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AIR NAVIGATION ACT (CHAPTER 6)

AIR NAVIGATION (91 — GENERAL OPERATING RULES) REGULATIONS 2018

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In exercise of the powers conferred by section 3A of the Air Navigation Act, the Civil Aviation Authority of Singapore, with the approval of the Minister for Transport, makes the following Regulations:

PART 1

PRELIMINARY

Citation and commencement

1. These Regulations are the Air Navigation (91 — General Operating Rules) Regulations 2018 and come into operation on 1 October 2018.

Definitions

2.—(1) In these Regulations, unless the context otherwise requires, any term defined in the First Schedule has the meaning given to that term in that Schedule.

(2) In these Regulations, “aircraft” does not include —

- (a) a balloon or free flight aerial object which, at any stage of its flight, is not more than 2 m in any linear dimension (after including any object attached to the balloon or free flight aerial object);
- (b) a kite not exceeding 2 kg in weight;
- (c) a parasail; or
- (d) an unmanned aircraft and unmanned aircraft system.

(3) In these Regulations —

“relevant aircraft” means —

- (a) any aircraft operated by a Singapore operator;
- (b) any Singapore registered aircraft operated by a person other than a Singapore operator; or
- (c) any foreign registered aircraft in Singapore that is operated by a person other than a Singapore operator;

“relevant operator” means —

- (a) any Singapore operator; or
- (b) any person other than a Singapore operator who is operating —
 - (i) a Singapore registered aircraft, whether in or outside Singapore; or
 - (ii) a foreign registered aircraft in Singapore.

(4) Every standard in these Regulations for which a value is prescribed in the International System of Units (SI) and an alternative value is prescribed in a non-SI alternative unit of measurement in parentheses, the relevant standard is to be regarded as reached when either value is obtained.

Application of these Regulations

3.—(1) Unless otherwise specified, these Regulations apply to —

- (a) every flight carried out by a Singapore operator involving any aircraft;
- (b) every flight involving a Singapore registered aircraft that is carried out by a person other than a Singapore operator; and
- (c) every flight involving a foreign registered aircraft in Singapore that is carried out by a person other than a Singapore operator.

(2) A person whose principal place of business or, if the person has no such place of business, whose permanent residence is Singapore and —

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- (a) who engages in any commercial air transport operations involving an aeroplane with an MAPSC exceeding 19 or an MCTOM exceeding 27,000 kg, must also comply with the requirements in —
- (i) the Air Navigation (119 — Air Operator Certification) Regulations 2018 (G.N. No. S 443/2018); and
 - (ii) the Air Navigation (121 — Commercial Air Transport by Large Aeroplanes) Regulations 2018 (G.N. No. S 444/2018);
- (b) who engages in any commercial air transport operations involving a helicopter or an aeroplane with an MAPSC not exceeding 19 and an MCTOM not exceeding 27,000 kg, must also comply with the requirements in —
- (i) the Air Navigation (119 — Air Operator Certification) Regulations 2018; and
 - (ii) the Air Navigation (135 — Commercial Air Transport by Helicopters and Small Aeroplanes) Regulations 2018 (G.N. No. S 445/2018).

Owner deemed to be operator of general aviation aircraft

4. For the purpose of these Regulations, the owner of a Singapore registered aircraft used for general aviation is deemed to be the operator of that aircraft unless the owner has informed the Director-General of Civil Aviation in writing otherwise.

PART 2

Division 1 — General

Aircraft airworthiness

5.—(1) The pilot-in-command of a relevant aircraft must not operate the aircraft unless —

- (a) there is in force in respect of the aircraft a Certificate of Airworthiness duly issued or rendered valid under the law

of the State of Registry or the law of the State of the Operator; and

- (b) the conditions subject to which the Certificate of Airworthiness was issued or rendered valid are complied with.
- (2) Paragraph (1) does not apply to —
- (a) any flight of a Singapore registered aircraft that —
- (i) begins and ends in Singapore without passing over any other country; and
- (ii) is flying in accordance with the “A Conditions” or “B Conditions” set out in the Second Schedule to the Air Navigation Order (O 2);
- (b) any flight of an aircraft flying in Singapore in accordance with the conditions of a permit to fly issued by the Authority in respect of that aircraft; or
- (c) any aircraft that is a kite or a captive balloon.
- (3) Any person who fails to comply with paragraph (1) shall be guilty of an offence and shall be liable on conviction —
- (a) for a first offence, to a fine not exceeding \$50,000 or to imprisonment for a term not exceeding 2 years or to both; and
- (b) for a second or subsequent offence, to a fine not exceeding \$100,000 or to imprisonment for a term not exceeding 5 years or to both.
- (4) A person applying for a permit to fly —
- (a) must make the application to the Authority in such form and manner, and provide such information, as the Authority may require; and
- (b) must pay to the Authority the application fee, if specified in the Second Schedule.
- (5) The Authority may issue a permit to fly that —
- (a) is valid for every flight specified in the permit; and

(b) is subject to such conditions as the Authority considers fit.

Adherence to operating limitations of aircraft

6. When operating a relevant aircraft, the pilot-in-command must comply with —

- (a) the operating limitations of the aircraft specified in the aircraft's flight manual, markings or placards; and
- (b) such other requirements as may be prescribed by the State of Registry.

Documents to be carried on board aircraft

7.—(1) The pilot-in-command of a relevant aircraft must not commence any flight unless —

- (a) the aircraft carries the documents which it is required to carry under the law of its State of Registry; and
- (b) the pilot-in-command has ascertained that the documents are in force and remain in force for the duration of the flight.

(2) For the purpose of paragraph (1)(a), a Singapore registered aircraft is required to carry the following documents on board every flight:

- (a) its Certificate of Registration;
- (b) its Certificate of Airworthiness;
- (c) the appropriate licence for each flight crew member;
- (d) the aircraft radio station licence;
- (e) the journey log book or equivalent record;
- (f) a noise certificate, if applicable;
- (g) a copy of the approvals, permissions, authorisations or exemptions relevant to the flight;
- (h) a certified true copy of any transfer agreement under Article 83 *bis* of the Chicago Convention, if applicable;

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- (i) a certified true copy of the agreement for the lease, charter, interchange or other similar arrangement for the aircraft, if applicable;
 - (j) the English translation of any document required in sub-paragraph (a), (b) or (f) that is written in a language other than English;
 - (k) a copy of each certificate of maintenance review in force in respect of the aircraft, if applicable.

(3) The operator of a Singapore registered aircraft must provide the English translation mentioned in paragraph (2)(j), if required.

(4) Despite paragraph (2), the documents listed in that paragraph may be kept at the aerodrome of departure if it is a flight —

- (a) that is intended to begin and end at the same aerodrome located in Singapore; and
- (b) that does not include passage over territory of any other State in its planned flight path.

Flight manual to be carried on board

8. The pilot-in-command of a relevant aircraft must not commence any flight unless the aircraft's flight manual, or equivalent document, is carried on board the aircraft.

Operational information and forms to be carried on board

9. The pilot-in-command of a relevant aircraft must not commence any flight unless the following documents are carried on board the aircraft:

- (a) documentation for the pilot-in-command to record operational information;
- (b) current and suitable charts to cover the route of the proposed flight and any route along which it is reasonable to expect that the flight may be diverted;
- (c) if the flight involves passage over territory of more than one State —
 - (i) the passenger and cargo manifests;

- (ii) a copy of the procedures to be followed by the pilot-in-command of an intercepted aircraft, as published in an official publication by the AIS provider (such as an AIC, AIP or NOTAM);
- (iii) a copy of the visual signals for use by intercepting and intercepted aircraft, as published in an official publication by the AIS provider (such as an AIC, AIP or NOTAM).

Operation of radio in aircraft

10.—(1) A person must not operate a radio station in a relevant aircraft, whether or not the aircraft is in flight, unless —

- (a) the person is duly licensed or otherwise permitted to operate the radio station under the law of the State of Registry or the State of the Operator; and
- (b) the radio station is operated in accordance with the conditions of the radio station licence issued under the law of the State of Registry or the State of the Operator, as applicable.

(2) When any relevant aircraft is in flight in circumstances that require the aircraft to be equipped with radio communication equipment, a person assigned duty as a flight crew member for the flight must keep a continuous radio watch by listening to the signals transmitted upon the frequency designated by a message received from the appropriate aeronautical radio station for use by that station.

(3) Despite paragraph (2) —

- (a) the radio watch may be discontinued, or continued on another frequency, for reasons of safety or to the extent that a message received from the appropriate aeronautical station permits; and
- (b) the radio 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) the aeronautical radio station is designated as being capable of transmitting a signal suitable for that purpose.

(4) A person must not operate a radio station in any relevant aircraft in a way that causes interference which would impair the efficiency of aeronautical telecommunications or navigational services.

(5) A person operating a radio station in a relevant aircraft may not make any emissions from the radio station unless —

(a) in accordance with general international aeronautical practice —

(i) the emissions are of the class and frequency in use in the airspace in which the aircraft is flying at the time of flight;

(ii) the emissions are messages and signals of distress, urgency or safety; or

(iii) the emissions are messages and signals relating to the flight of the aircraft; or

(b) the emissions are such public correspondence messages as may be permitted by or under the aircraft radio station licence mentioned in paragraph (1).

Ground operation of aircraft

11.—(1) A relevant operator must ensure that an aeroplane is not taxied on the movement area of any aerodrome unless the person at the controls of the aeroplane —

(a) is an appropriately qualified pilot; or

(b) is duly authorised by the operator, or the operator's designated agent, upon the operator or designated agent being satisfied that —

(i) the person is fully competent to taxi the aeroplane;

(ii) the person is qualified to use the aeroplane's radio communication equipment if radio communications are required;

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- (iii) the person has received instruction from a competent person on —
 - (A) the current layout of the aerodrome; and
 - (B) where appropriate, information on the routes, signs, markings, lights, signals and instructions sent by the appropriate air traffic control unit, phraseology and procedures involved; and
 - (iv) the person is able to conform to the operational standards required for safe movement of the aeroplane at the aerodrome.
- (2) A relevant operator must ensure that —
- (a) a helicopter rotor is not turned under power for the purpose of flight except by an appropriately qualified pilot; and
 - (b) a helicopter rotor is not turned under power for any purpose other than flight except by a person who —
 - (i) is duly authorised by the operator or the operator's designated agent; and
 - (ii) has been provided with training, and has been briefed, on the procedures to be followed.

Method of carriage of persons

12.—(1) A relevant operator must ensure that, when a relevant aircraft is in flight, no person is carried in or on any part of the aircraft which was not designed for the accommodation of persons.

(2) A relevant operator must not carry any person in or on any object, other than a glider or flying machine, towed by or attached to a relevant aircraft that is in flight.

(3) Despite paragraphs (1) and (2), a relevant operator may allow a person to have temporary access to any part of a relevant aircraft when the aircraft is in flight —

- (a) to take any action necessary for the safety of the aircraft, or the safety of any person or cargo in the aircraft; or

- (b) if the part of the aircraft where cargo or stores are carried is designed to enable a person to have access while the aircraft is in flight, to access the cargo or stores carried.

Flight instruction and testing

13. An operator of a relevant aircraft in Singapore (that is not a balloon) must not use the aircraft for the purpose of flight instruction in Singapore unless that aircraft is equipped with fully functioning dual controls.

Common language

14. The pilot-in-command of a relevant aircraft must ensure that every person assigned duty as a flight crew member for the flight is able to speak and understand the level of English used for aeronautical radiotelephony communications.

Information on emergency and survival equipment carried

15.—(1) The operator of a flight mentioned in regulation 3(1)(a) or (b) must have available, for immediate communication to rescue coordination centres when necessary, information on the emergency and survival equipment carried on board each of the operator's aircraft.

(2) The information required under paragraph (1) on the emergency and survival equipment carried on such an aircraft includes —

- (a) the number, colour and type of the life rafts;
- (b) the type of pyrotechnics;
- (c) details of emergency medical supplies and water supplies;
and
- (d) the type and operating frequencies of any emergency portable radio equipment, if such equipment is carried.

Storage of baggage and cargo

16.—(1) The pilot-in-command of a relevant aircraft must not commence a flight if any item carried on board the aircraft, including any item of baggage and cargo —

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- (a) is not stowed and restrained in accordance with the instructions in the aircraft's flight manual; and
 - (b) is not packaged to avoid injury to any person on board the aircraft.
- (2) The pilot-in-command of a relevant aircraft must not permit any item of baggage or cargo carried on board the aircraft —
- (a) to exceed the load limitation for the seats, berths, or floor structure as specified by the flight manual or by placards;
 - (b) to be located in a position that restricts the access to or use of any required emergency exit; or
 - (c) to be located in a position where the item of baggage or cargo may —
 - (i) restrict access to any flight control equipment or part of the aircraft cockpit; or
 - (ii) restrict visibility of any flight instrument.

Portable electronic devices

17. The operator of a flight mentioned in regulation 3(1)(a) or (b), must ensure that a person does not operate any portable electronic device on the aircraft except with the permission of the pilot-in-command of the aircraft.

Responsibility of pilot-in-command

18.—(1) The pilot-in-command for a flight mentioned in regulation 3(1)(a) or (b) is responsible for —

- (a) the safety and security of all persons on board the aircraft;
- (b) the operation and safety of the aircraft from the moment the aircraft starts an engine for the purpose of take-off until —
 - (i) the aircraft comes to a complete rest at the end of the flight; and
 - (ii) all of the engines used as primary propulsion units are shut down and, if applicable, all of the rotor blades are stopped; and

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- (c) the security of the aircraft when the aircraft is being operated.
- (2) A pilot-in-command's responsibilities under paragraph (1) include —
- (a) ensuring that the flight does not commence if any person assigned duty as a flight crew member for that flight is or is likely to be unable to perform the person's duties as a result of incapacitation by any cause such as injury, sickness, fatigue, or the effects of psychoactive substances;
 - (b) ensuring that the flight does not continue beyond the nearest suitable aerodrome when the capacity of a person, assigned duty as a required flight crew member for the flight, to perform the person's assigned duties is significantly reduced by impairment of faculties from causes such as fatigue, sickness or lack of oxygen;
 - (c) reporting all known or suspected defects in the aircraft at the termination of the flight;
 - (d) preserving the flight recorder records if the aircraft is involved in an accident or serious incident;
 - (e) notifying the appropriate local authority, in the event of an emergency situation that necessitates action in violation of local regulations or procedures; and
 - (f) reporting any act of unlawful interference to the Authority and to the designated local authority.

Prohibition of use of psychoactive substances

19.—(1) A person must not perform any duty or function in the capacity of a pilot, a flight dispatcher, or any personnel involved in preparation or conduct of a flight involving a relevant aircraft if the person is under the influence of any psychoactive substance which may render the person unable to perform such duty or function in a safe and proper manner.

(2) Any person who fails to comply with paragraph (1) shall be guilty of an offence and shall be liable on conviction to a fine not

exceeding \$20,000 or to imprisonment for a term not exceeding 12 months or to both.

Passenger briefing

20. The pilot-in-command for a flight mentioned in regulation 3(1)(a) or (b) must take all reasonable steps to ensure that —

- (a) before commencing the flight —
 - (i) all passengers are made familiar with the location and use of —
 - (A) safety belts or any other restraints;
 - (B) the aircraft's emergency exits;
 - (C) the life jackets provided, if required to be carried;
 - (D) other emergency equipment provided for individual use, including passenger safety cards;
 - (E) flotation equipment, if required to be carried;
 - (F) any oxygen dispensing equipment provided for the use of passengers, if required to be carried;
 - (G) the emergency proximity escape path marking system, if required to be installed; and
 - (H) all other devices intended for individual use by the passengers in the case of an emergency, as required to be carried; and
 - (ii) all passengers are made aware of the restrictions on smoking in the aircraft;
- (b) during take-off, landing and such other times as necessary, all persons on board the aircraft are instructed to be secured in their seats by means of the safety belts or other restraints provided; and
- (c) in the event of an emergency occurring during flight, all persons on board the aircraft are instructed in such

emergency action as may be appropriate to the circumstances.

Use and preservation of flight recorders and records

21.—(1) For every flight mentioned in regulation 3(1)(a) or (b) where the aircraft is required to carry a flight recorder, the pilot-in-command must ensure that —

- (a) each installed flight recorder is operated from the time any engine is first started for the purpose of taking off until the termination of the flight when the aircraft is no longer capable of moving under its own power;
- (b) depending on the availability of electrical power, each installed airborne image recorder or airborne image recording system, or cockpit voice recorder or cockpit audio recording system, is operated from a time as early as possible during the cockpit check before any engine is first started at the beginning of the flight until the cockpit checks immediately after engine shutdown at the end of the flight; and
- (c) each installed flight recorder is not to be switched off at any time during the flight.

(2) Where a Singapore registered aircraft, or any aircraft operated by a Singapore operator, is to be flown for more than one flight in a day, the pilot-in-command of the aircraft must, before the first flight of the day, monitor the built-in test for the flight recorders (including any associated flight data acquisition unit when installed) by manual or automatic checks.

(3) The operator of a flight mentioned in regulation 3(1)(a) or (b) must retain, for a period in accordance with the Sixth Schedule, a record of the flight data (including a means of identifying the flight to which the record relates) of at least one representative flight —

- (a) that was made in the 12 months immediately preceding the flight; and
- (b) that includes a take-off, climb, cruise, descent, approach to landing and landing.

(4) In the event of an accident or serious incident involving a relevant aircraft —

- (a) the pilot-in-command must ensure that all installed flight recorders are de-activated upon completion of the flight to preserve flight recorder records; and
- (b) the operator must retain the flight recorder records, and the associated flight recorders where possible, in safe custody for a period of 90 days (or such longer period as determined by the Director-General of Civil Aviation) after the accident or serious incident.

