MENTERI PERHUBUNGAN
REPUBLIK INDONESIA

PERATURAN MENTERI PERHUBUNGAN REPUBLIK INDONESIA

NOMOR PM 94 TAHUN 2015

TENTANG

PERATURAN KESELAMATAN PENERBANGAN SIPIL BAGIAN 91 (*CIVIL AVIATION SAFETY REGULATIONS PART 91*) TENTANG PENGOPERASIAN PESAWAT UDARA (*GENERAL OPERATING AND FLIGHT RULES*)

DENGAN RAHMAT TUHAN YANG MAHA ESA

MENTERI PERHUBUNGAN REPUBLIK INDONESIA,

Menimbang : a. bahwa untuk melaksanakan ketentuan Pasal 63 ayat (6) Undang-Undang Nomor 1 Tahun 2009 tentang Penerbangan, perlu menetapkan Peraturan Menteri Perhubungan tentang Peraturan Keselamatan Penerbangan Sipil Bagian 91 (*Civil Aviation Safety Regulations Part 91*) tentang Pengoperasian Pesawat Udara (*General Operating and Flight Rules*);

Mengingat : 1. Undang-Undang Nomor 1 Tahun 2009 tentang Penerbangan (Lembaran Negara Republik Indonesia Tahun 2009 Nomor 1, Tambahan Lembaran Negara Republik Indonesia Nomor 4956);

2. Peraturan Pemerintah Nomor 3 Tahun 2001 tentang Keamanan dan Keselamatan Penerbangan (Lembaran Negara Nomor 9 Tahun 2001, Tambahan Lembaran Negara Nomor 4075);

3. Keputusan Presiden Nomor 21 Tahun 1987 tentang Pengesahan *Protocol Relating to an Amendment to the Convention on International Civil Aviation (Article 83 Bis)* (Lembaran Negara Republik Indonesia Tahun 1987 Nomor 26);

4. Peraturan Presiden Nomor 7 Tahun 2015 tentang Organisasi Kementerian Negara (Lembaran Negara Republik Indonesia Tahun 2015 Nomor 8);

5. Peraturan Presiden Nomor 40 Tahun 2015 tentang Kementerian Perhubungan (Lembaran Negara Republik Indonesia Tahun 2015 Nomor 75);

6. Peraturan Menteri Perhubungan Nomor KM 8 Tahun 2010 tentang Pogram Keselamatan Penerbangan Nasional;

7. Peraturan Menteri Perhubungan Nomor KM 60 Tahun 2010 tentang Organisasi dan Tata Kementerian Perhubungan sebagaimana diubah terakhir dengan Peraturan Menteri Perhubungan Nomor PM 68 Tahun 2013;

8. Peraturan Menteri Perhubungan Nomor PM 41 Tahun 2011 tentang Organisasi dan Tata Kerja Kantor Otoritas Bandar Udara;

9. Peraturan Menteri Perhubungan Nomor PM 31 Tahun 2013 tentang Program Keamanan Penerbangan Nasional;

MEMUTUSKAN:

Menetapkan : PERATURAN MENTERI PERHUBUNGAN TENTANG PERATURAN KESELAMATAN PENERBANGAN SIPIL BAGIAN 91 (*CIVIL AVIATION SAFETY REGULATIONS PART 91*) TENTANG PENGOPERASIAN PESAWAT UDARA (*GENERAL OPERATING AND FLIGHT RULES*)

Pasal 1

(1) Memberlakukan Peraturan Keselamatan Penerbangan Sipil Bagian 91 (*Civil Aviation Safety Regulations Part 91*) tentang Pengoperasian Pesawat Udara (*General Operating And Flight Rules*).

(2) Peraturan Keselamatan Penerbangan Sipil Bagian 91 (*Civil Aviation Safety Regulations Part 91*) tentang Pengoperasian Pesawat Udara (*General Operating And Flight Rules*) sebagaimana dimaksud pada ayat (1) tercantum dalam Lampiran Peraturan dan merupakan bagian tidak terpisahkan dari Peraturan ini.

Pasal 2

Ketentuan lebih lanjut mengenai Peraturan Keselamatan Penerbangan Sipil Bagian 91 (*Civil Aviation Safety Regulations Part* 91) tentang Pengoperasian Pesawat Udara (*General Operating And Flight Rules*) sebagaimana dimaksud dalam Pasal 1 diatur dengan Peraturan Direktur Jenderal Perhubungan Udara.

Pasal 3

Direktur Jenderal Perhubungan Udara melakukan pengawasan terhadap pelaksanaan Peraturan ini.

Pasal 4

Pada saat Peraturan ini mulai berlaku, Keputusan Menteri Perhubungan Nomor KM 41 Tahun 2001 tentang Peraturan Umum Pengoperasian Pesawat Udara (*General Operating and Flight Rules*) sebagaimana telah diubah terakhir dengan Peraturan Menteri Perhubungan Nomor PM 80 Tahun 2011, dicabut dan dinyatakan tidak berlaku.

Pasal 5

Peraturan Menteri ini mulai berlaku pada tanggal diundangkan.

Agar setiap orang mengetahuinya, memerintahkan pengundangan Peraturan Menteri ini dengan penempatannya dalam Berita Negara Republik Indonesia.

Ditetapkan di Jakarta
pada tanggal 20 Mei 2015

MENTERI PERHUBUNGAN
REPUBLIK INDONESIA,

ttd

IGNASIUS JONAN

Diundangkan di Jakarta
pada tanggal 25 Mei 2015

MENTERI HUKUM DAN HAK ASASI MANUSIA
REPUBLIK INDONESIA,

ttd

YASONNA H. LAOLY

BERITA NEGARA REPUBLIK INDONESIA TAHUN 2015 NOMOR 766

Salinan sesuai dengan aslinya
KEPALA BIRO HUKUM DAN KSLN,

SRI LESTARI RAHAYU
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LAMPIRAN PERATURAN MENTERI PERHUBUNGAN
REPUBLIK INDONESIA
NOMOR : PM 94 TAHUN 2015
TANGGAL : 20 MEI 2015

CIVIL AVIATION SAFETY REGULATIONS

CASR 91

GENERAL OPERATING AND FLIGHT RULES

REPUBLIC OF INDONESIA
MINISTRY OF TRANSPORTATION

SUBPART A – GENERAL

91.1 Applicability

Except as provided in section 91.701 and 91.703, this part prescribes rules governing the operation of aircraft (other than Moored balloons, kites, unmanned rockets, and unmanned free balloons, which are governed by Part 101 of the CASRs, and ultralight vehicles operated in accordance with Part 103 of the CASRs) within Indonesia territory.

91.3 Responsibility and Authority of the Pilot in Command

(a) The pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation and security of the aircraft.

(b) In an in-flight emergency requiring immediate action, the pilot in command may deviate from any rule of this part to the extent required to meet that emergency.

(c) Each pilot in command who deviates from a rule under Paragraph (b) of this section shall, upon the request of the Director, send a written report of that deviation to the Director.

91.5 Aircraft Requiring More Than One Required Pilot

(a) No person may operate an aircraft that is type certificated for more than one required pilot flight crewmember unless the pilot in command meets the requirements of Section 61.58 of the CASRs.

(b) No person may designate a pilot to serve as second in command, nor may any pilot serve as second in command, of an aircraft that is type certified for more than one required pilot flight crewmember unless the second in command meets the requirements for second in command of Section 61.55 of the CASRs.

91.7 Civil Aircraft Airworthiness

(a) No person may operate a civil aircraft unless it is in an airworthy condition.

(b) The pilot in command of a civil aircraft is responsible for determining whether that aircraft is in condition for safe flight. The pilot in command shall discontinue the flight when unairworthy mechanical, electrical, or structural conditions occur.

91.9 Civil Aircraft Flight Manual, Marking, and Placard Requirements

(a) Except as provided in Paragraph (d) of this section, no person may operate a civil aircraft without complying with the operating limitations specified in the approved Airplane or Rotorcraft Flight Manual, markings, and placards, or as otherwise prescribed by the certificating authority of the aircraft's country of registry.

(b) No person may operate an Indonesian-registered civil aircraft:

(1) For which an Airplane or Rotorcraft Flight Manual is required by Part 21.5 of the CASRs unless there is available in the aircraft a current, approved Airplane or Rotorcraft Flight Manual or the manual provided for in Section 121.141(b); and

(2) For which an Airplane or Rotorcraft Flight Manual is not required by Section 21.5 of the CASRs, unless there is available in the aircraft a current approved Airplane or Rotorcraft Flight Manual, approved manual material, markings, and placards, or any combination of those devices.

(c) No person may operate an Indonesian-registered civil aircraft unless that aircraft is identified and marked in accordance with applicable policies of the CASRs.

(d) Any person taking off or landing a helicopter at a heliport constructed over water may make such momentary flight as is necessary for takeoff or landing through the prohibited range of the limiting height/speed envelope established for the helicopter if that flight through the prohibited range takes place over water on which a safe ditching can be accomplished and if the helicopter is amphibious or is equipped with floats or other emergency flotation gear adequate to accomplish a safe emergency ditching on open water.

(e) No person may operate a civil aircraft unless that aircraft operates within the mass limitations imposed by compliance with the CASR 36.

(f) The pilot-in-command shall determine that airplane performance will permit the take-off and departure to be carried out safely.

91.11 Prohibition Against Interference With Crewmembers

(a) No person may assault, threaten, intimidate, or interfere with a crewmember in the performance of the crewmember's duties aboard an aircraft being operated.

(b) Following an act of unlawful interference, the pilot-in-command shall submit, without delay, a report of such an act to the DGCA.

91.13 Careless Or Reckless Operation

No person shall operate an aircraft for the purpose of air navigation or for operations on any part of an airport (including areas used by those aircraft for receiving or discharging persons or cargo), in a reckless or reckless manner so as to endanger or be likely to endanger the life or property of any person.

91.14 Flight Crew Equipment

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

91.15 Dropping Objects

No person shall create a hazard to persons or property on the surface by dropping an object from an aircraft in flight. However, this section does not prohibit the dropping of any object if reasonable precautions are taken to avoid injury or damage to persons or property.

91.17 Alcohol Or Drugs

(a) No person may act or attempt to act as a crewmember of a civil aircraft
- (1) Within 8 hours after consuming alcohol;
- (2) While under the influence of alcohol;
- (3) While using any drug that affects the person's faculties in any way contrary to safety; or
- (4) While having 0.04 percent by weight or more alcohol in the blood.

(b) Except in an emergency, no pilot of a civil aircraft may allow a person who appears to be intoxicated or who demonstrates by manner or physical indications that the individual is under the influence of drugs (except a medical patient under proper care) to be carried in that aircraft.

(c) A crewmember shall do the following:
- (1) On request of a law enforcement officer, submit to a test to indicate the percentage by weight of alcohol in the blood, when
  - (i) The law enforcement officer is authorized by law to conduct the test or to have the test conducted; and
  - (ii) The law enforcement officer is requesting submission to the test to investigate a suspected violation of a law governing the same or substantially similar conduct prohibited by Paragraph (a)(1), (a)(2), or (a)(4) of this section.

- (2) Whenever the Director has a reasonable basis to believe that a person may have violated Paragraph (a)(1), (a)(2), or (a)(4) of this section, that person shall, upon request by the Director, furnish the Director, or authorize any clinic, hospital, doctor, or other person to release to the Director, the results of each test taken within 4 hours after acting or attempting to act as a crewmember that indicates percentage by weight of alcohol in the blood.

(d) Whenever the Director has a reasonable basis to believe that a person may have violated Paragraph (a)(3) of this section, that person shall, upon request by the Director, furnish the Director, or authorize any clinic, hospital, doctor, or other person to release to the Director, the results of each test taken within 4 hours after acting or attempting to act as a crewmember that indicates the presence of any drugs in the body.

(e) Any test information obtained by the Director under Paragraph (c) or (d) of this section may be evaluated in determining a person's qualifications for any airman certificate or possible violations of the CASRs and may be used as evidence in any legal proceeding.

91.19 Carriage Of Narcotic Drugs, Marihuana, And Depressant Or Stimulant Drugs Or Substances

(a) Except as provided in Paragraph (b) of this section, no person may operate a civil aircraft within Indonesia with knowledge that narcotic drugs, marihuana, and depressant or stimulant drugs or substances as defined by law are carried in the aircraft.

(b) Paragraph (a) of this section does not apply to any carriage of narcotic drugs, marihuana, and depressant or stimulant drugs or substances authorized by law or a national agency.

91.21 Portable Electronic Devices

(a) Except as provided in Paragraph (b) of this section, no person may operate, nor may any operator or pilot in command of an aircraft allow the operation of, any portable electronic device on any of the following Indonesian-registered civil aircraft:
   (1) Aircraft operated by a holder of an Air Carrier Operator Certificate or a Commercial Operator Certificate; or
   (2) Any other aircraft while it is operated under IFR.

(b) Paragraph (a) of this section does not apply to
   (1) Portable voice recorders;
   (2) Hearing aids;
   (3) Heart pacemakers;
   (4) Electric shavers; or
   (5) Any other portable electronic device that the operator of the aircraft has determined will not cause interference with the navigation or communication system of the aircraft on which it is to be used.

(c) In the case of an aircraft operated by a holder of an Air Carrier Operator Certificate or a Commercial Operator Certificate, the determination required by Paragraph (b)(5) of this section shall be made by that operator of the aircraft on which the particular device is to be used. In the case of other aircraft, the determination may be made by the pilot in command or other operator of the aircraft.

91.23 Truth-in-leasing Clause Requirement In Leases And Conditional Sales Contracts

(a) Except as provided in Paragraph (b) of this section, the parties to a lease or contract of conditional sale involving an Indonesian-registered large civil aircraft shall execute a written lease or contract and include in that document a written truth-in-leasing clause as a concluding paragraph in large print, immediately preceding the space for the signature of the parties, which contains the following information concerning each such aircraft:

   (1) Identification of the Civil Aviation Safety Regulations under which the aircraft has been maintained and inspected during the 12 months preceding the execution of the lease or contract of conditional sale, and certification by the parties to the lease or conditional sale regarding the aircraft's status of compliance with

applicable maintenance and inspection requirements in this part for the operation to be conducted under the lease or contract of conditional sale.

(2) The name and address (printed or typed) and the signature of the person responsible for operational control of the aircraft under the lease or contract of conditional sale, and certification that each person understands that person's responsibilities for compliance with applicable Civil Aviation Safety Regulations.

(3) A statement that an explanation of factors bearing on operational control and pertinent Civil Aviation Safety Regulations can be obtained from the DGCA.

(b) The requirements of Paragraph (a) of this section do not apply

(1) To a lease or contract of conditional sale when
   (i) The party to whom the aircraft is furnished is a foreign air carrier or certificate holder under Parts 121, 135, or 141 of the CASRs, or
   (ii) The party furnishing the aircraft is a foreign air carrier, certificate holder under Part 121 or 141 of the CASRs, or a certificate holder under Part 135 of the CASRs having appropriate authority to engage in operations as a commercial operator with large aircraft.

(2) To a contract of conditional sale, when the aircraft involved has not been registered anywhere prior to the execution of the contract, except as a new aircraft under a dealer's aircraft registration certificate issued in accordance with the CASRs.

(c) No person may operate a large civil aircraft of Indonesian registry that is subject to a lease or contract of conditional sale to which Paragraph (a) of this section applies, unless

(1) The lessee or conditional buyer, or the registered owner if the lessee is not a citizen of Indonesia, has mailed a copy of the lease or contract that complies with the requirements of Paragraph (a) of this section, within 24 hours of its execution, to the Director;

(2) A copy of the lease or contract that complies with the requirements of Paragraph (a) of this section is carried in the aircraft. The copy of the lease or contract shall be made available for review upon request by the Director; and

(3) The lessee or conditional buyer, or the registered owner if the lessee is not a citizen of Indonesia, has notified by telephone or in person the DGCA. Unless otherwise authorized by DGCA, the notification shall be given at least 48 hours before takeoff in the case of the first flight of that aircraft under that lease or contract and inform the DGCA of
   (i) The location of the airport of departure;
   (ii) The departure time; and
   (iii) The registration mark of the aircraft involved.

(d) The copy of the lease or contract furnished to the DGCA under Paragraph (c) of this section is considered commercial or financial information obtained from a person. It is, therefore, privileged and confidential and will not be made available by the DGCA for public inspection or copying unless it is recorded with the DGCA Aircraft Registry.

(e) For the purpose of this section, a lease means any agreement by a person to furnish an aircraft to another person for compensation or hire, whether with or without flight crewmembers, other than an agreement for the sale of an aircraft and a contract of conditional sale. The person furnishing the aircraft is referred to as the lessor, and the person to whom it is furnished the lessee.

91.25 Document to Be Carried

An operator shall ensure that the following documents are carried on each flight:

(a) Certificate of Registration.
(b) Certificate of Airworthiness.
(c) Aircraft Journey Log.
(d) Aircraft Radio Permit.
(e) Noise certificate.
(f) The appropriate licences for each member of the flight crew.
(g) Copy of the return to service, if any, in force with respect to the aircraft, or technical log, as applicable.
(h) AFM or RFM, for airplanes or helicopters.
(i) Operational Flight Plan.
(j) NOTAMS, AIS information and Meteorological briefing documentation.
(k) Current and suitable maps and charts for routes of proposed flight or possibly diverted flights.
(l) Search and rescue information.
(m) For international flights, a copy of the notified procedures to be followed by the pilot-in-command of an intercepted aircraft, and the notified visual signals for use by intercepting and intercepted aircraft.
(n) Passenger and cargo manifests.
(o) Copy of aircraft insurance.

91.26 through 91.99 [Reserved]

SUBPART B - FLIGHT RULES

GENERAL

91.101 Applicability

This subpart prescribes flight rules governing the operation of aircraft within Indonesia and within Indonesia Flight Information Region.

91.103 Preflight Action

Each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight. This information must include:

(a) For a flight under IFR or a flight not in the vicinity of an airport, weather reports and forecasts, fuel requirements, alternatives available if the planned flight cannot be completed, and any known traffic delays of which the pilot in command has been advised by ATC;

(b) For any flight, runway lengths at airports of intended use, and the following takeoff and landing distance information:
   (1) For civil aircraft for which an approved Airplane or Rotorcraft Flight Manual containing takeoff and landing distance data is required, the takeoff and landing distance data contained therein; and
   (2) For civil aircraft other than those specified in Paragraph (b)(1) of this section, other reliable information appropriate to the aircraft, relating to aircraft performance under expected values of airport elevation and runway slope, aircraft gross weight, and wind and temperature.

(c) No person may operate an aircraft without available on board all the essential information concerning the search and rescue services in the area over which an aircraft will be flown, such this information may be made available to the pilot by means of the operations manual or such other means as is considered appropriate.

91.104 Operating instructions

No person may taxi an airplane on the movement area of an aerodrome unless the person at the controls is an appropriately qualified pilot or:
(a) has been duly authorized by the operator or certificate holder;
(b) is fully competent to taxi the airplane;
(c) is qualified to use the radio if radio communications are required; and
(d) has received instruction from a competent person in respect of aerodrome layout, and where appropriate, information on routes, signs, marking, lights, ATC signals and instructions, phraseology and procedures, and is able to conform to the operational standards required for safe airplane movement at the aerodrome.

91.105 Flight Crewmembers At Stations

(a) During takeoff and landing, and while enroute, each required flight crewmember shall
   (1) Be at the crewmember station unless the absence is necessary to perform duties in connection with the operation of the aircraft or in connection with physiological needs; and
   (2) Keep the safety belt fastened while at the crewmember station.

(b) Each required flight crewmember of an Indonesian-registered civil aircraft shall, during takeoff and landing, keep his or her shoulder harness fastened while at his or her assigned duty station. This paragraph does not apply if
   (1) The seat at the crewmember's station is not equipped with a shoulder harness; or
   (2) The crewmember would be unable to perform required duties with the shoulder harness fastened.

(c) Flight crewmember shall use a boom or throat microphone to communicate with another flight crewmember and air traffic service below the transition level or altitude.

91.107 Seats, Safety Belts, Shoulder Harnesses, and Child Restraint Systems

(a) Unless otherwise authorized by the Director the following rules apply to all Indonesian-registered civil aircraft except a free balloon that incorporates a basket or gondola, or an airship.

   (1) No pilot may takeoff an aircraft unless the pilot in command of that aircraft ensures that each person on board is briefed on how to fasten and unfasten that person's safety belt and, if installed, that person's shoulder harness.

   (2) No pilot may cause to be moved on the surface, takeoff, or land an aircraft unless the pilot in command of that aircraft ensures that each person on board has been notified to fasten his or her safety belt and, if installed, his or her shoulder harness.

   (3) Except as provided in this paragraph, each person on board an aircraft must occupy an approved seat or berth with a safety belt and, if installed, shoulder harness, properly secured about him for her during movement on the surface, for takeoff, and for landing. For seaplane and float-equipped rotorcraft operations during movement on the surface, the person pushing-off the seaplane or rotorcraft from the dock and the person mooring the seaplane or rotorcraft at the dock are excepted from the preceding seating and safety belt requirements. Notwithstanding the preceding requirements of this paragraph, a person may:
      (i) Use the floor of the aircraft as a seat, provided that the person is on board for the purpose of engaging in sport parachuting; or
      (ii) Be held by an adult who is occupying an approved seat or berth, provided that the person being held has not reached his or her second birthday and does not occupy or use any restraining devices;

(iii) Notwithstanding any other requirement of the CASRs, occupy a child-restraint system furnished by the operator or one of the persons described in Paragraph (a)(3)(iii)(A) of this section provided that:

(A) The child is accompanied by a parent, guardian, or attendant designated by the child's parent or guardian to care for the safety of the child during the flight; and

(B) The operator complies with the following requirements:

(1) The restraint system must be properly secured to an approved forward-facing seat or berth; and

(2) The child must be properly secured in the restraint system and must not exceed the specified weight limit for the restraint system;

(3) The restraint system must bear the appropriate label(s).

(b) Unless otherwise stated, this section does not apply to operations conducted under Part 121 or 135 of the CASRs. Paragraph (a)(3) of this section does not apply to persons subject to Section 91.105.

91.109 Flight Instruction; Simulated Instrument Flight and Certain Flight Tests

(a) No person may operate a civil aircraft (except a manned free balloon) that is being used for flight instruction unless that aircraft has fully functioning dual controls. However, instrument flight instruction may be given in a single engine airplane equipped with a single, functioning throw over control wheel in place of fixed, dual controls of the elevator and ailerons when

(1) The instructor has determined that the flight can be conducted safely; and

(2) The person manipulating the controls has at least a private pilot certificate with appropriate category and class ratings.

(b) No person may operate a civil aircraft in simulated instrument flight unless

(1) The other pilot's seat is occupied by a safety pilot who possesses at least a private pilot certificate with category and class ratings appropriate to the aircraft being flown.

(2) The safety pilot has adequate vision forward and to each side of the aircraft, or a competent observer in the aircraft adequately supplements the vision of the safety pilot; and

(3) Except in the case of lighter-than-air aircraft, that aircraft is equipped with fully functioning dual controls. However, simulated instrument flight may be conducted in a single engine airplane, equipped with a single, functioning, throwover control wheel, in place of fixed, dual controls of the elevator and ailerons, when

(i) The safety pilot has determined that the flight can be conducted safely; and

(ii) The person manipulating the controls has at least a private pilot certificate with appropriate category and class ratings.

(c) No person may operate a civil aircraft that is being used for a flight test for an airline transport pilot certificate or a class or type rating on that certificate, or for a Part 121 proficiency flight test, unless the pilot seated at the controls, other than the pilot being checked, is fully qualified to act as pilot in command of the aircraft.

91.111 Operating Near Other Aircraft

(a) No person may operate an aircraft so close to another aircraft as to create a collision hazard.

(b) No person may operate an aircraft in formation flight except by arrangement with the pilot in command of each aircraft in the formation.

(c) No person may operate an aircraft, carrying passengers for hire, in formation flight.

91.113 Right of Way Rules: Except Water Operations

(a) Inapplicability. This section does not apply to the operation of an aircraft on water.

(b) General. When weather conditions permit, regardless of whether an operation is conducted under instrument flight rules or visual flight rules, vigilance shall be maintained by each person operating an aircraft so as to see and avoid other aircraft. When a rule of this section gives another aircraft the right of way, the pilot shall give way to that aircraft and may not pass over, under, or ahead of it unless well clear.

(c) In distress. An aircraft in distress has the right of way over all other air traffic.

(d) Converging. When aircraft of the same category are converging at approximately the same altitude (except head-on, or nearly so), the aircraft to the other's right has the right of way. If the aircraft are of different categories
   (1) A balloon has the right of way over any other category of aircraft;
   (2) A glider has the right of way over an airship, airplane, or rotorcraft; and
   (3) An airship has the right of way over an airplane or rotorcraft.

   However, an aircraft towing or refueling other aircraft has the right of way over all other engine driven aircraft.

(e) Approaching head-on. When aircraft are approaching each other head-on, or nearly so, each pilot of each aircraft shall alter course to the right.

(f) Overtaking. Each aircraft that is being overtaken has the right of way and each pilot of an overtaking aircraft shall alter course to the right to pass well clear.

(g) Landing. Aircraft, while on final approach to land or while landing, have the right of way over other aircraft in flight or operating on the surface, except that they shall not take advantage of this rule to force an aircraft

off the runway surface which has already landed and is attempting to make way for an aircraft on final approach. When two or more aircraft are approaching an airport for the purpose of landing, the aircraft at the lower altitude has the right of way, but it shall not take advantage of this rule to cut in front of another which is on final approach to land or to overtake that aircraft.

91.115 Right of Way Rules: Water Operations

(a) General. Each person operating an aircraft on the water shall, in sofar as possible, keep clear of all vessels and avoid impeding their navigation, and shall give way to any vessel or other aircraft that is given the right of way by any rule of this section.

(b) Crossing. When aircraft, or an aircraft and a vessel, are on crossing courses, the aircraft or vessel to the other's right has the right of way.

(c) Approaching head-on. When aircraft, or an aircraft and a vessel, are approaching head-on, or nearly so, each shall alter its course to the right to keep well clear.

(d) Overtaking. Each aircraft or vessel that is being overtaken has the right of way, and the one overtaking shall alter course to keep well clear.

(e) Special circumstances. When aircraft, or an aircraft and a vessel, approach so as to involve risk of collision, each aircraft or vessel shall proceed with careful regard to existing circumstances, including the limitations of the respective craft.

91.117 Aircraft Speed

(a) Unless otherwise authorized by the Director (or by ATC in the case of operations in Class A or Class B airspace), no person may operate an aircraft below 10,000 feet MSL at an indicated airspeed of more than 250 knots (288 m.p.h/460 k.p.h).

(b) Unless otherwise authorized or required by ATC, no person may operate an aircraft at or below 2,500 feet above the surface within 4 nautical miles of the primary airport of a Class C or Class D airport at an indicated airspeed of more than 200 knots (230 mph/460 kph).

(c) No person may operate an aircraft in the airspace underlying a Class B airspace area designated for an airport or in a VFR corridor designated through such a Class B airspace area, at an indicated airspeed of more than 200 knots (230 mph).

(d) If the minimum safe airspeed for any particular operation is greater than the maximum speed prescribed in this section, the aircraft may be operated at that minimum speed.

91.119 Minimum Safe Altitudes: General

Except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

(a) Anywhere. An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.

(b) Over congested areas. Over any congested area of a city, town, or settlement, or over any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 600 meters of the aircraft.

(c) Over other than congested areas. An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 200 meters to any person, vessel, vehicle, or structure.

(d) Helicopters. Helicopters may be operated at less than the minimums prescribed in Paragraph (b) or (c) of this section if the operation is conducted without hazard to persons or property on the surface. In addition, each person operating a helicopter shall comply with any routes or altitudes specifically prescribed for helicopters by the Director.

91.121 Altimeter Settings

Each person operating an aircraft within Indonesia FIR, shall maintain the cruising altitude or flight level of that aircraft, as the case may be, by reference to an altimeter that is set, when operating

(a) within longitude 135OE to the east area of Indonesia FIR:
   (1) Below 18,000 feet MSL, to:
      (i) The current reported altimeter setting of a station along the route and within 100 nautical miles of the aircraft;
      (ii) If there is no station within the area prescribed in Paragraph (a)(1)(i) of this section, the current reported altimeter setting of an appropriate available station; or

   (2) At or above 18,000 feet MSL, to 29.92" Hg or 1013.2 mb.

