

EXTENDED DIVERSION TIME OPERATIONS (EDTO) APPROVAL

1.0 PURPOSE

- 1.1 This Advisory Circular is issued to provide a summary to the industry on Extended Diversion Time Operations (EDTO) approval under the Civil Aviation Regulations.

2.0 REFERENCE

- 2.1 Regulations 106,107 and 109 of the Civil Aviation (Operations of Aircraft - Commercial) Regulations 2018
2.2 Form : AC - GEN022

3.0 GUIDANCE INFORMATION

3.1 Initial Contact

- 3.1.1 The application process begins with a visit, phone call, or e-mail to the flight operations Department.

3.2 Pre Application Phase:

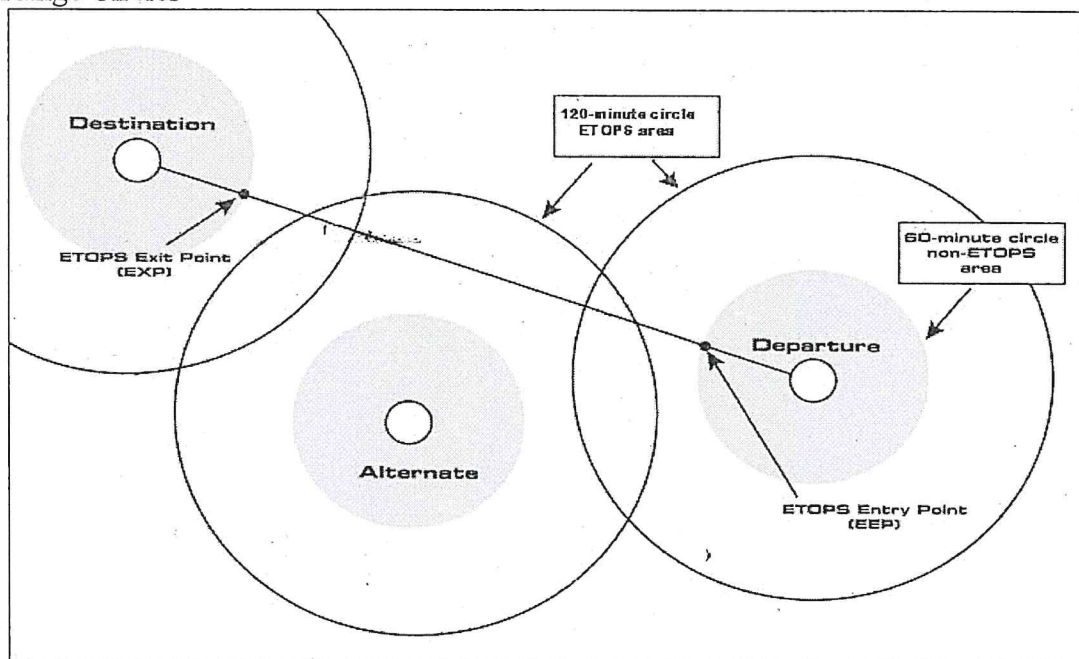
- 3.2.1 The flight operations Department will evaluate the application and determine the complexity of the proposed operation for the establishment of a certification team.

3.3 Initial Meeting.

- 3.3.1 The CPM shall arrange for a pre application meeting with the applicant to discuss the formal application requirements. These shall include the following:
- a) Identify all of the Point of Contact (POC) for the operator;
 - b) Discuss the EDTO Program Deficiencies the applicant may have;
 - c) Identify Appropriate Regulations and Guidance Materials;
 - d) Documentation to show that they have policies, procedures, and training programs for Flight Crew, Flight operations officers and Maintenance personnel to conduct EDTO;
 - e) Training program curriculum for approval;
 - f) EDTO Maintenance Procedures Manual;
 - g) Minimum Equipment List;
 - h) Aircraft Maintenance Program;
 - i) EDTO Operations Manual;
 - j) Policies and processes that the operator will use to collect, monitor, evaluate, and maintain records for their EDTO operations; and

- k) The engine out speed that applicants will submit for approval will be the basis for EDTO calculations. In addition, the applicant should provide a graphical display in the form of range circles for the proposed area of operation (see Figure below)

Range Circles



Note 1:

When the in service method is used, the applicant must understand that all training, processes, and procedures required for EDTO must already be in place prior to submitting their application.