(5) The operator of a flight mentioned in regulation 3(1)(a) or (b) must ensure that the documentation, concerning flight data recorder and airborne data recording system parameters, that is provided to an accident investigating authority is in electronic format and in line with industry specifications.

Division 2 — Operational procedures

Operational control

22. The pilot-in-command of a relevant aircraft is responsible for the operational control of the aircraft.

Flight planning

23.—(1) The pilot-in-command of a relevant aircraft must not commence a flight unless the pilot-in-command has obtained, become familiar with, and acted on all the relevant information concerning the flight.

(2) The information that a pilot-in-command is required to obtain, become familiar with, and act on, under paragraph (1) includes —

- (a) the current and forecast meteorological information;
- (b) the fuel and oil requirements for the flight;
- (c) all relevant details of the planned load;
- (d) the alternatives available if the flight cannot be completed as planned;

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- (e) any known or likely traffic delays as informed by the appropriate air traffic services unit in an official publication issued by the appropriate air traffic services unit (such as an AIC, AIP or NOTAM);
 - (f) the status of the communication and navigation facilities to be used for the flight;
 - (g) for the aerodrome of intended use, the current conditions, restrictions and runway lengths;
 - (h) all airspace restrictions that may apply on or adjacent to the planned route and alternatives available; and
 - (i) any volcanic activity within the vicinity of the planned route.

Flight Preparation

24. The pilot-in-command of a relevant aircraft must not commence a flight unless the pilot-in-command is satisfied that —

- (a) the aircraft is airworthy and in a condition for safe flight;
- (b) the documents and manuals required to be carried on the aircraft are on board;
- (c) the instruments and equipment installed on the aircraft are appropriate, and in accordance with Division 6, taking into account the expected flight conditions;
- (d) the installed instruments and equipment are in operable condition except for any instrument or item of equipment which the minimum equipment list states may be inoperable or not installed;
- (e) any necessary maintenance has been carried out in accordance with Division 7;
- (f) the correct quantity and type of fuel and oil, and engine coolant if required, are carried for the intended flight and that a safe margin has been allowed for contingencies;
- (g) the aircraft is capable of safely completing the intended flight, having regard to the performance of the aircraft in

the expected flight conditions and to any obstructions on the intended route;

- (h) the mass of the aircraft and centre of gravity are such that the flight can be conducted safely, taking into account the expected flight conditions;
- (i) any load carried on board is properly distributed and safely secured; and
- (j) the aircraft operating limitations contained in the aircraft's flight manual will not be exceeded.

ATS flight plans

25. Before the commencement of a flight of a relevant aircraft, the pilot-in-command must ensure that the ATS flight plan for the flight is submitted to all appropriate air traffic services units, in accordance with the Rules of the Air.

Operating in icing conditions — ground procedures

26.—(1) For every flight mentioned in regulation 3(1)(a) or (b), the pilot-in-command must not operate the aircraft in conditions where ground icing is known or suspected to be present, unless the aircraft —

- (a) is inspected for icing; and
- (b) is given such de-icing and anti-icing treatment as may be required upon inspection.

(2) For every flight mentioned in regulation 3(1)(a) or (b), the pilot-in-command must not perform a take-off in the aircraft if —

- (a) the aircraft has snow, ice or frost adhering to any wing, rotor, stabiliser or control surface of the aircraft; or
- (b) the aircraft has frost adhering to any propeller, windscreen or engine installation,

unless such action is specifically permitted by the aircraft's flight manual and the take-off is performed in accordance with the procedures in the aircraft's flight manual.

Operating in icing conditions — flight procedures

27. For any flight mentioned in regulation 3(1)(a) or (b), the pilot-in-command must not commence the flight or intentionally fly the aircraft into expected or actual icing conditions unless the aircraft is certificated and equipped to cope with such conditions.

Operating facilities

28.—(1) For any flight mentioned in regulation 3(1)(a) or (b), the pilot-in-command must not commence the flight from any aerodrome unless the pilot-in-command has ascertained, by every reasonable means available, that the ground facilities at the aerodrome (including communication facilities and navigation aids) that are required for the safe operation of the aircraft are adequate for the type of operation to be conducted.

(2) A pilot-in-command mentioned in paragraph (1) must report, without undue delay, any inadequacy of the ground facilities observed in the course of operations to the authority responsible for the facilities.

Use of aerodromes and landing sites

29.—(1) For any flight mentioned in regulation 3(1)(a) or (b), the pilot-in-command must not operate the aircraft at any aerodrome or landing site unless —

- (a) the aerodrome or landing site is adequate, taking into account the performance of the aircraft and the characteristics of the runway; and
- (b) at the expected time of use, the aerodrome or landing site is available and equipped with the necessary ancillary services and facilities (including air traffic services, lighting, communications, weather reporting, navigation aids and emergency services).

(2) For any flight mentioned in regulation 3(1)(a) or (b) involving a helicopter, the pilot-in-command must not operate the helicopter unless the pilot-in-command is satisfied that —

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- (a) any place to be used as a heliport, or landing site, within a congested area of a city, town or settlement has physical characteristics, obstacle limitation surfaces and visual aids commensurate with the characteristics of the helicopter being operated and the ambient light conditions;
 - (b) any place to be used as a heliport, or as a place to hover, that is outside a congested area of a city, town or settlement —
 - (i) is suitable for the helicopter to hover clear of obstructions; and
 - (ii) if it is to be used as a heliport, has a surface area suitable for touchdown and lift-off; and
 - (c) any place to be used as a heliport, or as a place to hover, has approach and take-off paths such that, if the helicopter is not operating in Performance Class 1, an emergency landing can be conducted without causing undue risk to any person or property on the ground.
- (3) A person must not operate —
- (a) any helicopter from an elevated heliport in a congested area within Singapore; or
 - (b) any Singapore registered helicopter from an elevated heliport in a congested area outside Singapore,
- unless the helicopter is being operated in Performance Class 1.

(4) A Singapore operator must not operate any helicopter from an elevated heliport in a congested area outside Singapore unless the helicopter is being operated in Performance Class 1.

Requirement to use certified aerodromes

30.—(1) The pilot-in-command of any aircraft within Singapore that is being operated for commercial air transport must not take off or land at any place in Singapore other than —

- (a) an aerodrome certified in accordance with paragraph 67 of the Air Navigation Order; or

(b) a government aerodrome listed in an official publication issued by the AIS provider (such as an AIP or a NOTAM).

(2) The pilot-in-command of an aircraft within Singapore that is being operated for a purpose other than commercial air transport must not take off or land at any place in Singapore other than an aerodrome described in paragraph (1)(a) or (b) unless otherwise approved by the Director-General of Civil Aviation.

(3) Despite paragraphs (1) and (2), the pilot-in-command of an aircraft in Singapore may select any suitable site in Singapore to land the aircraft during an emergency if —

(a) there is no alternative landing site; and

(b) the risks to other parties have been minimised.

General aerodrome operating minima

31.—(1) The pilot-in-command for a flight mentioned in regulation 3(1)(a) or (b) must not use an aerodrome as a departure, destination or alternate aerodrome if the aerodrome operating minima established by the State of the Aerodrome cannot be complied with.

(2) The pilot-in-command of a helicopter for a flight mentioned in regulation 3(1)(a) or (b) must not conduct any night operation without ground lighting to illuminate the final approach and take-off area, the runway and any obstacle within the aerodrome unless, before the commencement of the operation, the Director-General of Civil Aviation granted the pilot-in-command permission to conduct the operation without the requisite ground lighting.

(3) The Director-General of Civil Aviation may grant the permission mentioned in paragraph (2) subject to such conditions as the Director-General of Civil Aviation considers necessary or expedient to impose.

Aerodrome operating minima — general requirements

32.—(1) The pilot-in-command of a Singapore registered aircraft must, for every aerodrome that may be used in an aircraft operation, establish aerodrome operating minima —

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- (a) that takes into account the factors listed in paragraph (2); and
 - (b) that must not be lower than the aerodrome operating minima established or otherwise approved for that aerodrome by the State of the Aerodrome established or otherwise.
- (2) The pilot-in-command of a Singapore registered aircraft must take into account the following factors when establishing the aerodrome operating minima:
- (a) the type, performance and handling characteristics of the aircraft;
 - (b) the pilot-in-command's competence and experience;
 - (c) the dimensions and characteristics of the runways and final approach and take-off areas that may be selected for use;
 - (d) the adequacy and performance of the available visual and non-visual ground aids;
 - (e) the equipment available on the aircraft for the purpose of navigation and control of the flight path, during take-off, approach, flare, landing, rollout and any missed approach;
 - (f) the obstacles in the approach, the missed approach and the climb-out areas necessary for the execution of contingency procedures;
 - (g) the obstacle clearance altitude for the instrument approach procedures;
 - (h) the means to determine and report meteorological conditions;
 - (i) the flight technique to be used during the final approach.
- (3) The pilot-in-command of a relevant aircraft must not use any head-up display or enhanced vision system, where equipped, to gain operational credit in operations with lower visibility than that allowed under the aerodrome operating minima except under and in accordance with an approval granted to the operator —

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- (a) in the case of an aircraft operated for general aviation, by the State of Registry; or
- (b) in the case of an aircraft operated for commercial air transport or aerial work, by the State of the Operator.
- (4) For the purposes of paragraph (3) —
- (a) where the aircraft is a Singapore registered aircraft operated for general aviation; or
- (b) where the aircraft is operated by a Singapore operator, the relevant approval is an approval granted by the Director-General of Civil Aviation under the Air Navigation (98 — Special Operations) Regulations 2018 (G.N. No. S 442/2018) for that purpose.
- (5) The operator of a flight mentioned in regulation 3(1)(a) or (b) must not use aerodrome operating minima lower than Category I for any flight except under and in accordance with an approval granted to the operator by the Director-General of Civil Aviation under the Air Navigation (98 — Special Operations) Regulations 2018 for that purpose.

Aerodrome operating minima — commercial air transport operations by foreign operator in Singapore

- 33.—**(1) A foreign operator conducting commercial air transport operations must not operate an aircraft in or over Singapore unless the foreign operator —
- (a) has provided the Director-General of Civil Aviation with such particulars of the foreign operator's aerodrome operating minima for aerodromes in Singapore that the foreign operator has specified for the purpose of limiting the use of aerodromes in Singapore for take-off or landing by the foreign operator's aircraft; and
- (b) has complied with the instruction, if any, given by the Director-General of Civil Aviation to make an amendment or an addition to the aerodrome operating minima mentioned in sub-paragraph (a) for the purpose of ensuring the safety of the aircraft or the safety, efficiency or regularity of air navigation in Singapore.

(2) The Director-General of Civil Aviation may, from time to time, require the foreign operator to provide the particulars mentioned in paragraph (1)(a).

Noise abatement procedures

34.—(1) The pilot-in-command of a relevant aircraft must comply with noise abatement procedures to the extent that the procedures do not have a detrimental effect on aircraft safety.

(2) The pilot-in-command of a Singapore registered aircraft of a type specified in paragraph (5) may not land or take off in Singapore unless —

- (a) there is in force a noise certificate in respect of that aircraft that is issued by the Director-General of Civil Aviation in accordance with the Air Navigation Order; and
- (b) all of the conditions subject to which the noise certificate was issued are complied with.

(3) The pilot-in-command of a foreign registered aircraft of a type specified in paragraph (5) —

- (a) that is in or over Singapore; or
- (b) that is operated by a Singapore operator,

may not land or take off in Singapore unless paragraph (4) can be complied with.

(4) For a foreign registered aircraft of a type specified in paragraph (5) to land or take-off in Singapore —

- (a) there must be in force a noise certificate in respect of that aircraft —
 - (i) that is issued, or validated, by the competent authority of the State of Registry pursuant to Annex 16 to the Chicago Convention; or
 - (ii) that is issued, or validated, by the competent authority of the State of Registry and the Director-General of Civil Aviation is of the opinion that the standards applied by that competent authority

are substantially equivalent to Annex 16 to the Chicago Convention; and

- (b) all of the conditions subject to which the noise certificate was issued must be complied with.
- (5) For the purposes of paragraphs (2), (3) and (4), the specified aircraft types are —
- (a) any subsonic jet aeroplane;
 - (b) any supersonic aeroplane;
 - (c) any propeller-driven aeroplane, other than —
 - (i) a propeller-driven aeroplane that is specifically designed and used for agricultural or firefighting purposes; and
 - (ii) a propeller-driven aeroplane with an MCTOM not exceeding 8,618 kg that is specifically designed and used for aerobatic purposes; and
 - (d) any helicopter, other than a helicopter that is specifically designed and used —
 - (i) for agricultural or firefighting purposes; or
 - (ii) for the purpose of carrying an external load.
- (6) Paragraphs (2), (3) and (4) do not apply to —
- (a) an aircraft to be flown in accordance with “A Conditions” or “B Conditions” set out in the Second Schedule to the Air Navigation Order; or
 - (b) an aircraft in respect of which no noise certification standards are specified in Annex 16 to the Chicago Convention.

Alternate aerodromes — general requirements

35. The pilot-in-command of a Singapore registered aircraft must not nominate an aerodrome as an alternate aerodrome unless —

- (a) where the aerodrome has a specified instrument approach procedure, weather forecasts indicate that, at the estimated

time of use of the alternate aerodrome, the cloud ceiling and visibility will be at or above the minima specified; or

- (b) where the aerodrome has no specified instrument approach procedure, weather forecasts indicate that the cloud ceiling and visibility will be at or above the VFR minima specified in the Rules of the Air.

Destination alternate

36.—(1) Subject to paragraph (2), the pilot-in-command of a Singapore registered aeroplane must nominate at least one destination alternate aerodrome for any flight of the aeroplane that is to be conducted in accordance with the Instrument Flight Rules.

(2) A destination alternate aerodrome is not required for a flight of a Singapore registered aeroplane that is conducted in accordance with the Instrument Flight Rules —

- (a) when 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 of the destination aerodrome, a reasonable certainty exists that —
- (i) the approach and landing may be made under visual meteorological conditions; and
 - (ii) the destination aerodrome has separate runways that are usable, with at least one runway having an operational instrument approach procedure; or
- (b) when all of the following conditions are met:
- (i) the aerodrome of intended landing is an isolated aerodrome;
 - (ii) a standard instrument approach procedure is prescribed for the aerodrome of intended landing;
 - (iii) a point of no return is determined;
 - (iv) the flight is continued past the point of no return only when the current available meteorological

information indicates that both of the following meteorological conditions will exist at the aerodrome of intended landing at the estimated time of use:

- (A) a cloud base of at least 300 m (1,000 ft) above the minimum cloud base associated with the instrument approach procedure;
- (B) visibility of at least 5.5 km (3 NM), or of 4 km (2 NM) more than the minimum visibility associated with the procedure.

(3) Subject to paragraph (4), the pilot-in-command of a Singapore registered helicopter must nominate at least one destination alternate heliport for any flight of the helicopter that is to be conducted under the Instrument Flight Rules.

(4) A destination alternate heliport is not required for a flight of a Singapore registered helicopter that is conducted in accordance with the Instrument Flight Rules —

- (a) when the current available meteorological information indicates that, at the estimated time of use of the heliport of intended landing, the following meteorological conditions will exist:
 - (i) a cloud base of at least 120 m (400 ft) above the minimum cloud base associated with the instrument approach procedure;
 - (ii) visibility of at least 1.5 km more than the minimum visibility associated with the procedure; or
- (b) when all of the following conditions are met:
 - (i) the heliport of intended landing is an isolated heliport;
 - (ii) no suitable alternate heliport is available;
 - (iii) an instrument approach procedure is prescribed for the isolated heliport of intended landing;

(iv) a point of no return is determined, if the heliport of intended landing is an offshore destination.

(5) The pilot-in-command of a Singapore registered aircraft must ensure that, for every flight mentioned in paragraph (1) or (3) (as the case may be), the flight plan specifies the aerodrome or heliport that was nominated as the destination alternate aerodrome or destination alternate heliport.

Fuel and oil requirements — aeroplanes

37.—(1) The pilot-in-command of a Singapore registered aeroplane must not commence a flight unless the aeroplane carries sufficient fuel and oil to complete the flight, taking into account weather reports, forecasts and weather conditions.

(2) In paragraph (1), “sufficient fuel” means the amount of fuel required for an aeroplane —

- (a) when flying in accordance with the Instrument Flight Rules —
 - (i) to complete the flight to the intended destination with the final reserve fuel remaining if —
 - (A) a destination alternate aerodrome is not required in accordance with regulation 36(2)(a); or
 - (B) the intended destination is an isolated aerodrome; or
 - (ii) to fly to the intended destination, and then to an alternate, and complete the flight with the final reserve fuel remaining, if a destination alternate aerodrome is required in accordance with regulation 36(1);
- (b) when flying in accordance with the Visual Flight Rules by day, to complete the flight to the intended destination with the final reserve fuel remaining; or

- (c) when flying in accordance with the Visual Flight Rules by night, to complete the flight to the intended destination with the final reserve fuel remaining.

(3) When fuel is used after the commencement of the flight for any purpose other than the originally intended purpose (as determined during pre-flight planning), the pilot-in-command of the Singapore registered aeroplane must re-analyse the fuel required and adjust the planned operation, if applicable.

(4) Nothing in this regulation prohibits the amendment of a flight plan of an aeroplane in flight in order to change the destination aerodrome if the requirements in this regulation can be complied with from the point where the flight is re-planned.

(5) In this regulation, “final reserve fuel” means —

- (a) for the purposes of paragraph (2)(a)(i) and (ii) and (c), the amount of fuel required for an aeroplane to fly for 45 minutes at the aeroplane’s normal cruising speed; and
- (b) for the purpose of paragraph (2)(b), the amount of fuel required for an aeroplane to fly for 30 minutes at the aeroplane’s normal cruising speed.