(b) within longitude 135OE to the west area of Indonesia FIR:
   (1) Below 11,000 feet MSL, to:
      (i) The current reported altimeter setting of a station along the route and within 100 nautical miles of the aircraft;
      (ii) If there is no station within the area prescribed in Paragraph (b)(1)(i) of this section, the current reported altimeter setting of an appropriate available station; or
   (2) At or above 13,000 feet MSL, to 29.92" Hg or 1013.2 mb.

(c) To convert minimum altitude prescribed under Sections 91.119 and 91.177 to the minimum flight level, the pilot shall take the flight level equivalent of the minimum altitude in feet and add the appropriate number of feet specified below, according to the current reported altimeter setting:

Current altimeter setting	Adjustment factor
29.92 (or higher)	None
29.91 through 29.42	500
29.41 through 28.92	1,000
28.91 through 28.42	1,500
28.41 through 27.92	2,000
27.91 through 27.42	2,500
27.41 through 26.92	3,000

91.123 Compliance with ATC Clearances and Instructions

(a) When an ATC clearance has been obtained, a pilot in command may not deviate from that clearance, except in an emergency, unless that pilot obtains an amended clearance. However, except in Class A airspace, this paragraph does not prohibit that pilot from canceling an IFR flight plan if the operation is being conducted in VFR weather conditions. When a pilot is uncertain of an ATC clearance, that pilot must immediately request clarification from ATC.

(b) Except in an emergency, no person may operate an aircraft contrary to an ATC instruction in an area in which air traffic control is exercised.

(c) Each pilot in command who, in an emergency, deviates from an ATC clearance or instruction shall notify ATC of that deviation as soon as possible.

(d) Each pilot in command who (though not deviating from a rule of this subpart) is given priority by ATC in an emergency, shall submit a detailed report of that emergency within 48 hours to the manager of that ATC facility, if requested by ATC.

(e) Unless otherwise authorized by ATC, no person operating an aircraft may operate that aircraft according to any clearance or instruction that has been issued to the pilot of another aircraft for radar air traffic control purposes.

91.125 ATC Light Signals

ATC light signals have the meaning shown in the following table:

Color and Type of Signal	**Meaning with respect to aircraft on the surface**	**Meaning with respect to aircraft in flight**
Steady green	Cleared for takeoff	Cleared to land
Flashing green	Cleared to taxi	Return for landing (to be followed by steady green at proper time)
Steady red	Stop	Give way to other aircraft and continue circling
Flashing red	Taxi clear of runway in use	Airport unsafe – do not land
Flashing white	Return to starting point on aerodrome	Land at this aerodrome and proceed to apron

91.126 Operating on or in the Vicinity of an Airport in Class G Airspace

(a) General. Unless otherwise authorized or required, each person operating an aircraft on or in the vicinity of an airport in a Class G airspace area must comply with the requirements of this section.

(b) Direction of turns. When approaching to land at an airport without an operating control tower in a Class G airspace area
   (1) Each pilot of an airplane must make all turns of that airplane to the left unless the airport displays approved light signals or visual markings indicating that turns should be made to the right, in which case the pilot must make all turns to the right; and
   (2) Each pilot of a helicopter must avoid the flow of fixed wing aircraft.

(c) Flap setting. Except when necessary for training or certification, the pilot in command of a civil turbojet-powered aircraft must use, as a final flap setting, the minimum certificated landing flap set forth in the approved performance information in the Airplane Flight Manual for the applicable conditions. However each pilot in command has the final authority and responsibility for the safe operation of the pilot's airplane, and may use a different flap setting for the airplane if the pilot determines that it is necessary in the interest of safety.

(d) Communications with control towers. Unless otherwise authorized or required by ATC, no person may operate an aircraft to, from, through, or on an airport having an operational control tower unless two-way radio communications are maintained between that aircraft and the control tower. Communications must be established as soon as practicable. However, if the aircraft radio fails in flight, the pilot in command may operate that aircraft and land if weather conditions are at or above basic VFR weather minimums, visual contact with thètower is maintained, and a clearance to land is received. If the aircraft radio fails while in flight under IFR, the pilot must comply with Section 91.185.

91.127 Operating on or in the Vicinity of an Airport in Class E Airspace

(a) Unless otherwise required by the CASRs or unless otherwise authorized or required by the ATC facility having jurisdiction over the Class E airspace area, each person operating an aircraft on or in the vicinity of an airport in a Class E airspace area must comply with the requirements of Section 91.126.

(b) Departures. Each pilot of an aircraft must comply with any special traffic patterns established for that airport.

(c) Communications with control towers. Unless otherwise authorized or required by ATC, no person may operate an aircraft to, from, through, or on an airport having an operational control tower unless two-way radio communications are maintained between that aircraft and the control tower. Communications must be established as soon as practicable. However, if the aircraft radio fails in flight, the pilot in command may operate that aircraft and land if weather conditions are at or above basic VFR weather minimums, visual contact with the tower is maintained, and a clearance to land is received. If the aircraft radio fails while in flight under IFR, the pilot must comply with Section 91.185.

91.129 Operations in Class D Airspace

(a) General. Unless otherwise authorized or required by the ATC facility having jurisdiction over the Class D airspace area, each person operating an aircraft in Class D airspace must comply with the applicable provisions of this section. In addition, each person must comply with Sections 91.126 and 91.127. For the purpose of this section, the primary airport is the airport for which the Class D airspace area is designated. A satellite airport is any other airport within the Class D airspace area.

(b) Deviations. An operator may deviate from any provision of this section under the provisions of an ATC authorization issued by the ATC facility having jurisdiction over the airspace concerned. ATC may authorize a deviation on a continuing basis or for an individual flight, as appropriate.

(c) Communications. Each person operating an aircraft in Class D airspace must meet the following two-way radio communications requirements:
   (1) Arrival or through flight. Each person must establish two-way radio communications with the ATC facility (including foreign ATC in the case of foreign airspace designated in Indonesia) providing air traffic services prior to entering that airspace and thereafter maintain those communications while within that airspace.
   (2) Departing flight. Each person
      (i) From the primary airport or satellite airport with an operating control tower must establish and maintain two-way radio communications with the control tower, and thereafter as instructed by ATC while operating in the Class D airspace area; or
      (ii) From a satellite airport without an operating control tower, must establish and maintain two-way radio communications with the ATC facility having jurisdiction over the Class D airspace area as soon as practicable after departing.

(d) Communications failure. Each person who operates an aircraft in a Class D airspace area must maintain two-way radio communications with the ATC facility having jurisdiction over that area.
   (1) If the aircraft radio fails in flight under IFR, the pilot must comply with 91.185 of the part.
   (2) If the aircraft radio fails in flight under VFR, the pilot in command may operate that aircraft and land if
      (i) Weather conditions are at or above basic VFR weather minimums;
      (ii) Visual contact with the tower is maintained; and
      (iii) A clearance to land is received.

(e) Minimum Altitudes. When operating to an airport in Class D airspace, each pilot of
   (1) A large or turbine-powered airplane shall, unless otherwise required by the applicable distance from cloud criteria, enter the traffic pattern at an altitude of at least 1,500 feet above the elevation of the airport and maintain at least 1,500 feet until further descent is required for a safe landing;

(2) A large or turbine-powered airplane approaching to land on a runway served by an instrument landing system (ILS), if the airplane is ILS equipped, shall fly that airplane at an altitude at or above the glide slope between the outer marker (or point of interception of glide slope, if compliance with the applicable distance from clouds criteria requires interception closer in) and the middle marker; and

(3) An airplane approaching to land on a runway served by a visual approach slope indicator shall maintain an altitude at or above the glide slope until a lower altitude is necessary for a safe landing. Paragraphs (e)(2) and (e)(3) of this section do not prohibit normal bracketing maneuvers above or below the glide slope that are conducted for the purpose of remaining on the glide slope.

(f) Approaches. Except when conducting a circling approach authorized by a DGCA-approved standard instrument approach procedure or unless otherwise required by ATC, each pilot must
(1) Circle the airport to the left, if operating an airplane; or
(2) Avoid the flow of fixed wing aircraft, if operating a helicopter.

(g) Departures. No person may operate an aircraft departing from an airport except in compliance with the following:
(1) Each pilot must comply with any departure procedures established for that airport by the DGCA.
(2) Unless otherwise required by the prescribed departure procedure for that airport or the applicable distance from clouds criteria, each pilot of a turbine-powered airplane and each pilot of a large airplane must climb to an altitude of 1,500 feet above the surface as rapidly as practicable.

(h) Reverse.

(i) Takeoff, landing, taxi clearance. No person may, at any airport with an operating control tower, operate an aircraft on a runway or taxiway, or take off or land an aircraft, unless an appropriate clearance is received from ATC. A clearance to "taxi to" the takeoff runway assigned to the aircraft is not a clearance to cross that assigned takeoff runway, or to taxi on that runway at any point but is a clearance to cross other runways that intersect the taxi route to that assigned takeoff runway. A clearance to "taxi to" any point other than an assigned takeoff runway is clearance to cross all runways that intersect the taxi route to that point.

91.130 Operations in Class C Airspace

(a) General. Unless otherwise authorized by ATC, each aircraft operation in Class C airspace must be conducted in compliance with this section and Section 91.129. For the purpose of this section, the primary airport is the airport for which the Class C airspace area is designated. A satellite airport is any other airport within the Class C airspace area.

(b) Traffic patterns. No person may take off or land an aircraft at a satellite airport within a Class C airspace area except in compliance with DGCA arrival and departure traffic patterns.

(c) Communications. Each person operating an aircraft in Class C airspace must meet the following two-way radio communications requirements:

(1) Arrival or through flight. Each person must establish two-way radio communications with the ATC facility (including foreign ATC in the case of foreign airspace designated in Indonesia) providing air traffic services prior to entering that airspace and thereafter maintain those communications while within that airspace.

(2) Departing flight. Each person

(i) From the primary airport or satellite airport with an operating control tower must establish and maintain two-way radio communications with the control tower, and thereafter as instructed by ATC while operating in the Class C airspace area; or

(ii) From a satellite airport without an operating control tower, must establish and maintain two-way radio communications with the ATC facility having jurisdiction over the Class C airspace area as soon as practicable after departing.

(d) Equipment requirements. Unless otherwise authorized by the ATC having jurisdiction over the Class C airspace area, no person may operate an aircraft within a Class C airspace area designated for an airport unless that aircraft is equipped with the applicable equipment specified in Section 91.215.

(e) Deviations. An operator may deviate from any provision of this section under the provisions of an ATC authorization issued by the ATC facility having jurisdiction over the airspace concerned. ATC may authorize a deviation on a continuing basis or for an individual flight, as appropriate.

91.131 Operations in Class B Airspace

(a) Operating rules. No person may operate an aircraft within a Class B airspace area except in compliance with Section 91.129 and the following rules:

(1) The operator must receive an ATC clearance from the ATC facility having jurisdiction for that area before operating an aircraft in that area.

(2) Unless otherwise authorized by ATC, each person operating a large turbine engine-powered airplane to or from a primary airport for which a Class B airspace area is designated must operate at or above the designated floors of the Class B airspace area while within the lateral limits of that area.

(3) Any person conducting pilot training operations at an airport within a Class B airspace area must comply with any procedures established by ATC for such operations in that area.

(b) Pilot requirements.

No person may take off or land a civil aircraft at an airport within a Class B airspace area or operate a civil aircraft within a Class B airspace area unless___

(1) The pilot in command holds at least a private pilot certificate; or

(2) The aircraft is operated by a student pilot or recreational pilot who seeks private pilot certification and has met the requirements of Section 61.95 of the CASRs.

(c) Communications and navigation equipment requirements. Unless otherwise authorized by ATC, no person may operate an aircraft within a Class B airspace area unless that aircraft is equipped with__

(1) For IFR operation. An operable VOR or TACAN receiver; and

(2) For all operations. An operable two-way radio capable of communications with ATC on appropriate frequencies for that Class B airspace area.

(d) Transponder requirements. No person may operate an aircraft in a Class B airspace area unless the aircraft is equipped with the applicable operating transponder and automatic altitude reporting equipment specified in Paragraph (a) of Section 91.215, except as provided in Paragraph (d) of that section.

91.133 Restricted, Prohibited and Danger Areas

(a) No person may operate an aircraft within a restricted area contrary to the restrictions imposed, or within a prohibited area, unless that person has the permission of the using or controlling agency, as appropriate.

(b) Each person conducting, within a restricted area, an aircraft operation (approved by the using agency) that creates the same hazards as the operations for which the restricted area was designated may deviate from the rules of this subpart that are not compatible with the operation of the aircraft.

(c) Danger Area
Airspace within which activities may constitute a hazard to the flight of the aircraft may exist at specified times. No person may operate an aircraft within a designated disaster area unless that aircraft is participating in airborne relief activities under the direction of the authority responsible for relief activities.

91.134 Interception of Civil Aircraft

(a) Any aircraft violating the sovereign territory of Republic of Indonesia shall be given a warning and order to leave the areas by aviation traffic control officer(s).

(b) Any aircraft approaching and having entered the prohibited and restricted areas shall be warned and ordered to leave the area concerned by the aviation traffic control officer (s).

(c) The aviation traffic control officer(s) shall be obligated to give information on any aircraft violating to sovereign territory and prohibited and restricted areas (a) and (b) to the goverment apparatus responsible for national defense).

(d) In the case of non-compliance to the warning and order to leave as meant in items (a) and (b), enforcing action will be taken by state aircraft to force the violator (s) to leave the territory of the Republic of Indonesia or the prohibited and restricted areas, or to force the violator(s) to land on stipulated airbase or airport within the territory of the Republic of Indonesia.

(e) The crew, the aircraft and all loads of an aircraft violating of the provisions as meant in items (a) and (b) shall be examined and interrogated in accordance with valid laws and regulations.

(f) All civil aircraft of Indonesia registry, or operated by Indonesia operator shall comply with the interception orders from other states.

91.135 Operations in Class A Airspace

Except as provided in Paragraph (d) of this section, each person operating an aircraft in Class A airspace must conduct that operation under instrument flight rules (IFR) and in compliance with the following:

(a) Clearance. Operations may be conducted only under an ATC clearance received prior to entering the airspace.

(b) Communications. Unless otherwise authorized by ATC, each aircraft operating in Class A airspace must be equipped with a two-way radio capable of communicating with ATC on a frequency assigned by ATC. Each pilot must maintain two-way radio communications with ATC while operating in Class A airspace.

(c) Other equipment requirements.
   (1) Transponder requirement. Unless otherwise authorized by ATC, no person may operate an aircraft within Class A airspace unless that aircraft is equipped with the applicable equipment specified in Section 91.215.
   (2) Unless otherwise authorized by ATC, no person may operate an aircraft within Class A airspace, between F290 to F460 within ADS-B coverage unless that aircraft is equipped with the applicable equipment specified in Section 91.226.

After 31 December 2017, unless otherwise authorized by Director General, no person may operate an aircraft within Class A airspace, between F290 to F460 within ADS-B coverage unless that aircraft is equipped with the applicable equipment specified in Section 91.226"

(d) ATC authorizations. An operator may deviate from any provision of this section under the provisions of an ATC authorization issued by the ATC facility having jurisdiction of the airspace concerned. In the case of an inoperative transponder, ATC may immediately approve an operation within a Class A airspace area allowing flight to continue, if desired, to the airport of ultimate destination, including any intermediate stops, or to proceed to a place where suitable repairs can be made, or both. Requests for deviation from any provision of this section must be submitted in writing, at least 4 days before the proposed operation. ATC may authorize a deviation on a continuing basis or for an individual flight.

91.137 Temporary

Flight Restrictions

(a) The Director will issue a Notice to Airmen (NOTAM) designating an area within which temporary flight restrictions apply and specifying the

hazard or condition requiring their imposition, whenever he determines it is necessary in order to

(1) Protect persons and property on the surface or in the air from a hazard associated with an incident on the surface;

(2) Provide a safe environment for the operation of disaster relief aircraft; or (3) Prevent an unsafe congestion of sightseeing and other aircraft above an incident or event which may generate a high degree of public interest.

The Notice to Airmen will specify the hazard or condition that requires the imposition of temporary flight restrictions.

(b) When a NOTAM has been issued under Paragraph (a)(1) of this section, no person may operate an aircraft within the designated area unless that aircraft is participating in the hazard relief activities and is being operated under the direction of the official in charge of on scene emergency response activities.

(c) When a NOTAM has been issued under Paragraph (a)(2) of this section, no person may operate an aircraft within the designated area unless at least one of the following conditions are met:

(1) The aircraft is participating in hazard relief activities and is being operated under the direction of the official in charge of on scene emergency response activities.

(2) The aircraft is carrying law enforcement officials.

(3) The aircraft is operating under the ATC approved IFR flight plan.

(4) The operation is conducted directly to or from an airport within the area, or is necessitated by the impracticability of VFR flight above or around the area due to weather, or terrain; notification is given to the ATC facility specified in the NOTAM to receive advisories concerning disaster relief aircraft operations; and the operation does not hamper or endanger relief activities and is not conducted for the purpose of observing the disaster.

(5) The aircraft is carrying properly accredited news representatives, and, prior to entering the area, a flight plan is filed with the appropriate DGCA or ATC facility specified in the Notice to Airmen and the operation is conducted above the altitude used by the disaster relief aircraft, unless otherwise authorized by the official in charge of on scene emergency response activities.

(d) When a NOTAM has been issued under Paragraph (a)(3) of this section, no person may operate an aircraft within the designated area unless at least one of the following conditions is met:

(1) The operation is conducted directly to or from an airport within the area, or is necessitated by the impracticability of VFR flight above or around the area due to weather or terrain, and the operation is not conducted for the purpose of observing the incident or event.

(2) The aircraft is operating under an ATC approved IFR flight plan.

(3) The aircraft is carrying incident or event personnel, or law enforcement officials.

(4) The aircraft is carrying properly accredited news representatives and, prior to entering that area, a flight plan is filed with the appropriate ATC facility specified in the NOTAM.

(e) Flight plans filed and notifications made with an ATC facility under this section shall include the following information:
   (1) Aircraft identification, type and color.
   (2) Radio communications frequencies to be used.
   (3) Proposed times of entry of, and exit from, the designated area.
   (4) Name of news media or organization and purpose of flight.
   (5) Any other information requested by ATC.

91.139 Emergency Air Traffic Rules

(a) This section prescribes a process for utilizing Notices to Airmen (NOTAMs) to advise of the issuance and operations under emergency air traffic rules and regulations and designates the official who is authorized to issue NOTAMs on behalf of the Director in certain matters under this section.

(b) Whenever the Director determines that an emergency condition exists, or will exist, relating to the DGCA's ability to operate the air traffic control system and during which normal flight operations under the CASRs cannot be conducted consistent with the required levels of safety and efficiency
   (1) The Director issues an immediately effective air traffic rule or regulation in response to that emergency condition; and
   (2) The Director may utilize the NOTAM system to provide notification of the issuance of the rule or regulation.

   Those NOTAMs communicate information concerning the rules and regulations that govern flight operations, the use of navigation facilities, and designation of that airspace in which the rules and regulations apply.

(c) When a NOTAM has been issued under this section, no person may operate an aircraft, or other device governed by the regulation concerned, within the designated airspace except in accordance with the authorizations, terms, and conditions prescribed in the regulation covered by the NOTAM.

91.141 Flight Restrictions in the Proximity of the Presidential Area

No person may operate an aircraft over or in the vicinity of any area to be visited or traveled by the President and or the Vice President, contrary to the restrictions established by the Director and published in a Notice to Airmen (NOTAM).

91.143 Flight Limitation in the Proximity of Space Flight Operations

No person may operate any Indonesian Registry, or pilot any aircraft under the authority of an airman certificate issued by the DGCA within areas designated in a Notice to Airmen (NOTAM) for space flight operation except when authorized by ATC.

91.144 Temporary Restriction on Flight Operations During Abnormally High Barometric Pressure Conditions

(a) Special flight restrictions. When any information indicates that barometric pressure on the route of flight currently exceeds or will exceed 31 inches of mercury, no person may operate an aircraft or initiate a flight contrary to the requirements established by the Director and published in a Notice to Airmen issued under this section.

(b) Deviations. The Director may authorize deviations from restrictions issued under Paragraph (a) of this section to permit emergency supply, transport, or medical services to be delivered to isolated communities, where the operation can be conducted with an acceptable level of safety.

91.145 Journey Log book

(a) A journey log book shall be maintained for every aircraft engaged in domestic and/or international air navigation in which shall be entered particulars of the aircraft, its crew and each journey.

(b) The aircraft journey log shall contain the following items:
   (1) aircraft registration and nationality ;
   (2) date;
   (3) crew member names and duty assignments;
   (4) departure and arrival points and times;
   (5) purpose of flight private, aerial work, scheduled or non-scheduled);
   (6) observations regarding the flight; and
   (7) signature of the pilot-in-command.

(c) Other means of journey log book may be applied subject to approval by the Director.

(d) Completed journey log book should be retained to provide a continuous record of the last six months' operations.

91.146 Refueling with Passengers on Board

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

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

91.147 Performance Based Navigation

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

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

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

(c) No person may operate aircraft within the airspace where a Navigation Specification has been prescribed unless a flight plan is submitted to the appropriate ATS unit that includes in item 10 of the ICAO standard flight plan-
(1) the letter 'R' when indicating an aircraft approved for Required Navigation Performance / RNP operations; and
(2) the letter 'G' when indicating an aircraft equipped with an approved Global Navigation Satellite Systems / GNSS capability.

91.148 RESERVED

91.149 In-flight fuel management

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

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

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

VISUAL FLIGHT RULES

91.151 Fuel Requirements for Flight in VFR Conditions

(a) No person may begin a flight in an airplane under day VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed to fly after that for at least 30 minutes.

(b) No person may begin a flight in a rotorcraft under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed, to fly after that for at least 20 minutes.

91.152 Night VFR

Night VFR is prohibited unless authorized by the Director.

91.153 VFR Flight Plan: Information Required

(a) Information required. Unless otherwise authorized by ATC, each person filing a VFR flight plan shall include in it the following information:

(1) The aircraft identification number and, if necessary, its radio call sign.

(2) The type of the aircraft or, in the case of a formation flight, the type of each aircraft and the number of aircraft in the formation.

(3) The full name and address of the pilot in command or, in the case of a formation flight, the formation commander.

(4) The point and proposed time of departure.

(5) The proposed route, cruising altitude (or flight level), and true airspeed at that altitude.

(6) The point of first intended landing and the estimated elapsed time until over that point.

(7) The amount of fuel on board (in hours).

(8) The number of persons in the aircraft, except where that information is otherwise readily available to the DGCA.

(9) Any other information the pilot in command or ATC believes is necessary for ATC purposes.

(b) Cancellation. When a flight plan has been activated, the pilot in command, upon canceling or completing the flight under the flight plan, shall notify the appropriate ATC facility.

91.155 Basic VFR Weather Minimums

(a) Except as provided in Paragraph (b) of this section and Section 91.157, no person may operate an aircraft under VFR when the flight visibility is less, or at a distance from clouds that is less, than that prescribed for the corresponding altitude and class of airspace in the following table:

Airspace	Flight Visibility	Distance from Clouds
Class A	Not applicable	Not applicable
Class B	8 km above 10.000 feet 5 km below 10.000 feet	Clear of clouds
Class C	8 km above 10.000 feet 5 km below 10.000 feet	1,000 feet above 1,000 feet above 1,500 meters horizontal
Class D	8 km above 10.000 feet 5 km below 10.000 feet	1,000 feet above 1,000 feet above 1,500 meters horizontal
Class E	8 km above 10.000 feet 5 km below 10.000 feet	1,000 feet above 1,000 feet above 1,500 meters horizontal
Class F	8 km above 10.000 feet 5 km below 10.000 feet. The higher of: 3000 feet AMSL 5 km, or 1000 feet AGL in sight	1,000 feet above 1,000 feet above 1,500 meters horizontal Clear of clouds
Class G	8 km above 10.000 feet 5 km below 10.000 feet. The higher of: 3000 feet AMSL 5 km, or 1000 feet AGL in sight	1,000 feet above 1,000 feet above 1,500 meters horizontal Clear of clouds

(b) Class G Airspace. In Class G airspace below 1,200 feet above the surface notwithstanding the provisions of Paragraph (a) of this section, helicopter may be operated clear of clouds if operated at a speed that allows the pilot adequate opportunity to see any air traffic or obstruction in time to avoid a collision.

(c) No person may operate an aircraft beneath the ceiling under VFR within the lateral boundaries of controlled airspace designated to the surface for an airport when the ceiling is less than 1,000 feet.

(d) No person may take off or land an aircraft, or enter the traffic pattern of an airport, under VFR, within the lateral boundaries of the surface areas of Class B, Class C, Class D, or Class E airspace designated for an airport
   (1) Unless ground visibility at that airport is at least 3 statute miles (4.8 km); or
   (2) If ground visibility is not reported at that airport, unless flight visibility during landing or takeoff, or while operating in the traffic pattern is at least 3 statute miles (4.8 km).

(e) For the purpose of this section, an aircraft operating at the base altitude of a Class E airspace area is considered to be within the airspace directly below that area.

91.157 Special VFR Weather Minimums

(a) Special VFR operations may be conducted under the weather minimums and requirements of this section, instead of those contained in paragraph 91.155, below 10.000 feet MSL within the airspace contained by the upward extension of the lateral boundaries of the controlled airspace designated to the surface for an airport.

(b) Special VFR operations may only be conducted
   (1) With an ATC clearance;
   (2) Clear of clouds;
   (3) Except for helicopters, when flight visibility is at least 1 statute mile; and
   (4) Except for helicopter, between sunrise and sunset unless
      (i) the person being granted the ATC clearance meets the

applicable requirements for instrument flight under part 61 of this chapter; and

(ii) the aircraft is equipped as required in 91.205(d).

(c) No person may take off or land an aircraft (other than a helicopter) under special VFR

(1) Unless ground visibility is at least 1 statute mile; or

(2) If ground visibility is not reported, unless flight visibility is at least 1 statute mile. For the purpose of this paragraph, the term flight visibility includes the visibility from the cockpit of an aircraft in takeoff position if:

(i) The flight is conducted under this part 91; and

(ii) The airport at which the aircraft is located is a airport that does not have weather reporting capabilities.

(d) The determination of visibility by a pilot in accordance with paragraph (c)(2) of this section is not an official weather report or an official ground visibility report.

91.159 VFR Cruising Altitude or Flight Level

Except while holding in a holding pattern of 2 minutes or less, or while turning, each person operating an aircraft under VFR in level cruising flight more than 3,000 feet above the surface shall maintain the appropriate altitude or flight level prescribed below, unless otherwise authorized by ATC:

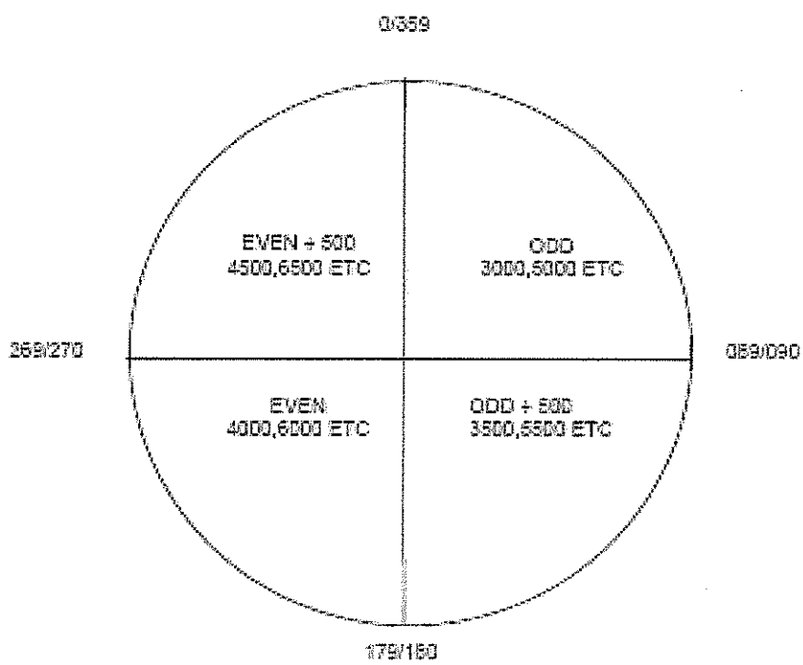
(a) When operating below 20,000 feet :

(1) On a magnetic track of zero degrees through 089 degrees any ODD thousand of feet (FL);

(2) On a magnetic track of 090 degrees through 179 degrees any ODD thousand of feet (FL) plus 500 feet;

(3) On a magnetic track of 180 degrees through 269 degrees any EVEN thousand of feet (FL)

(4) On a magnetic track of 270 degrees through 359 degrees any EVEN thousand of feet (FL) plus 500 feet;



(b) No aircraft may operated at FL 200 within Indonesian Airspace, when operating above FL 200 :

(1) On a magnetic course of 000° through 179°, useable flight level such as FL 210, FL 230, FL 250, FL 270.