Note 2:

Due to the unique and demanding nature of EDTO, Operators are urged to provide EDTO training to individuals conducting flight locating services or who have operational control responsibility.

3.4 Formal Application

3.4.1 The application package shall contain:

- a) The formal application Letter.
- b) Defined processes, procedures, and related resources being allocated to initiate and sustain EDTO operations. These processes, procedures, and related resources are typically referred to as the Operators EDTO program.
- c) A commitment by management and all personnel involved in EDTO flight operations and maintenance.
- d) The applicant must describe in detail how they will address the applicable flight operations requirements as defined in the applicable regulations.
- e) Description in detail how they will address each of the maintenance elements as defined in the applicable Regulations.
- f) EDTO authorization requested (e.g., 120 or 180 minutes).
- g) Proposed routes.
- h) Dispatch policies and procedures.
- i) Requested method of approval (in service or accelerated).

Note 3:

The method the applicant chooses requires the identification of a formal timeline.

- j) Documented plan for compliance with requirements of accelerated EDTO (if applicable).
- k) An approved airplane/engine combination, including engine out speed, those EDTO calculations will be based on.

3.5 Document Evaluation (Phase 3)

3.5.1 The CPM shall confirm whether the applicant included all of the required elements in their application package. If the applicant included all of the elements in the application package, then the inspector will continue with the evaluation process. If there are missing or incomplete elements, the CPM sends written notification to the operator describing the shortfalls.

3.5.2 After the inspector accepts the completed application package and the defined EDTO processes it contains, inform the operator to begin the execution of their demonstration plan.

3.5.3 The operator will complete the demonstration plan under the Authority's observation.

3.6 Demonstration (Phase 4)

3.6.1 The demonstration plan must include how the applicant intends to validate each of the process elements required to attain EDTO authorization. This plan will spell out in sufficient detail how the applicant intends to ensure that each required process works.

3.6.2 Ensure that there is a reliable method of communication between the aeroplane and the airline during the flight.

Note 4:

This is a living document and it can change many times.

- 3.6.3 The demonstration plan must ensure that each EDTO process is:
- a) Defined;
 - b) Demonstrated;
 - c) Analysed;
 - d) Amended (if required);
 - e) Revalidated; and
 - f) Proven (prior to EDTO authorization).
- 3.6.4 The demonstration plan may include validation through simulation; however, the regulations require final validations be conducted in the aircraft/engine combination that the prospective operator proposes to be used in their EDTO operation.
- 3.6.5 The final step in the Demonstration plan is the validation flights. The applicant cannot institute the validation flight portion of the demonstration until the Authority develops scenarios.
- 3.6.6 If the validation flight process is successful, then the operator may be granted EDTO approval.

3.7 METHODS FOR OBTAINING ETOPS OPERATIONS APPROVAL

There are two methods for obtaining an ETOPS approval, depending on the availability and amount of prior experience with the candidate airframe/engine combination:

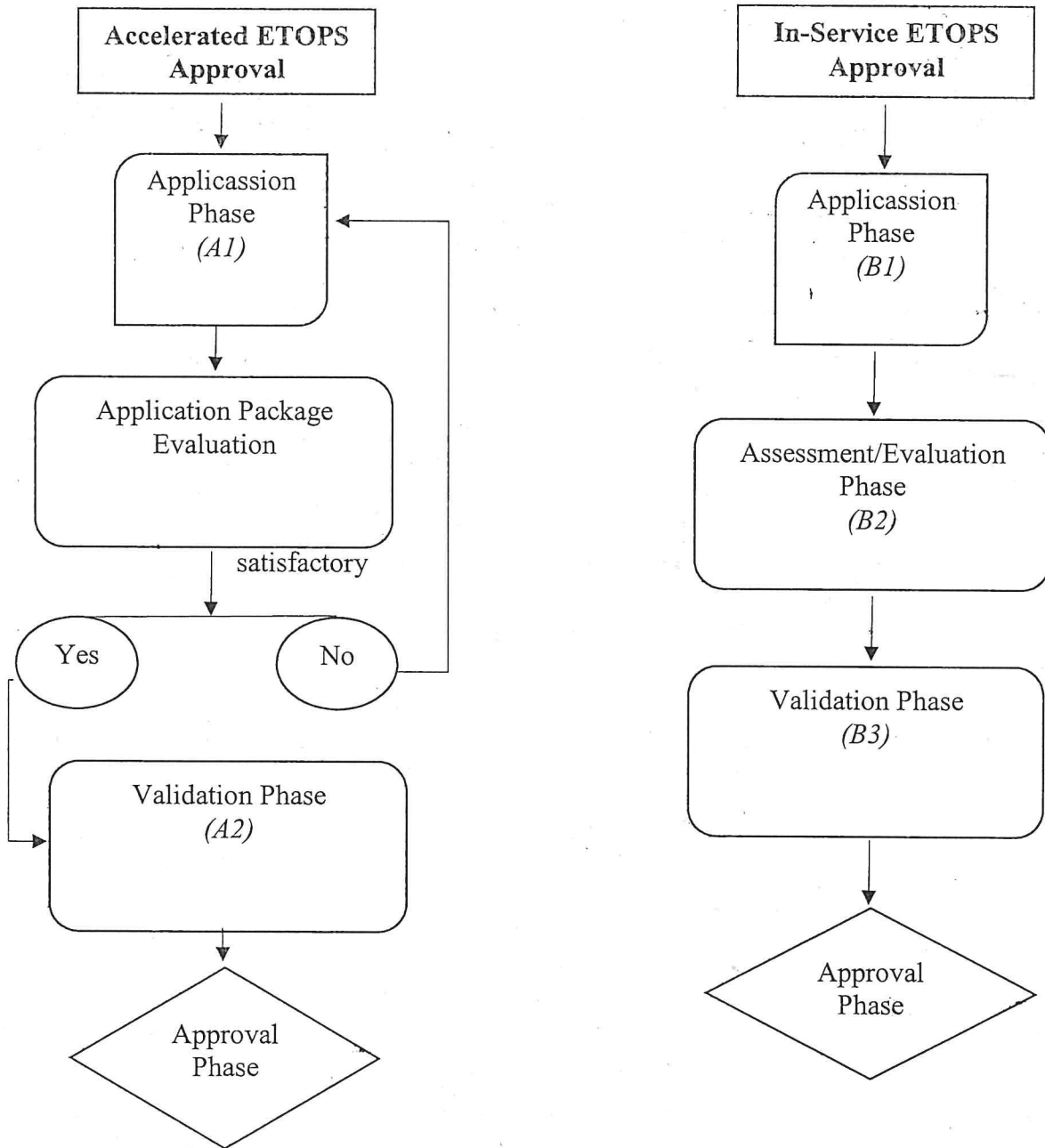
“Accelerated ETOPS approval”, does not require prior in-service experience with the candidate airframe/engine combination;

“In-service ETOPS Approval”, based on a pre-requisite amount of prior in-service experience with the candidate airframe/engine combination. Elements from the “accelerated ETOPS approval” method may be used to reduce the amount of prior in-service experience.



