PART II

FLIGHT AND NAVIGATIONAL INSTRUMENTS

General applicability of Part II

6. This Part prescribes the minimum requirements for flight and navigational instruments for aircraft operating in Trinidad and Tobago.

General Flight and Navigational Instruments Requirements

General requirements for flight and navigational instrument

7. (1) An operator of an aircraft shall ensure that such aircraft is equipped with flight and navigational instruments which shall enable—

(a) the flight crew to—

(i) control the flight path of the aircraft;

(ii) carry out any required procedural manoeuvres;

(iii) observe the operating limitations of the aircraft in the expected operating conditions; and

(b) the aircraft to proceed in accordance with—

(i) its operational flight plan; and

(ii) the requirements of Air Traffic Control, except when, if not prescribed by the Authority, navigation for flights under the visual flight rules is accomplished by visual reference to land marks at least every nautical miles.

(1A) the sixty nautical miles distance prescribed in subregulation (1) does not apply to air operators.

(2) An operator shall ensure that when a means is provided for transferring an instrument from its primary operating system to an alternative system, such means includes a positive positioning control and it shall be marked to indicate clearly which system is being used.

(3) An operator shall ensure that instruments used by a flight crew member are arranged in such a manner that would allow such flight crew member to see the indications readily from his station, with the minimum practicable deviation from the position and line of vision which he normally assumes when looking forward along the flight path.

(4) An operator shall ensure that all equipment is installed on an aircraft in such a manner that the failure of any single unit required either for communication or navigational purposes or both shall not result in the failure of another unit required for communication or navigational purposes.

(5) An operator shall ensure that his aircraft is equipped with the necessary instruments and equipment to ensure that in the event of the failure of one item of equipment at any stage of the flight, the remaining equipment shall enable the aircraft to be navigated in accordance with the—

(a) general, Minimum Navigation Performance Specifications; and

(b) Reduced Vertical Separation Minimum; and

(c) RNP type,

requirements of these Regulations where applicable.

Navigational Instruments

Minimum flight and navigational instruments

8. (1) An operator shall not operate an aircraft under Visual Flight Rules unless it is equipped with the following flight and navigational instruments:

(a) an airspeed indicating system calibrated in knots;

(b) a sensitive pressure altimeter calibrated in feet with a subscale setting calibrated in hectopascals or millibars, adjustable for any barometric pressure likely to be set during flight;

(c) an accurate timepiece indicating the time in hours minutes and seconds;

(d) a magnetic compass; and

(e) such additional instruments or equipment as may be required by the Authority.

(2) Where an operator intends to conduct operations in an aircraft under Visual Flight Rules as a controlled flight, he shall ensure that such aircraft is equipped with instruments specified under Regulation 10.

Instruments for Operations Requiring Two Pilots

Specific instrument required for operation requiring two pilots

9. (1) An operator shall ensure that, where two pilots are required to operate an aircraft, the stations of each pilot have separate flight instruments which include—

(a) an airspeed indicator calibrated in knots;

(b) a sensitive pressure altimeter calibrated in feet with a subscale setting calibrated in hectopascals or millibars, adjustable for any barometric pressure likely to be set during flight;

(c) a vertical speed indicator;

(d) a turn and slip indicator or a turn co-ordinator incorporating a slip indicator;

(e) an attitude indicator; and

(f) a stabilized direction indicator.

Instruments for Instrument Flight Rules Operations

Instrument Flight Rating instruments

10. (1) An operator shall not conduct operations in an aircraft under Instrument Flight Rules, at night or when the aircraft cannot be maintained in a desired attitude without reference to one or more flight instruments, unless such aircraft is equipped with—

(a) a magnetic compass;

(b) an accurate timepiece indicating the time in hours, minutes and seconds;

(c) a sensitive pressure altimeter calibrated in feet with a subscale setting calibrated in hectopascals or millibars, adjustable for any barometric pressure likely to be set during flight, with counter-drum pointer or equivalent presentation;

(d) an airspeed indicating system calibrated in knots with a means of preventing malfunctioning due to either condensation or icing;

(e) a turn and slip indicator for an aeroplane and a slip indicator for a helicopter;

(f) an attitude indicator for an aeroplane and two attitude indicators for a helicopter, one of which may be replaced by a turn indicator;

(g) a heading indicator;

(h) a means of indicating whether the supply of power to the gyroscopic instruments is adequate;

(i) a means of indicating in the flight crew compartment the outside air temperature;

(j) a rate-of-climb and descent indicator; and

(k) such additional instruments or equipment as may be required by the Authority.

(2) The requirements of *(e), (f)* and *(g)* may be met by combination of instruments or by integrated flight director system provided that the safeguards against total failure, inherent in the three separate instruments, are retained.

(3) An air operator shall not operate an aeroplane under Instrument Flight Rules, or at night or when the aircraft cannot be maintained in a desired attitude without reference to one or more flight instruments, unless such aircraft is equipped with—

(a) the instruments required under subregulation (1); and

(b) a sensitive pressure altimeter calibrated in feet with a subscale setting calibrated in hectopascals or millibars, adjustable for any barometric pressure likely to be set during flight, with counter-drum pointer or equivalent presentation.

