanes and helicopters) ..... 60 months
- Private pilot licence (aeroplanes and helicopters) ..... 60 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 ..... 48 months
- Student Air traffic controller licence ..... 48 months

The period of validity of a medical assessment may be reduced when clinically indicated.

Note: In order to let the calendar day on which the medical assessment expires remain constant year after year by allowing the expiry date of the current medical assessment to be the beginning of

the new validity period under the proviso that the whole medical examination process takes place during the period of validity of the current medical assessment but no more than 45 days before it expires.

(2) When the holders of either, airline transport pilot licences (aeroplanes or helicopters), or commercial pilot licences (aeroplanes or helicopters), who are engaged in single-crew commercial air transport operations carrying passengers, have passed their 40th birthday, the 12 months maximum period interval specified in sub-paragraph (1) shall be reduced to 6 months.

(3) When the holders of airline transport pilot licences (aeroplane or helicopter), or commercial pilot licences (aeroplane, helicopter), who are engaged in commercial air transport operations, have passed their 60th birthday, the period of validity specified in sub-paragraph (1) shall be reduced to 6 months.

(4) When the holders of either private pilot licences (aeroplanes, helicopters) or air traffic controller licences have passed their 40th birthday, the maximum interval specified in subparagraph (1) shall be reduced to 24 months. When these holders have passed their 50th birthday, the period of validity shall be further 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 shall have received training in aviation medicine, and shall receive refresher training at regular intervals. Before appointed by or acting under the authority of the Civil Aviation Authority, medical examiners shall demonstrate adequate competency in aviation medicine;

(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 and in other regulations issued by the Civil Aviation Authority, shall coordinate the results of the examination and issue individual confidential signed reports, or equivalent, which shall include the results of the various tests and evaluating the findings with regard to medical fitness. These reports must be submitted to the Civil Aviation Authority. If the medical report is in electronic format, adequate identification of the examiner shall be established;

(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 jeopardize 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 two or more medical examiners, the Civil Aviation Authority shall appoint one of these to be responsible for coordinating the results of the examination, evaluating the finding with regard to medical fitness, and signing the report. The Civil Aviation Authority shall use the services of medical assessors to evaluate reports submitted to the Civil Aviation Authority by medical examiners. The medical examiner shall be required to submit sufficient information to the Civil Aviation Authority to enable that Authority to undertake Medical Assessment audits. The purpose of such auditing is to ensure that medical examiners meet applicable standards for good practice and aeronautical risk assessment;

(e) the medical examiners appointed by or acting under the authority of the Civil Aviation Authority shall have practical knowledge and experience of the conditions in which the holders of licences and ratings carry out their duties. The competence of a medical examiner shall be evaluated periodically by the medical assessor; and

(f) medical confidentiality shall be respected at all times. All medical reports and records shall be securely held with accessibility restricted to authorized personnel. When justified by operational considerations, the medical assessor shall determine to what extent pertinent medical information is presented to relevant officials of the Civil Aviation Authority.

(2) Based on the medical examiner(s) reports, when the Civil Aviation Authority is satisfied that the requirements prescribed in this Schedule and in other regulations issued by the Civil Aviation Authority 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 medical certificate 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 medical certificate in Macao shall be required to furnish to the medical examiner a declaration signed by him/her stating whether he/she has previously undergone such medical examination, and if so, the date, place and result of the last examination. He/she shall indicate to the examiner whether a medical assessment has previously been refused, revoked or suspended and, if so, the reason for such refusal, revocation or suspension. 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, or which has required hospital treatment.

(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 medical certificate except, however as provided in subparagraph (2) of 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 Medical Requirements

- Commercial pilot licences (aeroplanes and helicopters)
- Airline transport pilot licences (aeroplanes and helicopters)

(b) Class 2 Medical Requirements

- Student pilot licences
- Private pilot licences (aeroplanes and helicopters)
- Flight navigator licences
- Flight engineer licences
- Flight radiotelephony operator licences

(c) **Class 3** applies to applicants for, and holders of:

- Air traffic controller licences
- Student 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**.