Civil Aviation Authority

Appendix 1
METHODS FOR OBTAINING ETOPS OPERATIONS APPROVAL



Notes A;

A1-Application package Shall contains as a minimum;

- a) Operational approval Plan
- b) Process elements
- c) Elements Documentation

A2-Validation process shall involve;

- a) Reduction in validation requirements is applicable
- b) Validation programme
- c) Validation documentation
- d) Validation of continuing airworthness and capability

Note B

B1-Capability Report

B2-Assessment of the operators' propulsion system reliability

B3- Validation of continuing airwothness and operations capability

**EXTENDED DIVERSION TIME OPERATION (EDTO)-APPLICATION APPROVAL
FORM**

1. General Application Information

Applicant Name		
Designated Representative/Post-holder:	Signature:	Date:

1.1	Aeroplane Registration	
	Aeroplane Manufacturer	
	Aeroplane Type Designation/Model Designation	
	Aeroplane Serial Number	
	Engine Manufacturer	
	Engine Type Designation/Model Designation	
	APU Manufacturer	
	APU Type Designation	

Scope of Application	Assessment			
	YES	NO	N/C	N/A
1) Application for EDTO 120 minutes				
2) Application for EDTO 180 minutes				
3) Application for EDTO 240 minutes				
4) Application for EDTO >240 minutes				
5) Other: (e.g. 138, 207 minutes etc)				
6) Initial request for EDTO approval for approval				
7) for aeroplane type / model				
8) Aircraft Entry into Service (EIS)				
9) Accelerated approval (Any time frame greater than 90 minutes at EIS)				
Application is based on CMP Document Reference No.:				

Note: For the situation, either world fleet data or similar and/or other relevant aircraft type experience data should be presented as a supplement.

2. Airworthiness Information

Type Design Approval for referenced Aeroplane Type Designation

The EDTO type design approval is reflected in:

Type Certificate	AFM	AFM Supplemental type Certificate	Type Certificate Data Sheet	Other
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The Aeroplane Flight Manual / Supplement shows following airworthiness approval for EDTO systems installation:

EDTO ----- minutes

Eligibility for referenced Aeroplane Serial Number	Assessment			
	YES	NO	N/C	N/A
1) Do you comply with the titles and numbers of all modifications, additions and changes which were made in order to substantiate the incorporation of the CMP standard in the aeroplane?				
2) CMP compliance list established?				

Applicant's Experience and Propulsion System Reliability (*)

Number of months/years of operational experience with specific airframe/engine combination

Item	Data
1) Total number of long range and/or domestic operations conducted with specific airframe/engine combinations	
2) Number of domestic segments Number of long range segments	
Operator's total number of airframe/engine hours and cycles with specific airframe/engine combination:	
1) Total airframe fleet hours	
2) Total airframe fleet cycles	
3) Total engine hours	
4) Hours of operator's high time engine	
In-flight shutdown (IFSD) rate (all causes), including the 12-month rolling average for both operator and the world fleet (IFSD per 1'000 engine flight hours)	
1) IFSD rate of operator's fleet	
2) IFSD rate of world fleet	
Unscheduled engine removal rate (URR) for both operator and the world fleet (URR rate per 1000 engine flight hours)	
1) URR of operator's fleet	
2) URR of world fleet	

Item	Assessment			
	YES	NO	N/C	N/A
1) Records of mean time between failures (MTBF) for major components available (unit flight hours/ number of unit failure)				
2) Records of APU start and run reliability available (if the APU is required for EDTO)				
3) Records of delays and cancellations due to technical issues relevant to EDTO, with the causes, by specific aeroplane systems (if available)				
Records of the following significant operator events where available: (including the phase of flight where the event occurred)				
1) Uncommanded power changes (surge or rollback)				
2) Inability to control engine or obtain desired power				
3) In-flight shutdown events				

Supplement to the Maintenance Program and Maintenance Procedures (*)

The applicant is required to establish the following procedures:	To be completed by applicant The procedures are described in (added manual reference, chapter and sub-chapter; e.g. MCM 16.4.1):
1) All EDTO specific tasks identified in the AMP	
2) Procedures to preclude simultaneous actions from being applied to multiple similar elements in any EDTO system.	
3) EDTO pre-departure service check for verifying the status of the aeroplane and ensuring that certain critical items are acceptable.	
4) Procedures for reviewing and documenting of log books to ensure proper MEL procedures, deferred items and maintenance checks and that system verification procedures have been properly performed.	
5) Procedures for monitoring of long term data for increasing trends	
6) EDTO pre-departure Service deck for aircraft type	
Engine Condition Monitoring Program	
1) Procedures for detecting deterioration of engine at an early stage to allow for corrective action before safe operation are affected.	
2) Parameters to be monitored, method of data collection and corrective action process.	