(2) On a magnetic course at 180° through 359ůseable flight level such as FL 220, FL 240, FL 260, FL 280.

(c) No aircraft may operated at or above FL 290 within VFR condition

TRACK				REMARKS
000°-089°	090°-179°	180°-269°	270°-359°	VFR Cruising altitude of Flight Level
3000	3500	4000	4500	
5000	5500	6000	6500	
7000	7500	8000	8500	
9000	9500	10000	10500	
11000	11500	12000	12500	
13000	13500	14000	14500	
15000	15500	16000	16500	
17000	17500	18000	18500	
19000	19500	-	-	
FL 200 UNUSEABLE LEVEL WITHIN INDONESIA AIR SPACE				

TRACK		REMARKS
000°-179°	180°-359°	
FL 210	FL 220	
FL 230 FL 250 FL 270	FL 240 FL 260 FL 280	
FL 290 AT OR ABOVE UNUABLE TO USE FOR VFR OPERATION WITHIN INDONESIA AIRSPACE		

(1) On a magnetic course of 0° through 179°, any flight level, at 4,000-foot intervals, beginning at and including flight level 300 (such as flight level 300, 340, or 380); or

(2) On a magnetic course of 180° through 359°, any flight level, at 4,000-foot intervals, beginning at and including flight level 320 (such as flight level 320, 360, or 400).

91.161 through 91.165 [RESERVED]

91.167 Fuel Requirements for Flight in IFR Conditions

(a) Except as provided in Paragraph (b) of this section, no person may operate a civil aircraft in IFR conditions unless it carries enough fuel (considering weather reports and forecasts and weather conditions) to
   (1) Complete the flight to the first airport of intended landing;
   (2) Fly from that airport to the alternate airport; and
   (3) Fly after that for 45 minutes at normal cruising speed or, for helicopters, fly after that for 30 minutes at normal cruising speed.

(b) Paragraph (a)(2) of this section does not apply if
   (1) The DGCA prescribes a standard instrument approach procedure for the first airport of intended landing; and
   (2) For at least 1 hour before and 1 hour after the estimated time of arrival at the airport, the weather reports or forecasts or any combination of them indicate
      (i) The ceiling will be at least 2,000 feet above the airport elevation; and Visibility will be at least 3 statute miles (4.8 km).
      (ii) For helicopters. At the estimated time of arrival and for 1 hour after the estimated time of arrival, the ceiling will be at least 1.000 feet above the airport elevation, or at least 400 feet above the lowest applicable approach minima, which ever is higher, and the visibility will be at least 2 statute miles.

91.169 IFR Flight Plan: Information Required

(a) Information required. Unless otherwise authorized by ATC, each person filing an IFR flight plan shall include in it the following information:
   (1) Information required under Section 91.153(a).
   (2) An alternate airport, except as provided in Paragraph (b) of this section.

(b) Exceptions to applicability of Paragraph (a)(2) of this section. Paragraph (a)(2) of this section does not apply if the DGCA prescribes an approved standard instrument approach procedure for the first airport of intended landing and, for at least 1 hour before and 1 hour after the estimated time of arrival, the weather reports or forecasts, or any combination of them, indicate
   (1) For at least 1 hour before and 1 hour after the estimated time of arrival, the weather reports or forecasts, or any combination of them, indicate The ceiling will be at least 2,000 feet above the airport elevation and the visibility will be at least 3 statute miles (4.8 km).
   (2) For helicopters, at least 2 hours before and 2 hours after the estimated time of arrival, the weather reports or forecasts, or any combination of them, indicate the ceiling will be at least 400 feet above the lowest applicable approach minima, and the visibility will be at least 1.5 km.

(c) IFR alternate airport weather minimums. Unless otherwise authorized by the Director, no person may include an alternate airport in an IFR flight plan unless current weather forecasts indicate that, at the estimated time of arrival at the alternate airport, the ceiling and visibility at that airport will be at or above the following alternate airport weather minimums:

(1) If an instrument approach procedure has been approved by the Director for that airport, the alternate airport minimums specified in that procedure or, if none are so specified, the following minimums:

(i) Precision approach procedure: Ceiling 600 feet and visibility 2 statute miles (3.2 km).

(ii) Non-precision approach procedure: Ceiling 800 feet and visibility 2 statute miles (3.2 km).

(2) If no instrument approach procedure has been approved by the Director for that airport, the ceiling and visibility minimums are those allowing descent from the MEA, approach, and landing under basic VFR.

(d) Cancellation. When a flight plan has been activated, the pilot in command, upon canceling or completing the flight under the flight plan, shall notify an appropriate ATC facility.

91.171 VOR Equipment Check for IFR Operations

(a) No person may operate a civil aircraft under IFR using the VOR system of radio navigation unless the VOR equipment of that aircraft

(1) Is maintained, checked, and inspected under an approved procedure; or

(2) Has been operationally checked within the preceding 30 days, and was found to be within the limits of the permissible indicated bearing error set forth in Paragraph (b) or (c) of this section.

(b) Except as provided in Paragraph (c) of this section, each person conducting a VOR check under Paragraph (a)(2) of this section shall

(1) Use, at the airport of intended departure, an DGCA-operated or approved test signal or a test signal radiated by a certificated and appropriately rated radio repair station or, outside Indonesia, a test signal operated or approved by an appropriate authority to check the VOR equipment (the maximum permissible indicated bearing error is ±4°); or

(2) Use, at the airport of intended departure, a point on the airport surface designated as a VOR system checkpoint by the Director, or, outside Indonesia, by an appropriate authority (the maximum permissible bearing error is ±4°);

(3) If neither a test signal nor a designated checkpoint on the surface is available, use an airborne checkpoint designated by the Director or, outside Indonesia, by an appropriate authority (the maximum permissible bearing error is ±6°); or

(4) If no check signal or point is available, while in flight

(i) Select a VOR radial that lies along the centerline of an established VOR airway;

(ii) Select a prominent ground point along the selected radial preferably more than 20 nautical miles from the VOR ground facility and maneuver the aircraft directly over the point at a reasonably low altitude; and

(iii) Note the VOR bearing indicated by the receiver when over the ground point. The maximum permissible variation between the published radial and the indicated bearing is 6 degrees.

(c) If dual system VOR (units independent of each other except for the antenna) is installed in the aircraft, the person checking the equipment may check one system against the other in place of the check procedures specified in Paragraph (b) of this section. Both systems shall be tuned to the same VOR ground facility and note the indicated bearings to that station. The maximum permissible variation between the two indicated bearings is 4 degrees.

(d) Each person making the VOR operational check, as specified in Paragraph (b) or (c) of this section, shall enter the date, place, bearing error, and sign the aircraft log or other record. In addition, if a test signal radiated by a repair station, as specified in Paragraph (b)(1) of this section, is used, an entry must be made in the aircraft log or other record by the repair station certificate holder or the certificate holder's representative certifying to the bearing transmitted by the repair station for the check and the date of transmission.

91.173 ATC Clearance and Flight Plan Required

No person may operate an aircraft in controlled airspace under IFR unless that person has

(a) Filed an IFR flight plan; and

(b) Received an appropriate ATC clearance.

91.175 Takeoff and Landing under IFR

(a) Instrument approaches to civil airports.

Unless otherwise authorized by the Director, when an instrument let down to a civil airport is necessary, each person operating an aircraft shall use a standard instrument approach procedure prescribed for the airport by the Director.

The OCA/OCH in the instrument Approach Procedure (IAP) are published by the Director through Aeronautical Information Publication (AIP) and if the operators implemented IAP different with published OCA/OCH the operator should propose the different MDA/MDH or DA/DH approved by the Director.

(b) Authorized DH or MDA. For the purpose of this section, when the approach procedure being used provides for and requires the use of a DH or MDA, the authorized DH or MDA is the highest of the following:

(1) The DH or MDA prescribed by the approach procedure.

(2) The DH or MDA prescribed for the pilot in command.

(3) The DH or MDA for which the aircraft is equipped.

(c) Operation below DH or MDA. Where a DH or MDA is applicable, no pilot may operate an aircraft, except a military aircraft of Indonesia, at any airport below the authorized MDA or continue an approach below the authorized DH unless

(1) The aircraft is continuously in a position from which a descent to a landing on the intended runway can be made at a normal rate of descent using normal maneuvers, and for operations conducted under Part 121 or Part 135 unless that descent rate will allow touchdown to occur within the touchdown zone of the runway of intended landing;

(2) The flight visibility is not less than the visibility prescribed in the standard instrument approach being used; and

(3) Except for a Category II or Category III approach where any necessary visual reference requirements are specified by the Director, at least one of the following visual references for the intended runway is distinctly visible and identifiable to the pilot:

(i) The approach light system, except that the pilot may not descend below 100 feet above the touchdown zone elevation using the approach lights as a reference unless the red terminating bars or the red side row bars are also distinctly visible and identifiable.

(ii) The threshold.

(iii) The threshold markings.

(iv) The threshold lights.

(v) The runway end identifier lights.

(vi) The visual approach slope indicator.

(vii) The touchdown zone or touchdown zone markings.

(viii) The touchdown zone lights.

(ix) The runway or runway markings.

(x) The runway lights.

(d) Landing. No pilot operating an aircraft may land that aircraft when the flight visibility is less than the visibility prescribed in the standard instrument approach procedure being used.

(e) Missed approach procedures. Each pilot operating an aircraft, except a military aircraft of Indonesia, shall immediately execute an appropriate missed approach procedure when either of the following conditions exist:

(1) Whenever the requirements of Paragraph (c) of this section are not met at either of the following times:

(i) When the aircraft is being operated below MDA; or

(ii) Upon arrival at the missed approach point, including a DH where a DH is specified and its use is required, and at any time after that until touchdown.

(2) Whenever an identifiable part of the airport is not distinctly visible to the pilot during a circling maneuver at or above MDA, unless the inability to see an identifiable part of the airport results only from a normal bank of the aircraft during the circling approach.

(f) Civil airport takeoff minimums. Unless otherwise authorized by the Director, no pilot operating an aircraft under Parts 121, 129, or 135 of the CASRs may takeoff from a civil airport under IFR unless weather conditions are at or above the weather minimum for IFR takeoff prescribed for that airport by the Director. If takeoff minimums are not prescribed by the Director for a particular airport, the following minimums apply to takeoffs under IFR for aircraft operating under those parts:

(1) For aircraft, other than helicopters, having two engines or less __1 statute mile (1.6 km) visibility.

(2) For aircraft having more than two engines __½ statute mile (800 meters) visibility.
(3) For helicopters __½ statute mile (800 meters) visibility.

(g) Military airports. Unless otherwise prescribed by the Director, each person operating a civil aircraft under IFR into or out of a military airport shall comply with the instrument approach procedures and the takeoff and landing minimum prescribed by the military authority having jurisdiction of that airport.

(h) Comparable values of RVR and ground visibility.
(1) Except for Category II or Category III minimums, if RVR minimums for takeoff or landing are prescribed in an instrument approach procedure, but RVR is not reported for the runway of intended operation, the RVR minimum shall be converted to ground visibility in accordance with the table in Paragraph (h)(2) of this section and shall be the visibility minimum for takeoff or landing on that runway.

RVR	Visibility	
Meters	Feet	Statute miles
400	1,600	¼
800	2,400	½
1,000	3,200	—
1,200	4,000	¾
1,400	4,500	—
1,600	5,000	1
2,000	6,000	1¼

(i) RESERVED

(j) Limitation on procedure turns. In the case of a radar vector to a final approach course or fix, a timed approach from a holding fix, or an approach for which the procedure specifies "No PT," no pilot may make a procedure turn unless cleared to do so by ATC.

(k) ILS components. The basic ground components of an ILS are the localizer, glide slope, outer marker, middle marker, and, when installed for use with Category II or Category III instrument approach procedures, an inner marker. A compass locator or precision radar may be substituted for the outer or middle marker. DME, VOR, or non-directional beacon fixes authorized in the standard instrument approach procedure or surveillance radar may be substituted for the outer marker. Applicability of, and substitution for, the inner marker for Category II or III approaches is determined by the appropriate DGCA-approved approach procedure, a letter of authorization issued by the DGCA, or operations specification pertinent to the operations.

91.177 Minimum Altitudes for IFR Operations

(a) Operation of aircraft at minimum altitudes. Except when necessary for takeoff or landing, no person may operate an aircraft under IFR bellow
(1) The applicable minimum altitudes prescribed; or
(2) If no applicable minimum altitude is prescribed in those parts
(i) In the case of operations over a mountainous area, an altitude of 2,000 feet above the highest obstacle within a horizontal

distance of 4 nautical miles from the course to be flown; or

(ii) In any other case, an altitude of 1,000 feet above the highest obstacle within a horizontal distance of 4 nautical miles from the course to be flown.

However, if both a MEA and a MOCA are prescribed for a particular route or route segment, a person may operate an aircraft below the MEA down to, but not below, the MOCA, when within 22 nautical miles of the VOR concerned (based on the pilot's reasonable estimate of that distance).

(b) Climb. Climb to a higher minimum IFR altitude shall begin immediately after passing the point beyond which that minimum altitude applies, except that when ground obstructions intervene, the point beyond which that higher minimum altitude applies shall be crossed at or above the applicable MCA.

91.179 IFR Flight Level

(a) In controlled airspace. Each person operating an aircraft under IFR in level cruising flight in controlled airspace shall maintain the altitude or flight level assigned that aircraft by ATC.

(b) In uncontrolled airspace. Except while in a holding pattern of 2 minutes or less or while turning, each person operating an aircraft under IFR in level cruising flight in uncontrolled airspace shall maintain an appropriate altitude as follows:

(1) When operating below flight level 200

(i) On a magnetic track of zero degrees through 089 degrees any ODD thousand of feet (FL);

(ii) On a magnetic track of 090 degrees through 179 degrees any ODD thousand of feet (FL) plus 500 feet;

(iii) On a magnetic track of 180 degrees through 269 degrees any EVEN thousand of feet (FL)

(iv) On a magnetic track of 270 degrees through 359 degrees any EVEN thousand of feet (FL) plus 500 feet;

(2) When operating above flight level 200 but below flight level 290:

(i) On magnetic track of zero degrees through 179 degrees any odd flight level such as : FL 210; FL 230 FL; FL 250 etc.

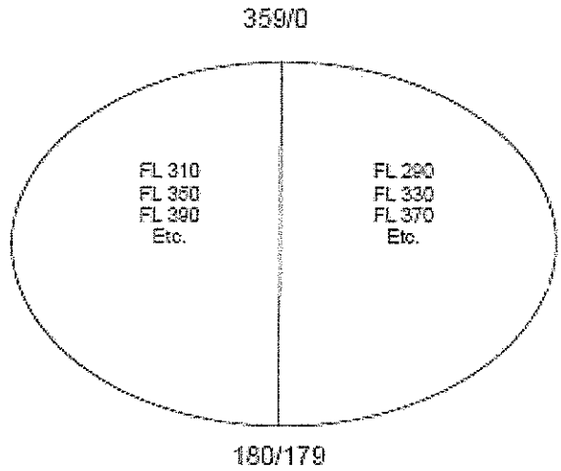
(ii) On magnetic track of 180 degrees through 359 degrees any even flight level such as : FL 220; FL 240 FL; FL 260 etc.

Note:
For separation purpose between aircraft operating in the Lower (below transition level) and Upper (above transition level) airspace shall not be used.

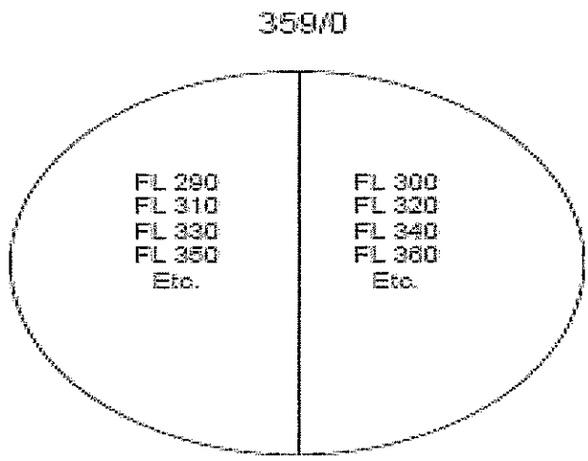
(3) When operating at or above flight level 290 within non RVSM Designated Route:

(i) On a magnetic track of zero degrees through 179 degrees, flight levels at 4.000 feet intervals beginning at and including FL 290 such as : FL 290; FL 330; FL 370 etc.

(ii) On a magnetic track of 180 degrees through 359 degrees, flight levels at 4.000 foot intervals beginning at and including FL 310, such as: FL 310; FL 350; FL 390 etc.



(4) When operating at or above FL 290 within RVSM Designated Route:
   (i) on magnetic track of zero degrees through 179 degrees, flight level FL at 2.000 feet intervals beginning at and including FL 290 such as : FL 290; FL 310; FL 330; FL 350 etc. up to FL 410.
   (ii) On a magnetic track of 180 degrees through 359 degrees, flight levels at 2.000 foot intervals beginning at and including FL 300, such as: FL 300; FL 320; FL 340; FL 360 etc up to FL 400.



TRACK				REMARKS
000° - 089°	090° - 179°	180° - 269°	270° - 359°	IFR Cruising altitude of Flight Level
3000	3500	4000	4500	
5000	5500	6000	6500	
7000	7500	8000	8500	
9000	9500	10000	10500	
11000	11500	12000	12500	
13000	13500	14000	14500	
15000	15500	16000	16500	
17000	17500	18000	18500	
19000	19500	-	-	
FL 200 UNUSEABLE LEVEL WITHIN INDONESIA AIR SPACE				
TRACK				REMARKS
000° - 179°		180° - 359°		
FL 210 FL 230 FL 250 FL 270		FL 220 FL 240 FL 260 FL 280		Flight level at 2000 foot intervals.
WHEN OPERATING ABOVE FLIGHT LEVEL 290 WITHIN NON RVSM DESIGNATED ROUTE.				
000° - 179°		180° - 359°		
FL 290 FL 330 FL 370 FL 410 FL 450		FL 310 FL 350 FL 390 FL 430 FL 470		Flight level at 4000 Foot intervals.

FL 490 etc.	FL 510 etc.	
WHEN OPERATING ABOVE FLIGHT LEVEL 290 UP TO AND INCLUDING FLIGHT LEVEL 410 WITHIN NON RVSM DESIGNATED ROUTE.		
000^0-179^0	180^0-359^0	
FL 290 FL 310 FL 330 FL 350 FL 370 FL 390 FL 410	FL 300 FL 320 FL 340 FL 360 FL 380 FL 400	Flight level at 2000 Foot intervals up to and including FL 410, at 4000 foot interval above FL410.
WHEN OPERATING ABOVE FLIGHT LEVEL 290 UP TO AND INCLUDING FLIGHT LEVEL 410 WITHIN RVSM DESIGNATED ROUTE.		
000^0-179^0	180^0-359^0	REMARKS
FL 290 FL 310 FL 330 FL 350 FL 370 FL 390 FL 410	FL 300 FL 320 FL 340 FL 360 FL 380 FL 400	Flight level at 2000 Foot intervals up to and including FL 410, at 4000 foot interval above FL410.

91.180 Operations within airspace designated as Reduced Vertical Separation Minimum airspace.

(a) Except as provided in paragraph (b) of this section, no person may operate a civil aircraft in airspace designated as Reduced Vertical Separation Minimum (RVSM) airspace unless:
   (1) The operator and the operator's aircraft comply with the minimum standards of appendix G of this part; and
   (2) The operator is authorized by the DGCA or the country of registry to conduct such operations.

(b) The DGCA may authorize a deviation from the requirements of this section.

91.181 Course to Be Flown

Unless otherwise authorized by ATC, no person may operate an aircraft within controlled airspace under IFR except as follows:

(a) On an airway, along the centerline of that airway.

(b) On any other route, along the direct course between the navigational aids or fixes defining that route. However, this section does not prohibit maneuvering the aircraft to pass well clear of other air traffic or the maneuvering of the aircraft in VFR conditions to clear the intended flight path both before and during climb or descent.

91.183 IFR Radio Communications

The pilot in command of each aircraft operated under IFR shall have a continuous watch maintained on the appropriate frequency and shall report by radio as soon as possible

(a) The time and altitude of passing each designated reporting point, or the reporting points specified by ATC, except that while the aircraft is under radar control, only the passing of those reporting points specifically requested by ATC need be reported;

(b) Any unforecast weather conditions encountered; and

(c) Any other information relating to the safety of flight.

91.185 IFR operations: Two-way Radio Communications Failure

(a) General. Unless otherwise authorized by ATC, each pilot who has two-way radio communications failure when operating under IFR shall comply with the rules of this section.

(b) VFR conditions. If the failure occurs in VFR conditions, or if VFR conditions are encountered after the failure, each pilot shall continue the flight under VFR and land as soon as practicable.

(c) IFR conditions. If the failure occurs in IFR conditions, or if Paragraph (b) of this section cannot be complied with, each pilot shall continue the flight according to the following:

(1) Unless otherwise prescribed on the basis of a regional air navigation agreement, in airspace where radar is not used in the provision of air traffic control, maintain the last assigned speed and level, or minimum flight altitude if higher, for a period of 20 minutes following the aircraft's failure to report its position over a compulsory reporting point and thereafter adjust level and speed in accordance with the filed flight plan; or,

(2) in airspace where radar is used in the provision of air traffic control, maintain the last assigned speed and level, or minimum flight altitude if higher, for a period of 7 minute following :

(i) The time the last assigned level or minimum flight altitude is reached; or

(ii) The time the transponder is set to Code 7600; or

(iii) The time aircraft's failure to report its position over a compulsory reporting point;

Whichever is later and thereafter adjust level and speed in accordance with the filed flight plan;

(3) When being radar vectored or having been directed by ATC to proceed offset using RNAV without a specified limit, proceed in the most direct manner possible to rejoin the current flight plan route no later than the next significant point, taking into consideration the applicable minimum flight altitude;

(4) Proceed according to the current flight plan route to the appropriate designated navigation aid or fix serving the destination aerodrome and, when required to ensure compliance with (5) below, hold over

this aid or fix until commencement of decent;

(5) Commence descent from the navigation aid or fix specified in (4) at, or as close as possible to, the expected approach time last received and acknowledged; or, if no expected approach time has been received and acknowledged, at, or as close as possible to, the estimated time of arrival resulting from the current flight plan.

(6) complete a normal instrument approach procedure as specified for the designated navigation aid or fix; and

(7) land, if possible, within 30 minutes after the estimated time of arrival specified in (5) or the last acknowledged expected approach time, whichever is later.

91.187 Operation under IFR: Malfunction Reports

(a) The pilot in command of each aircraft operated in controlled airspace under IFR shall report as soon as practical to ATC any malfunctions of navigational, approach, or communication equipment occurring in flight.

(b) In each report required by Paragraph (a) of this section, the pilot in command shall include the

(1) Aircraft identification;

(2) Equipment affected;

(3) Degree to which the capability of the pilot to operate under IFR in the ATC system is impaired; and

(4) Nature and extent of assistance desired from ATC.

91.189 Category II and III Operations: General Operating Rules

(a) No person may operate a civil aircraft in a Category II or III operation unless

(1) The flight crew of the aircraft consists of a pilot in command and a second in command who hold the appropriate authorizations and ratings prescribed in Section 61.3 of the CASRs;

(2) Each flight crewmember has adequate knowledge of, and familiarity with, the aircraft and the procedures to be used; and

(3) The instrument panel in front of the pilot who is controlling the aircraft has appropriate instrumentation for the type of flight control guidance system that is being used.

(b) Unless otherwise authorized by the Director, no person may operate a civil aircraft in a Category II or Category III operation unless each ground component required for that operation and the related airborne equipment is installed and operating.

(c) Authorized DH. For the purpose of this section, when the approach procedure being used provides for and requires the use of a DH, the authorized DH is the highest of the following:

(1) The DH prescribed by the approach procedure.

(2) The DH prescribed for the pilot in command.

(3) The DH for which the aircraft is equipped.

(d) Unless otherwise authorized by the Director, no pilot operating an aircraft in a Category II or Category III approach that provides and requires use of a DH may continue the approach below the authorized decision height unless the following conditions are met:

(1) The aircraft is in a position from which a descent to a landing on the intended runway can be made at a normal rate of descent using normal maneuvers, and where that descent rate will allow touchdown to occur within the touchdown zone of the runway of intended landing.

(2) At least one of the following visual references for the intended runway is distinctly visible and identifiable to the pilot:

(i) The approach light system, except that the pilot may not descend below 100 feet above the touchdown zone elevation using the approach lights as a reference unless the red terminating bars or the red side row bars are also distinctly visible and identifiable.

(ii) The threshold.

(iii) The threshold markings.

(iv) The threshold lights.

(v) The touchdown zone or touchdown zone markings.

(vi) The touchdown zone lights.

(e) Unless otherwise authorized by the Director, each pilot operating an aircraft shall immediately execute an appropriate missed approach whenever, prior to touchdown, the requirements of Paragraph (d) of this section are not met.

(f) No person operating an aircraft using a Category III approach without decision height may land that aircraft except in accordance with the provisions of the letter of authorization issued by the DGCA.

(g) Paragraphs (a) through (f) of this section do not apply to operations conducted by the holders of Air Operator Certificates issued under Parts 121, 129, or 135 of the CASRs. No person may operate a civil aircraft in a Category II or Category III operation conducted by the holder of a certificate issued under Parts 121, 129, or 135 of the CASRs unless the operation is conducted in accordance with that certificate holder's operations specifications.

91.191 Category II Manual

(a) No person may operate a civil aircraft of Indonesian registry in a Category II operation unless

(1) There is available in the aircraft a current, approved Category II manual for that aircraft;

(2) The operation is conducted in accordance with the procedures, instructions, and limitations in that manual; and

(3) The instruments and equipment listed in the manual that are required for a particular Category II operation have been inspected and maintained in accordance with the maintenance program contained in that manual.

(b) Each operator shall keep a current copy of the approved manual at its principal base of operations and shall make it available for inspection upon request of the Director.

(c) This section does not apply to operations conducted by the holder of a certificate issued under Part 121 or 135 of the CASRs.

91.195 through 91.199 RESERVED

SUBPART C - EQUIPMENT, INSTRUMENT, AND CERTIFICATE REQUIREMENTS

91.203 Civil Aircraft: Certifications Required

(a) Except as provided in Section 91.715, no person may operate a civil aircraft unless it has within the aircraft the following:

(1) An appropriate and current airworthiness certificate. Each Indonesian airworthiness certificate used to comply with this subparagraph, except the following

- A special flight permit,
- A copy of the applicable operations specifications issued under Part 21 of the CASRs,
- Appropriate sections of the air carrier manual required by Parts 121 and 135 of the CASRs containing that portion of the operations specifications issued under Part 21, or
- An authorization under Section 91.611 must have on it the registration mark assigned to the aircraft by the DGCA. However, the airworthiness certificate need not have on it an assigned special identification number until 10 days after that number is first affixed to the aircraft. A revised airworthiness certificate with an assigned special identification number, that has been affixed to an aircraft, may only be obtained upon application to the DGCA.

(2) An effective Indonesian registration certificate issued to its owner or, for operation within Indonesia, the duplicate copy of the Aircraft Registration Application as provided for by the DGCA, or a registration certificate issued under the laws of a foreign country.

(b) No person may operate a civil aircraft unless the airworthiness certificate required by Paragraph (a) of this section or a special flight authorization issued under Section 91.715 is displayed at the cabin or cockpit entrance so that it is legible to passengers or crew.

(c) No person may operate an aircraft with a fuel tank installed within the passenger compartment or a baggage compartment unless the installation was accomplished in accordance with applicable provisions of the CASRs, and a copy of DAC Form KU18 2A authorizing that installation is on board the aircraft.

(d) No person may operate a civil airplane (domestic or foreign) into or out of an airport in Indonesia unless it complies with the fuel venting and exhaust emissions requirements of the CASRs.

91.205 Powered Civil Aircraft with Standard Category Indonesian Airworthiness Certificates: Instrument and Equipment Requirements

(a) General. Except as provided in Paragraphs (c)(3) and (e) of this section, no person may operate a-powered civil aircraft with a standard category Indonesian airworthiness certificate in any operation described in Paragraphs (b) through (f) of this section unless that aircraft contains the instruments and equipment (or DGCA-approved equivalents) specified in

those paragraphs for that type of operation, and those instruments and items of equipment are in operable condition.

