NB. AMENDED AREAS ARE MARKED IN RED

8.7.2 AIRCRAFT USED IN COMMERCIAL AIR TRANSPORT

8.7.2.1 APPLICABILITY

This Section prescribes aircraft performance and operating limitations for aircraft used in commercial air transport operations, except those aircraft holding a special authority or waiver by the Authority which exempt them from specific operating and performance limitations.

8.7.2.2 GENERAL

(1) Each person operating an aircraft engaged in commercial air transport shall comply with the provisions of Subpart 8.7.2.

(2) Each person operating a rotorcraft identified as Class 1, 2, or 3 in international commercial air transport shall comply with the code of performance in IS: 8.7.2.2(b).

(3) The Authority may grant exemptions in accordance with Part 1 of these Directives, from the requirements of Subpart 8.7.2 if special circumstances make a literal observance of a requirement unnecessary for safety.

(4) Where full compliance with the requirements of Subpart 8.7.2 cannot be shown due to specific design characteristics (e.g., seaplanes, airships, or supersonic aircraft), the operator shall apply approved performance standards that ensure a level of safety not less restrictive than those of relevant requirements of this Subpart.

(5) No person may operate a multiengine aircraft used for commercial passenger-carrying operations that does not meet the performance limitations specified in Subparts 8.7.2.4 through 8.7.2.10 as may be applicable unless that aircraft is continually operated—

(a) In daylight;

(b) In VFR, excluding over the top operations; and

(c) At a mass that will allow it to climb, with the critical engine inoperative, at least 15 m (50 ft.) a minute when operating at the MEAs of the intended route or any planned diversion, or at 1500 m (5,000 ft.) MSL, whichever is higher.

(6) Multi-engine aircraft that are unable to comply with paragraph (5) (c) are, for the purpose of this Subpart, considered to be a single engine

aircraft and shall comply with the requirements of paragraph 8.7.2.3(1).

(7) Helicopters shall be operated in accordance with a code of performance established by the Authority, in compliance with the applicable provisions of this Part.

Note1: The code of performance reflects, for the conduct of operations, both the various phases of flight and the operational environment. The Helicopter Code of Performance Development Manual (Doc 10110) provides guidance to assist States in establishing a code of performance.

(8) In conditions where the safe continuation of flight is not ensured in the event of a critical engine failure, helicopter operations shall be conducted in conditions of weather and light, and over such routes and diversions, that permit a safe forced landing to be executed.

(9) Notwithstanding the provisions of GCADs 8.7.2.2(8), the Authority may, based on the result of a risk assessment, allow for variations without a safe forced landing to be included in the Code of Performance established in accordance with the provisions of GCADs 8.7.2.2(7). The risk assessment shall take into consideration at least the following:

(a) the type and circumstances of the operation;

(b) the area/terrain over which the operation is being conducted;

(c) the probability of, and length of exposure to, a critical engine failure and the tolerability of such an event;

(d) the procedures and systems for monitoring and maintaining the reliability of the engine(s);

(e) the training and operational procedures to mitigate the consequences of the critical engine failure; and

(f) helicopter equipment.

Note.— Guidance on conduct of the risk assessment to allow for variations to the need for a safe forced landing, including mitigation strategies to reduce the risk, is contained in Doc 10110.

(10) Where the Authority permits IMC operations in performance Class 3, such operations shall be conducted in accordance with the provisions of GCADs 8.7.2.9

(11) The Authority shall ensure that the level of performance specified in GCADs 8.7.1.2 is met as far as practicable, for helicopters for which Part IV of Annex 8 is not applicable because of the exemption provided for in Article 41 of the Convention.

Note: Guidance on the level of performance intended by the provisions of this chapter is contained in Doc 10110.

8.7.2.3 SINGLE-ENGINE AND MULTI-ENGINE AEROPLANE OPERATIONS

(1) No person shall operate a single-engine aeroplane in commercial passenger-carrying operations unless that aeroplane is continually operated in daylight, VFR, and over such routes and diversions therefrom that permit a safe forced landing to be executed in the event of an engine failure.

