



PRINCIPLE

(OPS.06) Extended diversion time operations

May 2024



Acknowledgement of Country

The Civil Aviation Safety Authority (CASA) respectfully acknowledges the Traditional Custodians of the lands on which our offices are located and their continuing connection to land, water and community, and pays respect to Elders past, present and emerging.

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Terminology

Acronyms and abbreviations

Table 1. List of acronyms and abbreviations

Acronym/abbreviation	Description
AEC	airframe/engine combination
AEO	all engines operative
AFM	aircraft flight manual
APU	auxiliary power unit
AWI	airworthiness inspector
CDL	configuration deviation list
CFR	critical fuel required
CFSS	cargo fire suppression system
CMP	configuration, maintenance and procedures
CMR	certification maintenance requirements
CP	critical point
ECM	engine condition monitoring
EDTO	extended diversion time operations
FSTD	flight simulation training device
EEP	EDTO entry point
EMPM	EDTO maintenance procedures manual
ETA	estimated time of arrival
ETP	equal time point
EXC	excess fuel
EXP	exit point
FOB	fuel on board
FOI	flight operations inspector
ICA	instruction for continuing airworthiness
ICAO	International Civil Aviation Organization
IFSD	in-flight shut down

Acronym/abbreviation	Description
ISA	international standard atmosphere
MDT	maximum diversion time
MEL	minimum equipment list
MMEL	master minimum equipment list
MPD	maintenance planning document
MPM	maintenance procedures manual
NAA	national aviation authority
OEI	one-engine-inoperative
OEM	original equipment manufacturer
OFP	operational flight plan
RFFS	rescue and firefighting service
TCDS	type certificate data sheet
TLS	time-limited system

Definitions

Table 2. List of definitions

Term	Definition
airframe/engine combination	A combination of aeroplane model and engine model which has been identified for the purpose of EDTO certification (also called type design and reliability approval) or authorised for EDTO. EDTO certification of a given aeroplane/engine combination is identified on the type certification datasheet (TCDS)
adequate aerodrome	<p>in relation to a flight of an aeroplane, means an aerodrome that complies with the following:</p> <ul style="list-style-type: none"> (a) an authorised weather forecast for the aerodrome must be available for the aeroplane's estimated time of use of the aerodrome (b) the aerodrome's services and facilities must be operational for at least the estimated time of use (c) the landing distance available for the aeroplane must be at least the landing distance required under these Regulations for the aeroplane's landing at the aerodrome (d) for an IFR flight—at least one authorised instrument approach procedure that is suitable for use by the aeroplane must be operational for at least the estimated time of use

Term	Definition
configuration, maintenance and procedures (CMP)	<p>means a document, provided by the manufacturer of an aeroplane and as existing from time to time, that:</p> <p>(a) specifies the minimum requirements for the aeroplane's configuration, including any special inspections, flight crew procedures, hardware life limits, master minimum equipment list (M MEL) constraints and maintenance practices necessary to establish the suitability of the airframe/engine combination for extended diversion time operations; and</p> <p>(b) is approved by the certification authority for the aeroplane</p>
critical point	<p>means a point en route during a flight of an aeroplane, determined by the operator or the pilot in command for the flight before the flight commences, at which the aeroplane can:</p> <p>(a) if it arrives at the point with adequate fuel to complete the flight to the planned destination aerodrome while maintaining the fuel required to continue to that aerodrome; or</p> <p>(b) otherwise—divert to an en-route alternate aerodrome while maintaining the fuel required</p>
diversion time	in relation to an aeroplane and an EDTO, means the time it would take for the aeroplane to fly from a point on a route, occurring beyond the threshold distance for the aeroplane, to an adequate aerodrome for the aeroplane
extended diversion time operation	means an operation in which an aeroplane is flown further from an adequate aerodrome for the aeroplane than the threshold distance for the aeroplane
EDTO critical fuel scenario	Means the fuel quantity necessary to fly to an en-route alternate aerodrome considering, at the most critical point on the route, the most limiting system failure
EDTO en-route alternate aerodrome	means an adequate aerodrome that is selected as an EDTO en-route alternate aerodrome under section 4.19 of the Part 121 Manual of Standards, for use in the event of a diversion during an EDTO
EDTO entry point	means the first point on a route at which an aeroplane exceeds the threshold distance from an adequate aerodrome
EDTO exit point	means the first point on a route at which an aeroplane enters the threshold distance from an adequate aerodrome
EDTO significant system	<p>means:</p> <p>(a) an aeroplane's propulsion system; or</p> <p>(b) any other aeroplane system:</p> <p>(i) whose failure or degradation could adversely affect the safety of an EDTO flight conducted by the aeroplane; or</p> <p>(ii) the functioning of which is important to continued safe flight and landing during a diversion</p>
en-route alternate aerodrome	means an alternate aerodrome that is an en-route alternate (within the meaning of Annex 2 to the Chicago Convention)