(b) Visual flight rules (day). For VFR flight during the day, the following instruments and equipment are required:
(1) Airspeed indicator.
(2) Altimeter.
(3) Magnetic direction indicator.
(4) Tachometer for each engine.
(5) Oil pressure gauge for each engine using pressure system.
(6) Temperature gauge for each liquid cooled engine.
(7) Oil temperature gauge for each air cooled engine.
(8) Manifold pressure gauge for each altitude engine.
(9) Fuel gauge indicating the quantity of fuel in each tank.
(10) Landing gear position indicator, if the aircraft has a retractable landing gear.
(11) If the aircraft is operated for hire over water and beyond power off gliding distance from shore, approved flotation gear readily available to each occupant and at least one pyrotechnic signaling device. As used in this section, "shore" means that area of the land adjacent to the water which is above the high water mark and excludes land areas which are intermittently under water.
(12) An approved safety belt with an approved metal-to-metal latching device for each occupant 2 years of age or older.
(13) For small civil airplanes manufactured after [27 December 1993], an approved shoulder harness for each front seat. The shoulder harness must be designed to protect the occupant from serious head injury when the occupant experiences the ultimate inertia forces specified in Part 23 of the CASRs. Each shoulder harness installed at a flight crewmember station must permit the crewmember, when seated and with the safety belt and shoulder harness fastened, to perform all functions necessary for flight operations. For purposes of this paragraph
(i) The date of manufacture of an airplane is the date the inspection acceptance records reflect that the airplane is complete and meets the DGCA-approved type design data; and
(ii) A front seat is a seat located at a flight crewmember station or any seat located alongside such a seat.
(14) An emergency locator transmitter, if required by Section 91.207.
(15) For normal, utility, and acrobatic category airplanes with a seating configuration (not including pilot seats) of 9 or less, manufactured after [date to be determined], a shoulder harness for
(i) Each front seat that meets the requirements of Part 23 of the CASRs in effect on [date to be determined];
(ii) Each additional seat that meets the requirements of Part 23 of the CASRs.
(16) For rotorcraft manufactured after September 16, 1992, a shoulder harness for each seat that meets the requirements of Part 27.2 and Part 29.2.

(c) Visual flight rules (night). For VFR flight at night, the following instruments and equipment are required:
(1) Instruments and equipment specified in paragraph (b) of this section;
(2) Approved position lights;
(3) a landing light;

(4) illumination for all flight instruments and equipment that are essential for the safe operation of the aircraft that are used by the flight crew;
(5) lights in all passenger compartments;
(6) an independent portable light for each crew member station;
(7) An adequate source of electrical energy for all installed electrical and radio equipment;
(8) An approved aviation red or aviation white anticollision light system;
(9) radio communications and navigational equipment appropriate to the ground facilities to be used; and
(10) One spare set of fuses, or three spare fuses of each kind required, that are accessible to the pilot in flight.

(d) Instrument flight rules. For IFR flight, the following instruments and equipment are required:
(1) Instruments and equipment specified in Paragraph (b) of this section, and, for night flight, instruments and equipment specified in Paragraph (c) of this section.
(2) Two-way radio communications system and navigational equipment appropriate to the ground facilities to be used.
(3) Gyroscopic rate of turn indicator, except on the following aircraft:
(i) Airplanes with a third attitude instrument system usable through flight attitudes of 360° of pitch and roll and installed in accordance with the instrument requirements prescribed in Section 121.305(j) of the CASRs; and
(ii) Rotorcraft with a third attitude instrument system usable through flight attitudes of ±80° of pitch and ±20° of roll and installed in accordance with Part 29.1303 (g) of the CASRs.
(4) Slip/skid indicator.
(5) Sensitive altimeter adjustable for barometric pressure.
(6) A clock displaying hours, minutes, and seconds with a sweep-second pointer or digital presentation.
(7) Generator or alternator of adequate capacity.
(8) Gyroscopic pitch and bank indicator (artificial horizon).
(9) Gyroscopic direction indicator (directional gyro or equivalent).

(e) Flight at and above 24,000 feet MSL (FL 240). If VOR navigational equipment is required under Paragraph (d)(2) of this section, no person may operate an Indonesian-registered civil aircraft within Indonesia at or above FL 240 unless that aircraft is equipped with approved distance measuring equipment (DME). When DME required by this paragraph fails at and above FL 240, the pilot in command of the aircraft shall notify ATC immediately, and then may continue operations at and above FL 240 to the next airport of intended landing at which repairs or replacement of the equipment can be made.

(f) (Category II operations. For Category II operations the instruments and equipment specified in Paragraph (d) of this section and Appendix A to this part are required.

(g) Category III operations. The instruments and equipment required for Category III operations are specified in paragraph (d) of this section.

(h) Excusions. Paragraph (f) and (g) do not apply to operations conducted by the holder of a certificate issued under Part 121 of the CASRs.

(i) Radio communication equipment required of this section shall be
   (1) Capable of conducting two-way communication at any time with air traffic services or aeronautical stations;
   (2) Capable of conducting communications on those frequencies prescribed by the DGCA,
   (3) Capable of receiving meteorological information at any time during the flight;
   (4) Capable of conducting communications on the aeronautical emergency frequency 121.5 MHz;
   (5) Installed such that the failure of any single unit required for communication equipment, will not result in the failure of another unit required for communications purposes; and
   (6) Meeting any other requirements as prescribed by the DGCA.

91.207 Emergency Locator Transmitters

(a) Except as provided in Paragraphs (e) and (f) of this section, no person may operate:
   (1) An aircraft unless equipped with at least one approved automatic emergency locator transmitter;
   (2) An airplane authorized to carry more than 19 passengers for which the individual certificate of airworthiness is first issued after 1 July 2008, unless it is equipped with at least two approved emergency locator transmitters, one of which shall be automatic.

(b) Each emergency locator transmitter required by Paragraph (a) of this section must be :
   (1) Operated on 406 MHz and 121.5 MHz simultaneously.
   (2) Attached to the airplane in such a manner that the probability of damage to the transmitter in the event of crash impact is minimized. Fixed and deployable automatic type transmitters must be attached to the airplane as far aft as practicable.

(c) Batteries used in the emergency locator transmitters required by Paragraphs (a) and (b) of this section must be replaced (or recharged, if the batteries are rechargeable)
   (1) When the transmitter has been in use for more than 1 cumulative hour; or
   (2) When 50 percent of their useful life (or, for rechargeable batteries, 50 percent of their useful life of charge) has expired, as established by the transmitter manufacturer under its approval.

   The new expiration date for replacing (or recharging) the battery must be legibly marked on the outside of the transmitter and entered in the aircraft maintenance record. Paragraph (c)(2) of this section does not apply to batteries (such as water activated batteries) that are essentially unaffected during probable storage intervals.

(d) Each emergency locator transmitter required by Paragraph (a) of this section must be inspected within 12 calendar months after the last inspection for
   (1) Proper installation;
   (2) Battery corrosion;
   (3) Operation of the controls and crash sensor; and
   (4) The presence of a sufficient signal radiated from its antenna.

(e) Notwithstanding Paragraph (a) of this section, a person may__
(1) Ferry a newly acquired airplane from the place where possession of it was taken to a place where the emergency locator transmitter is to be installed; and
(2) Ferry an airplane with an inoperative emergency locator transmitter from a place where repairs or replacements cannot be made to a place where they can be made.

No person other than required crewmembers may be carried aboard an airplane being ferried under Paragraph (e) of this section.

(f) Paragraph (a) of this section does not apply to
(1) Aircraft while engaged in flight operations incident to design and testing;
(2) New aircraft while engaged in flight operations incident to their manufacture, preparation, and delivery;
(3) Aircraft certificated by the Director for research and development purposes.

91.209 Aircraft Lights

No person may, during the period from sunset to sunrise

(a) Operate an aircraft unless it has lighted position lights;

(b) Park or move an aircraft in, or in dangerous proximity to, a night flight operations area of an airport unless the aircraft
(1) Is clearly illuminated;
(2) Has lighted position lights; or
(3) Is in an area which is marked by obstruction lights;

(c) Anchor an aircraft unless the aircraft
(1) Has lighted anchor lights; or
(2) Is in an area where anchor lights are not required on vessels; or

(d) Operate an aircraft, required by Section 91.205(c)(3) to be equipped with an anticollision light system, unless it has approved and lighted aviation red or aviation white anticollision lights. However, the anticollision lights need not be lighted when the pilot in command determines that, because of operating conditions, it would be in the interest of safety to turn the lights off.

91.211 Supplemental Oxygen

(a) General. No person may operate a civil aircraft of Indonesian registry
(1) At cabin pressure altitudes above 12,500 feet (MSL) up to and including 14,000 feet (MSL) unless the required minimum flight crew is provided with and uses supplemental oxygen for that part of the flight at those altitudes that is of more than 30 minutes duration;
(2) At cabin pressure altitudes above 14,000 feet (MSL) unless the required minimum flight crew is provided with and uses supplemental oxygen during the entire flight time at those altitudes; and
(3) At cabin pressure altitudes above 15,000 feet (MSL) unless each occupant of the aircraft is provided with supplemental oxygen.

(b) Pressurized cabin aircraft.

(1) No person may operate a civil aircraft of Indonesian registry with a pressurized cabin

(i) At flight altitudes above flight level 250 unless at least a 10 minute supply of supplemental oxygen, in addition to any oxygen required to satisfy Paragraph (a) of this section, is available for each occupant of the aircraft for use in the event that a descent is necessitated by loss of cabin pressurization; and

(ii) At flight altitudes above flight level 350 unless one pilot at the controls of the airplane is wearing and using an oxygen mask that is secured and sealed and that either supplies oxygen at all times or automatically supplies oxygen whenever the cabin pressure altitude of the airplane exceeds 14,000 feet (MSL), except that the one pilot need not wear and use an oxygen mask while at or below flight level 410 if there are two pilots at the controls and each pilot has a quick donning type of oxygen mask that can be placed on the face with one hand from the ready position within 5 seconds, supplying oxygen and properly secured and sealed.

(2) Notwithstanding Paragraph (b)(1)(ii) of this section, if for any reason at any time it is necessary for one pilot to leave the controls of the aircraft when operating at flight altitudes above flight level 350, the remaining pilot at the controls shall put on and use an oxygen mask until the other pilot has returned to that crewmember's station.

91.213 Inoperative Instruments and Equipment

(a) Except as provided in Paragraph (d) of this section, no person may takeoff an aircraft with inoperative instruments or equipment installed unless the following conditions are met:

(1) An approved Minimum Equipment List exists for that aircraft.

(2) The aircraft has within the aircraft a letter of authorization, issued by the DGCA authorizing operation of the aircraft under the Minimum Equipment List. The letter of authorization may be obtained by written request of the airworthiness certificate holder. The Minimum Equipment List and the letter of authorization constitute a supplemental type certificate for the aircraft.

(3) The approved Minimum Equipment List must

(i) Be prepared in accordance with the limitations specified in Paragraph (b) of this section; and

(ii) Provide for the operation of the aircraft with the instruments and equipment in an inoperable condition.

(iii) Be based upon, but no less restrictive than, the relevant master minimum equipment list;

(4) The aircraft records available to the pilot must include an entry describing the inoperable instruments and equipment.

(5) The aircraft is operated under all applicable conditions and limitations contained in the Minimum Equipment List and the letter authorizing the use of the list.

(b) The following instruments and equipment may not be included in a Minimum Equipment List:

(1) Instruments and equipment that are either specifically or otherwise required by the airworthiness requirements under which the aircraft

is type certificated and which are essential for safe operations under all operating conditions.

(2) Instruments and equipment required by an airworthiness directive to be in operable condition unless the airworthiness directive provides otherwise.

(3) Instruments and equipment required for specific operations by this part.

(c) A person authorized to use an approved Minimum Equipment List issued for a specific aircraft under Parts 121, or 135 of the CASR shall use that Minimum Equipment List in connection with operations conducted with that aircraft under this part without additional approval requirements.

(d) Except for operations conducted in accordance with Paragraph (a) or (c) of this section, a person may takeoff an aircraft in operations conducted under this part with inoperative instruments and equipment without an approved Minimum Equipment List provided

(1) The flight operation is conducted in a

(i) Rotorcraft, non-turbine powered airplane, glider, or lighter-than-air aircraft for which a master Minimum Equipment List has not been developed; or

(ii) Small rotorcraft, non-turbine powered small airplane, glider, or lighter-than-air aircraft for which a Master Minimum Equipment List has been developed; and

(2) The inoperative instruments and equipment are not

(i) Part of the VFR day type certification instruments and equipment prescribed in the applicable airworthiness regulations under which the aircraft was type certificated;

(ii) Indicated as required on the aircraft's equipment list, or on the Kinds of Operations Equipment List for the kind of flight operation being conducted;

(iii) Required by Section 91.205 or any other rule of this part for the specific kind of flight operation being conducted; or

(iv) Required to be operational by an airworthiness directive; and

(3) The inoperative instruments and equipment are

(i) Removed from the aircraft, the cockpit control placarded, and the maintenance recorded in accordance with the CASR Part 43; or

(ii) Deactivated and placarded "Inoperative." If deactivation of the inoperative instrument or equipment involves maintenance, it must be accomplished and recorded in accordance with the CASR Part 43; and

(4) A determination is made by a pilot, who is certificated and appropriately rated under Part 61 of the CASRs, or by a person, who is certificated and appropriately rated to perform maintenance on the aircraft, that the inoperative instrument or equipment does not constitute a hazard to the aircraft.

An aircraft with inoperative instruments or equipment as provided in Paragraph (d) of this section is considered to be in a properly altered condition acceptable to the Director.

(e) Reserve.

91.215 ATC Transponder and Altitude Reporting Equipment and Use

(a) All airspace: Indonesian-registered civil aircraft. For operations not conducted under Part 121 or 135 of the CASRs, ATC transponder equipment installed must meet the performance and environmental requirements acceptable by DGCA.

(b) All airspace. Unless otherwise authorized or directed by ATC, no person may operate an aircraft in the airspace described in Paragraphs (b)(1) through (b)(3) of this section, unless that aircraft is equipped with an operable coded radar beacon transponder having either Mode C capability that automatically replies to Mode C interrogations by transmitting pressure altitude information in 100-foot increments.

This requirement applies to

(1) All aircraft. In Class A, Class B, and Class C airspace areas;

(2) All aircraft in all airspace above the ceiling and within the lateral boundaries of a Class B or Class C airspace area designated for an airport upward to 10,000 feet MSL; and

(3) All aircraft in all airspace of Indonesia at and above 10,000 feet MSL, not including the airspace at and below 2,500 feet above the surface except any aircraft which was

(i) Not originally certificated with an engine driven electrical system or which has not subsequently been certified with such a system installed;

(ii) A balloon, or

(iii) glider.

(c) Transponder "ON" operation. While in the airspace as specified in Paragraph (b) of this section or in all controlled airspace, each person operating an aircraft equipped with an operable ATC transponder maintained in accordance with Section 91.413 of this part shall operate the transponder, including Mode C equipment if installed, and shall reply on the appropriate code or as assigned by ATC.

(d) ATC authorized deviations.

Requests for ATC authorized deviations must be made to the ATC facility having jurisdiction over the concerned airspace within the time periods specified as follows:

(1) For operation of an aircraft with an operating transponder but without operating automatic pressure altitude reporting equipment having a Mode C capability, the request may be made at any time.

(2) For operation of an aircraft with an inoperative transponder to the airport of ultimate destination, including any intermediate stops, or to proceed to a place where suitable repairs can be made or both, the request may be made at any time.

(3) For operation of an aircraft that is not equipped with a transponder, the request must be made at least one hour before the proposed operation.

91.217 Data Correspondence Between Automatically Reported Pressure Altitude Data and The Pilot's Altitude Reference

No person may operate any automatic pressure altitude reporting equipment associated with a radar beacon transponder

(a) When deactivation of that equipment is directed by ATC;

(b) Unless, as installed, that equipment was tested and calibrated to transmit altitude data corresponding within 125 feet (on a 95 percent probability basis) of the indicated or calibrated datum of the altimeter normally used to maintain flight altitude, with that altimeter referenced to 29.92 inches of mercury for altitudes from sea level to the maximum operating altitude of the aircraft; or

(c) Unless the altimeters and digitizers in that equipment meet the standards of the DGCA.

91.219 Altitude Alerting System or Device: Turbojet-powered Civil Airplanes

(a) Except as provided in Paragraph (d) of this section, no person may operate a turbojet-powered Indonesian-registered civil airplane unless that airplane is equipped with an approved altitude alerting system or device that is in operable condition and meets the requirements of Paragraph (b) of this section.

(b) Each altitude alerting system or device required by Paragraph (a) of this section must be able to
   (1) Alert the pilot
      (i) Upon approaching a preselected altitude in either ascent or descent, by a sequence of both aural and visual signals in sufficient time to establish level flight at that preselected altitude; or
      (ii) Upon approaching a preselected altitude in either ascent or descent, by a sequence of visual signals in sufficient time to establish level flight at that preselected altitude, and when deviating above and below that preselected altitude, by an aural signal;

   (2) Provide the required signals from sea level to the highest operating altitude approved for the airplane in which it is installed;
   (3) Preselect altitudes in increments that are commensurate with the altitudes at which the aircraft is operated;
   (4) Be tested without special equipment to determine proper operation of the alerting signals; and
   (5) Accept necessary barometric pressure settings if the system or device operates on barometric pressure. However, for operation below 3,000 feet AGL, the system or device need only provide one signal, either visual or aural, to comply with this Paragraph. A radio altimeter may be included to provide the signal if the operator has an approved procedure for its use to determine DH or MDA, as appropriate.

(c) Each operator to which this section applies must establish and assign procedures for the use of the altitude alerting system or device and each flight crewmember must comply with those procedures assigned to him.

(d) Paragraph (a) of this section does not apply to any operation of an airplane that has an experimental certificate or to the operation of any airplane for the following purposes:
   (1) Ferrying a newly acquired airplane from the place where possession of it was taken to a place where the altitude alerting system or device is to be installed.
   (2) Continuing a flight as originally planned, if the altitude alerting system or device becomes inoperative after the airplane has taken off; however, the flight may not depart from a place where repair or replacement can be made.
   (3) Ferrying an airplane with any inoperative altitude alerting system or device from a place where repairs or replacements cannot be made to a place where it can be made.
   (4) Conducting an airworthiness flight test of the airplane.
   (5) Ferrying an airplane to a place outside Indonesia for the purpose of registering it in a foreign country.
   (6) Conducting a sales demonstration of the operation of the airplane.
   (7) Training foreign flight crews in the operation of the airplane before ferrying it to a place outside Indonesia for the purpose of registering it in a foreign country.

91.221 Aircraft Overwater Operations

(a) All seaplanes including amphibians operated as seaplanes for all flights shall be equipped with:
   (1) one life jacket, or equivalent individual floatation device, for each person on board, stowed in a position readily accessible from the seat or berth;
   (2) equipment for making the sound signals prescribed in the International Regulations for Preventing Collisions at Sea, where applicable;
   (3) one anchor; and
   (4) one sea anchor (drogue), when necessary to assist in maneuvering.

(b) All single-engine landplanes shall carry one life jacket or equivalent individual floatation device for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided,
   (1) when flying en route over water beyond gliding distance from the shore; or
   (2) when taking off or landing 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 a ditching.

(c) All helicopters intended to be flown over water shall be fitted with a permanent or rapidly deployable means of flotation so as to ensure a safe ditching of the helicopter when engaged in offshore operations.

(d) All helicopters operating in accordance with the paragraph (c) shall be equipped with:

(1) one life jacket, or equivalent individual flotation device, for each person on board, stowed in a position easily accessible from the seat of the person for whose use it is provided;
(2) when not precluded by consideration related to the type of helicopter used, life-saving rafts in sufficient numbers to carry all persons on board, stowed so as to facilitate their ready use in emergency, provided with such life-saving equipment including means of sustaining life as is appropriate to the flight to be undertaken; and
(3) equipment for making the pyrotechnical distress signals.

(e) All helicopter when taking off or landing at a heliport where the take-off or approach path is so disposed over water that in the event of a mishap there would be likelihood of a ditching, at least the equipment required in paragraph (d) (1) shall be carried.

(f) Each life jacket and equivalent individual flotation device, when carried in accordance with paragraph (d) of this section, shall be equipped with a means of electric illumination for the purpose of facilitating the location of person.

91.223 Airplanes extended overwater operations

(a) All airplanes operated on extended flights over water shall be equipped with, at a minimum, one life jacket or equivalent individual floatation device for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided.

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

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

91.225 Emergency Equipment for Operations over Uninhabited Terrain Areas

Unless the aircraft has the following equipment, no person may conduct a flight over an uninhabited area or any other area that the Director General specifies required equipment for search and rescue in case of an emergency:
(a) Suitable pyrotechnic signaling devices.
(b) Enough survival kits, appropriately equipped for the route to be flown for the number of occupants of the aircraft.

91.226 Automatic Dependent Surveillance-Broadcast (ADS-B)

(a) If an aircraft carries ADS-B transmitting equipment for operational use in Indonesia airspace, the aircraft should has the following equipment installed:
   (1) ADS-B transmitting equipment that meets the requirements in FAA TSO-C166b, or CASA AUS ATSO-C100a or ATSO-C1005a, or others standards acceptable by DGCA.

(b) ADS-B transmitting equipment in Indonesian airspace must transmit:
   (1) A flight identification that corresponds exactly to the aircraft identification mentioned on the flight notification filed with ATC for the flight; or
   (2) If no flight notification is filed for the flight, the aircraft's registration mark; or
   (3) Another flight identification directed or approved by ATC.

91.227 Traffic alert and collision avoidance system equipment and use

(a) All turbine-engine airplanes of a maximum certificated take-off mass in excess of 15 000 kg or authorized to carry more than 30 passengers, for which the individual airworthiness certificate is first issued after 31 December 2015, shall be equipped with an Traffic alert and collision avoidance system (TCAS II).

(b) Traffic alert and collision avoidance system, operation required. Each person operating an aircraft equipped with an operable traffic alert and collision avoidance system shall have that system on and operating.

(c) The pilot-in-command of an airplane equipped with an Traffic alert and collision avoidance system (TCAS II) shall ensure that each flight crew member has been appropriately trained to competency in the use of TCAS II equipment and the avoidance of collision.

91.229 Terrain awareness and warning system.

(a) Airplanes manufactured before March 29, 2002. No person may operate a turbine-powered R.O.I.-registered airplane of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than nine passengers, unless that airplane is equipped with an approved terrain awareness and warning system that as a minimum meets the requirements for Class B equipment in FAA Technical Standard Order (TSO)-C151 or equivalent.

(b) Airplanes manufactured after March 29, 2002. No person may operate a turbine-powered R.O.I.-registered airplane of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than nine passengers, unless that airplane is equipped with an approved terrain awareness and warning system that as a minimum meets the requirements for Class A equipment in FAA Technical Standard Order (TSO)-C151 or equivalent.

(c) Airplane Flight Manual. The Airplane Flight Manual shall contain appropriate procedures for
   (1) The use of the terrain awareness and warning system; and
   (2) Proper flight crew reaction in response to the terrain awareness and warning system audio and visual warnings.

91.231 Flight Recorders

(a) No person may conduct any operation of aircraft unless that aircraft complies with any applicable flight data recorder and cockpit voice recorder requirements. However, the person may_
   (1) Ferry an aircraft with an inoperative flight data recorder or cockpit voice recorder from a place where repair or replacement cannot be made to a place where they can be made;
   (2) Continue a flight as originally planned, if the flight data recorder or cockpit voice recorder becomes inoperative after the aircraft has taken off;
   (3) Conduct an airworthiness flight test during which the flight data recorder or cockpit voice recorder is turned off to test it or to test any communications or electrical equipment installed in the aircraft; or
   (4) Ferry a newly acquired aircraft from the place where possession of it is taken to a place where the flight data recorder or cockpit voice recorder is to be installed.

(b) No person may operate an airplane unless it is equipped with an approved flight recorder, as defined in appendix E.

(c) No person may operate a helicopter unless it is equipped with an approved flight recorder, as defined in appendix F.

(d) Flight recorders shall be constructed, located and installed so as to provide maximum practical protection for the recordings in order that the recorded information may be preserved, recovered and transcribed. Flight recorders shall meet the prescribed crashworthiness and fire protection specifications.

(e) Flight recorders shall not be switched off during flight time.

(f) In the event the airplane becomes involved in an accident or incident, the pilot in command and/or the operator shall ensure,
   (1) The deactivation of flight recorders upon completion of flight time following an accident or incident and shall not be reactivated before their disposition as determined in accordance with CASR Part 830.
   (2) The preservation of all related flight recorder records, and if necessary the associated flight recorders, and their retention in safe custody pending their disposition as determined in accordance with CASR Part 830.
   (3) The documentation requirement concerning FDR and ADRS parameters required by National Transportation Safety Committee should be in electronic format.

(g) Operational checks and evaluations of recordings from the flight recorder systems shall be conducted to ensure the continued serviceability of the recorders in accordance with procedures stated in appendix E and appendix F.

91.233 Flight Data Recorders

(a) No person may operate an airplane unless it is equipped with a flight data recorders:

(1) All turbine-engine airplanes, for which the individual certificate of airworthiness was first issued on or after 1 January 2016, with a seating configurations of more than five passenger seats and a maximum certificated take-off mass of 5 700 kg or less shall be equipped with a Type II FDR.

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

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

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

(b) All airplanes which are required to record pilot input and/or control surface position of primary controls (pitch, roll, yaw) for which a type certificate is first issued on or after 1 January 2016 and which are required to be fitted with an FDR shall record those parameters at a maximum sampling and recording interval of 0.125 seconds.

(c) No person may operate a helicopter unless it is equipped with a flight data recorders:

(1) All helicopters of a maximum certificated take-off mass of over 3 180 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2016 shall be equipped with a Type IVA FDR.

(2) All helicopters of a maximum certificated take-off mass of over 7 000 kg, or having a passenger seating configuration of more than nineteen, for which the individual certificate of airworthiness is first issued on or after 1 January 1989 shall be equipped with a Type IV FDR.

(d) The use of the following recorders shall be discontinued:

(1) Engraving metal foil FDRs.

(2) Analogue FDRs using frequency modulation (FM).

(3) Photographic film FDRs.

(4) Magnetic tape FDRs by 1 January 2016.

(e) Types I, IA, and II FDRs shall be capable of retaining the information recorded during at least the last 25 hours of their operation.

(f) Types IV, IVA and V FDRs shall be capable of retaining the information recorded during at least the last ten hours of their operation.

91.235 Cockpit Voice Recorders (CVR) and Cockpit Audio Recording System (CARS)

(a) No person may operate an airplane unless it is equipped with either a CVR or a CARS:

(1) All turbine-engine airplanes, for which the individual certificate of airworthiness was first issued on or after 1 January 2016, with a seating configurations of more than five passenger seats and a maximum certificated take-off mass of 5 700 kg or less shall be equipped with either a CVR or a CARS.

(2) All turbine-engine airplanes for a maximum certificated take-off mass of over 5 700 kg for which the individual certificate of airworthiness was first issued on or after 1 January 2016 and required to be operated by more than one pilot shall be equipped with a CVR.

(3) All airplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 1987 shall be equipped with a CVR.

(b) No person may operate a helicopter unless it is equipped with a CVR:

(1) All helicopters of a maximum certificated take-off mass of over 7 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 1987 shall be equipped with a CVR. For helicopters not equipped with an FDR, at least main rotor speed shall be recorded on the CVR.

(2) All helicopters of a maximum certificated take-off mass of over 7 000 kg for which the individual certificate of airworthiness was first issued before 1 January 1987 shall be equipped with a CVR. For helicopters not equipped with an FDR, at least main rotor speed shall be recorded on the CVR.

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

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

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

91.237 Combination recorders

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

91.239 through 91.299 RESERVED

SUBPART D - SPECIAL FLIGHT OPERATIONS

91.301 RESERVED

91.303 Aerobatic Flight

No person may operate an aircraft in aerobatic flight
(a) Over any congested area of a city, town, or settlement;
(b) Over an open air assembly of persons;
(c) Within the lateral boundaries of the surface areas of Class B, Class C, Class F, or Class G airspace designated for an airport;
(d) Within 4 nautical miles of the center line of any airway;
(e) Below an altitude of 1,500 feet above the surface; or
(f) When flight visibility is less than 3 statute miles (4.8 km).