Fuel and oil requirements — helicopters

38.—(1) The pilot-in-command of a Singapore registered helicopter must not commence a flight unless the helicopter carries sufficient fuel and oil to complete the flight, taking into account the following factors:

- (a) meteorological conditions forecast;
- (b) expected air traffic control routings and traffic delays;
- (c) for IFR flights, to allow for one instrument approach at the destination heliport, including a missed approach;
- (d) the procedures for loss of pressurisation, where applicable, or failure of one engine while en-route;
- (e) any other conditions that may delay the landing of the helicopter, or increase fuel or oil consumption, or both.

(2) In paragraph (1), “sufficient fuel” means the amount of fuel required for a helicopter —

- (a) when flying in accordance with the Instrument Flight Rules and a destination alternate heliport is not required in accordance with regulation 36(4)(a) —
 - (i) to fly to and execute an approach at the intended destination; and
 - (ii) to have a final reserve fuel, and an additional amount of fuel to provide for the increased consumption of fuel on the occurrence of potential contingencies, remaining thereafter;
- (b) when flying in accordance with the Instrument Flight Rules and a destination alternate heliport is required in accordance with regulation 36(3) —
 - (i) to fly to and execute an approach and a missed approach at the intended destination;
 - (ii) to fly to and execute an approach at the alternate heliport specified in the flight plan after the procedures in sub-paragraph (i); and
 - (iii) to have a final reserve fuel, and an additional amount of fuel to provide for the increased consumption of fuel on the occurrence of potential contingencies, remaining after the procedures in sub-paragraphs (i) and (ii);
- (c) when flying in accordance with the Instrument Flight Rules and a destination alternate heliport is not available in accordance with regulation 36(4)(b), to fly for a period that will, based on geographic and environment conditions at the destination heliport, enable a safe landing to be made; and
- (d) when flying in accordance with the Visual Flight Rules —
 - (i) to fly to the intended destination; and
 - (ii) to have a final reserve fuel, and an additional amount of fuel to provide for the increased consumption of

fuel on the occurrence of potential contingencies, remaining thereafter.

(3) When fuel is used after the commencement of the flight for purposes other than the originally intended purpose (as determined during pre-flight planning), the pilot-in-command of the Singapore registered helicopter must re-analyse the fuel required and adjust the planned operation, if applicable.

(4) In this regulation, “final reserve fuel” means —

- (a) for the purpose of paragraph (2)(a), the amount of fuel required for a helicopter to fly for 30 minutes at 450 m (1,500 ft) above the destination heliport or landing location, holding at endurance speed, under standard temperature conditions, with standard approach procedures and standard landing procedures;
- (b) for the purpose of paragraph (2)(b), the amount of fuel required for a helicopter to fly for 30 minutes at 450 m (1,500 ft) above the destination alternate heliport or landing location, holding at endurance speed, under standard temperature conditions, and with standard approach procedures and standard landing procedures; and
- (c) for the purpose of paragraph (2)(d), the amount of fuel required for a helicopter to fly for 20 minutes at endurance speed.

In-flight fuel management

39.—(1) The pilot-in-command of a relevant aircraft must monitor the amount of usable fuel remaining on board to ensure the amount of usable fuel is not less than the amount of fuel required to proceed to an aerodrome or landing site (as applicable) where a safe landing can be made, with the planned final reserve fuel remaining.

(2) The pilot-in-command of a relevant aircraft must advise the appropriate air traffic control unit of a minimum fuel state by declaring “MINIMUM FUEL” when, after committing to land at a specific aerodrome or landing site (as applicable), the

pilot-in-command calculates that the aircraft may land with less than the planned final reserve fuel if there is —

- (a) any change to the existing clearance to that aerodrome or landing site; or
- (b) any other air traffic delay.

(3) The pilot-in-command of a relevant aircraft must 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 or landing site (as applicable) where a safe landing can be made is less than the planned final reserve fuel.

Checklists

40. The pilot-in-command for a flight mentioned in regulation 3(1)(a) or (b) must ensure that, where a checklist is provided to ensure compliance with operating procedures, the checklist is used by the assigned flight crew.

Use of Airborne Collision Avoidance System II (ACAS II)

41.—(1) When ACAS II is installed in an aircraft mentioned in regulation 3(1)(a) or (b), the pilot-in-command must ensure that ACAS II is used during flight in a mode that enables Resolution Advisories (RAs) to be produced unless the use of ACAS II in that mode is not appropriate for conditions existing at the time.

(2) When ACAS II produces an RA, the pilot flying the aircraft mentioned in paragraph (1) must immediately take the corrective action indicated by the RA, even if the action conflicts with an instruction from the appropriate air traffic control unit.

(3) The pilot flying an aircraft mentioned in paragraph (1) must use appropriate procedures to ensure that a rate of climb or descent not exceeding 8 m/sec (1,500 ft/min) is achieved throughout the last 300 m (1,000 ft) of climb or descent to the assigned altitude or flight level unless the appropriate air traffic control unit instructs otherwise.

(4) Nothing in this regulation prohibits the pilot-in-command of an aircraft mentioned in paragraph (1) from exercising the

pilot-in-command's judgment and full authority in the choice of action to resolve a traffic conflict or avert a potential collision.

Crew members at station

42.—(1) For every flight mentioned in regulation 3(1)(a) or (b), the pilot-in-command must ensure that —

- (a) every person assigned duty on the flight as a crew member who is on duty during take-off, landing or such other time as the pilot-in-command directs, is at the crew member's station with the safety belt, or harness where so equipped, fastened unless the person's absence is necessary for the performance of duties in connection with the operation of the aircraft; or
- (b) every person assigned duty on the flight as a flight crew member who is required to be on flight deck duty remains at the flight crew member's station with the safety belt fastened unless the person's absence is necessary for the performance of duties in connection with the operation of the aircraft or out of physiological need.

(2) A person assigned duty as a crew member for a flight mentioned in regulation 3(1)(a) or (b) must not perform any activity during a critical phase of flight unless the activity is required for the safe operation of the aircraft.

Use of oxygen

43.—(1) The pilot-in-command for an aircraft mentioned in regulation 3(1)(a) or (b) that has a non-pressurised cabin must ensure that —

- (a) when the aircraft is flying above flight level 100 up to and including flight level 130, and the duration of the flight at those altitudes is more than 30 minutes, all the flight crew members use oxygen;
- (b) before the aircraft reaches flight level 130, the method of use of the oxygen provided in the aircraft is demonstrated to all passengers; and

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- (c) when the aircraft is flying above flight level 130 —
- (i) all passengers and crew members are instructed to use oxygen; and
 - (ii) all the flight crew members continuously use oxygen.

(2) The pilot-in-command for an aircraft mentioned in regulation 3(1)(a) or (b) that has a non-pressurised cabin must not operate the aircraft above flight level 250.

Flight crew communication

44. A person assigned duty as a flight crew member for any flight mentioned in regulation 3(1)(a) or (b), and who is required to be on flight deck duty for the aircraft, must communicate through a boom or throat microphone if the aircraft is —

- (a) an aeroplane that is operating in accordance with the Instrument Flight Rules below transition level or altitude; or
- (b) a helicopter.

Fuelling operations

45.—(1) A relevant operator must ensure that the aircraft is not refuelled or defuelled when any passenger is embarking, disembarking or on board the aircraft.

(2) A relevant operator must ensure that a helicopter is not refuelled or defuelled when a helicopter rotor is turning.

(3) Paragraphs (1) and (2) do not apply when —

- (a) the aircraft being refuelled or defuelled is properly attended to by the pilot-in-command or other qualified personnel, who is ready to initiate and direct an evacuation of the aircraft in the most practical and expeditious means available; and
- (b) the relevant operator has ensured that two-way communications is maintained, by the aircraft's intercommunications system or other suitable means, between the ground crew supervising the refuelling or

defueling and the qualified personnel mentioned in sub-paragraph (a).

(4) A relevant operator must ensure that appropriate precautions are taken —

- (a) when refuelling an aircraft with a fuel other than aviation kerosene;
- (b) when refuelling an aircraft results in a mixture of aviation kerosene with other aviation turbine fuels; or
- (c) when an open line is used.

Fuel spillage

46. When the refuelling or defuelling of a relevant aircraft results in spilled fuel that is likely to endanger persons or property, the operator must ensure that —

- (a) the refuelling or defuelling is stopped immediately;
- (b) the emergency services, where available, are summoned;
- (c) immediate action is taken to reduce the fire hazard; and
- (d) the aircraft is moved clear of the contaminated area, with the agreement of any attending emergency services, before any of the aircraft's engine is started.

Journey log

47. On the completion of a flight mentioned in regulation 3(1)(a) or (b), the pilot-in-command must —

- (a) complete the journey log book or equivalent record; and
- (b) record in the technical log or other document acceptable to the Director-General of Civil Aviation, the information specified in regulation 108 and any aircraft defects that were identified during the flight.

Reporting of weather and hazardous conditions

48.—(1) The pilot-in-command of a relevant aircraft must make a report to the appropriate aeronautical station as soon as possible when

any of the following conditions are encountered or observed during flight:

- (a) moderate or severe turbulence;
- (b) moderate or severe icing;
- (c) severe mountain wave;
- (d) thunderstorm (with or without hail), that are obscured, embedded, widespread or in squall lines;
- (e) heavy duststorm or heavy sandstorm;
- (f) volcanic ash cloud;
- (g) pre-eruption volcanic activity or a volcanic eruption;
- (h) any hazardous conditions other than those associated with meteorological conditions, that in the pilot-in-command's opinion is likely to affect the safety of other aircraft.

(2) The report made under paragraph (1) must provide such details as may be pertinent to the safety of other aircraft.

Reporting of accidents, incidents and occurrences

49. The pilot-in-command of a relevant aircraft is responsible for notifying the nearest appropriate authority by the quickest available means of —

- (a) any accident involving the aircraft resulting in serious injury or the death of a person, or substantial damage to the aircraft or property; or
- (b) an emergency landing by the aircraft, as described in regulation 30(3).

Obligation to report reportable safety matters

50.—(1) A responsible person must make a report to the Authority in accordance with the notification requirements specified in the Third Schedule if the responsible person has knowledge of any reportable safety matter specified in the Third Schedule involving a flight mentioned in regulation 3(1)(a) or (b).

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- (2) In paragraph (1), a “responsible person” means —
- (a) in the case of an aircraft operated by a Singapore operator, the Singapore operator; or
 - (b) in any other case involving a Singapore registered aircraft, the pilot-in-command.
- (3) A responsible person who fails to comply with paragraph (2) shall be guilty of an offence and shall be liable on conviction —
- (a) for a first offence, to a fine not exceeding \$50,000; and
 - (b) for a second or subsequent offence, to a fine not exceeding \$100,000.

Occupation of seats and wearing of restraints

51.—(1) For a flight mentioned in regulation 3(1)(a) or (b), the pilot-in-command must require every person in the aircraft to occupy a seat or berth and to fasten the person’s safety belt or restraining belt, or shoulder harness or single diagonal shoulder belt if equipped, at the following times:

- (a) during take-off and landing;
 - (b) when the aircraft is flying at a height of less than 1,000 ft above the surface, unless operational requirements preclude such restraints and the procedures are approved by the Director-General of Civil Aviation;
 - (c) at any time when the pilot-in-command considers it necessary for the person’s safety;
 - (d) during aerobatic flight; and
 - (e) at all times, if the aircraft is an open cockpit aircraft.
- (2) For a flight mentioned in regulation 3(1)(a) or (b), the pilot-in-command must require each passenger to place the passenger’s seat in the take-off and landing configuration during take-off and landing.
- (3) Paragraph (1)(a), (b) and (c) does not apply to a child below 2 years of age if the child —

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- (a) is held by an adult who is occupying a seat or berth and who has the child securely restrained; or
 - (b) is accompanied by a parent, a guardian, or an attendant designated by the child's parent or guardian to attend to the safety of the child during the flight and the child —
 - (i) is occupying a seat equipped with an approved child restraint system; and
 - (ii) does not exceed the specified mass limit for that system.
- (4) Paragraphs (1) and (2) do not apply if the aircraft is a balloon.

Familiarity with operating limitations and emergency equipment

52. For a flight mentioned in regulation 3(1)(a) or (b), the pilot-in-command must be familiar with the following matters before commencing the flight:

- (a) the aircraft's flight manual;
- (b) any placard, listing, or instrument marking containing an operating limitation specified for the aircraft by the manufacturer or the Director-General of Civil Aviation;
- (c) the emergency equipment installed on the aircraft;
- (d) the identity of every crew member assigned to operate an item of emergency equipment;
- (e) the procedures to be followed for the use of normal and emergency equipment in an emergency situation.

Towing of gliders

53.—(1) A relevant operator must not use an aircraft to tow a glider unless —

- (a) the Certificate of Airworthiness issued or rendered valid in respect of the towing aircraft under the law of its State of Registry includes an express provision that the aircraft may be used for that purpose; and

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- (b) the towing is conducted in accordance with an approval granted by the Director-General of Civil Aviation, and is for such purpose as the Director-General of Civil Aviation may approve, subject to any condition that may be imposed on such approval.
- (2) The relevant operator must ensure that the combination of towing aircraft, tow rope and glider in flight does not exceed 150 m in length.
- (3) The pilot-in-command of a relevant aircraft must not commence a flight with a glider in tow unless the pilot-in-command is satisfied of the following matters:
- (a) the tow rope is in good condition and is of adequate strength to tow the glider;
 - (b) the combination of the towing aircraft and the glider, having regard to the performance of the combination in the conditions to be expected on the intended flight and to any obstructions at the place of departure and on the intended route, is capable of safely taking off, reaching and maintaining a safe height at which the towing aircraft may separate from the glider;
 - (c) the towing aircraft can make a safe landing at the intended destination after separating from the glider;
 - (d) signals have been agreed and communications established with persons suitably stationed so as to enable the glider to take off safely;
 - (e) emergency signals have been agreed between the pilot-in-command of the towing aircraft and the pilot-in-command of the glider —
 - (i) for the pilot-in-command of the towing aircraft to indicate that the tow should be immediately released by the glider; and
 - (ii) for the pilot-in-command of the glider to indicate that the tow cannot be released.

(4) In this regulation and regulation 54, “towing aircraft” means an aircraft that is used to tow a glider.

Towing, picking up and raising of persons and articles

54.—(1) Subject to paragraph (2), a relevant operator must not, by any means external to an aircraft, use the aircraft —

- (a) to tow an article other than a glider; or
- (b) to pick up or raise any person, animal or article.

(2) A relevant operator may use the aircraft for the purposes in paragraph (1)(a) or (b) if —

- (a) the Certificate of Airworthiness issued or rendered valid in respect of the aircraft under the laws of its State of Registry includes an express provision that the aircraft may be used for that purpose; and
- (b) the operation is conducted in accordance with an approval granted by the Director-General of Civil Aviation, and is for such purpose as the Director-General of Civil Aviation may approve, subject to any condition that may be imposed on such approval.

(3) A relevant operator must ensure that an aircraft does not tow any article other than a glider when in flight at night or when flight visibility is less than 1.6 km.

(4) A relevant operator must ensure that combination of towing aircraft, tow rope and article in tow does not exceed —

- (a) 150 m in length; or
- (b) such other length as the Director-General of Civil Aviation may authorise upon application by the operator.

(5) A relevant operator must ensure that, when an article, a person or an animal, is being suspended from a helicopter that it operates —

- (a) the helicopter does not fly at any height over a congested area of a city, town or settlement; and

(b) the helicopter does not carry any passenger other than a passenger who has duties to perform in connection with the article, person or animal being suspended.

(6) Nothing in this regulation prohibits an aircraft from picking up or raising any person, animal or article in an emergency or for the purpose of saving life.

(7) This regulation does not apply to a relevant aircraft that is being flown in accordance with the “B Conditions” set out in the Second Schedule to the Air Navigation Order.

Dropping of persons and articles

55.—(1) A relevant operator must ensure that no article, animal or person, whether or not attached to a parachute, is dropped or permitted to drop to the surface from an aircraft flying in Singapore unless —

- (a) the Certificate of Airworthiness issued or rendered valid in respect of the aircraft under the law of its State of Registry includes an express provision that the aircraft may be used for that purpose; and
- (b) the operation is conducted in accordance with an approval granted by the Director-General of Civil Aviation, and is for such purpose as the Director-General of Civil Aviation may approve, subject to any condition that may be imposed on such approval.

(2) Paragraph (1) does not apply to —

- (a) the descent of persons by parachute from an aircraft in an emergency; or
- (b) the dropping of articles by or with the authority of the pilot-in-command of the aircraft under the following circumstances:
 - (i) the dropping of articles for the purpose of saving life;
 - (ii) the jettisoning of fuel or other articles in the aircraft, in the case of an emergency;
 - (iii) the dropping of ballast in the form of fine sand or water;

- (iv) the dropping of ropes, banners or similar articles towed by an aircraft at an aerodrome in accordance with the Rules of the Air.

(3) In this regulation, “dropping” includes projecting and lowering.

Division 3 — Operating limitations

Meteorological conditions — VFR flight

56. The pilot-in-command of a relevant aircraft must not commence a flight in accordance with the Visual Flight Rules 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 in accordance with the Visual Flight Rules will be such as to enable compliance with the Visual Flight Rules at the appropriate time.

Meteorological conditions — IFR flight

57. Where a relevant aircraft is to be operated in accordance with the Instrument Flight Rules, the pilot-in-command —

- (a) must not take off from the departure aerodrome unless —
 - (i) the meteorological conditions at the departure aerodrome are at or above the aerodrome operating minima for that operation at the time of use; and
 - (ii) the current meteorological reports, or a combination of current reports and forecasts, indicate that the meteorological conditions at the aerodrome of intended landing, or at every alternate aerodrome selected in accordance with regulation 35 or 36 (as the case may be), will be at or above the aerodrome operating minima for that operation at the estimated time of use; and
- (b) must not continue beyond the point of in-flight re-planning unless paragraph (a)(ii) can be complied with.

