

Chapter 1

Policy and General Information

1.1 General

- 1.1.1 This document provides the policy, procedures and guidelines for obtaining Type Design and/or Operational Approval for two-engine transport category aeroplanes to operate over a specified route containing a point farther than 60 minutes flying time at the designated single engine cruise speed (under standard conditions in still air) from an adequate airport regardless of terrain. The 60-minute threshold is a point beyond which the provisions of this publication will apply. Previously issued approvals for ETOPS/ EROPS programs will continue to be valid; requests for new ETOPS authorizations or changes to existing programs will be assessed under the criteria outlined in this document. Specific criteria are included for deviation of 75, 90, 120, or 138 minutes and beyond.

1.2 Applicability

- 1.2.1 This manual applies to all twin-engine aeroplanes with a MCTOW of more than 8618 KG (19,000 pounds) for which a Canadian type certificate has been issued authorizing the transport of 20 or more passengers (whether or not the individual aircraft are configured for more than 20 passengers or not) operated by a Canadian air operator in an air transport service. ETOPS does not apply to flights conducted wholly within Canadian Domestic Airspace.

1.3 Reference Regulations

- 1.3.1 Air operators utilizing aircraft described in section 1.2, above, must refer to CAR 705.26.

1.4 Approval Procedures

- 1.4.1 Operators requesting approval for Extended Range (ER) operations with two-engine aeroplanes shall submit their requests, with the required supporting documentation to the Department at least 90 days prior to the proposed start of extended range operations.

- 1.4.2 The Aeroplane type design shall meet the requirements for ETOPS design features and criteria (reference Chapter Two, Design Features and Criteria). Notwithstanding, ETOPS type design approval is not required for operators requesting approval to conduct 75 minute operations in benign areas of operations. However, the airframe-engine combination will be reviewed to determine if there are any factors that could effect the safe conduct of operations;
- 1.4.3 In addition, for ETOPS operations other than 75 minutes Benign, the following criteria shall be met prior to conducting extended range operations:
- a) the applicant shall satisfy the operational approval considerations contained in Chapter Three, Operational Approval Authority;
 - b) the applicant has a system to maintain and dispatch an ETOPS aircraft in accordance with an approved maintenance, reliability and training program that includes ETOPS requirements in Chapter Four, ETOPS Maintenance and Reliability Requirements;
 - c) the applicant shall demonstrate that the maintenance checks, servicing, and programs called for in Chapter 4 will be properly conducted at representative departure and destination airports;
 - d) the applicant shall also demonstrate that ETOPS flight release practices, policies, and procedures are established for operations to and from representative departure and destination airports; and
 - e) a validation flight, in the aeroplane or an approved simulator (as determined by Transport Canada Aviation (TCA) on an individual basis), shall incorporate demonstration of the following emergency conditions:
 - i) total loss of thrust of one engine;
 - ii) total loss of normal generated electrical power;
 - iii) any other condition considered to be equivalent in airworthiness, crew workload or performance risk.
- 1.4.4 When the foregoing has been reviewed and found acceptable, a recommendation from the Regional Director, Airworthiness (RDA) shall be forwarded to the Chief, Airline Inspection (AARXD), or RDAC as applicable, for approval and the applicant shall be issued an Operations Specification to conduct ETOPS operations within specified limitations.

1.5 Definitions

a) Airport

1. Adequate - for the purpose of ETOPS, an adequate airport is an airport, which the operator and TCA consider to be adequate, having regard to the performance requirements applicable at the expected landing weight. In particular, it should be anticipated that at the expected time of use:
 - i) the airport will be available, and equipped with the necessary ancillary services, such as ATS, lighting, communications, weather reporting, nav aids and emergency services; and
 - ii) at least one letdown aid will be available for an instrument approach.
2. Suitable - for the purpose of ETOPS, a suitable airport is an adequate airport with weather reports, forecasts or combination thereof, indicating that the weather conditions will be at or above minima outlined in this document and field condition reports indicate that a safe landing can be accomplished during the period of intended operation.