For the purposes of this section, aerobatic flight means an intentional maneuver involving an abrupt change in an aircraft's attitude, an abnormal attitude, or abnormal acceleration, not necessary for normal flight.

91.305 Flight Test Areas

No person may flight test an aircraft except over open water, or sparsely populated areas, having light air traffic.

91.307 Parachutes and Parachuting

(a) No pilot of a civil aircraft may allow a parachute that is available for emergency use to be carried in that aircraft unless it is an approved type and
  (1) If a chair type (canopy in back), it has been packed by a certificated and appropriately rated parachute rigger within the preceding 120 days; or
  (2) If any other type, it has been packed by a certificated and appropriately rated parachute rigger
    (i) Within the preceding 120 days, if its canopy, shrouds, and harness are composed exclusively of nylon, rayon, or other similar synthetic fiber or materials that are substantially resistant to damage from mold, mildew, or other fungi and other rotting agents propagated in a moist environment; or
    (ii) Within the preceding 60 days, if any part of the parachute is composed of silk, pongee, or other natural fiber, or materials not specified in Paragraph (a)(2)(i) of this section.

(b) Except in an emergency, no pilot in command may allow, and no person may make, a parachute jump from an aircraft within Indonesia except in accordance with Part 105.

(c) Unless each occupant of the aircraft is wearing an approved parachute, no pilot of a civil aircraft carrying any person (other than a crewmember) may execute any intentional maneuver that exceeds
  (1) A bank of 60° relative to the horizon; or
  (2) A nose up or nose down attitude of 30° relative to the horizon.

(d) Paragraph (c) of this section does not apply to
  (1) Flight tests for pilot certification or rating; or
  (2) Spins and other flight maneuvers required by the regulations for any certificate or rating when given by_
    (i) A certificated flight instructor; or
    (ii) An airline transport pilot instructing in accordance with Section 61.169 of the CASRs.

(e) For the purposes of this section, "approved parachute" means
  (1) A parachute manufactured under a type certificate; or
  (2) A personnel carrying military parachute identified by an NAF, AAF, or AN drawing number, an AAF order number, or any other military designation or specification number.

91.309 Towing: Gliders

(a) No person may operate a civil aircraft towing a glider unless
  (1) The pilot in command of the towing aircraft is qualified under Section 61.69 of the CASRs;
  (2) The towing aircraft is equipped with a tow hitch of a kind, and installed in a manner, that is approved by the Director;
  (3) The towline used has breaking strength not less than 80 percent of the maximum certificated operating weight of the glider and not more than twice this operating weight. However, the towline used may have a breaking strength more than twice the maximum certificated operating weight of the glider if
    (i) A safety link is installed at the point of attachment of the towline to the glider with a breaking strength not less than 80 percent of the maximum certificated operating weight of the glider and not greater than twice this operating weight.
    (ii) A safety link is installed at the point of attachment of the towline to the towing aircraft with a breaking strength greater, but not more than 25 percent greater, than that of the safety link at the towed glider end of the towline and not greater than twice the maximum certificated operating weight of the glider;
  (4) Before conducting any towing operation within the lateral boundaries of the surface areas of Class B, Class C, Class F or Class G airspace designated for an airport, or before making each towing flight within such controlled airspace if required by ATC, the pilot in command notifies the control tower. If a control tower does not exist or is not in operation, the pilot in command must notify the DGCA flight service station serving that controlled airspace before conducting any towing operations in that airspace; and
  (5) The pilots of the towing aircraft and the glider have agreed upon a general course of action, including takeoff and release signals, airspeeds, and emergency procedures for each pilot.

(b) No pilot of civil aircraft may intentionally release a towline, after release of a glider, in a manner that endangers the life of property of another

91.311 Towing: Other than Under Section 91.309

No pilot of a civil aircraft may tow anything with that aircraft (other than gliders under Section 91.309) except in accordance with a Letter of Deviation Authority issued by the Director under the provisions of Section 91.903.

91.313 Restricted Category Civil Aircraft: Operating Limitations

(a) No person may operate a restricted category civil aircraft
   (1) For other than the special purpose for which it is certificated; or
   (2) In an operation other than one necessary to accomplish the work activity directly associated with that special purpose.

(b) For the purpose of Paragraph (a) of this section, operating a restricted category civil aircraft to provide flight crewmember training in a special purpose operation for which the aircraft is certificated is considered to be an operation for that special purpose.

(c) No person may operate a restricted category civil aircraft carrying persons or property for compensation or hire. For the purposes of this paragraph, a special purpose operation involving the carriage of persons or material necessary to accomplish that operation, such as crop dusting, seeding, spraying, and banner towing (including the carrying of required persons or material to the location of that operation), and operation for the purpose of providing flight crewmember training in a special purpose operation, are not considered to be the carriage of persons or property for compensation or hire.

(d) No person may be carried on a restricted category civil aircraft unless that person
   (1) Is a flight crewmember;
   (2) Is a flight crewmember trainee;
   (3) Performs an essential function in connection with a special purpose operation for which the aircraft is certificated; or
   (4) Is necessary to accomplish the work activity directly associated with that special purpose.

(e) Except when operating in accordance with the terms and conditions of a Letter of Deviation Authority or special operating limitations issued by the Director, no person may operate a restricted category civil aircraft within Indonesia
   (1) Over a densely populated area;
   (2) In a congested airway; or
   (3) Near a busy airport where passenger transport operations are conducted.

(f) This section does not apply to non-passenger carrying civil rotorcraft external load operations conducted under Part 135 of the CASRs.

(g) No person may operate a small restricted category civil airplane manufactured after [date to be determined], unless an approved shoulder harness is installed for each front seat. The shoulder harness must be designed to protect each occupant from serious head injury when the occupant experiences the ultimate inertia forces specified in Part 23 of the CASRs. The shoulder harness installation at each flight crewmember station must permit the crewmember, when seated and with the safety belt and shoulder harness fastened, to perform all function necessary for flight operation. For purposes of this paragraph
   (1) The date of manufacture of an airplane is the date the inspection acceptance records reflect that the airplane is complete and meets the DGCA-approved type design data; and

(2) A front seat is a seat located at a flight crewmember station or any seat located alongside such a seat.

91.315 Limited Category Civil Aircraft: Operating Limitations

No person may operate a limited category civil aircraft carrying persons or property for compensation or hire.

91.317 Reference to CASR 21.81(h)

91.319 Aircraft Having Experimental Certificates: Operating Limitations

(a) No person may operate an aircraft that has an experimental certificate__
   (1) For other than the purpose for which the certificate was issued; or
   (2) Carrying persons or property for compensation or hire.

(b) No person may operate an aircraft that has an experimental certificate outside of an area assigned by the Director until it is shown that_
   (1) The aircraft is controllable throughout its normal range of speeds and throughout all the maneuvers to be executed; and
   (2) The aircraft has no hazardous operating characteristics or design features.

(c) Unless otherwise authorized by the Director in special operating limitations, no person may operate an aircraft that has an experimental certificate over a densely populated area or in a congested airway. The Director may issue special operating limitations for particular aircraft to permit takeoffs and landings to be conducted over a densely populated area or in a congested airway, in accordance with terms and conditions specified in the authorization in the interest of safety in air commerce.

(d) Each person operating an aircraft that has an experimental certificate shall__
   (1) Advise each person carried of the experimental nature of the aircraft;
   (2) Operate under VFR, day only, unless otherwise specifically authorized by the Director; and
   (3) Notify the control tower of the experimental nature of the aircraft when operating the aircraft into or out of airports with operating control towers.

(e) The Director may prescribe additional limitations that the Director considers necessary, including limitations on the persons that may be carried in the aircraft.

91.321 through 91.399 RESERVED

SUBPART E - MAINTENANCE, PREVENTIVE MAINTENANCE, AND ALTERATIONS

91.401 Applicability

(a) This subpart prescribes rules governing the maintenance, preventive maintenance, and alterations of Indonesian-registered civil aircraft operating within or outside of Indonesia.

(b) Sections 91.405, 91.409, 91.411, 91.417, and 91.419 of this subpart do not apply to an aircraft maintained in accordance with a continuous airworthiness maintenance program as provided in Part 121, 129, or Section 135.367(a) of the CASR.

(c) RESERVED.

91.403 General

(a) The owner or operator of an aircraft is primarily responsible for maintaining that aircraft in an airworthy condition, including compliance with all relevant airworthiness directives.

(b) No person may perform maintenance, preventive maintenance, or alterations on an aircraft other than as prescribed in this subpart and other applicable regulations including Part 43 of the CASR.

(c) No person may operate an aircraft for which a manufacturer's maintenance manual or instructions for continued airworthiness has been issued that contains an airworthiness limitations section unless the mandatory replacement times, inspection intervals, and related procedures specified in that section or alternative inspection intervals and related procedures set forth in an operations specification approved by the Director under Part 121 or 135 of the CASR or in accordance with an inspection program approved under Section 91.409(e) have been complied with.

91.405 Maintenance Required

Each owner or operator of an aircraft

(a) Shall have that aircraft inspected as prescribed in Subpart E of this part and shall between required inspections, except as provided in Paragraph (c) of this section, have discrepancies repaired as prescribed in Part 43 of the CASR;

(b) Shall ensure that maintenance personnel make appropriate entries in the aircraft maintenance records indicating the aircraft has been approved for return to service;

(c) Shall have any inoperative instrument or item of equipment, permitted to be inoperative by Section 91.213(d)(2) of this part, repaired, replaced, removed, or inspected at the next required inspection; and

(d) When listed discrepancies include inoperative instruments or equipment, shall ensure that a placard has been installed as required by the CASR 43.11.

91.407 Operation After Maintenance, Preventive Maintenance, Rebuilding, or Alteration

(a) No person may operate any aircraft that has undergone maintenance, preventive maintenance, rebuilding, or alteration unless
   (1) It has been approved for return to service by a person authorized under Section 43.7 of the CASR; and
   (2) The maintenance record entry required by the CASR 43.9 or 43.11 as applicable of this chapter has been made.

(b) No person may carry any person (other than crewmembers) in an aircraft that has been maintained, rebuilt, or altered in a manner that may have appreciably changed its flight characteristics or substantially affected its operation in flight until an appropriately rated pilot with at least a private pilot certificate flies the aircraft, makes an operational check of the maintenance performed or alteration made, and logs the flight in the aircraft records.

(c) The aircraft does not have to be flown as required by Paragraph (b) of this section if, prior to flight, ground tests, inspection, or both show conclusively that the maintenance, preventive maintenance, rebuilding, or alteration has not appreciably changed the flight characteristics or substantially affected the flight operation of the aircraft.

91.409 Inspections

(a) Except as provided in Paragraph (c) of this section, no person may operate an aircraft unless, within the preceding 12 calendar months, it has had
   (1) An annual inspection in accordance with the CASR 43 and has been approved for return to service by a person authorized by the CASR 43.7; and
   (2) An inspection for the issuance of an airworthiness certificate in accordance with Part 21 of the CASR.

   No inspection performed under Paragraph (b) of this section may be substituted for any inspection required by this paragraph unless it is performed by a person authorized to perform annual inspections and is entered as an "annual" inspection in the required maintenance records.

(b) Except as provided in Paragraph (c) of this section, no person may operate an aircraft carrying any person (other than a crewmember) for hire, and no person may give flight instruction for hire in an aircraft which that person provides, unless within the preceding 100 hours of time in service the aircraft has received an annual or 100-hour inspection and been approved for return to service in accordance with the CASR 43 and has received an inspection for the issuance of an airworthiness certificate in accordance with Part 21 of the CASR. The 100-hour limitation may be exceeded by not more than 10 hours while enroute to reach a place where the inspection can be done. The excess time used to reach a place where the inspection can be done must be included in computing the next 100 hours of time in service.

(c) Paragraphs (a) and (b) of this section do not apply to

(1) An aircraft that carries a special flight permit, a current experimental certificate, or a provisional airworthiness certificate;

(2) An aircraft inspected in accordance with an approved aircraft inspection program under Part 135 of the CASR and so identified by the registration mark in the operations specifications of the certificate holder having the approved inspection program;

(3) An aircraft subject to the requirements of Paragraph (d) or (e) of this section; or

(4) Turbine-powered rotorcraft when the operator elects to inspect that rotorcraft in accordance with Paragraph (e) of this section.

(d) Progressive inspection. Each registered owner or operator of an aircraft desiring to use a progressive inspection program must submit a written request to the DGCA, and shall provide_

(1) A certificated mechanic holding an inspection authorization, a certificated airframe repair station, or the manufacturer of the aircraft to supervise or conduct the progressive inspection;

(2) A current inspection procedures manual available and readily understandable to pilot and maintenance personnel containing, in detail

(i) An explanation of the progressive inspection, including the continuity of inspection responsibility, the making of reports, and the keeping of records and technical reference material;

(ii) An inspection schedule, specifying the intervals in hours or days when routine and detailed inspections will be performed and including instructions for exceeding an inspection interval by not more than 10 hours while enroute and for changing an inspection interval because of service experience;

(iii) Sample routine and detailed inspection forms and instructions for their use; and

(iv) Sample reports and records and instructions for their use;

(3) Enough housing and equipment for necessary disassembly and proper inspection of the aircraft; and

(4) Appropriate current technical information for the aircraft.

The frequency and detail of the progressive inspection shall provide for the complete inspection of the aircraft within each 12 calendar months and be consistent with the manufacturer's recommendations, field service experience, and the kind of operation in which the aircraft is engaged. The progressive inspection schedule must ensure that the aircraft, at all times, will be airworthy and will conform to all applicable DGCA aircraft specifications, type certificate data sheets, airworthiness directives, and other approved data. If the progressive inspection is discontinued, the owner or operator shall immediately notify the DGCA, in writing, of the discontinuance. After the discontinuance, the first annual inspection under Section 91.409(a)(1) is due within 12 calendar months after the last complete inspection of the aircraft under the progressive inspection. The 100-hour inspection under Section 91.409(b) is due within 100 hours after that complete inspection.

A complete inspection of the aircraft, for the purpose of determining when the annual and 100-hour inspections are due, requires a detailed inspection of the aircraft and all its components in accordance with the progressive inspection. A routine inspection of the aircraft and a detailed inspection of several components is not considered to be a complete inspection.

(e) Large airplanes, turbojet multiengine airplanes, turbopropeller-powered multiengine airplanes, and turbine-powered rotorcraft. No person may operate a large airplane, turbojet multiengine airplane, turbopropeller-powered multiengine airplane, or turbine-powered rotorcraft unless the replacement times for life-limited parts specified in the aircraft specifications, type data sheets, or other documents approved by the Director are complied with and the airplane or turbine-powered rotorcraft, including the airframe, engines, propellers, rotors, appliances, survival equipment, and emergency equipment, is inspected in accordance with an inspection program selected under the provisions of Paragraph (f) of this section, except that, the owner or operator of a turbine-powered rotorcraft may elect to use the inspection provisions of Section 91.409(a), (b), (c), or (d) in lieu of an inspection option of Section 91.409(f).

(f) Selection of inspection program under Paragraph (e) of this section. The registered owner or operator of each airplane or turbine-powered rotorcraft described in Paragraph (e) of this section must select, identify in the aircraft maintenance records, and use one of the following programs for the inspection of the aircraft:

(1) A continuous airworthiness inspection program that is part of a continuous airworthiness maintenance program currently in use by a person holding an Air Operator Certificate issued under Parts 121 or 135 of the CASR and operating that make and model aircraft under Part 121 of the CASR or operating that make and model under Part 135 of the CASR and maintaining it under Section 135.367(a)(2) of the CASR.

(2) An approved aircraft inspection program approved under Section 135.367(b) of the CASR and currently in use by a person holding a Air Operator Certificate issued under Part 135 of the CASR.

(3) A current inspection program recommended by the manufacturer.

(4) Any other inspection program established by the registered owner or operator of that airplane or turbine-powered rotorcraft and approved by the Director under Paragraph (g) of this section. However, the Director may require revision of this inspection program in accordance with the provisions of Section 91.415.

Each operator shall include in the selected program the name and address of the person responsible for scheduling the inspections required by the program and make a copy of that program available to the person performing inspections on the aircraft and, upon request, to the Director.

(g) Inspection program approved under Paragraph (e) of this section. Each operator of an airplane or turbine-powered rotorcraft desiring to establish or change an approved inspection program under Paragraph (f)(4) of this section must submit the program for approval to the DGCA. The program must be in writing and include at least the following information:

(1) Instructions and procedures for the conduct of inspections for the particular make and model airplane or turbine-powered rotorcraft, including necessary tests and checks. The instructions and procedures must set forth in detail the parts and areas of the airframe, engines, propellers, rotors, and appliances, including survival and emergency equipment required to be inspected.

(2) A schedule for performing the inspections that must be performed under the program expressed in terms of the time in service, calendar time, number of system operations, or any combination of these.

(h) Changes from one inspection program to another. When an operator changes from one inspection program under Paragraph (f) of this section to another, the time in service, calendar times, or cycles of operation accumulated under the previous program must be applied in determining inspection due times under the new program.

91.411 Altimeter System and Altitude Reporting Equipment Tests and Inspections

(a) No person may operate an airplane, or helicopter, in controlled airspace under IFR unless
- (1) Within the preceding 24 calendar months, each static pressure system, each altimeter instrument, and each automatic pressure altitude reporting system has been tested and inspected and found to comply with the CASR;
- (2) Except for the use of system drain and alternate static pressure valves, following any opening and closing of the static pressure system, that system has been tested and inspected and found to comply with the CASR; and
- (3) Following installation or maintenance on the automatic pressure altitude reporting system of the ATC transponder where data correspondence error could be introduced, the integrated system has been tested, inspected, and found to comply with the CASR.

(b) The tests required by Paragraph (a) of this section must be conducted by
- (1) The manufacturer of the airplane, or helicopter, on which the tests and inspections are to be performed;
- (2) A certificated repair station properly equipped to perform those functions and holding_
  - (i) An instrument rating, Class I;
  - (ii) A limited instrument rating appropriate to the make and model of appliance to be tested;
  - (iii) A limited rating appropriate to the test to be performed;
  - (iv) An airframe rating appropriate to the airplane, or helicopter, to be tested; or
  - (v) A limited rating for a manufacturer issued for the appliance in accordance with the CASR; or
- (3) A certificated mechanic with an airframe rating (static pressure system tests and inspections only).

(c) Altimeter and altitude reporting equipment approved under Technical Standard Orders are considered to be tested and inspected as of the date of their manufacture.

(d) No person may operate an airplane, or helicopter, in controlled airspace under IFR at an altitude above the maximum altitude at which all altimeters and the automatic altitude reporting system of that airplane, or helicopter, have been tested.

91.413 ATC Transponder Tests and Inspections

(a) No persons may use an ATC transponder that is specified in 91.215(a) of the CASR unless, within the preceding 24 calendar months, the ATC transponder has been tested and inspected and found to comply with the CASR; and

(b) Following any installation or maintenance on an ATC transponder where data correspondence error could be introduced, the integrated system has been tested, inspected, and found to comply with the CASRs.

(c) The tests and inspections specified in this section must be conducted by
   (1) A certificated repair station properly equipped to perform those functions and holding
      (i) A radio rating, Class III;
      (ii) A limited radio rating appropriate to the make and model transponder to be tested;
      (iii) A limited rating appropriate to the test to be performed;
      (iv) A limited rating for a manufacturer issued for the transponder in accordance with the CASR; or
   (2) A holder of a continuous airworthiness maintenance program as provided in Part 121 or Section 135.367(a)(2) of the CASR; or
   (3) The manufacturer of the aircraft on which the transponder to be tested is installed, if the transponder was installed by that manufacturer.

91.415 Changes to Aircraft Inspection Programs

(a) Whenever the Director finds that revisions to an approved aircraft inspection program under Section 91.409(f)(4) are necessary for the continued adequacy of the program, the owner or operator shall, after notification by the Director, make any changes in the program found to be necessary by the Director.

(b) The owner or operator may petition the Director to reconsider the notice to make any changes in a program in accordance with Paragraph (a) of this section.

(c) The petition must be filed with the DGCA within 30 days after the certificate holder receives the notice.

(d) Except in the case of an emergency requiring immediate action in the interest of safety, the filing of the petition stays the notice pending a decision by the Director.

91.417 Maintenance Records

(a) Except for work performed in accordance with Section 91.411 and 91.413, each registered owner or operator shall keep the following records for the periods specified in Paragraph (b) of this section:
   (1) Records of the maintenance, preventive maintenance, and alteration and records of the 100-hour, annual, progressive, and other required or approved inspections, as appropriate, for each aircraft (including the airframe) and each engine, propeller, rotor, and

appliance of an aircraft. The records must include_

(i) A description (or reference to data acceptable to the Director) of the work performed; and

(ii) The date of completion of the work performed; and

(iii) The signature, and certificate number of the person approving the aircraft for return to service.

(2) Records containing the following information:

(i) The total time in service of the airframe, each engine, each propeller, and each rotor.

(ii) The current status of life-limited parts of each airframe, engine, propeller, rotor, and appliance.

(iii) The time since last overhaul of all items installed on the aircraft which are required to be overhauled on a specified time basis.

(iv) The current inspection status of the aircraft, including the time since the last inspection required by the inspection program under which the aircraft and its appliances are maintained.

(v) The current status of applicable airworthiness directives (AD) including, for each, the method of compliance, the AD number, and revision date. If the AD involves recurring action, the time and date when the next action is required.

(vi) Copies of the forms prescribed by the CASR for each major alteration to the airframe and currently installed engines, rotors, propellers, and appliances.

(b) The owner or operator shall retain the following records for the periods prescribed:

(1) The records specified in Paragraph (a)(1) of this section shall be retained until the work is repeated or superseded by other work or for two year after the work is performed.

(2) The records specified in Paragraph (a)(2) of this section shall be retained and transferred with the aircraft at the time the aircraft is sold.

(3) A list of defects furnished to a registered owner or operator required under the CASR shall be retained until the defects are repaired and the aircraft is approved for return to service.

(4) The records specified in paragraph (a)(2) of this section shall be retained for a minimum period of 90 days after the unit to which they refer has been permanently withdrawn from service.

(c) The owner or operator shall make all maintenance records required to be kept by this section available for inspection by the Director or any authorized representative of the DGCA.

(d) When a fuel tank is installed within the passenger compartment or a baggage compartment, a copy of DAC Form 43-337 shall be kept on board the modified aircraft by the owner or operator.

91.419 Transfer of Maintenance Records

Any owner or operator who sells an Indonesian-registered aircraft shall transfer to the purchaser, at the time of sale, the following records of that aircraft, in plain language form or in coded form at the election of the purchaser, if the coded form provides for the preservation and retrieval of information in a manner acceptable to the Director:

(a) The records specified in Section 91.417(a)(2).

(b) The records specified in Section 91.417(a)(1) which are not included in the records covered by Paragraph (a) of this section, except that the purchaser may permit the seller to keep physical custody of such records. However, custody of records by the seller does not relieve the purchaser of the responsibility under Section 91.417(c) to make the records available for inspection by the Director or any authorized representative of the DGCA.

91.421 Rebuilt Engine Maintenance Records

(a) The owner or operator may use a new maintenance record, without previous operating history, for an aircraft engine rebuilt by the manufacturer or by an agency approved by the manufacturer.

(b) Each manufacturer or agency that grants zero time to an engine rebuilt by it shall enter in the new record_
   (1) A signed statement of the date the engine was rebuilt;
   (2) Each change made as required by airworthiness directives; and
   (3) Each change made in compliance with manufacturer's service bulletins, if the entry is specifically requested in that bulletin.

(c) For the purposes of this section, a rebuilt engine is a used engine that has been completely disassembled, inspected, repaired as necessary, reassembled, tested, and approved in the same manner and to the same tolerances and limits as a new engine with either new or used parts. However, all parts used in it must conform to the production drawing tolerances and limits for new parts or be of approved oversized or undersized dimensions for a new engine.

91.423 Service Difficulty Reports

(a) Each operator of an airplane of a maximum certificated take-off mass in excess of 5 700 kg shall report the occurrence or detection of each failure, malfunction, or defect concerning:
   (1) Fires during flight and whether the related fire warning system functioned properly;
   (2) Fires during flight not protected by a related fire warning system;
   (3) False fire warning during flight;
   (4) An engine exhaust system that causes damage during flight to the engine, adjacent structure, equipment, or components;
   (5) An aircraft component that causes accumulation or circulation of smoke, vapor, or toxic or noxious fumes in the crew compartment or passenger cabin during flight;
   (6) Engine shutdown during flight because of flameout;
   (7) Engine shutdown during flight when external damage to the engine or airplane structure occurs;
   (8) Engine shutdown during flight due to foreign object ingestion or icing;
   (9) Engine shutdown during flight of more than one engine;
   (10) A propeller feathering system or ability of the system to control overspeed during flight;
   (11) A fuel or fuel dumping system that affects fuel flow or causes hazardous leakage during flight;

(12) An unwanted landing gear extension or retraction, or an unwanted opening or closing of landing gear doors during flight;
(13) Brake system components that result in loss of brake actuating force when the airplane is in motion on the ground;
(14) Aircraft structure that requires major repair;
(15) Cracks, permanent deformation, or corrosion of aircraft structures, if more than the maximum acceptable to the manufacturer or the DGCA;
(16) Aircraft components or systems that result in taking emergency actions during flight (except action to shut down an engine); and
(17) Emergency evacuation systems or components including all exit doors, passenger emergency evacuation lighting systems, or evacuation equipment that are found defective, or that fail to perform the intended functions during an actual emergency or during training, testing, maintenance, demonstrations, or inadvertent deployments.

(b) For the purpose of this section "during flight" means the period from the moment the aircraft leaves the surface of the earth on takeoff until it touches down on landing.

(c) In addition to the reports required by paragraph (a) of this section and as prescribed by the DGCA, each operator shall report any other failure, malfunction, or defect in an aircraft that occurs or is detected at any time if, in its opinion, that failure, malfunction, or defect has endangered or may endanger the safe operation of an aircraft used by it.

(d) Each operator shall send each report required by this section, in writing, to the DGCA office within the next 72 hours. However, a report that is due on Saturday or Sunday may be mailed or delivered on the following Monday, and one that is due on a holiday may be mailed or delivered on the next work day.

(e) The operator shall transmit the reports required by this section in a manner and on a form as prescribed by the Director, and shall include in the first report as much of the following as is available:
(1) Type and identification number of the aircraft.
(2) The name of the operator.
(3) The date, flight number, and stage during which the incident occurred (e.g., pre-flight, takeoff, climb, cruise, descent, landing, and inspection).
(4) The emergency procedure effected (e.g., unscheduled landing and emergency descent).
(5) The nature of the failure, malfunctions, or defects.
(6) Identification of the part and system involved, including available information pertaining to type designation of the major component and time since overhaul.
(7) Apparent cause of the failure, malfunctions, or defect (e.g. wear, crack, design deficiency, or personnel error).
(8) Whether the part was repaired, replaced, sent to the manufacturer, or other action taken.
(9) Whether the aircraft was grounded.
(10) Other pertinent information necessary for more complete identification, determination of seriousness, or corrective action.

(f) An operator that is also the holder of a Type Certificate (including a Supplement Type Certificate), a Parts Manufacturer Approval, or a Technical Standard Order Authorization, or that is the licensee of a type certificate holder, need not report a failure, malfunction, or defect under this section if the failure, malfunction, or defect has been reported by it under CASR 21.3.

(g) No person may withhold a report required by this section even though all information required in this section is not available.

(h) When operator gets additional information, including information from the manufacturer or other agency, concerning a report required by this section, it shall expeditiously submit it as a supplement to the first report and reference the date and place of submission of the first report.

(i) The operator shall transmit each report required by this section to the organization responsible for the type design of the aircraft.

91.425 through 91.499 RESERVED

SUBPART F - LARGE AND TURBINE-POWERED MULTIENGINE AIRPLANES

91.501 Applicability

This subpart prescribes additional operating rules for the operation of:

(a) airplanes with a certificated take-off mass exceeding 5,700 kg;

(b) airplanes equipped with one or more turbojet engines;

(c) an airplane with a seating configuration of more than 9 passenger seats; or

(d) an aviation operation with 3 or more aircraft that employs pilots to operate the aircraft.

91.503 Compliance with laws, Regulation and Procedures

(a) Each operator shall include in its operations manual a clear statement to all employees that they must comply with the laws, regulations and procedures of those States in which operations are conducted.