Departure limitations — IFR flight

58.—(1) The pilot-in-command of a relevant aircraft must not commence a flight in accordance with the Instrument Flight Rules unless —

- (a) the weather conditions at the departure aerodrome are at or above the weather minima specified for take-off in accordance with the Instrument Flight Rules, as determined in accordance with the requirements of the State of Registry or the State of the Operator (as applicable); and
- (b) the relevant runway visual range at the departure aerodrome is at least 400 m, except when the flight is conducted in accordance with an approval issued or granted by the State of Registry.

(2) In the case of a Singapore registered aircraft, the approval mentioned in paragraph (1)(b) is granted by the Director-General of Civil Aviation under the Air Navigation (98 — Special Operations) Regulations 2018.

Requirements for take-off — helicopters

59.—(1) Despite regulations 56 and 57, where a relevant aircraft is a helicopter, the pilot-in-command may commence a take-off —

- (a) when the reported meteorological visibility at the departure heliport is below that required to take-off and the runway visual range is not reported; or
- (b) when there is no reported meteorological visibility or runway visual range available for the departure heliport,

if the pilot-in-command can determine that the runway visual range and visibility along the take-off final approach and take-off area and runway are equal to or better than the required minima.

(2) Where a relevant aircraft is a helicopter that is operating under Performance Class 2, the pilot-in-command must remain clear of cloud during the take-off manoeuvre until the helicopter reaches Performance Class 1 capabilities.

Approach and landing conditions

60. The pilot-in-command of a relevant aircraft must not continue a flight towards the aerodrome of intended landing unless the latest available information indicates that, at the expected time of arrival at the aerodrome of intended landing, a landing can be effected at that aerodrome or at least one destination alternate aerodrome, in compliance with the appropriate operating minima.

Commencement and continuation of approach

61.—(1) The pilot-in-command of a relevant aircraft must not continue an instrument approach operation —

- (a) at an altitude above the aerodrome of intended landing that is below 300 m (1,000 ft) or into the final approach segment, unless the reported visibility or controlling RVR is at or above the aerodrome operating minima; or
- (b) beyond a point at which the limits of the operating minima specified for that aerodrome would be infringed.

(2) Despite paragraph (1), the pilot-in-command may continue the approach to decision altitude or height (DA/H) or minimum descent altitude or height (MDA/H) (as applicable) if —

- (a) after entering the final approach segment; or
- (b) after descending to an altitude above the aerodrome elevation that is below 300 m (1,000 ft),

the reported visibility or controlling RVR at the aerodrome of intended landing falls below the aerodrome operating minima.

(3) Where the relevant aircraft is a helicopter, the pilot-in-command must not continue an approach below MDA/H unless at least one of the following visual references of the intended final approach and take-off area or runway at the heliport of intended landing is distinctly visible and identifiable to the pilot-in-command:

- (a) the elements of approach light system;
- (b) the threshold;
- (c) the threshold markings;

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- (d) the threshold lights;
 - (e) the threshold identification lights;
 - (f) the visual glide slope indicator;
 - (g) the touchdown zone;
 - (h) the touchdown zone markings;
 - (i) the lights at the final approach and take-off area or edge of the runway;
 - (j) any other visual references as the Director-General of Civil Aviation may approve.

Instrument approach procedures

62. The pilot-in-command of a relevant aircraft that is being operated in accordance with the Instrument Flight Rules must comply with the instrument approach procedures approved by the State of the Aerodrome or the State responsible for any aerodrome that is located outside the territory of any State.

Prohibition against smoking during take-off and landing

63.—(1) The pilot-in-command of a relevant aircraft must not smoke during take-off and landing.

(2) The pilot-in-command of a relevant aircraft must ensure that no person smokes in the aircraft during take-off and landing.

(3) Any pilot-in-command who fails to comply with paragraph (1) shall be guilty of an offence and shall be liable on conviction to a fine not exceeding \$5,000 or to imprisonment for a term not exceeding 12 months or to both.

Division 4 — Mass and balance

Aircraft load limitation

64. The pilot-in-command for a flight mentioned in regulation 3(1)(a) or (b) must ensure that the limitations, contained in the aircraft's flight manual or other approved document, relating to mass and balance of the aircraft are complied with.

*Division 5 — Performance***Performance — General**

65.—(1) The pilot-in-command of a relevant aircraft must not commence a flight unless the pilot-in-command has determined that the aircraft is capable of —

- (a) taking off safely;
- (b) reaching and maintaining a safe height thereafter; and
- (c) making a safe landing at the place of intended destination,

having regard to the performance of the aircraft in the conditions to be expected on the intended flight, and to any obstructions at the places of departure, intended destination and on the intended route.

(2) For every flight mentioned in regulation 3(1)(a) or (b), the operator must ensure that the aircraft meets the aircraft performance requirements specified by the Director-General of Civil Aviation in Aviation Specifications 1 — Aircraft Performance Class for the applicable performance class in respect of during take-off, climb, en-route and landing.

*Division 6 — Instrument and equipment requirements***Application and interpretation**

66.—(1) The provisions in this Division do not apply to any aircraft that is operated by a Singapore operator.

(2) In this Division, “operator” does not include Singapore operator.

General requirements for instrument and equipment on aircraft

67.—(1) The operator of a foreign registered aircraft in Singapore must not operate the aircraft unless the aircraft is equipped in accordance with the laws of its State of Registry.

(2) Except for a prescribed instrument or item of equipment that is listed in the Fourth Schedule, the operator of a Singapore registered aircraft must ensure that the prescribed instrument or item of equipment (and the manner of its installation), is approved or

accepted by the Director-General of Civil Aviation in accordance with the Air Navigation Order.

Inoperative instruments or equipment

68.—(1) Subject to paragraph (3), an operator of a Singapore registered aircraft must not commence a flight using the aircraft if any instrument or item of equipment that the aircraft is required, in the circumstances of the intended flight, to carry under these Regulations is not carried or is not in a fit condition for use.

(2) The Director-General of Civil Aviation may, subject to such conditions as the Director-General of Civil Aviation considers fit, permit an operator to operate a Singapore registered aircraft in specified circumstances even if any instrument or item of equipment that the aircraft is required, in the circumstances of the intended flight, to carry under these Regulations is not carried or is not in a fit condition for use.

(3) When a permission is granted under paragraph (2), the operator may operate the Singapore registered aircraft under the circumstances specified in the permission if —

- (a) the operator has provided the particulars of the permission to the pilot-in-command of the aircraft;
- (b) the pilot-in-command has reviewed the particulars of the permission and determined that compliance with regulation 24 is possible; and
- (c) any inoperative instrument or item of equipment is conspicuously marked “Inoperative” and the required maintenance is recorded in the technical log.

Minimum equipment list

69. An operator must not use a minimum equipment list for a Singapore registered aircraft unless the minimum equipment list for that aircraft —

- (a) is based upon, but is no less restrictive than, the relevant master minimum equipment list; and

- (b) has been approved by the Director-General of Civil Aviation.

Marking of break-in points

70.—(1) An operator of a Singapore registered aircraft with an MCTOM exceeding 3,600 kg must ensure that every area of the aircraft fuselage suitable for break-in by rescue crews in the event of an emergency (called in this regulation a break-in area) —

- (a) is rectangular in shape;
- (b) is marked on the exterior surface of the aircraft's fuselage by right-angled corner markings, each arm of which is 10 cm in length along its outer edge and 3 cm in width; and
- (c) is marked across the centre with the words "CUT HERE IN EMERGENCY".

(2) Where a break-in area marked in accordance with paragraph (1) has corner markings that are more than 2 m apart, the operator mentioned in paragraph (1) must ensure that intermediate lines 10 cm in length and 3 cm in width are marked on the break-in area such that the distance between adjacent markings does not exceed 2 m.

(3) The operator mentioned in paragraph (1) must ensure that every marking required under this regulation —

- (a) is red in colour; and
- (b) in any case in which the colour of the adjacent background renders the red markings not readily visible, is outlined in white or some other contrasting colour in such a manner as to render the marking readily visible.

(4) The operator mentioned in paragraph (1) must ensure that every marking required under this regulation —

- (a) is painted or affixed by other equally permanent means; and
- (b) is kept clean and unobscured at all times.

Location of instruments and equipment

71. An operator of a Singapore registered aircraft must ensure that —

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- (a) any instrument or item of equipment to be operated or used by a single pilot is installed in the aircraft so that the instrument or item of equipment can be readily seen and operated from that pilot's normal seating position with minimum practicable deviation from the pilot's normal line of sight when the aircraft is in flight; and
 - (b) any single instrument or item of equipment to be operated or used by 2 pilots is installed in the aircraft so that the instrument or item of equipment can be readily seen and operated from each pilot's normal seating position.

Markings and placards

72. An operator of a Singapore registered aircraft must ensure that on the aircraft —

- (a) any placard, listing or instrument marking that specifies the aircraft's operating limitations is displayed —
 - (i) in a conspicuous place in the aircraft; and
 - (ii) in such a manner as to minimise the risk of erasure, disfigurement, obscuring or removal;
- (b) each unit of measure used on a placard, listing or instrument marking is the same as that on any related instrument or in the related flight manual;
- (c) each fuel contents gauge is clearly marked to indicate the units to which the gauge is calibrated;
- (d) a placard or marking is displayed in the immediate vicinity of each fuel and oil filler with the specification or grade, or both, of fuel or oil, as appropriate; and
- (e) any placard or marking required under any certificate issued in respect of the aircraft is present at the designated location and is legible.

Seating and restraints

73.—(1) An operator of a Singapore registered aircraft must ensure that the aircraft is equipped with —

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- (a) a seat or berth for each person on board; and
 - (b) a safety belt for each seat and restraining belts for each berth.
- (2) An operator of a Singapore registered aircraft must ensure that each flight crew member seat is equipped with —
- (a) a safety harness; or
 - (b) if the aircraft type certificate allows, a seat belt with a diagonal shoulder strap.
- (3) Despite paragraph (1), a child being carried on board in accordance with regulation 51(3)(a) does not require a seat, berth, safety belt or restraining belt.

Aircraft operating under VFR

- 74.**—(1) An operator of a Singapore registered aircraft to be flown in accordance with the Visual Flight Rules must ensure that the aircraft is equipped with a means of measuring and displaying —
- (a) magnetic heading;
 - (b) barometric airspeed;
 - (c) indicated airspeed;
 - (d) mach number, if the speed limitation prescribed by the aircraft flight manual is expressed in terms of mach number; and
 - (e) the time in hours, minutes and seconds.

(2) Paragraph (1) does not apply to any aircraft that is a non-power driven aircraft.

Equipment for flight in icing conditions

75. An operator of a Singapore registered aircraft to be operated in circumstances in which icing conditions are reported to exist or are expected to be encountered must ensure that the aircraft is certificated and equipped to operate in icing conditions for flight.

Aircraft operating under IFR or at night

76.—(1) An operator of a Singapore registered aircraft to be flown in accordance with the Instrument Flight Rules, or when the surface is not in sight, must ensure that the aircraft is equipped with a means of measuring and displaying —

- (a) magnetic heading (such as a standby compass);
- (b) barometric altitude;
- (c) indicated airspeed, with a means of preventing malfunctioning due to condensation or icing;
- (d) mach number, if the speed limitation specified in the aircraft's flight manual is expressed in terms of mach number;
- (e) stabilised aircraft heading;
- (f) the adequacy of the power supply to any gyroscopic instrument;
- (g) the outside air temperature;
- (h) the rate of climb and descent;
- (i) turn and slip if the aircraft is an aeroplane, or slip if the aircraft is a helicopter;
- (j) aircraft attitude for each required pilot, except that in an aeroplane one such indicator may be replaced with a turn and slip indicator; and
- (k) an additional indicator of aircraft attitude, if the aircraft is a helicopter; and
- (l) the time in hours, minutes and seconds.

(2) When an aircraft mentioned in paragraph (1) is to be flown at night, the operator must ensure that the aircraft is equipped with the following lights:

- (a) any light required by the Rules of the Air;
- (b) illumination for all flight instruments and equipment essential for the safe operation of the aircraft;

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- (c) lights in all passenger compartments;
 - (d) an independent portable light for each crew member station;
 - (e) a landing light which, if the aircraft is a helicopter, must be trainable in the vertical plane.
- (3) In paragraph (1) and regulation 77, “the surface is not in sight” means —
- (a) the flight crew is not able to see sufficient features of the surface; or
 - (b) the surface illumination is insufficient to enable the flight crew to maintain the aircraft in a desired altitude without reference to any flight instrument.

Spare fuses

77. An operator of a Singapore registered aircraft to be flown —

- (a) in accordance with the Visual Flight Rules or the Instrument Flight Rules; or
- (b) when the surface is not in sight,

must ensure that the aircraft is equipped with an appropriate quantity of spare fuses of relevant ratings for the replacement of those electrical fuses which are accessible during flight.

Communication equipment

78.—(1) An operator of a Singapore registered aircraft must ensure that the aircraft is equipped with —

- (a) radio communication equipment that is capable of providing a continuous two-way communication with an appropriate air traffic services unit or aeronautical telecommunications facility, and receiving meteorological information, at any time during the flight; and
- (b) a headset with a boom or throat microphone.

(2) The radio communication equipment required under paragraph (1)(a) must provide for communication on the emergency frequency 121.5 MHz.

(3) An operator of a Singapore registered aircraft must not operate the aircraft in defined portions of airspace or on a route where the appropriate air traffic services authority has specified a required communications performance for performance-based communication unless —

- (a) the aircraft is equipped with the capability of operating in accordance with the specified required communications performance; and
- (b) the operator has an approval granted by the Director-General of Civil Aviation under the Air Navigation (98 — Special Operations) Regulations 2018 for that purpose.

Navigation equipment

79.—(1) An operator of a Singapore registered aircraft must ensure that the aircraft is equipped with a navigation system that enables the aircraft to proceed in accordance with the flight plan and the requirements of the appropriate air traffic services authority, except when navigation for a VFR flight is accomplished by visual reference to landmarks.

(2) An operator of a Singapore registered aircraft must not operate an aircraft in an area where the appropriate air traffic services authority has specified a navigation specification for performance-based navigation unless —

- (a) the aircraft is equipped with the capability of operating in accordance with the required navigation specifications; and
- (b) the operator has an approval granted by the Director-General of Civil Aviation under the Air Navigation (98 — Special Operations) Regulations 2018 for that purpose.

(3) An operator of a Singapore registered aircraft must not operate an aircraft in RVSM airspace unless —

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- (a) the aircraft is equipped with the capability 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 the altitude of the aircraft deviates from the selected flight level by more than 300 ft (90 m); and
 - (iv) automatically reporting pressure altitude; and
 - (b) the operator has an approval granted by the Director-General of Civil Aviation under the Air Navigation (98 — Special Operations) Regulations 2018 for that purpose.

Surveillance Equipment

80.—(1) An operator of a Singapore registered aircraft must equip the aircraft with surveillance equipment for the aircraft to operate in accordance with the requirements of the appropriate air traffic services authority.

(2) An operator of a Singapore registered aircraft must not operate the aircraft in an area where the appropriate air traffic services authority has specified a required surveillance performance for performance-based surveillance unless —

- (a) the aircraft is equipped with the capability of operating in accordance with the required surveillance performance specifications; and
- (b) the operator has an approval granted by the Director-General of Civil Aviation under the Air Navigation (98 — Special Operations) Regulations 2018 for that purpose.

Installation of communication, navigation, surveillance equipment

81. An operator of a Singapore registered aircraft must ensure that the installation on the aircraft of any equipment required for

communications, navigation or surveillance purposes is such that the failure of any single unit of such equipment, or any combination thereof, will not result in the failure of another unit required for communications, navigation or surveillance purposes.

Landing in instrument meteorological conditions

82.—(1) An operator of a Singapore registered aircraft must ensure that the aircraft is provided with radio equipment appropriate to the navigation aids to be used if the aircraft is expected to land in instrument meteorological conditions.

(2) The equipment provided in accordance with paragraph (1) must be capable of receiving signals to provide guidance to a point from which a visual landing can be made at any aerodrome of intended landing and any designated alternate aerodrome.

Category II or III precision approach equipment

83. An operator of a Singapore registered aircraft must not use the aircraft to conduct a Category II or III precision approach procedure unless —

- (a) the aircraft is equipped with the capability to conduct such operations; and
- (b) the operator has an approval granted by the Director-General of Civil Aviation under the Air Navigation (98 — Special Operations) Regulations 2018 for that purpose.

Medical and emergency equipment

84.—(1) An operator of a Singapore registered aircraft must ensure that the aircraft is equipped with at least one first-aid kit.

(2) The operator must ensure that the first-aid kit mentioned in paragraph (1) —

- (a) is stowed in an accessible place; and
- (b) contains items appropriate to the nature of the flight and adequate to treat minor injuries.

(3) An operator of a Singapore registered aircraft must ensure that the aircraft is equipped with at least one fire extinguisher at each of the following locations:

- (a) the flight deck;
 - (b) any compartment that is separate from the flight deck and that is not readily accessible to the flight crew.
- (4) A fire extinguisher required under paragraph (3) —
- (a) must be a type that will not cause dangerous contamination of the air within the aircraft; and
 - (b) must not use any extinguishing agent listed in Annex A Group II of the Montreal Protocol on Substances that Deplete the Ozone Layer (8th Edition, 2009) if the fire extinguisher is —
 - (i) a portable fire extinguisher in an aircraft for which the Certificate of Airworthiness is first issued (whether in Singapore or elsewhere) on or after 31 December 2018; or
 - (ii) a built-in fire extinguisher located in a lavatory disposal receptacle for towels, paper or waste in an aircraft for which the Certificate of Airworthiness is first issued (whether in Singapore or elsewhere) on or after 31 December 2011.