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

[Paragraphs 37 (4) and 118A (4)]

MINIMUM NAVIGATION PERFORMANCE SPECIFICATIONS – SPECIFIED AIRSPACE AND NAVIGATION PERFORMANCE CAPABILITY

1. For the purpose of paragraph 37 (4) and 118A (4) 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 5.3×10^{-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 13×10^{-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 (1C) (d), 114]

AEROPLANE PERFORMANCE OPERATING LIMITATIONS

1. General

(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) Single-engine turbine-powered aeroplanes shall not be operated at night and/or in instrument meteorological conditions (IMC).

2. Macao registered aeroplanes shall be operated in accordance with a comprehensive and detailed code of performance established by the Civil Aviation Authority in compliance with the applicable requirements of this Schedule.

3. Paragraphs 3 to 8 of this Schedule are applicable to Macao registered aeroplanes of maximum certificated take-off mass over 5,700kg.

(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 flight manual.

(2) A flight shall not be commenced unless the performance information provided in the flight manual indicates that the requirements of paragraph 3 (3) to 8 of this Schedule can be complied with for the flight to be undertaken.

(3) In applying the provisions of this Schedule, account shall be taken of all factors that significantly affect the performance of the aeroplane, including but not limited to: the mass of the aeroplane, the operating procedures, the pressure-altitude appropriate to the elevation of the aerodrome, the ambient temperature, the wind, the runway slope and surface conditions of the runway. 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.

4. Mass limitations

(1) The mass of the aeroplane at the start of take-off shall not exceed the mass at which paragraph 5 of this Schedule is complied with, or the mass at which paragraph 6, 7 and 8 of this Schedule are complied with, allowing for expected reductions in mass as the flight proceeds, and for such fuel jettisoning as is envisaged in applying paragraph 6 and 7 of this Schedule and, in respect of alternate aerodromes, paragraph 4 (3) and 8 of this Schedule.

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

(3) 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 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.

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

5. Take-off

(1) The aeroplane shall be able, in the event of a critical engine failing, or for other reason, at any point in the take-off, either to discontinue the take-off and stop within the accelerate-stop distance available, or to continue the take-off and clear all obstacles along the flight path by an adequate vertical or horizontal distance until the aeroplane is in a position to comply with paragraph 6 of this Schedule. When determining the resulting take-off obstacle accountability area, the operating conditions, such as the crosswind component and navigation accuracy, must be taken into account.

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

6. En route — one engine inoperative

The aeroplane shall be able, in the event of the critical engine becoming inoperative at any point along the route or planned diversions therefrom, to continue the flight to an aerodrome at which the requirements of paragraph 8 of this Schedule can be met, without flying below the minimum flight altitude at any point.

7. En route — two engines inoperative

For aeroplane flying for the purpose of commercial air transport, in the case of aeroplanes having three or more engines, on any part of a route where the location of en-route alternate aerodromes and the total duration of the flight are such that the probability of a second engine becoming inoperative must be allowed for if the general level of safety implied by the provisions of this Schedule is to be maintained, the aeroplane shall be able, in the event of any two engines becoming inoperative, to continue the flight to an en-route alternate aerodrome and land.

8. 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.

9. Obstacle data

(1) Obstacle data shall be provided to enable the operator to develop procedures to comply with the requirements of paragraph 6 of this Schedule.

(2) The operator shall take account of charting accuracy when assessing compliance with the requirements of paragraph 5 of this Schedule.

EIGHTEENTH SCHEDULE

[Paragraph 26 (1C) (d), 174]

HELICOPTER PERFORMANCE OPERATING LIMITATIONS

1. General

(1) Helicopters operating in performance Classes 1 and 2 shall be certificated in Category A.

(2) Helicopters operating in performance Class 3 shall be certificated in either Category A or Category B (or equivalent).

(3) Take-off or landing from/to heliports in a congested hostile environment shall only be conducted in performance Class 1.

(4) Operations in performance Class 2 shall only be conducted with a safe forced landing capability during take-off and landing.

(5) Operations in performance Class 3 shall only be conducted in a non-hostile environment.