(b) Each operator shall ensure through its training program that all of its pilots are familiar with the laws, regulations and procedures pertinent to the performance of their duties for the areas to be traversed, the aerodromes to be used and the air navigation facilities to be used.

(c) Each operator shall ensure through its training program that other members of the flight crew are familiar with the laws, regulations and procedures pertinent to the performance of their duties.

(d) Each operator will ensure that the pilot in command is responsible for operational control of all flights.

(e) Each operator shall describe its operational control system in its operations manual and identify the roles and responsibilities of those involved with the operational control system.

(f) Each operator shall ensure that the pilot in command has available on board the aircraft all the essential information concerning the search and rescue services in the area over which the aircraft will be operated.

91.505 Safety Management System

Each operator shall establish and maintain a Safety Management System appropriate to the size and complexity of their operation.

91.507 Operating Facility

(a) Each operator shall establish in its operations manual a system to ensure the suitability, adequacy and current conditions of:
   (1) Ground or water facilities that may be used,

(2) Communication and navigation facilities that are required for the planned flights.

(b) Each operator shall establish an operating base and advise the DGCA of the location. Any change to the location of the operating base must be notified immediately to the DGCA.

91.509 Operation Manual

(a) Each operator shall establish and update as necessary an operations manual containing all of the instructions and information necessary for their personnel to perform their duties.

(b) The operations manual required by paragraph (a) of this section will be appropriate for the size and scope of the operations, and may be in two or more separate parts, containing at least of the following information:

(1) table of contents;
(2) amendment control page and list of effective pages, unless the entire document is reissued with each amendment and the document has an effective date on it;
(3) duties, responsibilities and succession of management and operating personnel;
(4) operator safety management system;
(5) operational control system;
(6) MEL procedures (where applicable);
(7) normal flight operations;
(8) standard operating procedures (SOPs);
(9) weather limitations;
(10) flight and duty time limitations;
(11) emergency operations;
(12) accident/incident considerations;
(13) personnel qualifications and training;
(14) record keeping;
(15) a description of the maintenance control system;
(16) security procedures (where applicable);
(17) performance operating limitations;
(18) use/protection of FDR/CVR records (where applicable);
(19) handling of dangerous goods; and
(20) use of head-up displays (HUD)/enhanced vision systems (EVS).

(c) Each operator shall include in its operations manual and training program sufficient information on aircraft performance to enable the pilot in command to determine the climb gradient and other performance information for the existing conditions.

(d) Each operator shall ensure that its training program instructs all operational personnel in their duties and responsibilities as well as the relationship of their duties to the entire operation.

(e) Checklists shall be carried on the airplane at all times and used by the crew during all phases of normal and abnormal operations to ensure compliance with the operating procedures contained in the aircraft operating manual and the airplane flight manual.

(f) An operator shall specify in its operations manual the method of establishing terrain clearance altitudes for IFR flights.

(g) Each operator shall establish procedures to ensure that no pilot in command operates to or from an aerodrome using minima lower than those specified by the state of aerodrome without the approval of that state.

(h) the operations manual prescribed in this section, or those parts of it that pertain to flight operations, shall be carried on the aircraft.

91.511 Passenger Safety Procedures

(a) Each operator shall develop procedures to ensure that all passengers are made familiar with the location and use of:
   (1) Seat belts,
   (2) Emergency exits,
   (3) Life jackets if carried,
   (4) Oxygen dispensing equipment if required,
   (5) Passenger briefing cards, and
   (6) Other emergency equipment for individual use.

(b) Each operator shall develop procedures to ensure that all persons on board are aware of the location and general manner of use of the principal emergency equipment for collective use.

(c) Each operator shall develop procedures to ensure that passengers are instructed in appropriate actions for emergencies occurring in flight.

(d) Each operator shall develop procedures to ensure that all passengers are secured in their seats using seat belts or safety harnesses during take-off, landing, turbulence, or any emergency.

(e) Each operator shall develop procedures to ensure that all baggage carried in the passenger cabin is adequately and securely stowed.

91.513 In-Flight Simulation of Emergency Situation

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

91.515 Fatigue Management Programme

Each operator shall establish and implement a fatigue management programme that:

(a) Ensures operations and maintenance staff are not fatigued when carrying out their duties,

(b) Addresses flight and duty time limitations, and

(c) Is included in the Operations Manual.

91.517 Flight Preparation

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

(a) The airplane is airworthy, registered and Certificate of Airworthiness and Certificate of Register on board;

(b) The instruments and equipment installed are appropriate for the expected flight conditions;

(c) Any necessary maintenance has been performed in accordance with Subpart E of this part;

(d) The mass of the airplane and center of gravity location are such that the planned flight can be completed safely;

(e) The load is properly distributed and secure; and

(f) The airplane operating limitations will not be exceeded during the planned flight.

91.519 Flight Plan

(a) Each operator shall develop and implement flight planning procedures that provide for the safe conduct of the flight considering airplane performance, operating limitations and expected conditions. These procedures will be described in the operations manual.

(b) Each operator shall ensure that a take-off alternate is included in the flight plan if the departure aerodrome weather is below applicable operating minima or the airplane cannot return to the departure aerodrome for another reason.

(c) The take-off alternate identified in the flight plan must be:
   (1) For twin engine airplane, within one hour flight time at the applicable single engine cruise speed;
   (2) For airplanes with more than two engines, within two hours flight time at the applicable one engine inoperative cruise speed.

(d) Each operator shall ensure that available information indicates that the take-off alternate selected will have suitable weather conditions and is appropriate for the airplane in question at the estimated time of arrival

91.521 Operations Beyond 60 Minutes to an en-route alternate aerodrome

An operator shall ensure, when conducting operations beyond 60 minutes from a point on a route to an en-route alternate aerodrome, that:

(a) en-route alternate aerodromes are identified; and

(b) the pilot-in-command has access to current information on the identified en-route alternate aerodromes, including operational status and meteorological conditions.

91.523 Oxygen Supply

(a) Each operator shall ensure that an airplane will not be operated at flight altitudes at which the personnel compartment atmospheric pressure will be below 700 hPa unless there is sufficient stored breathing oxygen to supply:

(1) All crew members and 10 per cent of the passengers for any period in excess of 30 minutes that the pressure in the passenger compartment will be between 700 hPa and 620 hPa, and

(2) The crew and passengers for any period that the atmospheric pressure in the passenger compartment will be less than 620 hPa.

(b) Each operator shall ensure that a flight to be operated with a pressurized airplane shall not be commenced unless a sufficient quantity of stored breathing oxygen is carried to supply all the crew members and passengers, as is appropriate to the circumstances of the flight being undertaken, in the event of loss of pressurization, for any period that the atmospheric pressure in any compartment occupied by them would be less than 700 hPa. In addition, when an airplane is operated at flight altitudes at which the atmospheric pressure is less than 376 hPa, or which, if operated at flight altitudes at which the atmospheric pressure is more than 376 hPa and cannot descend safely within four minutes to a flight altitude at which the atmospheric pressure is equal to 620 hPa, there shall be no less than a 10-minute supply for the occupants of the passenger compartment.

(c) Each operator shall ensure that all flight crew members, when engaged in performing duties essential to the safe operation of an airplane, shall use breathing oxygen continuously whenever the conditions identified in 91.523(a) or 91.523(b) are encountered.

(d) Each operator shall ensure that all flight crew members of pressurized airplanes operating above an altitude where the atmospheric pressure is less than 376 hPa shall have available at the flight duty station a quick-donning type of oxygen mask which will readily supply oxygen upon demand.

91.525 Standard Operating Procedures

(a) Each operator shall ensure the section of the operations manual that contains Standard Operating Procedures contains a complete description of the procedures for conducting instrument approach procedures.

(b) Each operator shall include noise abatement procedures in the section of its Operations Manual that contains Standard Operating Procedures.

(c) Each operator shall ensure that the section of the operations manual containing Standard Operating Procedures in the use of TCAS includes, unless otherwise specified in an air traffic control instruction, to avoid unnecessary Traffic alert and collision avoidance system (TCAS II). resolution advisories in aircraft at or approaching adjacent altitudes or flight levels, pilots should consider using appropriate procedures to ensure that a rate of climb or descent of less than 8 m/s or 1 500 ft/min (depending on the instrumentation available) is achieved throughout the last 300 m (1 000 ft) of climb or descent to the assigned altitude or flight level, when made aware of another aircraft at or approaching an adjacent altitude or flight level.

91.527 Duties Pilot In Command

The pilot in command is responsible to ensure:

(a) All of the checklists applicable for the phase of flight have been completed at the appropriate time;

(b) Notification of the appropriate authority by quickest available means of any accident resulting in serious injury, the death of any person, substantial damage to the airplane, or substantial damage to property;

(c) The reporting of all known or suspected defects in the airplane to the operator at the termination of the flight; and

(d) The accurate completion of the journey log book and general declaration.

91.529 Performance Limitation

(a) This sections prescribes airplane performance limitations for airplane over 5,700 kg take off mass.

(b) Each operator shall ensure that their airplanes are operated in compliance with the terms of the certificate of airworthiness and within the approved operating limitations contained in its flight manual.

(c) No person shall commence a flight unless all of the performance limitation standards can be met. Data contained in the AFM, RFM, or other authorized source must be used to determine compliance with the appropriate requirements of this section.

(d) When applying performance data, each person performing calculations shall account for all factors that significantly affect the performance of the aircraft configuration, including, but not limited to: mass of the airplane, the operating procedures, the pressure-altitude appropriate to the elevation of the aerodrome, the ambient temperature, the wind, the runway slope, actual position of the start of the take-off roll, and surface conditions of the runway i.e., environmental conditions, snow, slush, water, ice, for landplanes, water surface condition for seaplanes, and the operation of any system or systems that may have an adverse effect on performance.

(e) The factors described in pargraph (d) of this section of the aircraft performance calculations shall be taken into account directly as operations parameters or indirectly by means of allowances or margins, which may be provided in the scheduling of performance data or in the comprehensive and detailed code of performance in accordance with which the airplane is being operated.

(f) No person shall take off in an aircraft above the maximum mass at the start of the take-off, calculated based on actual or anticipated conditions along the planned route, exceeds the maximum mass:
   (1) Based on take-off performance contained in the airplane flight manual including accelerate stop distance and obstacle clearance along the departure flight path, or
   (2) Based on the ability to maintain minimum obstruction clearance altitudes along the planned route including any planned diversion in the event of the failure of the critical engine, or

(3) Based on the ability to safely clear all obstacles in the approach path and stop within the landing distance available at the destination or alternate aerodrome, or

(4) Based on the mass limitations, if applicable, imposed by the terms of its noise certification standards, as contained in the applicable part of ICAO Annex 16, Volume I, unless otherwise approved by the Authority.

91.531 Flying Equipment and Operating Information

(a) The pilot in command of an airplane shall ensure that the following flying equipment and aeronautical charts and data (including electronic navigation data), in current and appropriate form, are accessible for each flight at the pilot station of the airplane:

(1) A flashlight having at least two size "D" cells, or the equivalent, that is in good working order.

(2) A cockpit checklist containing the procedures required by Paragraph (b) of this section.

(3) Pertinent aeronautical charts.

(4) For IFR, or night operations, each pertinent navigational enroute, terminal area, and approach and letdown chart.

(5) In the case of multiengine airplanes, one engine inoperative climb performance data.

(b) Each cockpit checklist must contain the following procedures and shall be used by the flight crewmembers when operating the airplane:

(1) Before starting engines.

(2) Before takeoff.

(3) Cruise.

(4) Before landing.

(5) After landing.

(6) Stopping engines.

(7) Emergencies.

(c) Each emergency cockpit checklist procedure required by Paragraph (b)(7) of this section must contain the following procedures, as appropriate:

(1) Emergency operation of fuel, hydraulic, electrical, and mechanical systems.

(2) Emergency operation of instruments and controls.

(3) Engine inoperative procedures.

(4) Any other procedures necessary for safety.

(d) The equipment, charts, and data prescribed in this section shall be used by the pilot in command and other members of the flight crew, when pertinent.

91.533 Emergency Equipment

(a) No person may operate an airplane unless it is equipped with the emergency equipment listed in this section.

(b) Each item of equipment

(1) Must be inspected in accordance with Section 91.409 to ensure its continued serviceability and immediate readiness for its intended purposes;

(2) Must be readily accessible to the crew;
(3) Must clearly indicate its method of operation; and
(4) When carried in a compartment or container, must have that compartment or container marked as to contents and date of last inspection.

(c) Hand fire extinguishers must be provided for use in crew, passenger, and cargo compartments in accordance with the following:
(1) The type and quantity of extinguishing agent must be suitable for the kinds of fires likely to occur in the compartment where the extinguisher is intended to be used.
(2) The type of extinguishing agent in an airplane for which the individual certificate of airworthiness is first issued on or after 31 December 2016 shall not be of a type listed in the 1987 *Montreal Protocol on Substances that Deplete the Ozone Layer* as it appears in the Eighth Edition of the *Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer*, Annex A, Group II.
(3) At least one hand fire extinguisher must be conveniently located in the passenger compartment of each airplane accommodating more than six but less than 31 passengers, and at least two hand fire extinguishers must be conveniently located in the passenger compartment of each airplane accommodating more than 30 passengers.
(4) Hand fire extinguishers must be installed and secured in such a manner that they will not interfere with the safe operation of the airplane or adversely affect the safety of the crew and passengers. They must be readily accessible and, unless the locations of the fire extinguishers are obvious, their stowage provisions must be properly identified.

(d) A suitable number of adequate first aid kits are accessible on their aircraft. The minimum number of first aid kits to be provided:

Number of passengers	Number of first aid kits
0-100	1
101-200	2
201-300	3
301-400	4
401-500	5
501+	6

(e) Each airplane accommodating more than 19 passengers must be equipped with a crash axe.

(f) Each passenger carrying airplane must have a portable battery-powered megaphone or megaphones readily accessible to the crewmembers assigned to direct emergency evacuation, installed as follows:
(1) One megaphone on each airplane with a seating capacity of more than 60 but less than 100 passengers, at the most rearward location in the passenger cabin where it would be readily accessible to a normal flight attendant seat. However, the Director may grant a deviation from the requirements of this subparagraph if the Director finds that a different location would be more useful for evacuation of persons during an emergency.

(2) On each airplane with a seating capacity of 100 or more passengers, one megaphone installed at the forward end and one installed at the most rearward location where it would be readily accessible to a normal flight attendant seat.

91.535 Shoulder Harness

(a) No person may operate a transport category airplane that was type certificated after January 1, 1958, unless it is equipped at each seat at a flight deck station with a combined safety belt and shoulder harness that meets the applicable requirements specified in Section 25.785 of the CASRs, except that

(1) Shoulder harnesses and combined safety belt and shoulder harnesses that were approved and installed before promulgation of Part 25 may continue to be used; and

(2) Safety belt and shoulder harness restraint systems may be designed to the inertia load factors established under the certification basis of the airplane.

(b) No person may operate a transport category airplane unless it is equipped at each required flight attendant seat in the passenger compartment with a combined safety belt and shoulder harness that meets the applicable requirements specified in Section 25.785 of the CASRs, except that

(1) Shoulder harnesses and combined safety belt and shoulder harnesses that were approved and installed before the promulgation of Part 25 may continue to be used; and

(2) Safety belt and shoulder harness restraint systems may be designed to the inertia load factors established under the certification basis of the airplane.

91.537 Passenger Briefing

(a) Before each takeoff the pilot in command of an airplane carrying passengers shall ensure that all passengers have been orally briefed on__

(1) Smoking: Each passenger shall be briefed on when, where, and under what conditions smoking is prohibited. This briefing shall include a statement, as appropriate, that the Civil Aviation Safety Regulations require passenger compliance with lighted passenger information signs and no smoking placards, prohibit smoking in lavatories, and require compliance with crewmember instructions with regard to these items;

(2) Use of safety belts and shoulder harnesses: Each passenger shall be briefed on when, where, and under what conditions it is necessary to have his or her safety belt and, if installed, his or her shoulder harness fastened about him or her. This briefing shall include a statement, as appropriate, that the Civil Aviation Safety Regulations require passenger compliance with the lighted passenger sign and/or crewmember instructions with regard to these items;

(3) Location and means for opening the passenger entry door and emergency exits;

(4) Location of survival equipment;

(5) Ditching procedures and the use of flotation equipment required under Section 91.509 for a flight over water; and

(6) The normal and emergency use of oxygen equipment installed on the airplane.

(b) The oral briefing required by Paragraph (a) of this section shall be given by the pilot in command or a member of the crew, but need not be given when the pilot in command determines that the passengers are familiar with the contents of the briefing. It may be supplemented by printed cards for the use of each passenger containing_
(1) A diagram of, and methods of operating, the emergency exits; and
(2) Other instructions necessary for use of emergency equipment.
(3) Each card used under Paragraph (b) must be carried in convenient locations on the airplane for the use of each passenger and must contain information that is pertinent only to the type and model airplane on which it is used.

91.537 Composisition of the flight crew

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

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

91.541 Flight crew member emergency duties

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

91.543 Flight crew member training programmes

(a) An operator shall establish and maintain a training programme that is designed to ensure that a person who receives training acquires and maintains the competency to perform assigned duties, including skills related to human performance.

(b) Ground and flight training programmes shall be established, either through internal programmes or through a training services provider, and shall include or make reference to a syllabus for those training programmes in the company operations manual.

(c) The training programme shall include training to competency for all equipment installed.

(d) Flight simulators should be used to the maximum extent practicable for initial and annual recurrent training.

91.545 Flight Crew Qualification

(a) An operator shall:
   (1) ensure that each flight crew member assigned to duty holds a valid licence under CASR Part 61 and CASR Part 63;
   (2) ensure that flight crew members are properly rated; and
   (3) be satisfied that flight crew members are competent to carry out assigned duties.

(b) An operator shall not assign a pilot to act as pilot-in-command of an airplane unless that pilot has made at least three takeoffs and landings within the preceding 90 days on the same type of airplane or in a flight simulator approved for the purpose.

(c) An operator shall not assign a co-pilot to operate at the flight controls of an airplane during take-off and landing unless that pilot has made at least three take-offs and landings within the preceding 90 days on the same type of airplane or in a flight simulator approved for the purpose.

91.547 Flight Operations Officer/Flight Dispatcher

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

91.549 Flight Attendant Requirements

(a) The requirement for flight attendant for each type of airplane shall be determined by the operator, based on seating capacity or the number of passengers carried, in order to effect a safe and expeditious evacuation of the airplane, and the necessary functions to be performed in an emergency or a situation requiring emergency evacuation. The operator shall assign these functions for each type of airplane.

(b) When flight attendant are required by a DGCA, each flight attendant assigned to emergency evacuation duties shall occupy a seat provided in accordance with section 91.533 during take-off and landing and whenever the pilot-in-command so directs.

(c) Each flight attendant shall be seated with seat belt or, when provided, safety harness fastened during take-off and landing and whenever the pilot-in-command so directs.

(d) An operator shall ensure that a training programme is completed by all persons before being assigned as a flight attendant.

(e) An operator should establish and maintain a flight attendant training programme that is designed to ensure that persons who receive training acquire the competency to perform their assigned duties and includes or makes reference to a syllabus for the training programme in the company operations manual. The training programme should include Human Factors training.

91.551 Company Maintenance Manual

(a) An operator should provide a Company Maintenance Manual, for the use and guidance of maintenance and operations personnel. The design of the manual should observe Human Factors principles.

(b) A Company Maintenance Manual provided in accordance with paragraph (a), which may be issued in separate parts, should at a minimum contain information about:

(1) the means for complying with the CASR 91.403;
(2) Maintenance procedures and the procedures for completing and signing a maintenance release as required by CASR 91.407;
(3) The names, duties and responsibilities of the person responsible for maintenance;
(4) The procedures and programs required by CASR 91.409 (e) that must be followed in performing maintenance, preventive maintenance, and alterations of that operator's airplanes, including airframes, aircraft engines, propellers, appliances, emergency equipment, and parts thereof;
(5) Procedure for recording of maintenance carried out and retention of maintenance record;
(6) Procedures for reporting the occurance or detection of each failure, malfunction, or defect required by CASR 91.423;
(7) Procedure for implementing action resulting from airworthiness directive as required by CASR 39;
(8) Procedures for establishing and maintaining a system of analysis and continued monitoring of the performance and effectiveness of the maintenance programme;
(9) a description of aircraft types and models to which the manual applies; and
(10) procedures for ensuring that unserviceable systems and components affecting airworthiness are recorded and rectified, as required by CASR 91.213.

91.553 Security programme

An operator shall establishes, implements and maintains a written operator security programme that meets the requirements of the national civil aviation security programme of that State.

91.555 through 91.599 RESERVED

SUBPART G - ADDITIONAL EQUIPMENT AND OPERATING REQUIREMENTS FOR LARGE AND TRANSPORT CATEGORY AIRCRAFT

91.601 Applicability

This subpart applies to operation of large and transport category Indonesian-registered civil aircraft.

91.603 Aural Speed Warning Device

No person may operate a transport category airplane in air commerce unless that airplane is equipped with an aural speed warning device that complies with Section 25.1303(c)(1).

91.605 Transport Category Civil Airplane Weight Limitations

(a) No person may takeoff any transport category airplane (other than a turbine engine powered airplane) unless
   (1) The takeoff weight does not exceed the authorized maximum takeoff weight for the elevation of the airport of takeoff;
   (2) The elevation of the airport of takeoff is within the altitude range for which maximum takeoff weights have been determined;
   (3) Normal consumption of fuel and oil in flight to the airport of intended landing will leave a weight on arrival not in excess of the authorized maximum landing weight for the elevation of that airport; and
   (4) The elevations of the airport of intended landing and of all specified alternate airports are within the altitude range for which the maximum landing weights have been determined.

(b) No person may operate a turbine engine powered transport category airplane certificated contrary to the Airplane Flight Manual, or takeoff that airplane unless
   (1) The takeoff weight does not exceed the takeoff weight specified in the Airplane Flight Manual for the elevation of the airport and for the ambient temperature existing at the time of takeoff;
   (2) Normal consumption of fuel and oil in flight to the airport of intended landing and to the alternate airports will leave a weight on arrival not in excess of the landing weight specified in the Airplane Flight Manual for the elevation of each of the airports involved and for the ambient temperatures expected at the time of landing;
   (3) The takeoff weight does not exceed the weight shown in the Airplane Flight Manual to correspond with the minimum distances required for takeoff considering the elevation of the airport, the runway to be used, the effective runway gradient, and the ambient temperature and wind component existing at the time of takeoff; and
   (4) Where the takeoff distance includes a clearway, the clearway distance is not greater than one-half of the runway length.

(c) No person may takeoff a turbine engine powered transport category airplane unless, in addition to the requirements of Paragraph (b) of this section

(1) The accelerate-stop distance is no greater than the length of the runway plus the length of the stopway (if present); and
(2) The takeoff distance is no greater than the length of the runway plus the length of the clearway (if present); and
(3) The takeoff run is no greater than the length of the runway.

91.607 Emergency Exits for Airplanes Carrying Passengers for Hire

(a) Notwithstanding any other provision of the CASRs, no person may operate a large airplane in passenger carrying operations for hire, with more than the number of occupants prescribed for that aircraft by its type certificate.

However, with DGCA approval, an airplane may be operated with up to the listed number of occupants (including crewmembers) and the corresponding number of exits (including emergency exits and doors) approved for the emergency exit of passengers or with an occupant exit configuration approved under Paragraph (b) or (c) of this section.

(b) Occupants in addition to those authorized under Paragraph (a) of this section may be carried as follows:
(1) For each additional floor-level exit at least 24 inches wide by 48 inches high, with an unobstructed 20-inch wide access aisleway between the exit and the main passenger aisle, 12 additional occupants.
(2) For each additional window exit located over a wing that meets the requirements of the airworthiness standards under which the airplane was type certificated or that is large enough to inscribe an ellipse 19 x 26 inches, eight additional occupants.
(3) For each additional window exit that is not located over a wing but that otherwise complies with Paragraph (b)(2) of this section, five additional occupants.
(4) For each airplane having a ratio (as computed from the table in Paragraph (a) of this section) of maximum number of occupants to number of exits greater than 14:1, and for each airplane that does not have at least one full-size, door-type exit in the side of the fuselage in the rear part of the cabin, the first additional exit must be a floor-level exit that complies with Paragraph (b)(1) of this section and must be located in the rear part of the cabin on the opposite side of the fuselage from the main entrance door. However, no person may operate an airplane under this section carrying more than 115 occupants unless there is such an exit on each side of the fuselage in the rear part of the cabin.

(c) No person may eliminate any approved exit except in accordance with the following:
(1) The previously authorized maximum number of occupants must be reduced by the same number of additional occupants authorized for that exit under this section.
(2) Exits must be eliminated in accordance with the following priority schedule: First, non-overwing window exits; second, overwing window exits; third, floor-level exits located in the forward part of the cabin; and fourth, floor-level exits located in the rear of the cabin.

(3) At least one exit must be retained on each side of the fuselage regardless of the number of occupants.

(4) No person may remove any exit that would result in a ratio of maximum number of occupants to approved exits greater than 14:1.

(d) This section does not relieve any person operating under Part 121 of the CASRs from complying with the emergency evacuation procedures demonstration required by Section 121.291.

91.609 DELETED

91.611 Authorization for Ferry Flight with One Engine Inoperative

(a) General. The holder of an Air Carrier Operator Certificate or a Commercial Operator Certificate issued under the CASR may conduct a ferry flight of a four engine airplane or a turbine engine powered airplane equipped with three engines, with one engine inoperative, to a base for the purpose of repairing that engine subject to the following:

(1) The airplane model has been test flown and found satisfactory for safe flight in accordance with Paragraph (b) or (c) of this section, as appropriate.

(2) The approved Airplane Flight Manual contains the following performance data and the flight is conducted in accordance with that data:

(i) Maximum weight.
(ii) Center of gravity limits.
(iii) Configuration of the inoperative propeller (if applicable).
(iv) Runway length for takeoff (including temperature accountability).
(v) Altitude range.
(vi) Certificate limitations.
(vii) Ranges of operational limits.
(viii) Performance information.
(ix) Operating procedures.

(3) The operator has DGCA-approved procedures for the safe operation of the airplane, including specific requirements for

(i) Limiting the operating weight on any ferry flight to the minimum necessary for the flight plus the necessary reserve fuel load;
(ii) A limitation that takeoffs must be made from dry runways unless, based on a showing of actual operating takeoff techniques on wet runways with one engine inoperative, takeoffs with full controllability from wet runways have been approved for the specific model aircraft and included in the Airplane Flight Manual:
(iii) Operations from airports where the runways may require a takeoff or approach over populated areas; and
(iv) Inspection procedures for determining the operating condition of the operative engines.

(4) No person may takeoff an airplane under this section if

(i) The initial climb is over thickly populated areas; or
(ii) Weather conditions at the takeoff or destination airport are less than those required for VFR flight.

(5) Persons other than required flight crewmembers shall not be carried during the flight.

(6) No person may use a flight crewmember for flight under this section unless that crewmember is thoroughly familiar with the operating procedures for one engine inoperative ferry flight contained in the certificate holder's manual and the limitations and performance information in the Airplane Flight Manual.

(b) Flight tests: reciprocating engine powered airplanes. The airplane performance of a reciprocating engine powered airplane with one engine inoperative must be determined by flight test as follows:

(1) A speed not less than 1.3 Vs1 must be chosen at which the airplane may be controlled satisfactorily in a climb with the critical engine inoperative (with its SUBPART G propeller removed or in a configuration desired by the operator) and with all other engines operating at the maximum power determined in Paragraph (b)(3) of this section.

(2) The distance required to accelerate to the speed listed in Paragraph (b)(1) of this section and to climb to 50 feet must be determined with__

(i) The landing gear extended;

(ii) The critical engine inoperative and its propeller removed (or in a configuration desired by the operator); and

(iii) The other engines operating at not more than maximum power established under Paragraph (b)(3) of this section.

(3) The takeoff, flight and landing procedures, such as the approximate trim settings, method of power application, maximum power, and speed must be established.

(4) The performance must be determined at a maximum weight not greater than the weight that allows a rate of climb of at least 400 feet per minute in the enroute configuration set forth in Part 25 of the CASRs in effect on [date to be determined], at an altitude of 5,000 feet.

(5) The performance must be determined using temperature accountability for the takeoff field length, computed in accordance with Part 25 of the CASRs in effect on [date to be determined].