(2) Notwithstanding paragraph (1) of this subsection, the Authority may approve single-engine operations in propeller-driven, turbine-powered aeroplanes under IFR, at night, or under IMC for aeroplanes with a maximum certificated take-off mass of 5 700 kg (12 566 lb) or less and a maximum approved passenger seating configuration of nine or less, provided it meets the equipment requirements of Part 7 of these Directives.

(3) The Authority may approve single-engine cargo or mail operations by a single pilot in propeller-driven, turbine-powered aeroplanes under IFR, at night, or under IMC for aeroplanes with a maximum certificated take-off mass of 5 700 kg (12 566 lb) if the aeroplane is type certificated, provided it meets the equipment requirements of Part 7 of these Directives and any other conditions that the Authority may deem necessary.

(4) No person shall operate a single-engine turbine-powered aeroplane either at night, in IMC or both unless

(a) the aeroplane has an engine trend monitoring system, and where the individual certificate of airworthiness for the aeroplane is first issued on or after 01 January 2005, it has an automatic trend monitoring system;

(b) the airworthiness certification of the aeroplane is appropriate and acceptable to the Authority; and

(c) the overall safety of the operation is consistent with commercial air transportation operations as provided by:

(i) The reliability of the turbine engine;

(ii) The operator's maintenance procedures, operating practices, and flight dispatch procedures;

(iii) Crew training programmes; and

(iv) Equipment and additional requirements provided in accordance with paragraph (5) of this subsection.

(5) IS 8.7.2.3 prescribes additional airworthiness and operational requirements applicable to the operation of single-engine, turbine-powered aeroplanes either at night, in IMC or both with respect to:

(a) Turbine engine reliability;
(b) Systems and equipment;
(c) MEL;
(d) Aircraft Flight Manual information;
(e) Event reporting;
(f) Operator planning;
(g) Flight crew experience, training, and checking;
(h) Route limitations over water; and
(i) Operator certification or validation.

(6) The Authority shall not grant an exemption for single – pilot commercial passenger operations.

IS 8.7.2.3 SINGLE-ENGINE AND MULTI-ENGINE AEROPLANE OPERATIONS

(1) An AOC holder shall not operate single-engine turbine-powered aeroplanes either at night, in IMC or both unless the following airworthiness and operational requirements have been satisfied by the operator and approved by the Authority:

(a) Turbine engine reliability shall be shown to have a power loss rate of less than 1 per 100 000 engine hours.

Note: Power loss in this context is defined as any loss of power, the cause of which may be traced to faulty engine or engine component design or installation, including design or installation of the fuel ancillary or engine control systems.

(b) To minimise the probability of in-flight engine failure, the engine shall be equipped with:

- An ignition system that activates automatically, or is capable of being operated manually, for take-off and landing, and during flight, in visible moisture;

- A magnetic particle detection or equivalent system that monitors the engine, accessories gearbox, and reduction gearbox, and which includes a flight deck caution indication; and

- An emergency engine power control device that permits continuing operation of the engine through a sufficient power range to safely complete the flight in the event of any reasonably probable failure of the fuel control unit.

(c) **SYSTEMS AND EQUIPMENT**. Single-engine turbine-powered aeroplanes approved to operate either at night, in IMC or both shall be equipped with the following systems and equipment intended to ensure continued safe flight and to assist in achieving a safe forced landing after an engine failure, under all allowable operating conditions:

- Two separate electrical generating systems, each one capable of supplying all probable combinations of continuous in-flight electrical loads for instruments, equipment, and systems required either at night, in IMC or both;

- A radio altimeter;

- An emergency electrical supply system of sufficient capacity and endurance, following loss of all generated power, to as a minimum:

A. Maintain the operation of all essential flight instruments, communication, and navigation systems during a descent from the maximum certificated altitude in a glide configuration to the completion of a landing;

B. Lower the flaps and landing gear, if applicable;

C. Provide power to one pitot heater, which shall serve an air speed indicator clearly visible to the pilot;

D. Provide for operation of the landing light specified in subparagraph (x) of this IS;

E. Provide for one engine restart, if applicable; and

F. Provide for the operation of the radio altimeter;

- Two attitude indicators, powered from independent sources;

- A means to provide for at least one attempt at engine re-start;

- Airborne weather radar;

- A certified RNAV system capable of being programmed with the positions of aerodromes and safe forced landing areas, and providing instantly available track and distance information to those locations;

- For passenger operations, passenger seats and mounts that meet dynamically tested performance standards and are fitted with a shoulder harness or a safety belt with a diagonal shoulder strap for each passenger seat;

- In pressurised aeroplanes, sufficient supplemental oxygen for all occupants for descent following engine failure at the maximum glide performance from the maximum certificated altitude to an altitude at which supplemental oxygen is no longer required;

- A landing light that is independent of the landing gear and is capable of adequately illuminating the touchdown area in a night forced landing; and

- An engine fire warning system.