(6) In conditions where the safe continuation of flight is not ensured in the event of a critical engine failure, helicopter operations shall be conducted in a manner that gives appropriate consideration for achieving a safe forced landing.

(7) Operations in performance Class 3 in Instrument Meteorological Conditions (IMC) shall not be conducted.

(8) Where helicopters are operated to or from heliports in a congested hostile environment, operations shall be conducted in a manner that gives appropriate consideration for the risk associated with an engine failure.

2. Paragraphs 2 to 6 of this Schedule are applicable to Macao registered helicopters.

(1) Helicopters shall be operated in accordance with a code of performance established by the Civil Aviation Authority, in compliance with the applicable requirements 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 flight manual.

(3) A flight shall not be commenced unless the performance information provided in the flight manual indicates that the requirements contained in paragraphs 2 (4) and 3 of this Schedule can be complied with for the flight to be undertaken.

(4) In applying the provisions 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.

3. Mass limitations

(1) The mass of the helicopter at the start of take-off shall not exceed the mass at which the code of performance referred to in paragraph 2 (1) of this Schedule is complied with, allowing for expected reductions in mass as the flight proceeds, and for such fuel jettisoning as is appropriate.

(2) In no case shall the mass at the start of take-off exceed the maximum certificated take-off mass specified in the helicopter flight manual taking into account the factors specified in paragraph 2 (4) of this Schedule.

(3) 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 helicopter flight manual taking into account the factors specified in paragraph 2 (4) of this Schedule.

(4) 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, Volume I, unless otherwise authorized in exceptional circumstances for a certain operating site where there is no noise disturbance problem, by the competent authority of the State or Region in which the operating site is situated.

4. Take-off and initial climb phase

(1) *Operations in performance Class 1*. The helicopter shall be able, in the event of the failure of the critical engine being recognised 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 of the critical engine being recognised at or after the take-off decision point, to continue the take-off, clearing all obstacles along the flight path by an adequate margin until the helicopter is in a position to comply with paragraph 5 (1) of this Schedule.

(2) *Operations in performance Class 2*. The helicopter shall be able, in the event of the failure of the critical engine at any time after reaching DPATO, to continue the take-off, clearing all obstacles along the flight path by an adequate margin until the helicopter is in a position to comply with paragraph 5 (1) of this Schedule. Before the DPATO, failure of the critical engine may cause the helicopter to force-land; therefore, the conditions stated in paragraph 1 (6) of this Schedule shall apply.

(3) *Operations in performance Class 3*. At any point of the flight path, failure of an engine will cause the helicopter to force-land; therefore, the conditions stated in paragraph 1 (6) of this Schedule shall apply.

5. En-route phase

(1) *Operations in performance Class 1 and Class 2*. The helicopter shall be able, in the event of failure of the critical engine at any point in the en-route phase, to continue the flight to a site at which the conditions of paragraph 6 (1) of this Schedule for operations in performance Class 1, or the conditions of paragraph 6 (2) of this Schedule for operations in performance Class 2 can be met, without flying below the appropriate minimum flight altitude at any point. When the en-route phase is conducted over a hostile environment and the diversion time to an alternate would exceed two hours, the operator shall assess the risks associated with a second engine failure.

(2) *Operations in performance Class 3*. The helicopter shall be able, with all engines 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 an engine will cause

the helicopter to force-land; therefore, the conditions stated in paragraph 1 (6) of this Schedule shall apply.

6. Approach and landing phase

(1) *Operations in performance Class 1.* In the event of the failure of the critical engine being recognised 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, be able to land and stop within the landing distance available or to perform a balked landing and clear all obstacles in the flight path by an adequate margin equivalent to that specified in paragraph 4 (1) of this Schedule. 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.

(2) *Operations in performance Class 2.* In the event of the failure of the critical engine before the DPBL, the helicopter shall, at the destination and at any alternate, after clearing all obstacles in the approach path, be able either to land and stop within the landing distance available or to perform a balked landing and clear all obstacles in the flight path by an adequate margin equivalent to that specified in paragraph 4 (2) of this Schedule. After the DPBL, failure of an engine may cause the helicopter to force-land, therefore the conditions stated in paragraph 1 (6) of this Schedule shall apply.

