

ATTACHMENT 20-4 Additional Requirements for Approved Operations by Single-engine Turbine-powered Airplanes at Night and/or In Instrument Meteorological conditions (IMC)

This attachment was established in accordance with Article **202-1** of this AOR proper, and refer to the requirement of the flight crew experience addressed in the ICAO Annex 6, Part I, 5.1.2, 5.4, Appendix, Canadian Aviation Regulations Standard Part VII 723.24 and India Civil Aviation Requirement Section 3 Air Transport Series 'C' Part III.

1. In approving operations by single-engine turbine-powered airplanes at night and/or in IMC, the Operator shall ensure that the airworthiness certification of the airplane is appropriate and that the overall level of safety intended by the provisions of Aircraft Flight Operation Regulations and Regulations for Aircraft Airworthiness Certification and Maintenance Management is provided by:

1.1 the reliability of the turbine engine;

1.2 the operator's maintenance procedures, operating practices, flight dispatch procedures and crew training programs; and

1.3 equipment and other requirements provided in accordance with this Attachment.

2. Turbine engine reliability

2.1 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.

2.2 The operator shall be responsible for engine trend monitoring.

2.3 To minimize the probability of in-flight engine failure, the engine shall be equipped with:

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

2.3.2 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

2.3.3 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.

3. Systems and equipment

3.1 Single-engine turbine-powered airplanes approved to operate at night and/or in IMC 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:

- 3.1.1 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 at night and/or in IMC;
- 3.1.2 a radio altimeter;
- 3.1.3 an emergency electrical supply system of sufficient capacity and endurance, following loss of all generated power, to as a minimum:
 - 3.1.3.1 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;
 - 3.1.3.2 lower the flaps and landing gear, if applicable;
 - 3.1.3.3 provide power to one pitot heater, which must serve an air speed indicator clearly visible to the pilot;
 - 3.1.3.4 provide for operation of the landing light that is independent of the landing gear and is capable of adequately illuminating the touchdown area in a night forced landing.
 - 3.1.3.5 provide for one engine restart, if applicable; and
 - 3.1.3.6 provide for the operation of the radio altimeter;
- 3.1.4 two attitude indicators, powered from independent sources;
- 3.1.5 a means to provide for at least one attempt at engine re-start;
- 3.1.6 airborne weather radar;
- 3.1.7 a certified area navigation 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;
- 3.1.8 for passenger operations, passenger seats and mounts which meet dynamically-tested performance standards and which are fitted with a shoulder harness or a safety belt with a diagonal shoulder strap for each passenger seat;
- 3.1.9 in pressurized airplanes, 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;
- 3.1.10 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
- 3.1.11 an engine fire warning system.

4. Minimum equipment list

The operator shall require the minimum equipment list approved (as attachment 7) to specify the operating equipment required for night and/or IMC operations, and for day/VMC operations.

5. Flight manual information

The flight manual shall include limitations, procedures, approval status and other information relevant to operations by single-engine turbine-powered airplanes at night and/or in IMC.

6. Event reporting

6.1 Operator approved for operations by single-engine turbine-powered airplanes at night and/or in IMC shall report all significant failures, malfunctions or defects to the State of the Operator who in turn will notify the State of Design.

6.2 CAA shall review the safety data and monitor the reliability information so as to be able to take any actions necessary to ensure that the intended safety level is achieved. Operator will notify major events or trends of particular concern to the appropriate Type Certificate Holder and the State of Design.

7. Operator planning

7.1 Operator route planning shall take account of all relevant information in the assessment of intended routes or areas of operations, including the following:

7.1.1 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;

7.1.2 weather information, including seasonal and other adverse meteorological influences that may affect the flight; and

7.1.3 other criteria and limitations as specified by the State of the Operator.

7.2 An operator 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 area navigation system.

Note — A ‘safe’ forced landing in this context means a landing in an area at which it can reasonably be expected that it will not lead to serious injury or loss of life, even *though the airplane may incur extensive damage*.

8. Flight crew experience, training and checking

8.1 The PIC shall have instrument certificated and experience required as followings:

8.1.1 total flying experience at least 700 hours

8.1.2 total PIC flying experience at least 300 hours

8.1.3 total instrument flying experience as PIC at least 100 hours

8.1.4 total PIC flying experience on type at least 50 hours

8.1.5 PIC flying experience in the last six months on type at least 10 hours

8.1.6 total flying experience in night operations on type at least 10 hours

8.2 An operator’s 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.

9. Limitations

9.1 Route limitations

The flight plan route limitation for airplanes operating at steady wind weather condition, the gliding distance shall not beyond the distance from flight level at that time to an area suitable for a safe forced landing/ditching.

9.2 Passenger carried limitation

Operating a single-engine turbine-powered airplanes, passengers carried are limited to 8.

10. Operator certification or validation for operating night and/or in IMC

The operator shall demonstrate the ability to conduct operations by single-engine turbine-powered airplanes at night and/or in IMC through a certification and approval process specified by the State of the Operator.

11. All single-engine turbine-powered airplanes operating at Night and/or In Instrument

Meteorological conditions (IMC) shall be equipped with engine trend monitoring system. For the airplanes which the certificate of airworthiness is first issued on or after 1st of January 2005 shall be equipped with automatic turbine engine trend monitoring system.