(d) **MINIMUM EQUIPMENT LIST**. An AOC holder shall develop an MEL approved by the Authority that is appropriate to the type of single-engine turbine-powered aeroplane operated, specifying the operating equipment required for either at night, in IMC or both operations and for day/VMC operations.

(e) **AIRCRAFT FLIGHT MANUAL INFORMATION**. The Aircraft Flight Manual shall include limitations, procedures, approval status, and other information relevant to operations by single-engine turbine-powered aeroplanes either at night, in IMC or both.

(f) **EVENT REPORTING.** An AOC holder operating turbine-powered aeroplanes at night and/or in IMC shall report all significant failures, malfunctions, or defects to the Authority who in turn will notify the State of Design.

(g) **OPERATOR PLANNING**. Each AOC holder operating single-engine turbine-powered aeroplanes either at night, in IMC or both shall take account of all relevant information in the assessment of intended routes or areas of operation, including the following:

- The nature of the terrain to be overflown, including the potential for carrying out a safe forced landing in the event of an engine failure or major malfunction;

- Weather information, including seasonal and other adverse meteorological influences that may affect the flight; and

- Other criteria and limitations as specified by the Authority.

(h) Each AOC holder shall identify aerodromes or safe forced landing areas available for use in the event of engine failure and the position of these shall be programmed into the RNAV system.

Note 1: A "safe" forced landing in this context means a landing in an area in which it can reasonably be expected will not lead to serious injury or loss of life, even though the aeroplane may incur extensive damage.

Note 2: Operation over routes and in weather conditions that permit a safe forced landing in the event of an engine failure, as specified in paragraph 8.7.2.3(1) of this part is not required for aeroplanes approved in accordance with paragraph 8.7.2.3.(4)(c)(i) of this part. The availability of forced landing areas at all points along a route is not specified for these aeroplanes because of the very high engine reliability, additional systems and operational equipment, procedures, and training requirements specified in IS 8.7.2.3.

(i) **FLIGHT CREW EXPERIENCE, TRAINING AND CHECKING**. No person may serve as, and no AOC holder shall use, a flight crew member in single-engine turbine-powered aeroplanes engaged in commercial air transport unless he or she has completed the appropriate flight crew

member training as specified in this part and approved by the Authority. The AOC holder's approved flight crew training and checking shall be appropriate to night and/or IMC operations by single-engine turbine-powered aeroplanes, covering normal, abnormal, and emergency procedures and, in particular, engine failure, including descent to a forced landing in night and/or in IMC conditions.

(j) **ROUTE LIMITATIONS OVER WATER**.

i. An AOC holder shall not conduct over-water operations using single-engine turbine-powered aeroplanes operating either at night, in IMC or both except in areas of operation or over specific routes identified in the AOC holder's operations specifications.

ii. No AOC holder may conduct over water operations using single-engine turbine-powered aeroplanes operating either at night, in IMC or both except in accordance with procedures approved by the Authority in the AOC holder's OM for over-water operations covering flight beyond gliding distance from an area suitable for a safe forced landing/ditching having regard to the characteristics of the aeroplane, seasonal weather influences, including likely sea state and temperature, and the availability of search and rescue services.

(k) **OPERATOR CERTIFICATION OR VALIDATION.**

An AOC holder applying for operations specifications granting authorisation to conduct single-engine turbine-powered aeroplane operations either at night, in IMC or both shall demonstrate to the Authority, consistent with Part 9 of these Directives, the ability to conduct operations by single-engine turbine-powered aeroplanes either at night, in IMC or both through a certification and approval process specified by the Authority.