Term	Definition
holding fuel	means the amount of fuel required by an aeroplane to fly for the period of time anticipated for holding (taking into account the operating conditions), calculated at the holding fuel consumption rate established for the aeroplane for the anticipated meteorological conditions or international standard atmosphere (ISA)
in-flight shutdown	means an engine of an aeroplane: (a) ceasing to function normally in flight for any reason; and (b) shutting down, whether the shutting down is: (i) self-induced; or (ii) initiated by a crew member; or (iii) caused by some other external influence
maximum diversion time	means the maximum time approved by CASA for an operator to conduct an EDTO using a particular aeroplane and airframe/engine combination
time-limited system	means any EDTO significant system: (a) on whose availability the duration of a flight of an aeroplane depends; and (b) whose capacity has a time limit
threshold distance	in relation to an aeroplane, means the distance mentioned in subparagraph 121.030(1)(b)(ii) for the aeroplane
threshold time	The range, expressed in time, established by the State of the Operator, to an en-route alternate aerodrome, whereby any time beyond requires an EDTO approval from the State of the Operator

Reference to regulations

Unless specified otherwise, all subregulations, regulations, Divisions, Subparts and Parts referenced in this Principle are references to the *Civil Aviation Safety Regulations 1998* (CASR).

Reference to type design and certification documents – EDTO

A reference, in any of the following documents, to 'ETOPS':

- a flight manual
- a type certificate data sheet or a supplement to the sheet
- a CMP document

is, for the purposes of this principle, taken to be a reference to extended diversion time operations (EDTO).

1. EDTO specific approval requirements

1.1 General

Inspectors will use this principle to assess an operator's readiness to hold an approval under regulation 121.010 for extended diversion time operations (EDTO). The scope of the assessment is conducted in accordance with the guidance provided in ICAO Doc 10085—Extended Diversion Time Operations (EDTO) Manual.

EDTO approval requirements consider 2 aeroplane configurations:

1. aeroplanes with 2 turbine-engines
2. aeroplanes with 3 or 4 turbine-engines.

The operator must complete all sections of application form 977 and provide the evidence necessary to support the application.

1.2 Type design approval

CASA does not issue a type design approval, but rather relies on the EDTO certification of the State of design. The type design of the aeroplane must be approved for EDTO with at least the diversion time limit requested by the operator, as evidenced in any of the following documents for the aeroplane:

- the flight manual
- the type certificate data sheet or a supplement to the sheet
- the CMP document.

Aeroplane airframe/engine combination (AEC)

EDTO approvals are specific approvals typically granted individually by the aeroplane airframe/engine combination (AEC). However, approvals may be combined for model variations within the same aeroplane family (e.g. 737-700/800, A320/A321).

Example

An EDTO approval for a B777-300 fitted with GE engines does not apply to a B777-300 fitted with Trent engines. Each AEC must be assessed and approved.

1.3 EDTO approval

CASA must be satisfied that the operator has both the capability and competence to safely conduct and adequately support EDTO operations. Operators will specify their requested maximum diversion time (MDT) when making application for approval.

The assessment for EDTO considers 2 MDT scenarios:

1. up to and including 180 minutes MDT
2. beyond 180 minutes MDT.

Note: CASA does not require specific operational experience to support a requested MDT.

When considering an application for EDTO, the inspector must take into account:

- the number of aerodromes in the area of operations
- the weather conditions normally prevailing in the area

- the availability of communications
- the safety and reliability of operations conducted with the AEC and any additional minimum equipment list (MEL) restrictions.

1.3.1 Aeroplanes with 2 turbine engines

For the requested MDT for a specific 2 turbine-engine aeroplane, the inspector must take into consideration the following as applicable:

- the aeroplane certified MDT for the AEC
- the time limit for the cargo fire suppression system (CFSS), reduced by 15 minutes
- the time limit for the most EDTO significant time-limited system (other than CFSS), reduced by 15 minutes.