Note: Additional information contained in 3.4.6 and Appendix B.

b) Auxiliary Power Unit (APU)

A gas turbine engine intended for use as a power source for driving generators, hydraulic pumps and other aeroplane accessories and equipment and/or to provide compressed air for aeroplane pneumatic systems.

c) Benign Area of Operation

An area that provides numerous adequate airports and a high level of reliability and availability of communication, navigation and ATC services and facilities. Furthermore, an area where prevailing weather conditions are stable and generally do not approach extremes in temperature, wind, ceiling, and visibility.

d) Configuration, Maintenance and Procedures (CMP)

A document containing the minimum requirements for the aircraft configuration including any special maintenance tasks, life limits and Master Minimum Equipment List (MMEL)

constraints necessary to establish and maintain the suitability of an airframe-engine combination for extended range operations.

e) Demanding Area of Operation

An area that has one or more of the following characteristics:

1. prevailing weather conditions can approach extremes in winds, temperature, ceiling, and visibility for prolonged period of time;
2. few alternate airports;
3. due to remote or overwater area, a high level of reliability and availability of communications, navigation, and ATC services may not exist.

f) Engine

The basic engine assembly plus its essential accessories as supplied by the engine manufacturers.

g) Engineering Judgement

A subjective decision required due to the complexity of an issue based upon a qualitative analysis of relevant data.

h) Extended Range (ER) or ETOPS Operations

For the purpose of this document, extended range operations are those operations conducted over a specified route that contain a point further than 60 minutes flying time at the specified single engine cruise speed (under standard conditions in still air) from an adequate airport.

i) ER (or ETOPS) Area of Operation

The area in which an operator is authorized to conduct a flight under ETOPS regulations. It is defined by circles centred on the adequate airports, the radius of which is the allowed maximum diversion distance (maximum diversion distance equals approved maximum diversion time multiplied by the approved single engine cruise speed).

j) ER Entry Point (EEP)

The EEP is the point located on the aircraft's outbound route at one hour flying time at the approved one-engine inoperative speed (in ISA conditions and still air) from the last adequate airport prior to entering the extended range segment. It marks the beginning of the extended range segment.

k) ER segment

The extended range segment starts at the EEP and ends at the point where the route is continuously within the 60-minute area from an adequate airport for the duration of the flight.

l) ER Sensitive Event

An ER sensitive event is any occurrence that could be detrimental to ER operations. This includes, but is not limited to, in-flight shutdowns; diversions or turnbacks; uncommanded power changes or surges; inability to control the engine or obtain desired power; and problems with systems critical to ETOPS.

m) Fail-Safe

Fail-safe is the design methodology upon which Airworthiness Standards for Transport Category Aeroplanes are based. It requires that the effect of failures and combinations of failures must be considered in defining a safe design.

n) In-Flight Shutdown (IFSD)

When an engine ceases to function in flight and is shut down, for any reason (i.e., including flameout, internal failure, crew-initiated shut-off, foreign object ingestion, icing, inability to obtain and/or control desired thrust, etc.)

o) Power Plant

A system consisting of an engine and all ancillary components installed on the engine prior to installation on the aeroplane to provide and control power/thrust and for the extraction of energy.

p) Single Engine Cruise Speed (or One-Engine-Inoperative Cruise Speed)

1. The approved single engine cruise speed for the intended area of operation shall be a speed, within the certified limits of the aeroplane, selected by the operator and approved by Transport Canada Aviation.
2. The operator shall use this speed in:
 - i) establishing the area of operations and any dispatch limitations;
 - ii) calculation of single engine fuel requirements under section 3.4.5 (Fuel and Oil Supply) of TP6327; and
 - iii) establishing the level off altitude (net performance) data. This level off altitude (net performance) must clear any obstacles en route by margins as specified in applicable operating rules.

q) System

A system includes all elements of equipment necessary for the control and performance of a particular major function. It includes both the equipment specifically provided for the function in question and other basic equipment such as that required to supply power for the equipment operation.

1. Airframe System - any system on the aeroplane that is not a propulsion system.
2. Propulsion System - the aeroplane power plant installation including each component that: is necessary for propulsion, affects the control of the major propulsion units or affects the safety of the major propulsion units (Airworthiness Manual 525.901(a)).

r) Unacceptable Thrust-Loss

Total thrust-loss or loss of thrust to an extent that precludes continued controlled flight to an adequate airport.

1.6 Continuity of ETOPS

- 1.6.1 Due to the special nature of ETOPS an operator is required to maintain processes and procedures once ETOPS approval is issued.
- 1.6.2 Where a carrier ceases ETOPS operations for a period exceeding 13 months, application for re-instatement must be submitted. Recommendation from the Regional Director, Airworthiness

must be forwarded to the Chief, Airline Inspection or Regional Director, Air Carrier, as appropriate, for approval, prior to conducting such operations.