(3) *Operations in performance Class 3.* At any point of the flight path, failure of an engine will cause the helicopter to force-land, therefore the conditions stated in paragraph 1 (6) of this Schedule shall apply.

7. Obstacle data

The operator shall use available obstacle data to develop procedures to comply with the take-off, initial climb, approach and landing phases requirements detailed in code of performance established by the Civil Aviation Authority.

NINETEENTH SCHEDULE

OPERATOR'S CONTINUING AIRWORTHINESS RESPONSIBILITY

OPSM.875 General

(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.

(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.

OPSM.890 Continuing Airworthiness Responsibility

(a) An operator shall ensure the airworthiness of the aircraft and the serviceability of both operational and emergency equipment by:

(1) The accomplishment of preflight inspections;

(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;

(3) The accomplishment of all maintenance in accordance with the approved operator's aircraft maintenance programme specified in OPSM.910;

(4) The analysis of the effectiveness of the operator's approved aircraft maintenance programme;

(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.

(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.

(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).

(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.

(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.

(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 an 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.

(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.

(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.

(h) An operator must provide suitable office accommodation at appropriate locations for the personnel specified in sub–paragraph (b) above.

OPSM.900 Quality System

(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 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.

(b) An operator's aircraft maintenance programme and any subsequent amendment must be approved by the Civil Aviation Authority.

OPSM.915 Operator's Aircraft Technical Log

(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 Continuing Airworthiness Records

(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.

(c) In the event of a temporary transfer of operator, the records specified in subparagraphs (a) and (b) shall be made available to the new operator. 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.

OPSM.930 Continued Validity of the Air Operator Certificate in Respect of the Maintenance System

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

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.

TWENTIETH SCHEDULE

[Paragraph 41, Paragraph 177, Paragraph 178 and Paragraph 179]

TRANSPORT OF DANGEROUS GOODS BY AIR

Introduction

1. (1) Dangerous goods shall not be carried or have loaded in an aircraft without the written permission of Civil Aviation Authority.

(2) An operator shall note that permission to carry dangerous goods by air from Civil Aviation Authority does not constitute a permission to import cargo into Macao.

Permission to transport dangerous goods

2. (1) Any permission granted for carriage of dangerous goods by air will specify that dangerous goods must be carried in accordance with the provisions of the Technical Instructions and ICAO Annex 18.

(2) Any permission granted for the carriage of dangerous goods by air does not imply that the permission to carry munitions of war on board.

Scope

3. (1) An operator shall comply with the provisions contained in the Technical Instructions on all occasions when dangerous goods are carried, irrespective of whether the flight is wholly or partly within or wholly outside the area of Macao.

(2) A shipper and freight forwarder shall comply with the relevant provisions contained in the Technical Instructions on all occasions when dangerous goods are offered to an operator for carriage by air.

(3) A designated postal operator shall comply with the relevant provisions contained in the Technical Instructions on all occasions when mails are accepted to be introduced into air transport through its postal services.

(4) Articles and substances which would otherwise be classed as dangerous goods which are required to be aboard the aircraft in accordance with the pertinent airworthiness requirements and operating regulations or for those specialized purpose identified in the Technical Instructions, shall be excepted from the provisions of this Schedule.

(5) Articles and substances intended as replacements or which have been removed for replacement for those in sub-paragraph (4) above shall be transported on an aircraft as specified in the Technical Instructions.

(6) Specific articles and substances carried by passengers or crew members shall be excepted from the provisions of this Schedule to the extent as specified in the Technical Instructions.

(7) Provision must be made to stow and secure dangerous goods transported under this paragraph during take-off and landing and at all other times when deemed necessary by the pilot-in-command;

(8) The dangerous goods must be under control of trained personnel during the time when they are in use on the aircraft.