Emergency locator transmitter

85.—(1) An operator of a Singapore registered aircraft must ensure that all required emergency locator transmitters —

- (a) operate in accordance with the requirements of Volume III of Annex 10 to the Chicago Convention; and
 - (b) are capable of transmitting on 121.5 MHz and 406 MHz.
- (2) The operator must ensure that every emergency locator transmitter capable of transmitting on 406 MHz —
- (a) is coded in accordance with Volume III of Annex 10 to the Chicago Convention; and

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- (b) is registered with the agency responsible for the maintenance of the aircraft register.
- (3) An operator of a Singapore registered aeroplane must ensure that the aeroplane is equipped with —
- (a) in the case of an aeroplane for which the Certificate of Airworthiness was first issued after 1 July 2008, at least one automatic emergency locator transmitter; and
 - (b) in any other case, at least one emergency locator transmitter of any type.
- (4) An operator of a Singapore registered helicopter must ensure that the helicopter is equipped with —
- (a) at least one automatic ELT; and
 - (b) when flying over water as described in regulation 87, at least one survival emergency locator transmitter which is stowed in a raft or with a life jacket.

Survival equipment

- 86.** An operator of a Singapore registered aircraft must ensure that —
- (a) the aircraft carries survival equipment and signalling devices appropriate to the areas to be overflown; and
 - (b) the decision on the equipment to be carried must be made with regard to the circumstances of the flight.

Flights over water

- 87.—**(1) An operator of a Singapore registered aircraft must ensure that every life jacket provided in accordance with regulations 88 and 89 —
- (a) is equipped with a survivor locator light;
 - (b) is equipped with a whistle, except for a life jacket constructed and carried on board solely for use by a child below 4 years of age; and

(c) is stowed in a place which is easily accessible from the seat or berth of the person for whom the life jacket is provided.

(2) An operator of a Singapore registered aircraft must ensure that each life raft, life jacket or signalling device provided in accordance with regulations 88 and 89 —

(a) is installed in a conspicuously identified location with the contents clearly indicated; and

(b) is easily accessible in the event of a ditching.

Flights over water — aeroplanes

88.—(1) An operator of a Singapore registered single-engine landplane must ensure that the landplane is equipped with a life jacket for each person on board if the landplane —

(a) is to be flown en-route over water beyond gliding distance from the shore; or

(b) is to take off or land at an aerodrome where, in the opinion of the pilot-in-command, the take-off or approach path is so disposed over water that in the event of a mishap there would be a likelihood of ditching.

(2) Where a Singapore registered aeroplane is to be flown over water and the operator has completed a survival risk assessment for the flight, the operator —

(a) must determine that the aeroplane is equipped with life rafts —

(i) that are of a sufficient number to accommodate all the persons on board; and

(ii) that are stowed so as to facilitate ready use in the event of an emergency;

(b) must provide the following equipment on the aeroplane:

(i) such life-saving equipment (including means of sustaining life) as is appropriate to the flight to be undertaken;

- (ii) equipment for making the distress signals described in the Rules of the Air;
- (iii) any additional equipment decided with reference to the operator's survival risk assessment.

(3) Where the Singapore registered aeroplane to be operated over water is a seaplane or an amphibian aeroplane, the operator must ensure that the aeroplane is equipped with —

- (a) the equipment for making sound signals, as specified in rule 33 in the Schedule to the Merchant Shipping (Prevention of Collisions at Sea) Regulations (Cap. 179, Rg 10);
- (b) the equipment necessary for mooring, anchoring or manoeuvring the aircraft on water, appropriate to the size, mass and handling characteristics of the aircraft; and
- (c) one sea anchor.

Flights over water — helicopters

89.—(1) An operator of a Singapore registered helicopter must ensure that the helicopter is equipped with a life jacket for each person on board if the helicopter —

- (a) is to be operated in Performance Class 1 or 2 —
 - (i) when the helicopter is engaged in offshore or other over water operations;
 - (ii) when the helicopter is to be flown over water in a hostile environment; or
 - (iii) when the helicopter is to be flown over water at a distance from land that is more than 10 minutes at normal cruise speed; and
- (b) is to be operated in Performance Class 3 when the helicopter is to be flown at a distance from land that is beyond the auto-rotational distance.

(2) An operator of a Singapore registered helicopter must ensure that every occupant of the helicopter wears a life jacket, or an

integrated survival suit that includes the functionality of a life jacket, during the following times:

- (a) when the helicopter is flying over water in a hostile environment;
 - (b) when the helicopter is flying over water at a distance from land that is more than 10 minutes at normal cruise speed;
 - (c) whenever the pilot-in-command, based on the pilot-in-command's determination of the risk to survival of the occupants in the event of ditching, so decides.
- (3) Where a Singapore registered helicopter is to be operated over water, the operator must ensure that —
- (a) if the helicopter is required under this regulation to carry more than one life raft —
 - (i) at least 50% of the life rafts are deployable by remote control; and
 - (ii) any life raft that is not deployable by remote control, and has a mass of more than 40 kg, is equipped with some means of mechanically assisted deployment; and
 - (b) if the helicopter is fitted with only 2 life rafts, each life raft is able to carry all the occupants of the helicopter when the life raft is in the overload state.
- (4) In paragraph (3)(b), “overload state” means a design safety margin of 1.5 times the maximum capacity of the life raft.

Pressure-altitude reporting transponder

90. An operator of a Singapore registered aircraft must ensure that the aircraft is equipped with a pressure-altitude reporting transponder which operates in accordance with the provisions of Volume IV of Annex 10 to the Chicago Convention.

Oxygen indicators

91. An operator of a Singapore registered aircraft that is to be operated at any altitude above flight level 130, or for more than

30 minutes at an altitude between flight level 100 up to and including flight level 130, must ensure the aircraft is equipped with a means of indicating to the flight crew —

- (a) whether the passenger oxygen system is activated;
- (b) if the oxygen system is supplied by a gaseous system, the amount of breathing oxygen available in each source of supply; and
- (c) if the aircraft is a pressurised aircraft, by visual or aural warning, when the cabin pressure altitude exceeds 10,000 ft.

Oxygen equipment and supplies for non-pressurised aircraft

92.—(1) Subject to paragraph (2), where a Singapore registered aircraft with a non-pressurised cabin is to be operated at any altitude above flight level 100, the operator must ensure that the aircraft is equipped with a supply of oxygen sufficient for the circumstances that the aircraft is to be operated in, in accordance with the following Table 1.

Table 1: Oxygen supply for an unpressurised aircraft

<i>Circumstances</i>	<i>Supply for</i>	<i>Duration</i>
(1) When flying above flight level 100 but not exceeding flight level 120	All flight crew members	Any period during which the aircraft is flying above flight level 100.
	All cabin crew members and 10% of passengers	For any continuous period exceeding 30 minutes, the duration is the period by which 30 minutes is exceeded.
(2) When flying above flight level 120	All crew members and passengers	Any period during which the aircraft flies above flight level 120.

(2) An operator of a Singapore registered aircraft for which the Certificate of Airworthiness was first issued before 1 January 1989 (whether in Singapore or elsewhere), may, in lieu of complying with

paragraph (1), ensure that the aircraft is equipped with a supply of oxygen sufficient for continuous use by —

- (a) all flight crew members for any period during which the aircraft flies above flight level 100; and
- (b) all persons on board for the whole time during which the aircraft flies above flight level 130.

(3) An operator mentioned in paragraph (1) or (2) must ensure that the Singapore registered aircraft is equipped with suitable and sufficient apparatus to enable every person on board to use the oxygen provided.

(4) The quantity of oxygen required to comply with paragraphs (1) and (2) is to be computed in accordance with the relevant information and instructions specified in the operator's Operations Manual or equivalent document.

Oxygen equipment and supplies for pressurised aircraft

93.—(1) An operator of a Singapore registered pressurised aircraft must ensure that the aircraft is equipped with suitable and sufficient apparatus to enable every person on board the aircraft to use the oxygen provided.

(2) The apparatus required under paragraph (1) includes —

- (a) automatically deployable oxygen equipment with a quantity of oxygen dispensing units that exceeds the number of seats in the passenger cabin by at least 10%; and
- (b) an oxygen mask for each flight crew member that supplies oxygen on demand and is readily accessible from that flight crew member's normal seated position.

(3) Where a Singapore registered pressurised aircraft is to be operated at any altitude above flight level 250, the operator must ensure that every oxygen mask provided to fulfil the requirement in paragraph (2)(b) is a quick donning type.

(4) Subject to paragraph (6), where a Singapore registered pressurised aircraft is to be operated at any altitude above flight level 100, the operator must ensure that the aircraft carries a supply of oxygen that is the greater of —

- (a) the amount of oxygen calculated in accordance with the operator's Operations Manual or equivalent document, taking into consideration —
 - (i) the possibility of depressurisation when flying above flight level 100;
 - (ii) the possibility of failure of one or more of the aircraft engines;
 - (iii) any restrictions due to required minimum safe altitude;
 - (iv) any fuel requirements; and
 - (v) the performance of the aircraft; or
- (b) the total amount of oxygen prescribed in the following Table 2 for the circumstances that the aircraft is to be operated in.

Table 2: Oxygen supply for pressurised aircraft

<i>Circumstances</i>	<i>Supply for</i>	<i>Duration</i>
(1) When flying above flight level 100 but not exceeding flight level 250	(a) every flight crew member	30 minutes or whenever the cabin pressure altitude exceeds 10,000 ft, whichever is the greater.
	(b) every cabin crew member and 10% of the passengers	(i) When the aeroplane is capable of descending and continuing to its destination as specified in Capability 1 below, 30 minutes or whenever the cabin pressure altitude exceeds 10,000 ft, whichever is the greater.

<i>Circumstances</i>	<i>Supply for</i>	<i>Duration</i>
		(ii) When the aeroplane is not so capable, whenever the cabin pressure altitude is greater than 10,000 ft but does not exceed 12,000 ft.
	(c) every cabin crew member and all passengers	When the aeroplane is not capable of descending and continuing to its destination as specified in Capability 1 below, and the cabin pressure altitude exceeds 12,000 ft, the expected continuous duration of time when the cabin pressure altitude exceeds 12,000 ft or 10 minutes whichever is the greater.
(2) When flying above flight level 250	(a) every flight crew member	2 hours or whenever the cabin pressure altitude exceeds 10,000 ft, whichever is the greater.
	(b) every cabin crew member	Whenever the cabin pressure altitude exceeds 10,000 ft and a portable supply for 15 minutes.
	(c) 10% of the passengers	Whenever the cabin pressure altitude exceeds 10,000 ft, but does not exceed 12,000 ft.

<i>Circumstances</i>	<i>Supply for</i>	<i>Duration</i>
	(d) 30% of the 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 expected continuous duration of time when the cabin pressure altitude exceeds 15,000 ft or 10 minutes, whichever is the greater.
	(f) 2% of the passengers or 2 passengers, whichever is the greater, being the supply of first-aid oxygen which must be available for simultaneous first-aid treatment of 2% of the passengers or 2 passengers wherever they are seated in the aeroplane.	After decompression, whenever cabin pressure altitude exceeds 8,000 ft.

(5) In Table 2, “Capability 1” means the situation when a failure to maintain cabin pressurisation occurs and the aircraft is capable of —

- (a) descending to flight level 130 within 4 minutes, in accordance with the emergency descent procedure specified in the aircraft’s flight manual and without flying below the minimum altitudes for safe flight specified in the Operations Manual or equivalent document relating to the aircraft; and
- (b) continuing at or below that flight level to its intended destination or any other place at which a safe landing can be made.

(6) An operator of a Singapore registered pressurised aircraft may, in lieu of complying with paragraph (4), ensure that the aircraft is equipped with a supply of oxygen in accordance with paragraph (7) if the aircraft —

- (a) has a Certificate of Airworthiness that was first issued before 1 January 1989 (whether in Singapore or elsewhere); and
- (b) is provided with a means of maintaining the pressure in the flight crew compartment, and the compartments in which passengers are carried, at above 700 hPa throughout the flight.

(7) The supply of oxygen to be provided for the purposes of paragraph (6) is —

- (a) in every case where the aircraft is to be flown at an altitude above flight level 350, a supply of oxygen in a portable container sufficient for simultaneous first-aid treatment of 2 passengers; and
- (b) in the event of a failure to maintain a pressure greater than 700 hPa in accordance with paragraph (6)(b) in the circumstances specified in columns 1 and 2 of the following Table 3, a supply of oxygen sufficient for continuous use by the persons specified in column 3 for the period specified in column 4 of the Table.

Table 3: Alternative oxygen supply

<i>Column 1</i>	<i>Column 2</i>	<i>Column 3</i>	<i>Column 4</i>
<i>Altitude at which aircraft is operating</i>	<i>Capability of aircraft to descend (where relevant)</i>	<i>Persons for whom oxygen is to be provided</i>	<i>Period of supply of oxygen</i>
(1) Above flight level 100		In addition to any passenger for whom oxygen is provided as specified below, all the crew members.	30 minutes or the period specified at Condition A, whichever is the greater.
(2) Above flight level 100 but not above flight level 300	Aircraft is flying at or below flight level 150	10% of the passengers.	30 minutes or the period specified at Condition A, whichever is the greater.
	Aircraft is capable of descending and continuing to destination as specified at Condition X		
	Aircraft is flying above flight level 150 and is not capable of descending and continuing to destination	All passengers.	10 minutes or the period specified at Condition B, whichever is the greater.
		10% of the passengers.	30 minutes or the period specified at Condition C, whichever is the greater.

<i>Column 1</i>	<i>Column 2</i>	<i>Column 3</i>	<i>Column 4</i>
<i>Altitude at which aircraft is operating</i>	<i>Capability of aircraft to descend (where relevant)</i>	<i>Persons for whom oxygen is to be provided</i>	<i>Period of supply of oxygen</i>
(3) Above flight level 300 but not above flight level 350	Aircraft is capable of descending and continuing to destination as specified at Condition Y	15% of the passengers.	30 minutes or the period specified at Condition A, whichever is the greater.
	Aircraft is not capable of descending and continuing to destination under Condition Y	All passengers.	10 minutes or the period specified at Condition B, whichever is the greater.
		15% of the passengers.	30 minutes or the period specified at Condition C, whichever is the greater.
(4) Above flight level 350		All passengers.	10 minutes or the period specified at Condition B, whichever is the greater.
		15% of the passengers.	30 minutes or the period specified at Condition C, whichever is the greater.

(8) In Table 3 —

“Condition A” means the whole period during which the aircraft flies above flight level 100, after a failure to maintain a pressure greater than 700 hPa in the flight crew compartment and in the compartments in which passengers are carried has occurred;

“Condition B” means the whole period during which the aircraft flies above flight level 150, after a failure to maintain a pressure greater than 700 hPa in the flight crew compartment and in the compartments in which passengers are carried has occurred;

“Condition C” means the whole period during which the aircraft flies between flight level 100 and flight level 150, after a failure to maintain a pressure greater than 700 hPa in the flight crew compartment and in the compartments in which passengers are carried has occurred;

“Condition X” means that, at the time when a failure to maintain a pressure greater than 700 hPa in the flight crew compartment and in the compartments in which passengers are carried occurs, the aircraft is capable of —

- (a) descending to flight level 150 within 6 minutes, 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, or equivalent, relating to the aircraft; and
- (b) 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;

“Condition Y” means that, when a failure to maintain a pressure greater than 700 hPa in the flight crew compartment and in the compartments in which passengers are carried occurs, the aircraft is capable of —

- (a) descending to flight level 150 within 4 minutes, 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, or equivalent, relating to the aircraft; and

- (b) 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.

Device to warn flight crew of loss of pressurisation

94. Where a Singapore registered pressurised aeroplane is to be operated at any altitude of 25,000 ft or higher, the operator must equip the aeroplane with a device to provide positive warning to the flight crew of any dangerous loss of pressurisation.

Flight recorders — construction, installation and continued serviceability

95.—(1) An operator of a Singapore registered aircraft must ensure that every flight recorder required to be installed on the aircraft pursuant to regulations 96, 97 and 98 is constructed, located and installed so as to provide maximum practical protection for the recordings in order that the recorded information may be preserved, recovered and transcribed.

(2) The operator mentioned in paragraph (1) must ensure that every flight recorder required to be installed on a Singapore registered aircraft pursuant to regulations 96, 97 and 98 meets the requirements specified by the Director-General of Civil Aviation in Aviation Specification 2 — Flight Recorders for the respective type of flight recorders in respect of —

- (a) specified crashworthiness and fire protection requirements;
- (b) performance;
- (c) parameters or information to be recorded;
- (d) duration of recording; and
- (e) continued serviceability.

Flight recorders — flight data recorder (FDR)

96.—(1) An operator of a Singapore registered helicopter must ensure the helicopter is equipped with —

- (a) a Type IV FDR, if the helicopter was first issued a Certificate of Airworthiness on or after 1 January 1989 but

before 1 January 2016 and has an MCTOM exceeding 7,000 kg;

- (b) a Type IV FDR, if the helicopter was first issued a Certificate of Airworthiness on or after 1 January 1989 but before 1 January 2016 and has an MAPSC exceeding 19;
- (c) a Type V FDR, if the helicopter was first issued a Certificate of Airworthiness on or after 1 January 1989 but before 1 January 2016 and has an MCTOM exceeding 3,175 kg but not exceeding 7,000 kg; or
- (d) a Type IVA FDR, if the helicopter was first issued a Certificate of Airworthiness on or after 1 January 2016 and has an MCTOM exceeding 3,175 kg.