(4) An air operator shall not operate a helicopter under Instrument Flight Rules, or at night or when the aircraft cannot be maintained in a desired attitude without reference to one or more flight instruments, unless such helicopter is equipped with—

(a) the instrument required under subregulation (1);

(b) an attitude indicator; and

(c) a stabilizing system.

(5) A stabilization system under subregulation (4)*(b)*, may not be required where it was demonstrated to the satisfaction of the State of Design that the helicopter possesses, by nature of its design, adequate stability without such stabilization system.

(6) An air operator shall not operate an aeroplane under Instrument Flight Rules, or under Visual Flight Rules over routes that cannot be navigated by reference to visual landmarks, unless such aeroplane is equipped with navigational equipment in accordance with the requirements of Air Traffic Control in the area of operations, that includes—

(a) one VHF Omni-Range receiving system, one Automatic Direction Finder system, one Distance Measuring Equipment and one Marker Beacon receiving system;

(b) one Instrument Landing System or Microwave Landing System where Instrument Landing System or Microwave Landing System is required for approach navigation purposes;

(c) an Area Navigational System when area navigation is required for the route being flown;

(d) an additional VHF Omni-Range receiving system to the requirements of paragraph *(a)*, on any route, or part thereof, where navigation is based only on VHF Omni- Range signals; and

(e) an additional Automatic Direction Finder system to the requirements of paragraph *(a)*, on any route, or part thereof, where navigation is based only on non-directional beacon signals.

(7) An operator shall ensure that an aircraft intended to land in Instrument Meteorological Conditions or at night is provided with radio navigation equipment capable of receiving signals that provide guidance to—

(a) a point from which a visual landing can be effected; or

(b) each aerodrome at which it is intended to land in Instrument Meteorological Conditions; and

(c) any designated alternate aerodrome.

(8) An air operator shall not conduct single-pilot Instrument Flight Rules operations unless the aeroplane is equipped with an automatic pilot with at least an altitude hold mode and a heading mode.

Standby Attitude Indicator

Standby attitude indicator

11. (1) An operator shall not operate—

(a) an aeroplane with a maximum certified take-off mass exceeding five thousand, seven hundred kilogrammes;

(b) an aircraft having a maximum approved passenger seating configuration of more than nine seats; or

(c) a Performance Class 1 helicopter or a Performance Class 2 helicopter, unless it is equipped with a single stand-by attitude indicator or artificial horizon indicator that—

(d) is operated and illuminated independently of any other attitude indicating system;

(e) is powered continuously during normal operations; and

(f) is automatically powered for a minimum of thirty minutes from a source independent of the normal electrical generating system, after a total failure of the normal electrical generating system.

(2) When the stand-by attitude indicator is operating on emergency power, such emergency power operation, shall be clearly indicated to the flight crew.

(3) When the stand-by attitude indicator is operating on its own power supply, there shall be an associated indication, either on the instrument or on the instrument panel that such power supply is in use.

(4) Where the stand-by attitude instrument system is installed and usable through flight attitudes of 360° of pitch and roll, the turn and slip indicator may be replaced by slip indicators.

Instruments and Equipment for Category II Operations

Instruments and Equipment for Category II Operations Schedule 1

12. An operator shall ensure that his aircraft engaged in Category II operations is installed with the instruments and equipment listed in Schedule 1 appropriate to its group.

Navigation Equipment for Operations in Airspace

Navigation equipment for operations in Minimum Navigational Performance Specifications airspace

13. (1) An air operator shall not operate an aeroplane in Minimum Navigation Performance Specifications airspace unless it is equipped with navigation equipment that—

(a) continuously provides indications to the flight crew of adherence to or departure from the defined track to the required degree of accuracy at any point along such track; and

(b) has been authorized by the Authority for Minimum Navigation Performance Specifications operations.

(2) An air operator shall ensure that—

(a) navigation equipment required for operations in Minimum Navigation Performance Specifications airspace are visible and usable by each pilot seated at his duty station;

(b) an aeroplane operating unrestricted in Minimum Navigation Performance Specifications airspace is equipped with two independent Long Range Navigation Systems; and

(c) an aeroplane operating in Minimum Navigation Performance Specifications airspace along notified special routes is equipped with one Long Range Navigation System, unless otherwise specified by the Authority.

(3) Where an operator is conducting operations in an aircraft in which a navigation specification for performance based navigation has been prescribed, he shall ensure that the—

(a) aircraft is equipped with navigation equipment that will enable it to operate in accordance with the prescribed navigation specifications; and

(b) operations of the aircraft are approved by the Authority.

(4) Where an operator is conducting operations in an aeroplane in defined portions of airspace based on a Regional Air Navigation Agreement and where a Reduced Vertical Separation Minimum of 1000 feet is applied between FL 290 and FL 410 inclusive, the operator shall ensure that the aeroplane-

(a) has the required equipment that is capable of—

(i) indicating to the flight crew the flight level being flown;

(ii) automatically maintaining a selected flight level;

(iii) automatically reporting pressure-altitude;

(iv) providing an alert at a maximum threshold of plus or minus 300 feet to the flight crew when a deviation occurs from the selected flight level; and

(b) is authorized by the Authority for the operations in the airspace concerned.

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