Limitations on the transport of dangerous goods

4. (1) The dangerous goods described hereunder shall be forbidden on aircraft unless exempted by the Civil Aviation Authority and the States or Regions concerned or unless the provisions of the Technical Instructions indicate they may be transported under an approval granted by the State of Origin:

(a) Dangerous goods that are identified in the Technical Instructions as being forbidden for transport in normal circumstances; and

(b) Infected live animals.

(2) An operator shall take all reasonable measures to ensure that articles and substances that are specifically identified by name or generic description in the Technical Instructions as being forbidden for transport under any circumstances are not carried on any aircraft.

Classification

5. An operator shall take all reasonable measures to ensure that articles and substances are classified as dangerous goods as specified in the Technical Instructions.

Packing

6. An operator shall take all reasonable measures to ensure that dangerous goods are packed as specified in the Technical Instructions and in accordance with ICAO Annex 18.

Labelling and marking

7. (1) An operator shall take all reasonable measures to ensure that packages, overpacks and unit load devices are labeled and marked as specified in the Technical Instructions.

(2) Labeling and marking must be in the English language in addition to any other languages requirement.

Dangerous goods transport document

8. (1) An operator shall ensure that, except when otherwise specified in the Technical Instructions, dangerous goods are accompanied by a completed dangerous goods transport document and other additional document required by the Technical Instructions.

(2) The dangerous goods transport document shall bear a declaration signed by the person who offers dangerous goods for transport indicating that the dangerous goods are fully and accurately described by their proper shipping names and that they are classified, packed, marked, labeled, and in proper condition for transport by air in accordance with the Technical Instructions.

(3) The English language must be used for the dangerous goods transport document in addition to any other languages requirement.

(4) The operator must ensure that at least one copy of documents appropriate to the transport by air of a consignment of dangerous goods is retained for a minimum period of six months after the flight on which the dangerous goods were transported. As a minimum, the documents that must be retained are the dangerous goods transport documents, the acceptance checklist and the written information to the pilot-in-command.

Acceptance of dangerous goods

9. (1) An operator shall not accept dangerous goods for transport until the package, overpack or freight container containing the dangerous goods has been inspected in accordance with the acceptance procedures in the Technical Instructions.

(2) An operator or his handling agent shall use an acceptance check list. The acceptance check list shall allow for all relevant details to be checked and shall be in such form as will allow for the recording of the results of the acceptance check by manual, mechanical or computerized means.

(3) When an operator accepts a unit load device or other types of pallet containing consumer commodities, dry ice or magnetized material, the operator must attach an identification tag to the unit load device.

Inspection for damage, leakage or contamination

10. An operator shall ensure that:

(1) Packages, overpacks and freight containers containing the dangerous goods are inspected for evidence of leakage or damage immediately prior to loading on an aircraft or into a unit load device, as specified in the Technical Instructions;

(2) A unit load device is not loaded on an aeroplane unless it has been inspected as required by the Technical Instructions and found free from any evidence of leakage from, or damage to, the dangerous goods contained therein;

(3) Leaking or damaged packages, overpacks or freight containers are not loaded on an aircraft;

(4) Any package of dangerous goods found on an aircraft and which appears to be damaged or leaking is removed or arrangements made for its removal by an appropriate authority or organisation. In this case the remainder of the consignment shall be inspected to ensure it is in a proper condition for transport and that no damage or contamination has occurred to the aircraft or its load; and

(5) Packages, overpacks and freight containers containing dangerous goods are inspected for signs of damage or leakage upon unloading from an aircraft or from a unit load device and, if there is evidence of damage or leakage, the area where the dangerous goods were stowed is inspected for damage or contamination.

Removal of contamination

11. An operator shall ensure that:

(1) Any hazardous contamination found as a result of the leakage or damage of dangerous goods is removed without delay; and

(2) An aircraft which has been contaminated by radioactive materials is immediately taken out of service and not returned until the radiation level at any accessible surface and the non-fixed contamination are not more than the values specified in the Technical Instructions.

Loading restrictions

12. (1) An Operator shall ensure that packages and overpacks containing dangerous goods and freight containers containing radioactive materials shall be loaded and stowed on an aircraft in accordance with the provisions of the Technical Instructions.