(2) An operator of a Singapore registered helicopter must ensure that the following types of flight data recorders are not used:

- (a) engraving metal foil FDR;
- (b) photographic film FDR;
- (c) analogue FDR using frequency modulation;
- (d) magnetic tape FDR.

Flight recorders — cockpit voice recorder (CVR)

97.—(1) An operator of a Singapore registered helicopter must ensure that the helicopter is equipped with a cockpit voice recorder if —

- (a) the helicopter was first issued a Certificate of Airworthiness on or after 1 January 1987 and has an MCTOM exceeding 3,175 kg; or
- (b) the helicopter was first issued a Certificate of Airworthiness before 1 January 1987 and has an MCTOM exceeding 7,000 kg.

(2) Where a Singapore registered helicopter mentioned in paragraph (1)(a) or (b) is not equipped with a flight data recorder, the operator must ensure that the cockpit voice recorder also records the main rotor speed.

(3) An operator of a Singapore registered helicopter must ensure that the following types of cockpit voice recorders are not used:

- (a) magnetic tape CVR;
- (b) wire CVR.

Flight recorders — data link recorders

98.—(1) Where a Singapore registered helicopter is required to carry a cockpit voice recorder in accordance with regulation 97, the operator must ensure that the helicopter is equipped with a flight recorder that records data link communications messages (called in this regulation a data link recorder) —

- (a) for a helicopter with a Certificate of Airworthiness that is first issued on or after 1 January 2016, if the helicopter utilises any of the data link communications applications specified by the Director-General of Civil Aviation; or
- (b) for a helicopter with a Certificate of Airworthiness that is first issued before 1 January 2016, if the helicopter is modified on or after 1 January 2016 to install and utilise any of the data link communications applications specified by the Director-General of Civil Aviation.

(2) The operator mentioned in paragraph (1) must ensure that —

- (a) the minimum recording duration of the data link recorder is at least equal to the minimum recording duration of the cockpit voice recorder; and
- (b) the recordings of the data link recorder can be correlated to the recorded cockpit audio.

Combination recorders

99. Nothing in these Regulations prohibits an operator of a Singapore registered helicopter from equipping the helicopter with a combination recorder to meet the requirements of regulations 96 and 97.

*Division 7 — Maintenance***Continuing airworthiness management**

100.—(1) The operator of a Singapore registered aircraft must ensure that the aircraft is maintained in accordance with the Air Navigation Order and the Singapore Airworthiness Requirements.

(2) The operator of a Singapore registered aircraft must appoint a person who is responsible for ensuring that appropriate arrangements (commensurate with the number, type and complexity of the aircraft and the type of operations) are in place for continuing airworthiness management.

(3) The person appointed under paragraph (2) must be accepted by the Director-General of Civil Aviation.

Technical log

101.—(1) The operator of a Singapore registered aircraft must have a technical log for the purposes of paragraph (2).

(2) Subject to paragraph (4), the pilot-in-command of a Singapore registered aircraft must enter the following details in a technical log on the termination of each flight:

- (a) the time of the take-off and the time of the landing;
- (b) the particulars of any defect known to the pilot-in-command and which affects the airworthiness or safe operation of the aircraft;
- (c) such other particulars in respect of the airworthiness or operation of the aircraft that the Authority may specify.

(3) For the purposes of paragraph (2)(b), if no defect of the Singapore registered aircraft is known to the pilot-in-command at the termination of a flight, the pilot-in-command must make an entry to that effect in the technical log.

(4) The pilot-in-command may make the entries mentioned in paragraph (2) at the end of the last flight of a series of flights unless a defect of the Singapore registered aircraft becomes known to the pilot-in-command during an earlier flight.

(5) In this regulation, “series of flights” means consecutive flights within a period of 24 consecutive hours by a pilot-in-command who uses the same aircraft for every such flight, and each flight begins and ends at the same aerodrome.

Maintenance release

102.—(1) The operator of a Singapore registered aircraft must not operate the aircraft unless the aircraft has been maintained and released to service with —

- (a) a certificate of release to service issued under the Air Navigation Order; or
- (b) an equivalent release document.

(2) The certificate of release to service, or the equivalent release document, must contain a record of the details of maintenance carried out on the aircraft.

(3) The details of maintenance mentioned in paragraph (2) include —

- (a) the basic details of the maintenance performed;
- (b) the date on which the maintenance was completed;
- (c) the identity of the approved maintenance organisation, where applicable; and
- (d) the identity of the person signing the certificate of release or equivalent release document, being a person who is qualified under paragraph 10(4) of the Air Navigation Order to issue a certificate of release to service.

Continuous airworthiness information

103. The operator of a Singapore registered aeroplane with an MCTOM exceeding 5,700 kg, or a Singapore registered helicopter with an MCTOM exceeding 3,175 kg, must ensure that there exists a system to transmit information on faults, malfunctions, defects and other occurrences that cause or might cause adverse effects on the continuing airworthiness of the aircraft to all of the following persons:

- (a) the Director-General of Civil Aviation;

- (b) the organisation responsible for the type design of that aircraft;
- (c) if the information relates to an engine or propeller, the organisation responsible for the type design of that engine or propeller;
- (d) if the information relates to a continuing airworthiness safety issue that is associated with a modification, the organisation responsible for the design of the modification.

Division 8 — Crew requirements

Composition of crew

- 104.**—(1) A person must not operate an aircraft unless —
- (a) in the case of a flight mentioned in regulation 3(1)(a) or (b), the aircraft carries a flight crew of the number and description specified in the Certificate of Airworthiness or flight manual; or
 - (b) in the case of a flight mentioned in regulation 3(1)(c), the aircraft carries a flight crew of the number and description required by the aircraft’s State of Registry.
- (2) Subject to paragraph (3), an operator mentioned in regulation 3(1)(a) or (b) must not operate an aircraft along any route where the route (including any diversion from the route) —
- (a) is intended to pass over any part of an area specified in the Fifth Schedule; or
 - (b) includes any point which is more than 500 nautical miles from the point of take-off as measured along the route to be flown.
- (3) In the circumstances mentioned in paragraph (2), the operator may operate an aircraft if —
- (a) the aircraft includes a flight navigator as an additional flight crew member; or
 - (b) the aircraft is fitted with navigational equipment approved by the Director-General of Civil Aviation and which is to be

used in accordance with the conditions subject to which that approval was given.

Flight crew requirements

105. The pilot-in-command of a relevant aircraft must not commence a flight unless the pilot-in-command is satisfied that every person assigned duty as a flight crew member for that flight —

- (a) holds an appropriate licence that —
 - (i) is current;
 - (ii) is issued or validated by the State of Registry of the aircraft; and
 - (iii) includes the appropriate rating for the flight crew member's assigned duty;
- (b) is competent to carry out the flight crew member's assigned duty; and
- (c) has been appropriately trained to competency in the use of an airborne collision avoidance system for the avoidance of collisions where the aircraft is so equipped.

Flight crew recency

106. A person must not act as a pilot-in-command for a flight mentioned in regulation 3(1)(a) or (b) that involves the carriage of at least one passenger unless the person —

- (a) has, in the 90 days immediately preceding the flight, completed at least 3 take-offs and 3 landings on an aircraft of the type that is to be used for the flight;
- (b) has demonstrated competence on a flight simulation training device approved for that purpose; or
- (c) has satisfactorily demonstrated to the Director-General of Civil Aviation continued proficiency in an aircraft of the type that is to be used for the flight.

*Division 9 — Fatigue of the crew***Fatigue — Crew member responsibilities**

107.—(1) A person must not act as a crew member for any flight mentioned in regulation 3(1)(a) or (b), if the person knows or suspects that the person 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 must not act as a flight crew member for any flight mentioned in regulation 3(1)(a) or (b) if, at the beginning of the flight (other than a private flight of an aircraft with an MCTOM not exceeding 1,600 kg), the aggregate of the person's previous and planned flight times as a flight crew member —

- (a) exceeds 100 hours during the 28-day period immediately preceding the day on which the flight begins; or
- (b) exceeds 1,000 hours during the 12-month period immediately preceding the day on which the flight begins.

*Division 10 — Manuals, logs and records***Journey log book or equivalent record**

108.—(1) For every flight mentioned in regulation 3(1)(a) or (b), the operator must keep an accurate journey log book or equivalent record that contains the following information for every flight or series of flights operated by it:

- (a) the aircraft's nationality and registration;
- (b) the date of the flight;
- (c) the name of every person acting as a crew member;
- (d) the duty assignment to each crew member;
- (e) the place of departure;
- (f) the place of arrival;
- (g) the time of departure;
- (h) the time of arrival;

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- (i) the duration of the flight;
 - (j) the nature of the flight (private, aerial work, scheduled or non-scheduled commercial air transport);
 - (k) any incidents or observations;
 - (l) the signature of the pilot-in-command.

(2) An aircraft journey log book, or parts of an aircraft journey log book, may not be required if the relevant information is available in other documentation.

(3) All entries in the journey log book or equivalent record are permanent in nature.

(4) In this regulation, “series of flights” means consecutive flights within a period of 24 consecutive hours by a pilot-in-command who uses the same aircraft for every such flight, and each flight begins and ends at the same aerodrome.

Document retention period

109. For every flight mentioned in regulation 3(1)(a) or (b), the operator must ensure that all the information, reports and records specified in the Sixth Schedule are retained for their respective retention periods prescribed in that Schedule.

Aircraft’s flight manual

110. For every aircraft mentioned in regulation 3(1)(a) or (b), the operator must ensure that the aircraft’s flight manual is updated and amended to implement any change mandated by the State of Design, State of Manufacture or the Director-General of Civil Aviation.

PART 3

MISCELLANEOUS PROVISIONS

Fees

111.—(1) The Second Schedule sets out the fees for the following:

- (a) the issue, 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) under these Regulations;

- (b) the undergoing of any audit, inspection or investigation required by these Regulations;
- (c) the grant of any permission or approval required by, or for the purpose of, these Regulations.

(2) The Director-General of Civil Aviation may, in any particular case, waive or refund in whole or in part any fee payable under these Regulations where the Director-General of Civil Aviation considers fit.

Financial penalties

112.—(1) Subject to paragraphs (2) and (3), where the Authority is of the opinion that a person (*Z*) is contravening, or has contravened, any provision in Part 2 that is not a criminal offence, the Authority may direct *Z* to pay financial penalty not exceeding the higher of —

- (a) \$500,000; or
- (b) 5% of *Z*'s annual revenue derived from the regulated activity.

(2) Before exercising any power under paragraph (1), the Authority must give written notice to *Z* —

- (a) stating that the Authority intends to impose on *Z* a financial penalty under this regulation;
- (b) specifying each instance of non-compliance that is the subject of the financial penalty; and
- (c) specifying the time (being not less than 14 days after the service of notice on *Z*) within which written representations may be made to the Authority with respect to the non-compliance that is the subject of the financial penalty.

(3) The Authority may, after considering any written representations under paragraph (2)(c), decide to impose such financial penalty under paragraph (1) as the Authority considers appropriate.

(4) Where the Authority has made any decision under paragraph (3) against *Z*, the Authority must serve on *Z* a notice of its decision.

(5) To avoid doubt, this regulation does not affect the operation of section 4C, 4D or 4E of the Act.

(6) In this regulation —

“annual revenue” means the amount of money received by *Z* in the calendar year during which *Z* contravened a provision in Part 2 that is not a criminal offence;

“regulated activity” means the flights or operations conducted by *Z* under these Regulations.

Grant of approvals or acceptance

113.—(1) To avoid doubt, an approval or acceptance granted by the Director-General of Civil Aviation under any provision of these Regulations is not an aviation safety instrument.

(2) Where the Director-General of Civil Aviation is required to grant an approval or acceptance, the application —

(a) must be made by the relevant person in such form and manner as the Director-General of Civil Aviation may specify; and

(b) must provide such information as the Director-General of Civil Aviation may require.

(3) The Director-General of Civil Aviation may grant an approval or acceptance subject to such conditions as the Director-General of Civil Aviation considers necessary or expedient.

(4) The Director-General of Civil Aviation may withdraw an approval or acceptance, or impose, add, delete, substitute or modify conditions in respect of any such approval or acceptance if —

(a) the Director-General of Civil Aviation considers such action necessary to ensure compliance with these Regulations or any other relevant aviation safety subsidiary legislation; or

- (b) the Director-General of Civil Aviation is satisfied that there is or is likely to be a failure to comply with these Regulations or any other relevant aviation safety subsidiary legislation.

(5) In this regulation, “relevant person” means the employee of an operator who is responsible for applying to the Director-General of Civil Aviation for a specific approval or acceptance under these Regulations.

PART 4

SAVING AND TRANSITIONAL PROVISIONS

Saving and transitional provisions

114.—(1) Subject to paragraph (2), where —

- (a) an approval, acceptance or permission is granted by the Chief Executive under the Air Navigation Order immediately before 1 October 2018; and
- (b) such approval, acceptance or permission may be granted by the Director-General of Civil Aviation under these Regulations,

the approval, acceptance or permission granted by the Chief Executive continues in force as if the Director-General of Civil Aviation granted that approval, acceptance or permission under these Regulations until the approval, acceptance or permission is superseded, revoked or otherwise terminated.

(2) An approval, acceptance or permission mentioned in paragraph (1)(a) that is expressed to continue in force for a definite period ceases to be in force after the expiration of that period unless the approval, acceptance or permission is renewed in accordance with these Regulations.

(3) An application under any provision of the Air Navigation Order immediately before 1 October 2018 for an approval, acceptance or permission that may be granted by the Director-General of Civil Aviation under these Regulations, which application is still pending

on or after 1 October 2018, is to be treated as if that application was made under these Regulations.

FIRST SCHEDULE

Regulation 2

DEFINITIONS

“Accident” means an occurrence associated with the operation of an aircraft (which takes place from the time a person first boards the aircraft with the intention of flight until the time after all persons on board the aircraft have disembarked) in which —

(a) a person (not being a stowaway hiding outside the areas normally available to passengers and crew) is fatally or seriously injured as a result of —

(i) being in the aircraft;

(ii) having direct contact with any part of the aircraft, including parts which have become detached from the aircraft; or

(iii) having direct exposure to jet blast,

except where the injuries arise from natural causes, are self-inflicted or inflicted by another person;

(b) the aircraft sustains damage or structural failure which —

(i) adversely affects the structural strength, performance or flight characteristics of the aircraft; and

(ii) requires major repair to the aircraft or the replacement of the affected component,

but excludes —

(iii) engine failure or damage, when the damage is limited to a single engine (including its cowlings or accessories) or to propellers, wing tips, antennas, probes, vanes, tyres, brakes, wheels, fairings, panels, landing gear, doors, windcreens or the aircraft skin (such as small dents or puncture holes);

(iv) minor damage to main rotor blades, tail rotor blades or landing gear; and

(v) minor damage resulting from hail or bird strike (including holes in the radome); or

FIRST SCHEDULE — *continued*

(c) the aircraft is missing or completely inaccessible.

“Aerial work”, in relation to an aircraft operation, means the operation of an aircraft for specialised services such as agriculture, construction, photography, surveying, observation and patrol, search and rescue, and aerial advertisement.

“Aerobatic flight” means that portion of a flight when an aircraft engages in —

- (a) an intentional manoeuvre in which the aircraft is in sustained inverted flight or is rolled from upright to inverted or from inverted to upright position; or
- (b) manoeuvres such as rolls, loops, spins, upward vertical flight culminating in a stall turn, hammerhead or whip stall, or a combination of such manoeuvres.

“Aerodrome”, in relation to the operation of aircraft that is not confined to aeroplanes, includes heliport.

“Aerodrome operating minima” means the limits of usability of an aerodrome for —

- (a) take-off, expressed in terms of runway visual range or visibility or both and, if necessary, cloud conditions;
- (b) landing in 2D instrument approach operations, expressed in terms of visibility or RVR, MDA/H and, if necessary, cloud conditions; and
- (c) landing in 3D instrument approach operations, expressed in terms of visibility or RVR, and DA/H as appropriate to the type or category of operations.

“Aeronautical Information Circular” or “AIC” means a notice containing information which relates to flight safety, air navigation, or the technical, administrative or legislative matters relating to a flight.

“Aeronautical Information Publication” or “AIP” means a publication issued by and with the authority of the Aeronautical Information Services provider and containing the aeronautical information of a lasting character essential to air navigation.

“Aeronautical Information Services” or “AIS” means the services established within the defined area of coverage for the provision of aeronautical information and data necessary for the safety, regularity and efficiency of air navigation and, where appropriate, includes the personnel and facilities employed to provide information pertaining to the availability of air

FIRST SCHEDULE — *continued*

navigation services and their associated procedures necessary for the safety, regularity and efficiency of air navigation.

“Aeronautical station” means a land station in the aeronautical mobile service, which may in certain instances be located on board a 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.

“Air operator certificate” means a certificate issued by the competent authority of the State of the Operator for an operator to carry out specified commercial air transport operations, which, in the case of Singapore, is the certificate issued by the Authority in accordance with the Air Navigation (119 — Air Operator Certification) Regulations 2018.

“Air traffic control unit” includes area control centre, approach control unit and aerodrome control tower.

“Air traffic services unit” includes air traffic control unit, flight information centre or air traffic services reporting office.

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

“Airborne collision avoidance system II” or “ACAS II” means an airborne collision avoidance system which provides vertical resolution advisories in addition to traffic advisories.

“Aircraft component” means —

- (a) an aircraft engine;
- (b) an aircraft propeller; or
- (c) any part or equipment of an aircraft, being a part or an equipment fitted to or provided in an aircraft, and includes an assembly of aircraft parts or equipment.

“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.

