



## C Series

# ETOPS Courses (Extended Twin Engine Operations)

### Course Description

- ETOPS (Extended Twin Engine Operations) is the acronym created by ICAO (International Civil Aviation Organisation) to describe the operation of twin-engine aircraft over a route that contains a point further than one hour's flying time from an adequate airport at the approved one-engine inoperative cruise speed.
- ETOPS rules are based on operational regulations, typically promulgated by EU OPS and transferred to the operator's documentation.
- Some Bombardier CS100/300-operators seek ETOPS approval as well.
- Specific rules rest entirely with the operator.
- Training for ETOPS is not simply a matter of learning piloting skills for flying the aircraft, but rather understanding the long-range operation and the associated additional rules in respect to flight planning and inflight contingencies and decision making.

### Aircraft Type

- C Series CS100 and CS300 (BD-500)

### Course Goal

- The aim of the respective training is to fulfil the operator's training requirements.

### Course Structure and Duration

- Self-study WBT/CBT and/or classroom lecture
- One FFS-Session 4.00 hours (two ETOPS scenarios)

■ Self-study / WBT   □ Classroom   ■ Training on system trainer   ■ Practical training on FFS   T Theoretical test   T Practical test

Theoretical training is performed during a four-hour classroom session. The following topics are addressed:

### Theoretical Training and Checking

#### 1. Aircraft System Reliability

- Propulsion System Reliability
  - Propulsion system reliability is the most vital aspect of ETOPS and must be sufficient to ensure that the probability of a double engine failure from independent causes is lower than defined limits.
- Electrical Power Sources Redundancy
  - A sufficient number of reliable, independent and non-time-limited electrical power sources (at least three) must be available to ensure that basic aircraft functions including communication, navigation, and basic flight instrumentation remain available.
  - Engines and APU electrical generators must provide full technical electrical power availability throughout the normal flight envelope.
  - Every ETOPS aircraft is equipped with an emergency-standby generator which means that there are a total of four independent generators.
  - The design intent is to obtain dispatch flexibility when planning/conducting an ETOPS mission.

- APU Design
  - APU must be designed to have airstart capability throughout the normal flight envelope and cold start capability at all certified operating temperatures.
- Emergency-Standby Electrical Generator Design
  - In the event of any single failure or combination of failures, electrical power is still provided for essential equipment.
  - All information provided to the flight crew remains sufficiently accurate.
- System Redundancy after Engine Failure
  - During single-engine operation, the remaining electrical, hydraulic, and pneumatic power should continue to be available at levels necessary for a safe flight and landing.

## 2. Aerodrome Classification

- Adequate aerodrome
- Suitable aerodrome

## 3. ETOPS Operational Topics

- Maximum Diversion Time
  - The maximum diversion time (typically 180 minutes) from an en-route alternate airport is granted by the operator's national authority and is included in the individual airline's operating specifications
- One-Engine-Out Diversion Speed Schedule
- Critical Fuel Scenarios
- Operating and Planning Minima
  - Preflight Minima
  - Inflight Minima

### Practical Training and Checking

- The practical training is performed during a four-hour-FFS mission.
- Every pilot performs two ETOPS scenarios.
- The simulator's repositioning function is used to set the aircraft into the ETOPS area to start the exercises.
- ETOPS competence is not addressed during a type rating skill test.
- Consequently, there is no requirement to perform an ETOPS exercise during a skill test.

### Training Documents

- FTA offers a generic ETOPS handout.
- Specific operator's rules are documented in the airline's own operational manual.