(2) An operator shall ensure that packages or overpacks of dangerous goods bearing the "Cargo Aircraft Only" label are carried on a cargo aircraft and loaded as specified in the Technical Instructions.

(3) For aeroplane operation:

(a) Passenger cabin and flight deck: An operator shall ensure that dangerous goods are not carried in an aeroplane cabin occupied by passengers or on the flight deck, unless otherwise specified in the Technical Instructions.

(b) Cargo compartments: An operator shall ensure that dangerous goods are loaded, segregated, stowed and secured on an aeroplane as specified in the Technical Instructions.

(4) For helicopter operation:

Passenger cabin, flight deck and cargo compartments: An operator shall ensure that dangerous goods are loaded, segregated, stowed, secured and carried in a helicopter as specified in the Technical Instructions.

Separation and segregation

13. (1) Packages containing dangerous goods which might react dangerously one with another shall not be stowed on an aircraft next to each other or in a position that would allow interaction between them in the event of leakage.

(2) Packages of toxic and infectious substances shall be stowed on an aircraft in accordance with the provisions of the Technical Instructions.

(3) Packages of radioactive materials shall be stowed on an aircraft so that they are separated from persons, live animals and undeveloped film, in accordance with the provisions in the Technical Instructions.

Securing of dangerous goods cargo loads

14. When dangerous goods are loaded in an aircraft, the operator shall protect the dangerous goods from being damaged, and shall secure such goods in the aircraft in such a manner that will prevent any movement in flight which would change the orientation of the packages. For packages containing radioactive materials, the securing shall be adequate to ensure the separation requirements of 13 (3) are met at all times.

Training

15. (1) An operator, whether or not approved to transport dangerous goods, shall establish and update a dangerous goods training programme that meets the requirements of ICAO Annex 18, the applicable requirements of the Technical Instructions and the provisions of this Regulation, as appropriate. Details of the dangerous goods training programme shall be included in the operator's operations manuals. The dangerous goods training programme of the operator of a Macao registered aircraft must be subjected to review and approval by the Civil Aviation Authority.

(2) An operator, shipper, freight forwarder, designated postal operator and security service provider shall ensure that personnel identified in the categories specified in the Technical Instructions must be trained or training must be verified prior to the person performing any duty in accordance with the Technical Instructions.

(3) A test to verify understanding must be provided following training. Confirmation that the test has been completed satisfactorily is required.

(4) An operator, shipper, freight forwarder, designated postal operator and security service provider shall ensure that recurrent training be provide within 24 months of previous training to ensure knowledge is current. However, if recurrent training is completed within the final three months of validity of previous training, the period of validity extends from the date on which the recurrent training was completed until 24 months from the expiry date of the previous training.

(5) An operator, shipper, freight forwarder, designated postal operator and security service provider shall ensure that records of dangerous goods training are maintained for all staff trained in accordance with the Technical Instructions.

(6) An operator shall ensure that his handling agent's staff are trained in accordance with the applicable requirements above.

(7) Instructors of initial and recurrent dangerous goods training programs must have adequate instructional skills and have successfully completed a dangerous goods training program in accordance with the Technical Instructions.

(8) Instructors delivering initial and recurrent training programs must at least every 24 months deliver such courses, or in the absence of this attend recurrent training.

Provision of information

16. (1) An operator shall establish dangerous goods policies and procedures in its operations manual to meet, at minimum, the requirements of ICAO Annex 18, the Technical Instructions and the provisions of this Regulation to enable operator personnel to:

Applicable to operator not approved to transport dangerous goods

(a) identify and reject undeclared dangerous goods, including COMAT classified as dangerous goods; and

(b) report to the appropriate authorities of the State of the Operator and the State or Region in which it occurred any:

(i) occasions when undeclared dangerous goods are discovered in cargo or mail; and

(ii) dangerous goods accidents and incidents.