FIRST SCHEDULE — *continued*

- “Airworthy” means the status of an aircraft, engine, propeller or part when the aircraft, engine, propeller or part 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 and which meets all of the following requirements:
- (a) the necessary services and facilities are available;
 - (b) the aircraft performance requirements can be met;
 - (c) the aerodrome is operational at the expected time of use.
- “Altitude” means the vertical distance of a level, a point, or an object considered as a point, measured from mean sea level.
- “Approach ban” means the prohibition, as prescribed in regulation 61, against commencing or continuing of an instrument approach into the final approach segment unless certain conditions are met.
- “Approach to landing” means that portion of the flight of an aircraft —
- (a) when the aircraft is descending to a height or altitude that is below 300 m (1,000 ft) above the aerodrome elevation; or
 - (b) when the aircraft is entering the final approach segment.
- “Appropriate aeronautical radio station”, in relation to an aircraft, means an aeronautical radio station serving the area in which the aircraft is in at that point in time.
- “Appropriate air traffic control unit”, in relation to an aircraft, means a unit that is responsible for providing air traffic control services to the aircraft in the airspace which the aircraft is in at that point in time.
- “Appropriate air traffic services unit”, in relation to an aircraft, means an air traffic services unit that is responsible for providing air traffic services for the aircraft in the airspace which the aircraft is in at that point in time.
- “Appropriate air traffic services authority” means the relevant authority designated by the State responsible for providing air traffic services in the particular airspace concerned.
- “Apron” means a defined area within a land aerodrome intended to accommodate aircraft for the purpose of loading or unloading passengers, mail or cargo, fuelling, parking, or maintenance.
- “Area navigation” means a method of navigation which permits aircraft operation on any desired flight path —

FIRST SCHEDULE — *continued*

- (a) within the coverage of ground or space based navigation aids;
- (b) within the limits of the capability of self-contained aids; or
- (c) that is a combination of paragraphs (a) and (b).

“ATS” means air traffic services.

“Baggage” means personal property of any passenger or crew member that is carried on an aircraft by agreement with the operator.

“Balloon” means a non-power-driven lighter-than-air aircraft.

“Cabin crew member” means a member of the crew who performs, in the interests of safety of passengers, duties assigned by the operator or the pilot-in-command of the aircraft, but does not include a flight crew member.

“Cargo”, in relation to freight or air cargo, means any property carried on an aircraft other than mail, stores and accompanied or mishandled baggage.

“Ceiling” means the height above the ground or water of the base of the lowest layer of cloud below 20,000 ft covering more than half the sky.

“Certificate of Airworthiness” —

- (a) means a certificate issued or rendered valid by the State of Registry or the relevant State based on an Article 83 *bis* agreement that certifies that the aircraft is in compliance with applicable airworthiness and safety requirements; and
- (b) includes any validation by the State of Registry or the relevant State based on an Article 83 *bis* agreement, and any flight manual, performance schedule or other document, whatever its title, incorporated by reference in that certificate relating to the Certificate of Airworthiness.

“Certificate of release to service” means a certificate that is issued under paragraph 10 of the Air Navigation Order.

“Combined vision system” or “CVS” means a system to display images from a combination of an enhanced vision system and a synthetic vision system.

“Commercial air transport”, in relation to an aircraft operation, means an aircraft operation involving the transport of passengers, cargo or mail for remuneration or hire, but does not include the carriage of passengers who are participants of an aerial sports activity as determined by the Director-General of Civil Aviation.

FIRST SCHEDULE — *continued*

“Competent authority” means —

- (a) in relation to Singapore, the Authority; and
- (b) in relation to any other country, the authority responsible under the law of that country for exercising the safety regulatory oversight of civil aviation.

“Configuration”, in relation to an aeroplane, means a particular combination of the positions of the movable elements, such as wing flaps or landing gear, which affect the aerodynamic characteristics of the aeroplane.

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

“Continuing airworthiness” means the set of processes by which an operator of an aircraft complies with the applicable airworthiness requirements for that aircraft, engine, propeller or part to remain in a condition for safe operation throughout the operating life of the aircraft, engine, propeller or part respectively.

“Controlling RVR” —

- (a) 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; and
- (b) unless otherwise specified, is the touchdown RVR whenever RVR is used.

“Crew member” means a person assigned by an operator of an aircraft to be involved in the operation of the aircraft during any portion of a flight.

“Critical phase of flight”, in relation to aircraft operations, includes an operation involving push back, taxi, take-off, approach and landing.

“Dangerous goods” means any article or substance which is capable of posing a risk to health, safety, property or the environment and which is set out in the list of dangerous goods in the Technical Instructions or which is classified as such according to those Instructions.

“Dangerous goods incident” has the meaning given by paragraph 50B of the Air Navigation Order.

“Decision altitude” or “DA”, “decision height” or “DH”, in relation to the operation of an aircraft at an aerodrome, means a specified altitude or height in a three-dimensional (3D) instrument approach operation at which

FIRST SCHEDULE — *continued*

the pilot-in-command must initiate a missed approach if the visual reference to continue the approach has not been established.

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

“Emergency locator transmitter” or “ELT” means any equipment which broadcasts distinctive signals on designated frequencies and, depending on application, is automatically activated by impact or manually activated, and includes the following:

- (a) automatic fixed ELT, which is an automatically activated ELT that is permanently attached to an aircraft;
- (b) automatic portable ELT, which is an automatically activated ELT that is rigidly attached to an aircraft but may be removed readily;
- (c) automatically deployable ELT, which is an ELT that is rigidly attached to an aircraft and is capable of both manual deployment and automatic deployment and activation upon impact;
- (d) survival ELT, which is an ELT which is removable from an aircraft that is stowed so as to facilitate its ready use in an emergency and is activated manually.

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

“Enhanced vision system” or “EVS” means a system to display electronic real-time images of the external scene achieved through the use of image sensors but does not include night vision imaging systems (NVIS).

“Equivalent release document” means a document issued in accordance with the regulations of a foreign civil aviation authority and accepted by the Director-General of Civil Aviation as equivalent to a certificate of release to service.

“Estimated time of use”, in relation to a destination alternate aerodrome or heliport, means the period that commences one hour before the earliest time of arrival and ends one hour after the latest time of arrival.

“Fatigue” means a physiological state of reduced mental or physical performance capability resulting from sleep loss or extended wakefulness, circadian phase, or workload (mental or physical activity,

FIRST SCHEDULE — *continued*

or both) that can impair a person's alertness and ability to safely operate an aircraft or perform safety-related duties.

“Final approach and take-off area” means a defined area —

- (a) over which the final phase of the approach procedure to hover or land is completed and from which the take-off manoeuvre is commenced; and
- (b) that includes the rejected take-off area available, in the case of a helicopter operating in Performance Class 1.

“Final approach segment” means the segment of an instrument approach procedure in which alignment and descent for landing are accomplished.

“Flight” means the period that commences when a powered aircraft first moves under its own power for the purposes of taking off or in the case of a glider when it first moves and ends when the aircraft or glider comes to rest after landing.

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

“Flight dispatcher” or “flight operations officer” means a person designated by the operator of an aircraft —

- (a) to engage in the control and supervision of flight operations while acting as a close link between the aircraft in flight and the ground services, and between the flight crew and the operator's ground staff; and
- (b) to provide support, briefing or assistance to the pilot-in-command in the safe conduct of the flight, including pre-flight preparation for the despatch release.

“Flight level” means a surface of constant atmospheric pressure which is related to a specific pressure datum (1013.2 hPa or 1013.2 mb) and is separated from other such surfaces by specific pressure intervals.

“Flight manual” means a manual that is associated with an aircraft's Certificate of Airworthiness and contains —

- (a) the limitations within which the aircraft may be considered airworthy; and
- (b) the instructions and information necessary for the flight crew to safely operate the aircraft.

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

FIRST SCHEDULE — *continued*

“Flight recorder” means any type of recorder installed in the aircraft for the purpose of complementing an investigation into an accident or incident involving the aircraft.

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

- (a) 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 aircraft type are realistically simulated;
- (b) a flight procedure trainer, which provides a realistic flight deck environment and which simulates instrument responses, simple control functions of the mechanical, electrical, electronic, etc., aircraft systems, and the performance and flight characteristics of aircraft of a particular class;
- (c) a basic instrument flight trainer, which is equipped with appropriate instruments and which simulates the flight deck environment of an aircraft in flight in instrument flight conditions.

“Flight time” means —

- (a) in relation to an aeroplane, the total time from the moment an aeroplane first moves under its own power for the purpose of taking off until the moment it comes to rest at the end of the flight;
- (b) in relation to a helicopter, the total time from the moment a helicopter’s rotor blades start turning until the moment the helicopter comes to rest at the end of the flight, and the rotor blades are stopped.

“Flying machine” means a heavier-than-air aircraft that is power-driven and includes —

- (a) an aeroplane (such as a landplane, seaplane, amphibian or self-launching motor glider);
- (b) a powered lift (or tilt rotor); and
- (c) a rotorcraft (such as a helicopter or gyroplane).

FIRST SCHEDULE — *continued*

- “Forecast”, in relation to meteorological conditions, means a statement of expected meteorological conditions for a specified time or period, and for a specified area or portion of airspace.
- “Foreign operator” means an operator whose principal place of business is not in Singapore.
- “General aviation”, in relation to an aircraft operation, means the operation of one or more aircraft for any purpose other than for commercial air transport or aerial work.
- “Heading” means the direction in which the longitudinal axis of an aircraft is pointed, usually expressed in degrees from North (true, magnetic or compass).
- “Head-up display” or “HUD” means a display system that presents flight information into the pilot’s forward external field of view.
- “Helicopter” means a heavier-than-air aircraft supported in flight chiefly by the reactions of the air on one or more power-driven rotors on substantially vertical axes.
- “Heliport” means an aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters.
- “Hostile environment” means an environment in which —
- (a) in all cases —
 - (i) a safe forced landing cannot be accomplished because the surface and surrounding environment are inadequate;
 - (ii) search and rescue response or capability is not provided consistent with anticipated exposure; or
 - (iii) there is an unacceptable risk of endangering persons or property on the ground; or
 - (b) in the case where the aircraft is a helicopter, the helicopter occupants cannot be adequately protected from the elements.
- “Human performance” means human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations.
- “IFR flight” means a flight conducted in accordance with the Instrument Flight Rules.

FIRST SCHEDULE — *continued*

“Instrument approach operation” —

- (a) means an approach and landing using instruments for navigation guidance based on an instrument approach procedure, executed in the following methods:
- (i) a two-dimensional (2D) instrument approach operation, using lateral navigation guidance only;
 - (ii) a three-dimensional (3D) instrument approach operation, using both lateral and vertical navigation guidance; and
- (b) is classified based on the designed lowest operating minima below which an approach operation must only be continued with the required visual reference as follows:
- (i) Type A: which is an instrument approach operation that involves a minimum descent height or decision height at or above 75 m (250 ft); and
 - (ii) Type B: which is an instrument approach operation that involves a decision height below 75 m (250 ft) and which is further categorised as follows:
 - (A) Category I (CAT I): where the decision height is 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;
 - (B) Category II (CAT II): where the decision height is lower than 60 m (200 ft), but not lower than 30 m (100 ft) and with a runway visual range not less than 300 m;
 - (C) Category IIIA (CAT IIIA): where the decision height is lower than 30 m (100 ft), or there is no decision height, and a runway visual range not less than 175 m;
 - (D) Category IIIB (CAT IIIB): where the decision height is lower than 15 m (50 ft), or no decision height and a runway visual range less than 175 m but not less than 50 m;
 - (E) Category IIIC (CAT IIIC): no decision height and no runway visual range limitations.

FIRST SCHEDULE — *continued*

- “Instrument approach procedure” means a series of pre-determined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix or from the beginning of a defined arrival route where applicable, 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 Flight Rules” means the Instrument Flight Rules contained in the Rules of the Air.
- “Instrument meteorological conditions” means meteorological conditions, expressed in terms of visibility distance from cloud and ceiling, which are less than the minima specified for visual meteorological conditions.
- “Interchange”, in relation to aircraft, means a mutual exchange of aircraft between 2 operators for an agreed period of time.
- “Isolated aerodrome” means a destination aerodrome for which there is no destination alternate aerodrome suitable for a given aeroplane type.
- “Isolated heliport” means a destination heliport for which there is no destination alternate heliport suitable for a given helicopter type.
- “Landplane” means a fixed wing aircraft which is designed for taking off and landing on land and includes an amphibian aeroplane that is operated as a landplane.
- “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 country in which the licence is granted.
- “Life jacket” means any device designed to support a person individually in or on water.
- “Load sheet” means a document which enables the pilot-in-command to determine that the aircraft’s load and its distribution throughout the aircraft are such that the mass and balance limits of the aircraft are not exceeded.
- “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 in a book or by any other means approved by the Director-General of Civil Aviation in the particular case.
- “Maintenance programme” means the maintenance schedule and related procedures necessary for the safe operation of those aircraft to which it applies.
- “Maintenance release” means a document which contains a certification confirming that the maintenance work to which it relates has been

FIRST SCHEDULE — *continued*

completed in a satisfactory manner, either in accordance with the approved data and the procedures described in the maintenance organisation's procedures manual or under an equivalent system.

“Maintenance schedule” means a document which describes the specific scheduled maintenance tasks and the frequency of completion for each scheduled task to ensure the safe operation of those aircraft to which the schedule applies.

“Master minimum equipment list” or “MMEL” means a list that —

- (a) is established for a particular aircraft type by the organisation responsible for the type design with the approval of the State of Design;
- (b) contains the items which are permitted to be unserviceable at the commencement of the flight; and
- (c) may be for general use or associated with special operating conditions, limitations or procedures.

“Maximum approved passenger seating configuration” or “MAPSC” means the maximum passenger seating capacity of an individual aircraft that is specified in the operations manual, used by the operator and approved by the appropriate authority, and excludes pilot seats or flight deck seats and cabin crew seats, as applicable.

“Maximum certificated take-off mass” or “MCTOM”, 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 a meteorological report, analysis, forecast, and any other statement relating to existing or expected meteorological conditions.

“Minimum descent altitude” or “MDA”, or “minimum descent height” or “MDH”, means a specified altitude or height in a two-dimensional (2D) instrument approach operation or circling approach operation below which the pilot-in-command must not continue the descent without the required visual reference.

“Minimum equipment list” or “MEL” means a list which states the particular equipment which may be inoperative during the operation of an aircraft, subject to specific conditions, and which is prepared by an operator in conformity with, to be more restrictive than, the MMEL established for the aircraft type.

FIRST SCHEDULE — *continued*

- “Modification”, in relation to an aircraft or aircraft component, means the alteration of the aircraft or aircraft component to conform to the approved standard for that aircraft or aircraft component.
- “Movement area” means that part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and an apron.
- “Navigation guidance” means guidance in the lateral or vertical plane that is provided by —
- (a) a ground-based radio navigation aid; or
 - (b) computer-generated navigation data from ground-based, space-based or self-contained navigation aids, or a combination of these aids.
- “Navigation specification” means a set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace.
- “Night” means the time between 20 minutes after sunset and 20 minutes before sunrise, the timing of sunset and sunrise being determined at surface level.
- “Noise certificate” means a certificate issued or validated or other document approved by the competent authority of a State to the effect that the aircraft to which the certificate or other document relates complies with the applicable noise certification requirement in force in that State.
- “NOTAM” or “notice to airmen” means a notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.
- “Obstacle” means any fixed or mobile object or part thereof —
- (a) which is located in an area intended for the surface movement of aircraft; or
 - (b) which extends above a defined surface intended to protect aircraft in flight.
- “Obstacle clearance altitude” or “obstacle clearance height” means the lowest altitude or the lowest height above the elevation of the relevant runway threshold or the aerodrome elevation as applicable, used to establish compliance with appropriate obstacle clearance criteria.

FIRST SCHEDULE — *continued*

“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, or the regularity or efficiency of the flight.

“Operational credit” means —

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

“Operational flight plan”, in relation to an aeroplane or helicopter, means an operator’s plan for the safe conduct of the flight based on considerations of the aeroplane’s or helicopter’s performance, other operating limitations and relevant expected conditions on the route to be followed and at the aerodromes or heliports concerned.

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

“Operator” means the person who, at the relevant time, is engaged in or offering to engage in an aircraft operation, except in the following cases:

- (a) where there is an agreement for the charter, hire, lease or loan of an aircraft from one person (called the firstmentioned person) to another person, other than an air transport undertaking or an aerial work undertaking for a period not exceeding 14 days, the firstmentioned person is deemed to be the operator;
- (b) where the aircraft is not used in an aircraft operation, the person who owns or whose management or control the aircraft is in is deemed to be the operator; or
- (c) where regulation 4 applies.

“Performance-based communication” or “PBC” means communication based on performance specifications applied to the provision of air traffic services.

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

“Performance-based surveillance” or “PBS” means a surveillance based on performance specifications applied to the provision of air traffic services.

FIRST SCHEDULE — *continued*

“Performance Class 1”, in relation to helicopter operations, means a flight where, in the event of the failure of an engine —

- (a) when the engine failure recognition occurs during take off at or before the helicopter reaches the take-off decision point, the helicopter will be able to land safely within the area from which it had taken off; or
- (b) when the engine failure recognition occurs at any other time during flight, the helicopter will be able to continue the flight safely and land at an appropriate landing area.

“Performance Class 2”, in relation to helicopter operations, means a flight where, in the event of the failure of an engine —

- (a) where the failure occurs during the take-off manoeuvre or the landing manoeuvre, and the helicopter is unable to take off or land, the helicopter will be able to carry out a forced landing; or
- (b) where the failure occurs at any other point during the flight, the helicopter will be able to safely continue the flight to an appropriate landing area.