1.3.2 Aeroplanes with more than 2 engines

There are no specific categories for EDTO authorisation for operations with transport category aeroplanes with more than 2 turbine engines. That is, there are neither specific diversion time categories nor specific methods of authorisation.

The assessment will involve a review of the time capabilities of the relevant EDTO time-limited systems (TLSs). This review should be performed, even though EDTO certification is not required for an aeroplane with more than 2 engines, to consider the relevant TLS. The most limiting TLS must be reduced by 15 minutes to calculate the maximum diversion time. On most aeroplanes with more than 2 engines, the only relevant TLS is the cargo fire protection system.

1.4 EDTO proving flights

The decision to conduct a proving flight will depend on the operator's experience and the inspector's confidence that the operator can conduct EDTO safely. Validation of an operator's capability may be limited to onsite demonstration of their flight planning, operational control and communication facilities.

Where an operator is new to EDTO, the inspector should consider a proving flight on the operator's proposed routes. For an operator with previous EDTO experience, the inspector may conduct a proving flight where there has been a significant change to the operator's area of operations or MDT.

The intent of the proving flight is to validate an operator's procedures and ensure that the required EDTO flight operations and maintenance (as applicable) processes and procedures can support the requested MDT.

The proving flight should validate:

- flight planning procedures
- pre-flight procedures
- operational control (including inflight communications)
- inflight diversion strategies
- passenger recovery plans (if required).

The proving flight may be conducted concurrently with the introduction of a new aeroplane or, where the operator is not introducing a new aeroplane type, on the inaugural EDTO flight.

A proving flight conducted in an approved flight simulation training device (FSTD), representing the relevant aeroplane type/model, should be planned to validate the operator's systems as if the flight was conducted in an aeroplane.

Where conducted in an FSTD, the inspector must ensure the operator is able to provide simulated operational control. The scenario must be of sufficient length to validate the operators' systems and could include an inflight diversion to the EDTO alternate.

Note: the proving flight does not need to operate to the MDT requested but should demonstrate EDTO procedures in practice.

1.5 Assessment instructions

ICAO Doc 10085—*Extended Diversion Time Operations (EDTO) Manual* forms the principle for the assessment of an application to operate in the EDTO.

To access the ICAO documents, you will need to request an individual username and password from ICAO to gain access to ICAO's secure portal. Use the following link for guidance on how to setup your secure account: [How to access secure ICAO documents and downloads \(sharepoint.com\)](https://www.sharepoint.com/How-to-access-secure-ICAO-documents-and-downloads)

Once you have set up your username and password, use the following link to log in: <http://portal.icao.int>

1.5.1 Assessment worksheet user instructions

This principle provides guidance to the inspector when using the associated Worksheet (OPS.06) Extended diversion time operations. The worksheet provides inspectors with a regulation-based tool for recording the outcomes of the assessment. It is set out as follows:

- user instructions
- assessment worksheets
- assessment summary
- approval data sheet.

2. Aircraft airworthiness considerations

The term 'aircraft airworthiness considerations for EDTO' refers to the assessment for EDTO of the type design, reliability and maintenance program of the concerned aircraft model (i.e. a given AEC) for EDTO. The aim of this assessment is to ensure that:

- the design features are suitable for the intended EDTO operations (equipment required for EDTO should be properly identified)
- the reliability of relevant aircraft systems is suitable for the intended EDTO operations (modifications to systems that may be necessary to achieve the desired level of reliability should be properly identified)
- the aircraft maintenance and reliability programs can contribute to maintaining the desired level of reliability of relevant aircraft systems for EDTO (special maintenance program requirements for EDTO should be properly identified).

Chapter 2 of ICAO Doc 10085 is not relevant; CASA relies on the State of design certification.

3. EDTO Flight operations requirements

Use chapter 3 of ICAO Doc 10085 for this assessment.

4. EDTO Maintenance and reliability requirements

Use chapter 4 of ICAO Doc 10085 for this assessment.

5. Revision history

Amendments/revisions for this principle are recorded below in order of the most recent first.

Table 3. Revision history table

Version No.	Date	Parts / Sections	Details
1.1	May 2024	Section 1.3	Addition of accelerated EDTO process
1.0	February 2024	All	First issue