Applicable to operator approved to transport dangerous goods

(c) identify and reject undeclared or misdeclared dangerous goods, including COMAT classified as dangerous goods;

(d) report to the appropriate authorities of the State of the Operator and the State or Region in which it occurred any;

(i) occasions when undeclared or dangerous goods are discovered in cargo or mail; and

(ii) dangerous goods accidents and incidents;

(e) report to the appropriate authorities of the State of the Operator and the State of Origin any occasions when dangerous goods are discovered to have been carried;

(i) when not loaded, segregated, separated or secured in accordance with the Technical Instructions; and

(ii) without information having been provided to the pilot-in-command;

(f) accept, handle, store, transport, load and unload dangerous goods, including COMAT classified as dangerous goods as cargo on board an aircraft; and

(g) provide the pilot-in-command with accurate and legible written or printed information concerning dangerous goods that are to be carried as cargo.

(2) An operator shall provide such information in the operations manual to crew members, ground staff, and where applicable its ground handling agents, as will enable them to carry out their responsibilities with regard to the transport of dangerous goods and shall provide instructions as to the action to be taken in the event of emergencies arising involving dangerous goods.

(3) An operator shall ensure that all personnel, including third-party personnel, involved in the acceptance, handling, loading and unloading of cargo are informed of the operator's operational approval and limitations with regard to the transport of dangerous goods.

(4) The operator of an aircraft in which dangerous goods are to be carried shall provide the pilot-in-command as early as practicable before departure of the aircraft with written information as specified in the Technical Instructions.

(5) An operator shall ensure that information is promulgated in such a manner that passengers are warned as to the types of dangerous goods which they are forbidden from transporting aboard an aircraft as provided for in the Technical Instructions.

(6) An operator shall ensure that if an in-flight emergency occurs, the pilot-in-command shall, as soon as the situation permits, inform the appropriate air traffic unit, for the information of aerodrome authorities, of any dangerous goods on board the aircraft, as provided for in the Technical Instructions.

(7) Information in the event of an aircraft incident or accident

(a) In the event of:

(i) an aircraft accident; or

(ii) a serious incident where dangerous goods carried as cargo may be involved,

the operator of an aircraft carrying dangerous goods as cargo shall provide information, without delay, to emergency services responding to the accident or serious incident about the dangerous goods on board, as shown on the written information to the pilot-in-command. As soon as possible, the operator shall also provide this information to the appropriate authorities of the State of the Operator and the State or Region in which the accident occurred.

(b) In the event of an aircraft incident, the operator of an aircraft carrying dangerous goods as cargo shall, if requested to do so, provide information without delay, to emergency services responding to the incident and to the appropriate authorities of the State or Region in which

the incident occurred, about the dangerous goods on board, as shown on the written information to the pilot-in-command.

Reporting of dangerous goods occurrence

17. (1) Dangerous goods incident and accident. An operator shall report dangerous goods incidents and accidents which occur in Macao or outside the area of Macao which involve the transport of dangerous goods originating in or destined for another State or Region. Report on such accidents and incidents shall be made in accordance with the detailed provisions of the Technical Instructions.

(2) Undeclared or misdeclared dangerous goods. An operator shall report any instances when undeclared or misdeclared dangerous goods are discovered in cargo which occur in Macao or outside the area of Macao which involve the transport of dangerous goods originating in or destined for another State or Region. Report on such instances shall be made in accordance with the detailed provisions of the Technical Instructions.

(3) An initial report shall be dispatched to Civil Aviation Authority within 72 hours of the event unless exceptional circumstances prevent this.

Production of documents and records

18. The operator of an aircraft shall, within a reasonable time after being requested so to do by Civil Aviation Authority, cause to be produced to Civil Aviation Authority such of the following documents as may have been requested:

(a) The written permission of transport of dangerous goods by air;

(b) The dangerous goods transport document or other document in respect of any dangerous goods;

(c) The completed acceptance check list in a legible form in respect of any dangerous goods;

(d) A copy of the written information provided to the pilot-in-command of the aircraft.

Notification of variations from the Technical Instructions

19. The operator of a Macao registered aircraft shall ensure that when it adopts more restrictive requirements than those specific in the Technical Instructions, the notification of such operator variations is made to ICAO for publication in the Technical Instructions.