“Performance Class 3”, in relation to helicopter operations, means a flight where, in the event of the failure of an engine at any time during the flight, the helicopter will be required to carry out a forced landing.

“Permit to fly” means a certificate issued by the Authority to permit an aircraft, that does not have a valid certificate of airworthiness or is not constructed to international recognised design standards, to fly in accordance with conditions specified on the certificate.

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

“Portable electronic device” or “PED” means any electronic device that transmits electromagnetic signals and is capable of being brought on board an aeroplane, and which includes both intentionally transmitting PED and unintentionally transmitting PED, but does not include —

- (a) a PED that has very low power consumption (such as a heart pacemaker, hearing aid or digital watch); or
- (b) a medical PED (such as an automated external defibrillator or a portable oxygen concentrator) that is approved for use in the aeroplane.

FIRST SCHEDULE — *continued*

- “Precision approach” means an instrument approach using Instrument Landing System, Microwave Landing System or Precision Approach Radar for guidance in both azimuth and elevation.
- “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 of the aircraft a pressure greater than that of the surrounding atmosphere.
- “Principal place of business” means the head office or registered office of the organisation within which the principal financial functions and operational control of the activities referred to in these Regulations are exercised.
- “Private flight” means a flight, which is neither for the purpose of aerial work nor commercial air transport.
- “Psychoactive substances” includes alcohol, opioids, cannabinoids, sedatives and hypnotics, cocaine, other psychostimulants, hallucinogens, and volatile solvents, and excludes coffee and tobacco.
- “Quality system” means the organisational structure, procedures, processes and resources needed to implement quality management.
- “Rating” means an authorisation entered on, or associated with, a licence and forming part of a licence, which states special conditions, privileges, or limitations pertaining to such licence.
- “Record” —
- (a) includes —
 - (i) a record in writing;
 - (ii) any disc, tape, soundtrack or other device in which sounds or signals are embodied so as to be capable (with or without the aid of some other instrument) of being reproduced therefrom;
 - (iii) any film, tape or other device in which visual images are embodied so as to be capable (with or without the aid of some other instrument) of being reproduced therefrom; and
 - (iv) any photograph; and

FIRST SCHEDULE — *continued*

(b) any reference to a copy of a record includes —

- (i) in the case of a record that falls within paragraph (a)(ii) only, a transcript of the sounds or signals embodied therein;
- (ii) in the case of a record that falls within paragraph (a)(iii) only, a still reproduction of the images embodied therein; and
- (iii) in the case of a record falling within both paragraph (a)(ii) and (iii), such a transcript together with such a still reproduction.

“Reduced vertical separation minimum airspace” or “RVSM airspace” means any airspace between flight level 290 and flight level 410 (both altitudes inclusive) designated by the relevant competent authority as being airspace within which a vertical separation minimum of 300 metres (1,000 ft) is to be applied.

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

“Replacement”, in relation to any part of an 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 designated to be removable solely for the purpose of enabling another part to be inspected, repaired, removed or replaced or cargo to be loaded.

“Rules of the Air” means the rules set out in the Eleventh Schedule to the Air Navigation Order.

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

“Runway visual range” or “RVR” means the range over which the pilot of an aircraft on the centre line of a runway can see —

- (a) the runway surface markings;
- (b) the lights delineating the runway; or
- (c) the lights identifying its centre line.

FIRST SCHEDULE — *continued*

- “Seaplane” means a fixed wing aircraft which is designed for taking off and landing on water and includes an amphibian aeroplane that is being operated as a seaplane.
- “Search and rescue facility” means any mobile resource used to conduct search and rescue operations, and includes designated search and rescue units.
- “Singapore operator” means an operator holding an air operator certificate issued under the Air Navigation (119 — Air Operator Certification) Regulations 2018.
- “State of Design” means the State which has jurisdiction over the organisation responsible for the type design.
- “State of Manufacture” means the State which has jurisdiction over the organisation responsible for the final assembly of the aircraft.
- “State of the Aerodrome” means the State in which the aerodrome is located.
- “Suitable alternate aerodrome” means an aerodrome where, at the anticipated time of use —
- (a) the weather reports or forecasts, or any combination of the reports and forecasts, indicate that the weather conditions will be at or above the required aerodrome operating minima; and
 - (b) the runway surface condition reports indicate that a safe landing will be possible.
- “Take-off alternate” means an alternate aerodrome at which an aircraft can land if it become necessary for the aircraft to land shortly after take-off and the aerodrome of departure cannot be used.
- “Taxi”, in relation to an aircraft, means the movement of an aircraft on the surface of an aerodrome under its own power, excluding take-off and landing.
- “Touchdown” means the point at which the nominal glide path of an aircraft intercepts the runway.
- “Transition altitude” or “transition level” 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 type and to certify that this design meets the appropriate airworthiness requirements of that State.
- “VFR flight” means a flight conducted in accordance with the Visual Flight Rules.

FIRST SCHEDULE — *continued*

“Visibility”, for aeronautical purposes, means the greater of —

- (a) the furthest distance at which a black object of suitable dimensions, situated near the ground, can be seen and recognised when observed against a bright background; or
- (b) the furthest distance at which lights in the vicinity of 1,000 candelas can be seen and identified against an unlit background.

“Visual Flight Rules” or “VFR” means the Visual Flight Rules contained in the Rules of the Air.

“Visual meteorological conditions” or “VMC” means meteorological conditions expressed in terms of visibility distance from cloud, and ceiling, which is equal to or better than specified minima.

SECOND SCHEDULE

Regulations 5(4) and 111

FEES

- | | |
|--|--|
| 1. Application fee for a permit to fly | Cost of the assessment, which must not exceed \$6 per kg of the MCTOM of the aircraft involved |
| 2. Grant of a permit to fly | \$370 |

THIRD SCHEDULE

Regulation 50(1) and Sixth Schedule

REPORTABLE SAFETY MATTERS

List of reportable safety matters

1. The responsible person must report to the Authority —
 - (a) every accident; and
 - (b) every incident of the following nature:
 - (1) a near collision;
 - (2) an incident that occurs during a critical phase of flight that has a high potential of causing an accident;
 - (3) a take-off, landing, or attempted take-off or landing, on a closed, unassigned or engaged runway or helipad;

THIRD SCHEDULE — *continued*

- (4) an incident when Controlled Flight Into Terrain (CFIT) was only marginally avoided;
- (5) any difficulty in controlling the aircraft;
- (6) any flight crew incapacitation;
- (7) an evacuation of crew, passengers or both;
- (8) any use of fire extinguishing agent or fire suppression agent;
- (9) a fire or smoke event, including an event where the fire was extinguished;
- (10) an event requiring the emergency use of oxygen;
- (11) any gross failures to achieve predicted performance during take-off or initial climb;
- (12) a declaration of emergency;
- (13) any failure of, or significant damage to, aircraft structure or disintegration of any part of the engine or external part of the aircraft, or uncontained turbine engine failures, that is not classified as an accident;
- (14) any failure of more than one system in a multiple-redundancy system mandatory for flight guidance and navigation, not being circumstances permitted under the minimum equipment list;
- (15) an incident of multiple malfunctions of one or more aircraft systems that seriously affected the operation of the aircraft;
- (16) a dangerous goods incident;
- (17) any carriage of dangerous goods in a manner that does not conform with the provisions of Annex 18 to the Chicago Convention and its Technical Instructions;
- (18) any violation of local safety legislation or requirements;
- (19) an air turn-back;
- (20) a diversion;
- (21) a rejected take-off;
- (22) a significant safety or security-related event;
- (23) any circumstances requiring a manoeuvre to avoid collision with another aircraft other than a near collision;

THIRD SCHEDULE — *continued*

- (24) any activation of ground proximity warning system other than an incident described in sub-paragraph (4);
- (25) any shutdown of an engine in flight;
- (26) a hard landing;
- (27) any windshear requiring pilot to initiate recovery action;
- (28) an activation of stall warning or stick shaker;
- (29) an air traffic control-related event;
- (30) any unintentional deviation of airspeed, intended track or altitude that result in the activation of a deviation notification;
- (31) a taxi error;
- (32) an unstabilised approach;
- (33) a lightning strike;
- (34) a bird strike;
- (35) any incapacitation of a cabin crew member that renders that cabin crew member unable to perform critical safety duties;
- (36) an aircraft abnormality or engine vibration;
- (37) a blown tire or wheel failure;
- (38) any damage to aircraft by a foreign object;
- (39) any use of incorrect or contaminated fuel, oil or other fluid;
- (40) any underfuelling;
- (41) a loading or load sheet error;
- (42) any significant spillage or leakage of oil, fuel or other fluid;
- (43) any other occurrence that endangers or may endanger the operation of an aircraft, or which causes or may cause a danger to persons or property.

THIRD SCHEDULE — *continued*

Notification requirements

2.—(1) The responsible person must notify the Authority immediately through the most expeditious means available upon becoming aware of —

- (a) an accident, or possible accident, involving an aircraft that the responsible person operates; or
- (b) any incident listed in paragraph 1(b)(1) to (22).

(2) The responsible person must submit a formal written notification to the Authority —

- (a) for any matter referred to in paragraph 2(1)(a), within 3 hours after the initial notification;
- (b) for any incident listed in paragraph 1(b)(1) to (18), within 24 hours after becoming aware of the incident;
- (c) for any incident listed in paragraph 1(b)(19) to (22), within 72 hours after the incident or after the completion of the affected flight, or as advised otherwise by the Authority; or
- (d) for any incident listed in paragraph 1(b)(23) to (43), within 3 working days after the incident or after the completion of the affected flight.

(3) All formal written notifications must be made in a manner acceptable to the Authority.

FOURTH SCHEDULE

Regulation 67(2)

EQUIPMENT THAT DO NOT REQUIRE APPROVAL

1. A time piece.
2. A whistle.
3. A sea anchor and any equipment necessary for mooring, anchoring or manoeuvring an aircraft on water.
4. Any equipment required for making distress signals.

FIFTH SCHEDULE

Regulation 104(2)

**AREAS SPECIFIED IN CONNECTION WITH CARRIAGE OF FLIGHT
NAVIGATORS**

Areas specified in connection with the carriage of a flight navigator as a flight crew member, or with the carriage of approved navigational equipment, on public transport aircraft.

The following areas are specified for the purposes of regulation 104(2):

Area A — Arctic

All that area north of latitude 68° north but excluding any part within the area enclosed by rhumb lines joining successively the following points:

68° north latitude 00° east/west longitude

73° north latitude 15° east longitude

73° north latitude 30° east longitude

68° north latitude 45° east longitude

68° north latitude 00° east/west longitude

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:

30° north latitude 05° west longitude

24° north latitude 11° west longitude

14° north latitude 11° west longitude

14° north latitude 28° east longitude

24° north latitude 28° east longitude

28° north latitude 23° east longitude

30° north latitude 15° east longitude

30° north latitude 05° west longitude

FIFTH SCHEDULE — *continued*

Area D — South America

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 E — Pacific Ocean

All that area enclosed by rhumb lines joining successively the following points:

- 60° north latitude 180° east/west longitude
- 20° north latitude 128° east longitude
- 04° north latitude 128° east longitude
- 04° north latitude 180° east/west longitude
- 55° south latitude 180° east/west longitude
- 55° south latitude 82° west longitude
- 25° south latitude 82° west longitude
- 60° north latitude 155° west longitude
- 60° north latitude 180° east/west longitude

FIFTH SCHEDULE — *continued***Area F — 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 G — Indian Ocean

All that area enclosed by rhumb lines joining successively the following points:

35° south latitude 110° east longitude

55° south latitude 180° east/west longitude

55° south latitude 10° east longitude

40° south latitude 10° east longitude

25° south latitude 60° east longitude

20° south latitude 60° east longitude

05° south latitude 43° east longitude

10° north latitude 55° east longitude

10° north latitude 73° east longitude

04° north latitude 77° east longitude

04° north latitude 92° east longitude

10° south latitude 100° east longitude

10° south latitude 110° east longitude

35° south latitude 110° east longitude

FIFTH SCHEDULE — *continued*

Area H — North Atlantic Ocean

All that area enclosed by rhumb lines joining successively the following points:

55° north latitude 15° west longitude
68° north latitude 28° west longitude
68° north latitude 60° west longitude
45° north latitude 45° west longitude
40° north latitude 60° west longitude
40° north latitude 19° west longitude
55° north latitude 15° west longitude

Area I — South Atlantic Ocean

All that area enclosed by rhumb lines joining successively the following points:

40° north latitude 60° west longitude
18° north latitude 60° west longitude
05° south latitude 30° west longitude
55° south latitude 55° west longitude
55° south latitude 10° east longitude
40° 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 60° west longitude

FIFTH SCHEDULE — *continued***Area J — Northern Canada**

All that area enclosed by rhumb lines joining successively the following points:

68° north latitude 130° west longitude

55° north latitude 115° west longitude

55° north latitude 70° west longitude

68° north latitude 60° west longitude

68° north latitude 130° west longitude

Area K — Northern Asia

All that area enclosed by rhumb lines joining successively the following points:

68° north latitude 56° east longitude

68° north latitude 160° east longitude

50° north latitude 125° east longitude

50° north latitude 56° east longitude

68° north latitude 56° east longitude

Area L — South Asia

All that area enclosed by rhumb lines joining successively the following points:

50° north latitude 56° east longitude

50° north latitude 125° east longitude

40° north latitude 110° east longitude

30° north latitude 110° east longitude

30° north latitude 80° east longitude

35° north latitude 80° east longitude

35° north latitude 56° east longitude

50° north latitude 56° east longitude

SIXTH SCHEDULE

Regulations 21(3) and 109

RETENTION PERIODS

TABLE 1

Information used for the preparation and execution of the flight	
1. Operational flight plan	3 months after the date of completion of the flight.
2. Technical log	24 months after the date of entry.
3. Route specific NOTAM or AIS briefing documentation if — (a) the documentation was edited by the operator; or (b) the documentation is for flights on a route not normally flown	3 months after the date of completion of the flight.
4. Load sheet	3 months after the date of completion of the flight.
5. Notification of a special load (including written information to the pilot-in-command about dangerous goods)	3 months after the date of completion of the flight.
6. Fuel and oil records	3 months after the date of completion of the flight.

SIXTH SCHEDULE — *continued*

TABLE 2

Reports	
1. Journey log	6 months after the date of completion of the flight.
2. Flight report for recording details of — (a) any reportable safety matter specified in the Third Schedule; or (b) any event which the pilot-in-command considers necessary to report or record	3 months after the date of completion of the flight.
3. Any report on the exceedance of duty period or the reduction of rest periods or both	6 months after the date of such report.

TABLE 3

Flight crew records	
1. Record of a flight crew member's assigned flight, duty and rest time	12 months after the date of the flight, duty or rest time.
2. Flight Crew Member's Licence (including information on the ratings, currency, validity and limitations)	For as long as the flight crew member is exercising the privileges of the licence for the operator
3. Record of any flight used by a flight crew member to maintain recency	3 years after the date of the flight.

SIXTH SCHEDULE — *continued*

Flight crew records	
<p>4. Record of any training course or checking that a flight crew member has attended, which includes —</p> <p>(a) the date and particulars of each test required and undergone by the crew member, including the name and qualification of the examiner;</p> <p>(b) the date which that crew member last practised carrying out of duties assigned;</p> <p>(c) the operator's conclusion of that crew member's competence to perform his or her duties, based on the crew member's performance at a test mentioned in sub-paragraph (a) and a practice mentioned in sub-paragraph (b); and</p> <p>(d) the date and particulars of any decision taken by the operator regarding the competence of a pilot designated as a pilot-in-command, including particulars of the evidence upon which that decision was based</p>	<p>3 years after the completion of the course or checking.</p>
<p>5. Record of a flight crew member's training and qualification for specific operations (such as Category II or Category III operations)</p>	<p>For as long as the flight crew member's licence is valid.</p>
<p>6. Record of a flight crew member's dangerous goods training, where required</p>	<p>2 years after the completion of the training.</p>

SIXTH SCHEDULE — *continued*

TABLE 4

Cabin crew records	
1. Record of a cabin crew member's assigned flight, duty and rest time	12 months after the date of the flight, duty or rest time.
2. All training courses attended (except dangerous goods training)	For as long as the cabin crew member is employed by the operator and, from the date the cabin crew member leaves the employment, for another 12 months after that date.
3. Dangerous goods training, where required	2 years after the completion of the training.

TABLE 5

Records for other operational personnel	
1. Training and qualification records of other operations personnel for whom an approved training programme is required under the provisions of the Air Navigation (121 — Commercial Air Transport by Large Aeroplanes) Regulations 2018 or the Air Navigation (135 — Commercial Air Transport by Helicopters and Small Aeroplanes) Regulations 2018, as appropriate	For as long as the record is not superseded by 2 more recent training or qualification records.

SIXTH SCHEDULE — *continued*

TABLE 6

Other records	
1. Records on cosmic and solar radiation dosage for each crew member	For as long as the crew member is employed by the operator and, from the date the crew member leaves the employment, for another 12 months after that date.
2. Quality system records	3 years after the date of entry.
3. Dangerous goods transport document	3 months after the date of the document.
4. Dangerous goods acceptance checklist	3 months after the date of the flight when the checklist was used.
5. Application for approvals under the Air Navigation (98 — Special Operations) Regulations 2018	12 months after the date of the application.
6. Record of the flight data from a representative flight (as described in regulation 21(3))	12 months after the date of the flight, unless superseded by the record from a more recent representative flight.

Made on 21 June 2018.

LEE HSIEN YANG
Chairman,
Civil Aviation Authority of Singapore.

[LE/LGN/A1.8; AG/LLRD/SL/6/2010/9 Vol. 5]

(To be presented to Parliament under section 3A(8) of the Air Navigation Act).