(c) Flight tests: Turbine engine powered airplanes. The airplane performance of a turbine engine powered airplane with one engine inoperative must be determined by flight tests, including at least three takeoff tests, in accordance with the following:

(1) Takeoff speeds Vr and V2, not less than the corresponding speeds under which the airplane was type certificated under Section 25.107 of the CASRs, must be chosen at which the airplane may be controlled satisfactorily with the critical engine inoperative (with its propeller removed or in a configuration desired by the operator, if applicable) and with all other engines operating at not more than the power selected for type certification as set forth in Section 25.101 of the CASRs.

(2) The minimum takeoff field length must be the horizontal distance required to accelerate and climb to the 35-foot height at V2 speed (including any additional speed increment obtained in the tests) multiplied by 115 percent and determined with

(i) The landing gear extended;

(ii) The critical engine inoperative and its propeller removed (or in a configuration desired by the operator, if applicable); and

(iii) The other engine operating at not more than the power selected for type certification as set forth in Section 25.101 of the CASRs.

(3) The takeoff, flight, and landing procedures such as the approximate trim setting, method of power application, maximum power, and speed must be established. The airplane must be satisfactorily controllable during the entire takeoff run when operated according to these procedures.

(4) The performance must be determined at a maximum weight not greater than the weight determined under Section 25.121(c) of the CASRs but with

(i) The actual steady gradient of the final takeoff climb requirement not less than 1.2 percent at the end of the takeoff path with two critical engines inoperative; and

(ii) The climb speed not less than the two engine inoperative trim speed for the actual steady gradient of the final takeoff climb prescribed by Paragraph (c)(4)(i) of this section.

(5) The airplane must be satisfactorily controllable in a climb with two critical engines inoperative. Climb performance may be shown by calculations based on, and equal in accuracy to, the results of testing.

(6) The performance must be determined using temperature accountability for takeoff distance and final takeoff climb computed in accordance with Section 25.101 of the CASRs.

For the purpose of Paragraphs (c)(4) and (5) of this section, "two critical engines" means two adjacent engines on one side of an airplane with four engines, and the center engine and one outboard engine on an airplane with three engines.

91.613 Materials for Compartment Interiors

No person may operate an airplane that supplemental type certificate was issued unless the materials for compartment interiors meet the airworthiness standards. When the aircraft was certificated under the CASRs for a maximum certificated takeoff weight in excess of 12,500 pounds, within 1 year after issuance of the initial airworthiness certificate under the CASR, the airplane must meet the compartment interior requirements set forth in Section 25.853(a), (b), (b-1), (b-2), and (b-3) of the CASRs.

91.615 Radiation Indicator

Airplanes intended to be primarily operated above 15 000 m (49 000 ft) should carry equipment to measure and indicate continuously the dose rate of total cosmic radiation being received (i.e. the total of ionizing and neutron radiation of galactic and solar origin) and the cumulative dose on each flight. The display unit of the equipment shall be readily visible to a flight crew member.

91.617 through 91.699 RESERVED

SUBPART H - FOREIGN AIRCRAFT OPERATIONS AND OPERATIONS OF INDONESIAN-REGISTERED CIVIL AIRCRAFT OUTSIDE OF INDONESIA

91.701 Applicability

This subpart applies to the operations of civil aircraft of Indonesian registry outside of Indonesia and the operations of foreign civil aircraft within Indonesia.

91.703 Operations of Civil Aircraft of Indonesian Registry Outside of Indonesia

Each person operating a civil aircraft of Indonesian registry outside of Indonesia shall

(1) When over the high seas, comply with Annex 2 (Rules of the Air) to the Convention on International Civil Aviation and with Sections 91.117(c), 91.127, 91.129, and 91.131;

(2) When within a foreign country, comply with the regulations relating to the flight and maneuver of aircraft there in force;

(3) Except for Sections 91.307(b), 91.309, and 91.711, comply with this part so far as it is not inconsistent with applicable regulations of the foreign country where the aircraft is operated or Annex 2 of the Convention on International Civil Aviation; and

(4) When operating within airspace designated as Reduced Vertical Separation Minimum (RVSM) airspace, comply with section 91.706.

91.705 RESERVED

91.706 Operation within Airspace Designated as Reduced Vertical Separation Minimum Airspace

(a) Except as provided in paragraph (b) of this section, no person may operate a civil aircraft in airspace designated as Reduced Vertical Separation Minimum (RVSM) unless:
   (1) The operator and the operator's aircraft comply with the requirement of appendix G of this part; and
   (2) The operator is authorized by the Director to conduct such operations.

(b) The Director may authorize a deviation from the requirements of this section in accordance with Section 5 of appendix G to this part.

(c) RVSM implemented within Indonesia FIR, which are published in Indonesia AIP.

(d) Aircraft which flying within RVSM airspace should be equipped with TCAS II Version 7.

91.711 Special Rules for Foreign Civil Aircraft

(a) General. In addition to the other applicable regulations of this part, each person operating a foreign civil aircraft within Indonesia shall comply with this section.

(b) VFR. No person may conduct VFR operations which require two-way radio communications under this part unless at least one crewmember of that aircraft is able to conduct two-way radio communications in the English language and is on duty during that operation.

(c) IFR. No person may operate a foreign civil aircraft under IFR unless
- (1) That aircraft is equipped with
  - (i) Radio equipment allowing two-way radio communication with ATC when it is operated in controlled airspace; and
  - (ii) Radio navigational equipment appropriate to the navigational facilities to be used;
- (2) Each person piloting the aircraft
  - (i) Holds a current Indonesian instrument rating or is authorized by his foreign airman certificate to pilot under IFR; and
  - (ii) Is thoroughly familiar with Indonesian enroute, holding, and letdown procedures; and
- (3) At least one crewmember of that aircraft is able to conduct two-way radio telephone communications in the English language and that crewmember is on duty while the aircraft is approaching, operating within, or leaving Indonesia.

(d) Over water. Each person operating a foreign civil aircraft over water off the shores of Indonesia shall give flight notification or file a flight plan in accordance with the Supplementary Procedures for the ICAO region concerned.

(e) Flight at and above FL 240. If VOR navigational equipment is required under Paragraph (c)(1)(ii) of this section, no person may operate a foreign civil aircraft within Indonesia at or above FL 240, unless the aircraft is equipped with distance measuring equipment (DME) capable of receiving and indicating distance information from the VORTAC facilities to be used. When DME required by this paragraph fails at and above FL 240, the pilot in command of the aircraft shall notify ATC immediately and may then continue operations at and above FL 240 to the next airport of intended landing at which repairs or replacement of the equipment can be made. However, Paragraph (e) of this section does not apply to foreign civil aircraft that are not equipped with DME when operated for the following purposes and if ATC is notified prior to each takeoff:

- (1) Ferry flights to and from a place in Indonesia where repairs or alterations are to be made.
- (2) Ferry flights to a new country of registry.
- (3) Flight of a new aircraft of Indonesian manufacture for the purpose of
  - (i) Flight testing the aircraft;
  - (ii) Training foreign flight crews in the operation of the aircraft; or
  - (iii) Ferrying the aircraft for export delivery outside Indonesia.
- (4) Ferry, demonstration, and test flight of an aircraft brought to Indonesia for the purpose of demonstration or testing the whole or any part thereof.

91.713 RESERVED

91.715 Special Flight Authorizations for Foreign Civil Aircraft

Foreign civil aircraft may be operated without airworthiness certificates required under Section 91.203 if a special flight authorization for that operation is issued under this section. Application for a special flight authorization must be made to the DGCA.

91.717 through 91.799 RESERVED

SUBPART J - DEVIATION AUTHORITY

91.903 Policy and Procedures

(a) The Director may, upon consideration of the circumstances of a particular operation, issue a Letter of Deviation Authority providing relief from specified sections of Part 91. This deviation authority will be issued as a Letter of Deviation Authority.

(b) A Letter of Deviation Authority may be terminated or amended at any time by the Director.

(c) A request for deviation authority must be submitted to the DGCA, not less than 60 days prior to the date of intended operations. A request for deviation authority must contain a complete statement of the circumstances and justification for the deviation requested.

91.907 through 91.999 RESERVED

APPENDIX A - CATEGORY II OPERATIONS: MANUAL, INSTRUMENTS, EQUIPMENT, AND MAINTENANCE

91xA.1 Category II Manual

(a) Application for approval. An applicant for approval of a Category II manual or an amendment to an approved Category II manual must submit the proposed manual or amendment to the DGCA. If the application requests an evaluation program, it must include the following:
   (1) The location of the aircraft and the place where the demonstrations are to be conducted; and
   (2) The date the demonstrations are to commence (at least 10 days after filing the application).

(b) Contents. Each Category II manual must contain:
   (1) The registration mark, make, and model of the aircraft to which it applies; (2) A maintenance program as specified in Section 4 of this appendix; and
   (2) The procedures and instructions related to recognition of decision height, use of runway visual range information, approach monitoring, the decision region (the region between the middle marker and the decision height), the maximum permissible deviations of the basic ILS indicator within the decision region, a missed approach, use of airborne low approach equipment, minimum altitude for the use of the autopilot, instrument and equipment failure warning systems, instrument failure, and other procedures, instructions, and limitations that may be found necessary by the Director.

91xA.2 Required Instruments and Equipment

The instruments and equipment listed in this section must be installed in each aircraft operated in a Category II operation. This section does not require duplication of instruments and equipment required by Section 91.205 or any other provisions of the CASRs.

(a) Group I.
   (1) Two localizer and glide slope receiving systems. Each system must provide a basic ILS display and each side of the instrument panel must have a basic ILS display. However, a single localizer antenna and a single glide slope antenna may be used.
   (2) A communications system that does not affect the operation of at least one of the ILS systems.
   (3) A marker beacon receiver that provides distinctive aural and visual indications of the outer and the middle markers.
   (4) Two gyroscopic pitch and bank indicating systems.
   (5) Two gyroscopic direction indicating systems.
   (6) Two airspeed indicators.
   (7) Two sensitive altimeters adjustable for barometric pressure, each having a placarded correction for altimeter scale error and for the wheel height of the aircraft. After [date to be determined], two sensitive altimeters adjustable for barometric pressure, having markings at 20-foot intervals and each having a placarded correction for altimeter scale error and for the wheel height of the aircraft.

(8) Two vertical speed indicators.

(9) A flight control guidance system that consists of either an automatic approach coupler or a flight director system. A flight director system must display computed information as steering command in relation to an ILS localizer and, on the same instrument, either computed information as pitch command in relation to an ILS glide slope or basic ILS glide slope information. An automatic approach coupler must provide at least automatic steering in relation to an ILS localizer. The flight control guidance system may be operated from one of the receiving systems required by Subparagraph (1) of this paragraph.

(10) For Category II operations with decision heights below 150 feet either a marker beacon receiver providing aural and visual indications of the inner marker or a radio altimeter.

(b) Group II.

(1) Warning systems for immediate detection by the pilot of system faults in items (1), (4), (5), and (9) of Group I and, if installed for use in Category III operations, the radio altimeter and autothrottle system.

(2) Dual controls.

(3) An externally vented static pressure system with an alternate static pressure source.

(4) A windshield wiper or equivalent means of providing adequate cockpit visibility for a safe visual transition by either pilot to touchdown and rollout.

(5) A heat source for each airspeed system pitot tube installed or an equivalent means of preventing malfunctioning due to icing of the pitot system.

91xA.3 Instruments and Equipment Approval

(a) General. The instruments and equipment required by Section 2 of this appendix must be approved as provided in this section before being used in Category II operations. Before presenting an aircraft for approval of the instruments and equipment, it must be shown that since the beginning of the 12th calendar month before the date of submission

(1) The ILS localizer and glide slope equipment were bench checked according to the manufacturer's instructions and found to meet those standards specified by the Director.

(2) The altimeters and the static pressure systems were tested and inspected in accordance with Appendix E to Part 43 of the CASRs; and

(3) All other instruments and items of equipment specified in Section 2(a) of this appendix that are listed in the proposed maintenance program were bench checked and found to meet the manufacturer's specifications.

(b) Flight control guidance system. All components of the flight control guidance system must be approved as installed by the evaluation program specified in Paragraph (e) of this section if they have not been approved for Category III operations under applicable type or supplemental type certification procedures. In addition, subsequent changes to make, model, or design of the components must be approved under this paragraph. Related systems or devices, such as the

autothrottle and computed missed approach guidance system, must be approved in the same manner if they are to be used for Category II operations.

(c) Radio altimeter. A radio altimeter must meet the performance criteria of this paragraph for original approval and after each subsequent alteration.

(1) It must display to the flight crew clearly and positively the wheel height of the main landing gear above the terrain.

(2) It must display wheel height above the terrain to an accuracy of ±5 feet or 5 percent, whichever is greater, under the following conditions:

(i) Pitch angles of zero to ±5° about the mean approach attitude.

(ii) Roll angles of zero to 20° in either direction.

(iii) Forward velocities from minimum approach speed up to 200 knots.

(iv) Sink rates from zero to 15 feet per second at altitudes from 100 to 200 feet.

(3) Over level ground, it must track the actual altitude of the aircraft without significant lag or oscillation.

(4) With the aircraft at an altitude of 200 feet or less, any abrupt change in terrain representing no more than 10 percent of the aircraft's altitude must not cause the altimeter to unlock, and indicator response to such changes must not exceed 0.1 seconds and, in addition, if the system unlocks for greater changes, it must reacquire the signal in less than 1 second.

(5) Systems that contain a push to test feature must test the entire system (with or without an antenna) at a simulated altitude of less than 500 feet.

(6) The system must provide to the flight crew a positive failure warning display any time there is a loss of power or an absence of ground return signals within the designed range of operating altitudes.

(d) Other instruments and equipment. All other instruments and items of equipment required by Paragraph 2 of this appendix must be capable of performing as necessary for Category II operations. Approval is also required after each subsequent alteration to these instruments and items of equipment.

(e) Evaluation program

(1) Application. Approval by evaluation is requested as a part of the application for approval of the Category II manual.

(2) Demonstrations. Unless otherwise authorized by the Director, the evaluation program for each aircraft requires the demonstrations specified in this paragraph. At least 50 ILS approaches must be flown with at least five approaches on each of three different ILS facilities and no more than one half of the total approaches on any one ILS facility. All approaches shall be flown under simulated instrument conditions to a 100-foot decision height and 90 percent of the total approaches made must be successful. A successful approach is one in which

(i) At the 100-foot decision height, the indicated airspeed and heading are satisfactory for a normal flare and landing (speed must be ±5 knots of programmed airspeed, but may not be less than computed threshold speed if autothrottles are used);

(ii) The aircraft at the 100-foot decision height, is positioned so that the cockpit is within, and tracking so as to remain within,

the lateral confines of the runway extended;

(iii) Deviation from glide slope after leaving the outer marker does not exceed 50 percent of full-scale deflection as displayed on the ILS indicator;

(iv) No unusual roughness or excessive attitude changes occur after leaving the middle marker; and

(v) In the case of an aircraft equipped with an approach coupler, the aircraft is sufficiently in trim when the approach coupler is disconnected at the decision height to allow for the continuation of a normal approach and landing.

(3) Records. During the evaluation program the following information must be maintained by the applicant for the aircraft with respect to each approach and made available to the Director upon request:

(i) Each deficiency in airborne instruments and equipment that prevented the initiation of an approach.

(ii) The reasons for discontinuing an approach, including the altitude above the runway at which it was discontinued.

(iii) Speed control at the 100-foot decision height if auto throttles are used.

(iv) Trim condition of the aircraft upon disconnecting the auto coupler with respect to continuation to flare and landing.

(v) Position of the aircraft at the middle marker and at the decision height indicated both on a diagram of the basic ILS display and a diagram of the runway extended to the middle marker. Estimated touchdown point must be indicated on the runway diagram.

(vi) Compatibility of flight director with the auto coupler, if applicable.

(vii) Quality of overall system performance.

(4) Evaluation. A final evaluation of the flight control guidance system is made upon successful completion of the demonstrations. If no hazardous tendencies have been displayed or are otherwise known to exist, the system is approved as installed.

91xA.4 Maintenance program

(a) Each maintenance program must contain the following:

(1) A list of each instrument and item of equipment specified in Paragraph 2 of this appendix that is installed in the aircraft and approved for Category II operations, including the make and model of those specified in Paragraph 2(a).

(2) A schedule that provides for the performance of inspections under Subparagraph (5) of this paragraph within 3 calendar months after the date of the previous inspection. The inspection must be performed by a person authorized by Part 43 of the CASRs, except that each alternate inspection may be replaced by a functional flight check. This functional flight check must be performed by a pilot holding a Category II pilot authorization for the type aircraft checked.

(3) A schedule that provides for the performance of bench checks for each listed instrument and item of equipment that is specified in Section 2(a) within 12 calendar months after the date of the previous bench check.

(4) A schedule that provides for the performance of a test and inspection of each static pressure system in accordance with Appendix E to Part 43 of the CASRs within 12 calendar months after the date of the previous test and inspection.

(5) The procedures for the performance of the periodic inspections and functional flight checks to determine the ability of each listed instrument and item of equipment specified in Section 2(a) of this appendix to perform as approved for Category II operations including a procedure for recording functional flight checks.

(6) A procedure for assuring that the pilot is informed of all defects in listed instruments and items of equipment.

(7) A procedure for assuring that the condition of each listed instrument and item of equipment upon which maintenance is performed is at least equal to its Category II approval condition before it is returned to service for Category II operations.

(8) A procedure for an entry in the maintenance records required by Section 43.9 of the CASRs that shows the date, airport, and reasons for each discontinued Category II operation because of a malfunction of a listed instrument or item of equipment.

(b) Bench check. A bench check required by this section must comply with this paragraph.

(1) It must be performed by a certificated repair station holding one of the following ratings as appropriate to the equipment checked:

(i) An instrument rating.

(ii) A radio rating.

(iii) A rating issued under Subpart D of Part 145 of the CASRs.3

(2) It must consist of removal of an instrument or item of equipment and performance of the following:

(i) A visual inspection for cleanliness, impending failure, and the need for lubrication, repair, or replacement of parts;

(ii) Correction of items found by that visual inspection; and

(iii) Calibration to at least the manufacturer's specifications unless otherwise specified in the approved Category II manual for the aircraft in which the instrument or item of equipment is installed.

(c) Extensions. After the completion of one maintenance cycle of 12 calendar months, a request to extend the period for checks, tests, and inspections is approved if it is shown that the performance of particular equipment justifies the requested extension.

APPENDIX B - PERFORMANCE BASED NAVIGATION

91. XB1. Electronic Navigation Data Management

No person shall employ electronic navigation data products that have been processed for application in the air and on the ground unless the Director has approved :

(a) The operator's procedures for ensuring that the process applied and the products delivered have acceptable standards of integrity and that the products are compatible with the intended function of the equipment that will use them;

(b) The operator's program for continual monitoring of both process and products; and

(c) The operator's procedures to ensure the timely distribution and insertion of current and unaltered electronic navigation data to all aircraft that require it.

91. XB2. Initial PBN Operations Training

(a) No person may serve nor may any AOC holder use a person as a flight crew member or flight operations officer (if applicable) unless he or she has completed the appropriate initial PBN operations training curriculum approved by the Director.

(b) The initial PBN training curriculum for each Navigation Specification shall ensure that each pilot and flight operations officer (if applicable) is qualified in the type of operation in which he or she serves and in any specialized or new equipment, procedures, and techniques, such as:
   (1) Knowledge of specialized navigation procedures;
   (2) Knowledge of specialized equipment;
   (3) Standard Instruments Departure/SID and Standard Instrument Arrival/STARs (if applicable);
   (4) The ability of the airborne equipment to fly the designed flight path. This may involve pilot intervention where the equipment functionality is limited;
   (5) Management of changes (procedure, runway, track, etc);
   (6) Turn management (turn indications, airspeed & bank angle, lack of guidance in turns);
   (7) Route modification (insertion/deletion of waypoints, direct to waypoint) and restrictions on route modification;
   (8) Intercepting route, radar vectors; and
   (9) Where GNSS is used, flight crews will be trained in GNSS principles.

(c) Each AOC holder shall require each pilot and flight operations officer (if applicable) to complete a demonstration of competence to a defined standard of knowledge and performance.

APPENDIX C - OPERATIONS IN THE NORTH ATLANTIC (NAT) MINIMUM NAVIGATION PERFORMANCE SPECIFICATIONS (MNPS) AIRSPACE

91xC.1

NAT MNPS airspace is that volume of airspace between FL 275 and FL 400 extending between latitude 27° north and the North Pole, bounded in the east by the eastern boundaries of control areas Santa Maria Oceanic, Shanwick Oceanic, and Reykjavik Oceanic and in the west by the western boundary of Reykjavik Oceanic Control Area, the western boundary of Gander Oceanic Control Area, and the western boundary of New York Oceanic Control Area, not including the areas west of 60 degrees west and south of 38 degrees 30 minutes north.

91xC.2

The navigation performance capability required for aircraft to be operated in the airspace defined in Section 1 of this appendix is as follows:

(a) The standard deviation of lateral track errors shall be less than 6.3 NM (11.7 km Standard deviation is a statistical measure of data about a mean value. The mean is zero nautical miles. The overall form of data is such that the plus and minus 1 standard deviation about the mean encompasses approximately 68 percent of the data and plus or minus two deviations encompasses approximately 95 percent.

(b) The proportion of the total flight time spent by aircraft 30 NM (55.6 km or more off the cleared track shall be less than 5.3 x 10^-4 (less than 1 hour in 1,887 flight hours).

(c) The proportion of the total flight time spent by aircraft between 50 NM and 70 NM (92.6 km and 129.6 km) off the cleared track shall be less than 13 x 10^-5 (less than 1 hour in 7,693 flight hours.)

91xC.3

Air traffic control (ATC) may authorize an aircraft operator to deviate from the requirements of Section 91.705 for a specific flight if, at the time of flight plan filing for that flight, ATC determines that the aircraft may be provided appropriate separation and that the flight will not interfere with, or impose a burden upon, the operations of other aircraft which meet the requirements of Section 91.705.

APPENDIX D - [RESERVED]

APPENDIX E – AIRPLANE FLIGHT RECORDER SPECIFICATIONS

Crash protected flight recorders comprise four systems: a flight data recorder (FDR), a cockpit voice recorder (CVR), an airborne image recorder (AIR) and a data link recorder (DLR). Lightweight flight recorders comprise four systems, an aircraft data recording system (ADRS), a cockpit audio recording system (CARS), an airborne image recording system (AIRS) and a data link recording system (DLRS).

1. General requirements

a. Nonejectable flight recorder containers shall:
   (1) be painted a distinctive orange or yellow colour;
   (2) carry reflective material to facilitate their location; and
   (3) have securely attached an automatically activated underwater locating device operating at a frequency of 37.5 kilohertz (kHz). At the earliest practical date, but not later than 1 January 2018, this device shall operate for a minimum of ninety days.

b. The flight recorder systems shall be installed so that:
   (1) the probability of damage to the recordings is minimized;
   (2) they receive electrical power from a bus that provides the maximum reliability for operation of the flight recorder systems without jeopardizing service to essential or emergency loads;
   (3) there is an aural or visual means for pre-flight checking that the flight recorder systems are operating properly; and
   (4) if the flight recorder systems have a bulk erasure device, the installation shall be designed to prevent operation of the device during flight time or crash impact.

c. The flight recorder systems, when tested by methods approved by DGCA, shall be demonstrated to be suitable for the environmental extremes over which they are designed to operate.

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

2. Flight Data Recorder (FDR)

a. The flight data recorder shall start to record prior to the airplane moving under its own power and record continuously until the termination of the flight when the airplane is no longer capable of moving under its own power.

b. Parameters to be recorded
   (1) Flight data recorders shall be classified as Type I, Type IA, Type II and Type IIA depending upon the number of parameters to be recorded and the duration required for retention of the recorded information.

(2) The parameters that satisfy the requirements for FDRs are listed in the paragraphs below. The number of parameters to be recorded shall depend on airplane complexity. The parameters without an asterisk (*) are mandatory parameters which shall be recorded regardless of airplane complexity. In addition, the parameters designated by an asterisk (*) shall be recorded if an information data source for the parameter is used by airplane systems or the flight crew to operate the airplane. However, other parameters may be substituted with due regard to the airplane type and the characteristics of the recording equipment.

(a) The following parameters shall satisfy the requirements for flight path and speed:
- i. Pressure altitude
- ii. Indicated airspeed or calibrated airspeed
- iii. Air-ground status and each landing gear air-ground sensor when practicable
- iv. Total or outside air temperature
- v. Heading (primary flight crew reference)
- vi. Normal acceleration
- vii. Lateral acceleration
- viii. Longitudinal acceleration (body axis)
- ix. Time or relative time count
- x. Navigation data*: drift angle, wind speed, wind direction, latitude/longitude
- xi. Groundspeed*
- xii. Radio altitude*

(b) The following parameters shall satisfy the requirements for attitude:
- i. Pitch attitude
- ii. Roll attitude
- iii. Yaw or sideslip angle*
- iv. Angle of attack*

(c) The following parameters shall satisfy the requirements for engine power:
- i. Engine thrust/power: propulsive thrust/power on each engine, cockpit thrust/power lever position
- ii. Thrust reverse status*
- iii. Engine thrust command*
- iv. Engine thrust target*
- v. Engine bleed valve position*
- vi. Additional engine parameters*: EPR, N1, indicated vibration level, N2, EGT, TLA, fuel flow, fuel cut-off lever position, N3

(d) The following parameters shall satisfy the requirements for configuration:
- i. Pitch trim surface position
- ii. Flaps*: trailing edge flap position, cockpit control selection
- iii. Slats*: leading edge flap (slat) position, cockpit control selection
- iv. Landing gear*: landing gear, gear selector position
- v. Yaw trim surface position*

vi. Roll trim surface position*
vii. Cockpit trim control input position pitch*
viii. Cockpit trim control input position roll*
ix. Cockpit trim control input position yaw*
x. Ground spoiler and speed brake*: Ground spoiler position, ground spoiler selection, speed brake position, speed brake selection
xi. De-icing and/or anti-icing systems selection*
xii. Hydraulic pressure (each system)*
xiii. Fuel quantity in CG trim tank *
xiv. AC electrical bus status*
xv. DC electrical bus status*
xvi. APU bleed valve position*
xvii. Computed centre of gravity*

(e) The following parameters shall satisfy the requirements for operation:
i. Warnings
ii. Primary flight control surface and primary flight control pilot input: pitch axis, roll axis, yaw axis
iii. Marker beacon passage
iv. Each navigation receiver frequency selection
v. Manual radio transmission keying and CVR/FDR synchronization reference
vi. Autopilot/autothrottle/AFCS mode and engagement status*
vii. Selected barometric setting*: pilot, first officer
viii. Selected altitude (all pilot selectable modes of operation)*
ix. Selected speed (all pilot selectable modes of operation)*
x. Selected Mach (all pilot selectable modes of operation)*
xi. Selected vertical speed (all pilot selectable modes of operation)*
xii. Selected heading (all pilot selectable modes of operation)*
xiii. Selected flight path (all pilot selectable modes of operation)*: course/DSTRK, path angle
xiv. Selected decision height*
xv. EFIS display format*: pilot, first officer
xvi. Multi-function/engine/alerts display format*
xvii. GPWS/TAWS/GCAS status*: selection of terrain display mode including pop-up display status, terrain alerts, both cautions and warnings, and advisories, on/off switch position
xviii. Low pressure warning*: hydraulic pressure, pneumatic pressure
xix. Computer failure*
xx. Loss of cabin pressure*
xxi. TCAS/ACAS (traffic alert and collision avoidance system/airborne collision avoidance system)*
xxii. Ice detection*
xxiii. Engine warning each engine vibration*
xxiv. Engine warning each engine over temperature*
xxv. Engine warning each engine oil pressure low*
xxvi. Engine warning each engine over speed*
xxvii. Wind shear warning*

xxviii. Operational stall protection, stick shaker and pusher activation*
xxix. All cockpit flight control input forces*: control wheel, control column, rudder pedal cockpit input forces
xxx. Vertical deviation*: ILS glide path, MLS elevation, GNSS approach path
xxxi. Horizontal deviation*: ILS localizer, MLS azimuth, GNSS approach path
xxxii. DME 1 and 2 distances*
xxxiii. Primary navigation system reference*: GNSS, INS, VOR/DME, MLS, Loran C, ILS
xxxiv. Brakes*: left and right brake pressure, left and right brake pedal position
xxxv. Date*
xxxvi. Event marker*
xxxvii. Head up display in use*
xxxviii. Para visual display on*

(f) Type IA FDR. This FDR shall be capable of recording, as appropriate to the airplane, at least the 78 parameters in Table E.

(g) Type I FDR. This FDR shall be capable of recording, as appropriate to the airplane, at least the first 32 parameters in Table E.

(h) Types II FDR. These FDR shall be capable of recording, as appropriate to the airplane, at least the first 15 parameters in Table E.

(i) The parameters that satisfy the requirements for flight path and speed as displayed to the pilot(s) are listed below. The parameters without an (*) are mandatory parameters which shall be recorded. In addition, the parameters designated by an (*) shall be recorded if an information source for the parameter is displayed to the pilot and is practicable to record:
i. Pressure altitude
ii. Indicated airspeed or calibrated airspeed
iii. Heading (primary flight crew reference)
iv. Pitch attitude
v. Roll attitude
vi. Engine thrust/power
vii. Landing-gear status*
viii. Total or outside air temperature*
ix. Time*
x. Navigation data*: drift angle, wind speed, wind direction, latitude/longitude
xi. Radio altitude*

c. Additional information
(1) A Type IIA FDR, in addition to a 30-minute recording duration, shall retain sufficient information from the preceding take-off for calibration purposes.
(2) The measurement range, recording interval and accuracy of parameters on installed equipment shall be verified by methods approved by the appropriate certificating authority.

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

3. Cockpit Voice Recorder (CVR) and Cockpit Audio Recording System (CARS)

a. Signals to be recorded

The CVR and CARS shall start to record prior to the airplane moving under its own power and record continuously until the termination of the flight when the airplane is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the CVR and CARS shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

(1) The CVR shall record on four separate channels, or more, at least the following:
   (a) voice communication transmitted from or received in the airplane by radio;
   (b) aural environment on the flight deck;
   (c) voice communication of flight crew members on the flight deck using the airplane's interphone system, if installed;
   (d) voice or audio signals identifying navigation or approach aids introduced in the headset or speaker; and
   (e) digital communication with ATS, unless recorded by the FDR.

(2) The CARS shall record on two separate channels, or more, at least the following:
   (a) voice communication transmitted from or received in the airplane by radio;
   (b) aural environment on the flight deck; and
   (c) voice communication of flight crew members on the flight deck using the airplane's interphone system, if installed.

(3) The recorder shall be capable of recording on at least four channels simultaneously. On a tape-based CVR, to ensure accurate time correlation between channels, the CVR is to record in an in-line format. If a bi-directional configuration is used, the in-line format and channel allocation shall be retained in both directions.

(4) The preferred channel allocation shall be as follows:
   (a) Channel 1 — co-pilot headphones and live boom microphone
   (b) Channel 2 — pilot headphones and live boom microphone
   (c) Channel 3 — area microphone
   (d) Channel 4 — time reference plus the third and fourth crew members' headphone and live microphone, if applicable.

Note 1.— Channel 1 is located closest to the base of the recording head.

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

4. Inspections of flight recorder systems

a. Prior to the first flight of the day, the built-in test features for the flight recorders and flight data acquisition unit (FDAU), when installed, shall be monitored by manual and/or automatic checks.

b. Annual inspections shall be carried out as follows:
   (1) an analysis of the recorded data from the flight recorders shall ensure that the recorder operates correctly for the nominal duration of the recording;
   (2) the analysis of the FDR shall evaluate the quality of the recorded data to determine if the bit error rate (including those errors introduced by recorder, the acquisition unit, the source of the data on the airplane and by the tools used to extract the data from the recorder) is within acceptable limits and to determine the nature and distribution of the errors;
   (3) a complete flight from the FDR shall be examined in engineering units to evaluate the validity of all recorded parameters. Particular attention shall be given to parameters from sensors dedicated to the FDR. Parameters taken from the aircraft's electrical bus system need not be checked if their serviceability can be detected by other aircraft systems;
   (4) the readout facility shall have the necessary software to accurately convert the recorded values to engineering units and to determine the status of discrete signals;
   (5) an annual examination of the recorded signal on the CVR or CARS shall be carried out by replay of the CVR or CARS recording. While installed in the aircraft, the CVR or CARS shall record test signals from each aircraft source and from relevant external sources to ensure that all required signals meet intelligibility standards;
   (6) where practicable, during the annual examination, a sample of in-flight recordings of the CVR or CARS shall be examined for evidence that the intelligibility of the signal is acceptable; and

c. Flight recorder systems shall be considered unserviceable if there is a significant period of poor quality data, unintelligible signals, or if one or more of the mandatory parameters is not recorded correctly.

d. A report of the annual inspection shall be made available on request to regulatory authorities for monitoring purposes.

e. Calibration of the FDR system:
   (1) for those parameters which have sensors dedicated only to the FDR and are not checked by other means, recalibration shall be carried out at least every five years or in accordance with the recommendations of the sensor manufacturer to determine any discrepancies in the engineering conversion routines for the mandatory parameters and to ensure that parameters are being recorded within the calibration tolerances; and
   (2) when the parameters of altitude and airspeed are provided by sensors that are dedicated to the FDR system, there shall be a recalibration performed as recommended by the sensor manufacturer, or at least every two years.

Table E - Parameter Guidance for Flight Data Recorders

Parameter	Range	Installed system [1] minimum accuracy (to recovered data)	Sampling interval (per second)	Resolution [4] read out
Relative Time (From Recorded on Prior to Takeoff)	8 hr minimum	±0.125% per hour	1	1 sec
Indicated Airspeed	V_{S0} to V_D (KIAS)	±5% or ±10 knots, whichever is greater. Resolution 2 knots below 175 KIAS	1	1% [3]
Altitude	-1,000 feet to max cert. alt. of A/C	±100 to ±700 feet (see Table 1, TSO C51-a)	11	25 to 150 feet
Magnetic Heading	360°	±5°	1	1°
Vertical Acceleration	-3 g to +6 g	±0.2 g in addition to ±0.3 g maximum datum	4 (or 1 per second where peaks, ref. to 1 g are recorded)	0.03 g
Longitudinal Acceleration	±1.0 g	±1.5% max. range excluding datum error of ±5%	2	0.01 g
Pitch Attitude	100% of usable	±2°	1	0.8°
Roll Attitude	±60° or 100% of usable range, whichever is greater	±2°	1	0.8°
Stabilizer Trim Position, or Pitch Control Position.	Full Range	±3% unless higher uniquely required	1	1% [3]
Engine Power, Each Engine:	Full Range	±3% unless higher uniquely required	1	1% [3]
Fan or N1 Speed or EPR or Cockpit indications Used for Aircraft Certification OR	Maximum Range	±5%	1	1% [3]
Prop. Speed and Torque (Sample Once/Sec as Close together as Practicable)			1 (prop Speed) 1 (torque)	1% [3]

Parameter	Range	Installed system [1] minimum accuracy (to recovered data)	Sampling interval (per second)	Resolution [4] read out
Altitude Rate [2] (need depends on altitude resolution)	±8,000 fpm	±10%. Resolution 250 fpm below 12,000 feet indicated	1	250 fpm. below 12,000
Angle of Attack [2] (need depends on altitude resolution)	-20° to 40° or 100% of usable range	±2°	1	0.8% [3]
Radio Transmitter Keying (Discrete)	On/Off		1	
TE Flaps (Discrete or Analog)	Each discrete position (U, D, T/O, AAP) OR Analog 0-100% range	±3%	1	1% [3]
LE Flaps (Discrete or Analog)	Each discrete position (U, D, T/O, AAP) OR Analog 0-100% range	±3%	1	1% [3]
Thrust Reverser, Each Engine (Discrete)	Stowed or full reverse			
Spoiler/Speedbrake (Discrete)	Stowed or out		1	
Autopilot Engaged (Discrete)	Engaged or Disengaged		1	

Notes:

[1] When data sources are aircraft instruments (except altimeters) of acceptable quality to fly the aircraft the recording system excluding these sensors (but including all other characteristics of the recording system) shall contribute no more than half of the values in this column.

[2] If data from the altitude encoding altimeter (100 feet resolution) is used, then either one of these parameters should also be recorded. If however, altitude is recorded at a minimum resolution of 25 feet, then these two parameters can be omitted.

[3] Percent of full range.

[4] This column applies to aircraft manufactured after October 11, 1991.

If further recording capacity is available, recording of the following additional information should be considered:

a) operational information from electronic display systems, such as electronic flight instrument systems (EFIS), electronic centralized aircraft monitor (ECAM) and engine indication and crew alerting system (EICAS). Use the following order of priority:
   1) parameters selected by the flight crew relating to the desired flight path, e.g. barometric pressure setting, selected altitude, selected airspeed, decision height, and auto-flight system engagement and mode indications if not recorded from another source;
   2) display system selection/status, e.g. SECTOR, PLAN, ROSE, NAV, WXR, COMPOSITE, COPY, ETC.;

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

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

APPENDIX F - HELICOPTER FLIGHT RECORDER SPECIFICATIONS

Crash protected flight recorders comprise one or more of the following systems: a flight data recorder (FDR), a cockpit voice recorder (CVR), an airborne image recorder (AIR) and/or a data link recorder (DLR).

1. General requirements

a. Nonejectable flight recorder containers shall:
   (1) be painted a distinctive orange or yellow colour;
   (2) carry reflective material to facilitate their location; and
   (3) have securely attached an automatically activated underwater locating device operating at a frequency of 37.5 kilohertz (kHz). At the earliest practical date, but not later than 1 January 2018, this device shall operate for a minimum of ninety days.

b. The flight recorder systems shall be installed so that:
   (1) the probability of damage to the recordings is minimized;
   (2) they receive electrical power from a bus that provides the maximum reliability for operation of the flight recorder systems without jeopardizing service to essential or emergency loads;
   (3) there is an aural or visual means for pre-flight checking that the flight recorder systems are operating properly; and
   (4) if the flight recorder systems have a bulk erasure device, the installation shall be designed to prevent operation of the device during flight time or crash impact.

c. The flight recorder systems, when tested by methods approved by DGCA, shall be demonstrated to be suitable for the environmental extremes over which they are designed to operate.

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

2. Flight Data Recorder (FDR)

a. The flight data recorder shall start to record prior to the helicopter moving under its own power and record continuously until the termination of the flight when the helicopter is no longer capable of moving under its own power.

b. Parameters to be recorded
   (1) Flight data recorders shall be classified as Type IV, Type IVA, and Type V depending upon the number of parameters to be recorded.
   (2) The parameters that satisfy the requirements for Type IV, Type IVA, and Type V FDRs, are listed in the paragraphs below. The number of parameters to be recorded shall depend on helicopter complexity. The parameters without an asterisk (*) are mandatory parameters which shall be recorded regardless of helicopter complexity. In addition, the parameters designated by an asterisk (*) shall be recorded if an information data source for the parameter is used by helicopter systems or the flight crew to operate the helicopter. However, other parameters may be substituted with due regard to the helicopter type and the characteristics of the recording equipment.

(a) The following parameters shall satisfy the requirements for flight path and speed:
   i. Pressure altitude
   ii. Indicated airspeed
   iii. Outside air temperature
   iv. Heading
   v. Normal acceleration
   vi. Lateral acceleration
   vii. Longitudinal acceleration (body axis)
   viii. Time or relative time count
   ix. Navigation data*: drift angle, wind speed, wind direction, latitude/longitude
   x. Radio altitude*

(b) The following parameters shall satisfy the requirements for attitude:
   i. Pitch attitude
   ii. Roll attitude
   iii. Yaw or sideslip angle

(c) The following parameters shall satisfy the requirements for engine power:
   i. Power on each engine: free power turbine speed (Nf), engine torque, engine gas generator speed (Ng), cockpit power control position
   ii. Rotor: main rotor speed, rotor brake
   iii. Main gearbox oil pressure*
   iv. Gearbox oil temperature*: main gearbox oil temperature, intermediate gearbox oil temperature, tail rotor gearbox oil temperature
   v. Engine exhaust gas temperature (T4)*
   vi. Turbine inlet temperature (TIT)*.

(d) The following parameters shall satisfy the requirements for operation:
   i. Hydraulics low pressure
   ii. Warnings
   iii. Primary flight controls — pilot input and/or control output position: collective pitch, longitudinal cyclic pitch, lateral cyclic pitch, tail rotor pedal, controllable stabilator, hydraulic selection
   iv. Marker beacon passage
   v. Each navigation receiver frequency selection
   vi. AFCS mode and engagement status*
   vii. Stability augmentation system engagement*
   viii. Indicated sling load force*
   ix. Vertical deviation*: ILS glide path, MLS elevation, GNSS approach path
   x. Horizontal deviation*: ILS localizer, MLS azimuth, GNSS approach path
   xi. DME 1 and 2 distances*
   xii. Altitude rate*
   xiii. Ice detector liquid water content*
   xiv. Helicopter health and usage monitor system (HUMS)*: engine data, chip detectors, channel timing, exceedance discretes, broadband average engine vibration.

(e) The following parameters shall satisfy the requirements for configuration:
   i. Landing gear or gear selector position*
   ii. Fuel contents*
   iii. Ice detector liquid water content*.

(f) Type IVA FDR. This FDR shall be capable of recording, as appropriate to the helicopter, at least the 48 parameters in Tabel F.

(g) Type IV FDR. This FDR shall be capable of recording, as appropriate to the helicopter, at least the first 30 parameters in Tabel F.

(h) Types V FDR. These FDR shall be capable of recording, as appropriate to the helicopter, at least the first 15 parameters in Tabel F.

(i) If further recording capacity is available, recording of the following additional information shall be considered:
   i. Additional operational information from electronic displays, such as electronic flight instrument systems (EFIS), electronic centralized aircraft monitor (ECAM) and engine indication and crew alerting system (EICAS); and
   ii. Additional engine parameters (EPR, N1, fuel flow, etc.).

c. Additional information
   (1) The measurement range, recording interval and accuracy of parameters on installed equipment shall be verified by methods approved by the appropriate certificating authority.
   (2) Documentation concerning parameter allocation, conversion equations, periodic calibration and other serviceability/maintenance information shall be maintained by the operator. The documentation shall to be sufficient to ensure that accident investigation authorities have the necessary information to read out the data in engineering units.

3. Cockpit Voice Recorder (CVR)

a. Signals to be recorded
The CVR shall start to record prior to the helicopter moving under its own power and record continuously until the termination of the flight when the helicopter is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the CVR shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.
   (1) The CVR shall record on four separate channels, or more, at least the following:
      (a) voice communication transmitted from or received in the helicopter by radio;
      (b) aural environment on the flight deck;
      (c) voice communication of flight crew members on the flight deck using the helicopter's interphone system, if installed;

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

(e) voice communication of flight crew members using the passenger ddres system, if installed.

(2) The CVR shall be capable of recording on at least four channels simultaneously. On a tape-based CVR, to ensure accurate time correlation between channels, the CVR is to record in an in-line format. If a bi-directional configuration is used, the in-line format and channel allocation shall be retained in both directions.

(3) The preferred channel allocation shall be as follows:

(a) Channel 1 — co-pilot headphones and live boom microphone

(b) Channel 2 — pilot headphones and live boom microphone

(c) Channel 3 — area microphone

(d) Channel 4 — time reference plus the third and fourth crew members' headphone and live microphone, if applicable.

Note 1.— Channel 1 is located closest to the base of the recording head.

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

4. Inspections of flight recorder systems

a. Prior to the first flight of the day, the built-in test features for the flight recorders and flight data acquisition unit (FDAU), when installed, shall be monitored by manual and/or automatic checks.

b. Annual inspections shall be carried out as follows:

(1) an analysis of the recorded data from the flight recorders shall ensure that the recorder operates correctly for the nominal duration of the recording;

(2) the analysis of the FDR shall evaluate the quality of the recorded data to determine if the bit error rate (including those errors introduced by recorder, the acquisition unit, the source of the data on the helicopter and by the tools used to extract the data from the recorder) is within acceptable limits and to determine the nature and distribution of the errors;

(3) a complete flight from the FDR shall be examined in engineering units to evaluate the validity of all recorded parameters. Particular attention shall be given to parameters from sensors dedicated to the FDR. Parameters taken from the aircraft's electrical bus system need not be checked if their serviceability can be detected by other aircraft systems;

(4) the readout facility shall have the necessary software to accurately convert the recorded values to engineering units and to determine the status of discrete signals;

(5) an annual examination of the recorded signal on the CVR or CARS shall be carried out by replay of the CVR or CARS recording. While installed in the aircraft, the CVR or CARS shall record test signals from each aircraft source and from relevant external sources to ensure that all required signals meet intelligibility standards;

(6) where practicable, during the annual examination, a sample of in-flight recordings of the CVR or CARS shall be examined for evidence that the intelligibility of the signal is acceptable; and

c. Flight recorder systems shall be considered unserviceable if there is a significant period of poor quality data, unintelligible signals, or if one or more of the mandatory parameters is not recorded correctly.

d. A report of the annual inspection shall be made available on request to regulatory authorities for monitoring purposes.

e. Calibration of the FDR system:
   (1) for those parameters which have sensors dedicated only to the FDR and are not checked by other means, recalibration shall be carried out at least every five years or in accordance with the recommendations of the sensor manufacturer to determine any discrepancies in the engineering conversion routines for the mandatory parameters and to ensure that parameters are being recorded within the calibration tolerances; and
   (2) when the parameters of altitude and airspeed are provided by sensors that are dedicated to the FDR system, there shall be a recalibration performed as recommended by the sensor manufacturer, or at least every two years.

Table F - Parameter Guidance for Flight Data Recorders

Parameters	Range	Installed system [1] minimum accuracy (to recovered data)	Sampling interval (per second)	Resolution [3] read out
Relative Time (From Recorded on Prior to Takeoff)	4 hr minimum	±0.125% per hour	1	1 sec
Indicated Airspeed	Vm in to V_D (KIAS) (minimum airspeed signal attainable with installed pitot/static system)	±5% or ±10 knots, whichever is greater	1	1 knot
Altitude	-1,000 feet to 20,000 feet pressure altitude	±100 to ±700 feet (see Table 1, TSO C51-a)	1	25 to 150 feet
Magnetic Heading	360°	±5°	1	1°
Vertical Acceleration	-3 g to +6 g	±0.2 g in addition to ±0.3 g maximum datum	4 (or 1 per second where peaks, ref. to 1 g are recorded)	0.05 g
Longitudinal Acceleration	±1.0 g	±1.5% max. range excluding datum error of ±5%	2	0.03 g
Pitch Attitude	100% of usable range	±2°	1	0.8°
Roll Attitude	±60 or 100% of usable range, whichever is greater	±2°	1	0.8°
Altitude Rate	±8,000 fpm	±10% Resolution 250 fpm below 12,000 feet indicated	1	250 fpm below 12,000.

Parameters	Range	Installed system [1] minimum accuracy (to recovered data)	Sampling interval (per second)	Resolution [3] read out
Engine Power, Each Engine				
Main Rotor Speed	Maximum Range	±5%	1	1% [2]
Free or Power Turbine	Maximum Range	±5%	1	1% [2]
Engine Torque	Maximum Range	±5%	1	1% [2]
Flight Control Hydraulic Pressure				
Primary (Discrete)	High/Low		1	
Secondary - if applicable (Discrete)	High/Low		1	
Radio Transmitter Keying (Discrete)	On/Off		1	
Autopilot Engaged (Discrete)	Engaged or Disengaged		1	
SAS Status Engaged (Discrete)	Engaged or Disengaged		1	
SAS Fault Status (Discrete)	Fault/OK		1	
Flight Controls				
Collective	Full range	±3%	2	1% [2]
Pedal Position	Full range	±3%	2	1% [2]
Lat. Cyclic	Full range	±3%	2	1% [2]
Long. Cyclic	Full range	±3%	2	1% [2]
Controllable Stabilator Position	Full range	±3%	2	1% [2]

Notes:

[1] When data sources are aircraft instruments (except altimeters) of acceptable quality to fly the aircraft the recording system excluding these sensors (but including all other characteristics of the recording system) shall contribute no more than half of the values in this column.

[2] Percent of full range.

[3] This column applies to aircraft manufactured after October 11, 1991.

APPENDIX G - OPERATIONS IN REDUCED VERTICAL SEPARATION MINIMUM (RVSM) AIRSPACE

Section 1. Definitions

Reduced Vertical Separation Minimum (RVSM) Airspace. Within RVSM airspace, air traffic control (ATC) separates aircraft by a minimum of 1,000 feet vertically between flight level (FL) 290 and FL 410 inclusive. RVSM airspace is special qualification airspace; the operator and the aircraft used by the operator must be approved by the Director General. Air-traffic control notifies operators of RVSM by providing route planing information. Section 8 of this appendix identifies airspace where RVSM may be applied.

RVSM Group Aircraft. Aircraft within a group of aircraft, approved as a group by the Director General, in which each of the aircraft satisfy each of the following:

(a) The aircraft have been manufactured to the same design, and have been approved under the same type certificate, amended type certificate, or supplemental type certificate.

(b) The static system of each aircraft is installed in a manner and position that is the same as those of the other aircraft in the group. The same static source error correction is incorporated in each aircraft of the group.

(c) The avionics units installed in each aircraft to meet the minimum RVSM equipment requirements of this appendix are:

  (1) Manufactured to the same manufacturer specification and have the same part number; or
  (2) Of a different manufacturer or part number, if the applicant demonstrates that the equipment provides equivalent system performance.

RVSM Nongroup Aircraft. An aircraft that is approved for RVSM operations as an individual aircraft.

RVSM Flight envelope. An RVSM flight envelope includes the range of Mach number, weight divided by atmospheric pressure ratio, and altitudes over which an aircraft is approved to be operated in cruising flight within RVSM airspace. RVSM flight envelopes are defined as follows:

(a) The *full RVSM flight envelope* is bounded as follows:

  (1) The altitude flight envelope extends from FL 290 upward to the lowest altitude of the following:
    (i) FL 410 (the RVSM altitude limit);
    (ii) The maximum certificated altitude for the aircraft; or
    (iii) The altitude limited by cruise thrust, buffet, or other flight limitations.

  (2) The airspeed flight envelope extends:
    (i) From the airspeed of the slats/flaps-up maximum endurance (holding) airspeed, or the maneuvering airspeed, whichever is lower;

(ii) To the maximum operating airspeed (Vmo/Mmo), or airspeed limited by cruise thrust buffet, or other flight limitations, whichever is lower.

(3) All permissible gross weights within the flight envelopes defined in paragraphs (1) and (2) of this definition.

(b) The *basic RVSM flight envelope* is the same as the full RVSM flight envelope except that the airspeed flight envelope extends:

(1) From the airspeed of the slats/flaps-up maximum endurance (holding) airspeed, or the maneuver airspeed, whichever is lower;
(2) To the upper Mach/airspeed boundary defined for the full RVSM flight envelope, or a specified lower value not less than the long-range cruise Mach number plus 0.04 Mach, unless further limited by available cruise thrust, buffet, or other flight limitations.

Section 2. Aircraft Approval

(a) An operator may be authorized to conduct RVSM operations if the Director General finds that its aircraft comply with this section.

(b) The applicant for authorization shall submit the appropriate data package for aircraft approval. The package must consist of at least the following:

(1) An identification of the RVSM aircraft group or the nongroup aircraft;
(2) A definition of the RVSM flight envelopes applicable to the subject aircraft;
(3) Documentation that establishes compliance with the applicable RVSM aircraft requirements of this section; and
(4) The conformity tests used to ensure that aircraft approved with the data package meet the RVSM aircraft requirements.

(c) *Altitude-keeping equipment: All aircraft.* To approve an aircraft group or a nongroup aircraft, the Director General must find that the aircraft meets the following requirements:

(1) The aircraft must be equipped with two operational independent altitude measurement systems.
(2) The aircraft must be equipped with at least one automatic altitude control system that controls the aircraft altitude –

(i) Within a tolerance band of ±65 feet about an acquired altitude when the aircraft is operated in straight and level flight under nonturbulent, nongust conditions; or
(ii) Within a tolerance band of ±130 feet under nonturbulent, nongust conditions for aircraft for which application for type certification occurred on or before April 9, 1997 that are equipped with an automatic altitude control system with flight management/performance system inputs.

(3) The aircraft must be equipped with an altitude alert system that signals an alert when the altitude displayed to the flight crew deviates from the selected altitude by more than:

(i) ±300 feet for aircraft for which application for type certification was made on or before April 9, 1997; or
(ii) ±200 feet for aircraft for which application for type certification is made after April 9, 1997.

(d) *Altimetry system error containment: Group aircraft for which application for type certification was made on or before April 9, 1997.* To approve group aircraft for which application for type certification was made on or before April 9, 1997, the Director General must find that the altimetry system error (ASE) is contained as follows:

(1) At the point in the basic RVSM flight envelope where mean ASE reaches its largest absolute value, the absolute value may not exceed 80 feet.
(2) At the point in the basic RVSM flight envelope where mean ASE plus three standard deviations reaches its largest absolute value, the absolute value may not exceed 200 feet.
(3) At the point in the full RVSM flight envelope where mean ASE reaches its largest absolute value, the absolute value may not exceed 120 feet.
(4) At the point in the full RVSM flight envelope where mean ASE plus three standard deviations reaches its largest absolute value, the absolute value may not exceed 245 feet.
(5) Necessary operating restrictions. If the applicant demonstrates that its aircraft otherwise comply with the ASE containment requirements, the Director General may establish an operating restriction on that applicant's aircraft to restrict the aircraft from operating in areas of the basic RVSM flight envelope where the absolute value of mean ASE exceeds 80 feet, and/or the absolute value of mean ASE plus three standard deviations exceeds 200 feet; or from operating in areas of the full RVSM flight envelope where the absolute value of the mean ASE exceeds 120 feet and/or the absolute value of the mean ASE plus three standard deviations exceeds 245 feet.

(e) *Altimetry system error containment: Group aircraft for which application for type certification is made after April 9, 1997.* To approve group aircraft for which application for type certification is made after April 9, 1997, the Director General must find that the altimetry system error (ASE) is contained as follows:

(1) At the point in the full RVSM flight envelope where mean ASE reaches its largest absolute value, the absolute value may not exceed 80 feet.
(2) At the point in the full RVSM flight envelope where mean ASE plus three standard deviations reaches its largest absolute value, the absolute value may not exceed 200 feet.

(f) *Altimetry system error containment: Non group aircraft.* To approve a non group aircraft, the Director General must find that the altimetry system error (ASE) is contained as follows:

(1) For each condition in the basic RVSM flight envelope, the largest combined absolute value for residual static source error plus the avionics error may not exceed 160 feet.

(2) For each condition in the full RVSM flight envelope, the largest combined absolute value for residual static source error plus the avionics error may not exceed 200 feet.

(g) If the Director General finds that the applicant's aircraft comply with this section, the Director General notifies the applicant in writing.

Section 3. Operator Authorization

(a) Authority for an operator to conduct flight in airspace where RVSM is applied is issued in operations specifications or a Letter of Authorization, as appropriate. To issue an RVSM authorization, the Director General must find that the operator's aircraft have been approved in accordance with Section 2 of this appendix and that the operator complies with this section.

(b) An applicant for authorization to operate within RVSM airspace shall apply in a form and manner prescribed by the Director General. The application must include the following:

(1) An approved RVSM maintenance program outlining procedures to maintain RVSM aircraft in accordance with the requirements of this appendix. Each program must contain the following:

(i) Periodic inspections, functional flight tests, and maintenance and inspection procedures, with acceptable maintenance practices, for ensuring continued compliance with the RVSM aircraft requirements.
(ii) A quality assurance program for ensuring continuing accuracy and reliability of test equipment used for testing aircraft to determine compliance with the RVSM aircraft requirements.
(iii) Procedures for returning non compliant aircraft to service.

(2) For an applicant who operates under part 121 or 135, initial and recurring pilot training requirements.
(3) Policies and Procedures. An applicant who operates under part 121 or 135 shall submit RVSM policies and procedures that will enable it to conduct RVSM operations safely.

(c) Validation and Demonstration. In a manner prescribed by the Director General, the operator must provide evidence that:

(1) It is capable to operate and maintain each aircraft or aircraft group for which it applies for approval to operate in RVSM airspace; and
(2) Each pilot has an adequate knowledge of RVSM requirements, policies, and procedures.

(d) Operators that have been issued an RVSM authorization, shall ensure that a minimum two airplanes of each (RVSM) aircraft type grouping of the operator have their height-keeping performance monitored, at least once every two years or within interval of 1000 flight hours per airplane, whichever period is longer.

Note: If an owner/operator aircraft type grouping consists of a single airplane, monitoring of that airplane shall be accomplished within the specified period above.

MINISTER FOR TRANSPORTATION
REPUBLIC OF INDONESIA,

ttd

IGNASIUS JONAN

Salinan sesuai dengan aslinya

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