3) Procedures for engine limit margin monitoring to ensure that a prolonged single-engine diversion may be conducted without exceeding approved engine limits.	
Verification Program after Maintenance	
1) List of primary systems critical to EDTO.	
2) Conditions that require verification flights.	
3) Procedures for initiating verification actions.	
4) Procedures that ensure corrective action is taken after engine shutdown and any other significant failure.	
5) Procedures that identify and reverse adverse trends.	
6) Procedures that preclude repeat items from occurring.	
7) Procedures that monitor and evaluate corrective actions.	
8) Procedures that preclude simultaneous actions from being applied to multiple similar elements in any EDTO significant system.	
Reliability Program	
1) Event-orientated program for EDTO, in addition to the normal reliability program, to allow early identification and prevention of EDTO problems.	
2) Procedures to ensure reporting of significant individual events (in-flight shutdowns, flight diversions or turn-back, uncommanded power changes or surges, inability to control the engine or obtain desired power) problems with systems critical to EDTO and any other event detrimental to EDTO.	
3) Reporting criteria for the reporting to Authority of events reportable through this program.	
4) Procedures for downgrade/upgrade criteria (diversion time).	
5) Procedures for monitoring of APU high altitude in-flight start and run capability	

Propulsion System Monitoring Program	
1) Procedures for the monitoring of propulsion system in-flight shutdown (IFSD) rate, evaluation of sustained trends and corrective actions.	
2) Procedures for the monitoring of long term IFSD trends (12 month moving average).	
3) Reporting criteria for the assessment of propulsion system reliability and reporting to Authority of results of operator's assessment.	
Dual Maintenance Requirement	
1. The list of EDTO significant systems may identify the systems that are identical and those that are similar.	
2. List of maintenance actions on EDTO significant systems which are subject to dual maintenance limitations.	
3. Procedure for determination of common mechanical tasks.	
Maintenance Training Program	
1. Training programs to ensure each person, including contract personnel, involved in EDTO is adequately trained on operator's EDTO procedures and is competent to perform his/her duties (EDTO awareness training).	
2. Procedures for ensuring that maintenance personnel have completed EDTO awareness training and have satisfactorily performed EDTO maintenance tasks under supervision, within the framework of KCARs approved procedures for personnel Authorisation.	
3. This EDTO training programme should typically include: <ul style="list-style-type: none"> a) introduction to EDTO regulations; b) focus on applicable elements of national EDTO regulation; c) overview of EDTO certification of twin-engine aircraft; d) EDTO significant systems; e) EDTO authorization f) CMP and EDTO maintenance programme; g) EDTO pre-departure service check h) EDTO reliability programme procedures, i) additional procedures for EDTO (as applicable). 	
4. <i>initial training</i> to ensure that all personnel have the knowledge, skills and ability to perform an adequate EDTO technical procedure for the specific AEC; and	

5. <i>recurrent training</i> to ensure that all personnel maintain and update, if necessary, their awareness of EDTO maintenance specificities.	
Parts Control Program	
1. Procedures that ensure that proper EDTO parts are used and EDTO configuration is maintained.	
2. Control procedures for parts pooling and borrowing.	
Oil Consumption	
1. The maximum oil consumption rate should include procedure applied to compute the consumption rate and detect unusual oil uplift.	
2. The dispatch procedures for EDTO segments are to take into account peak consumption and current running average consumption, including consumption on the immediately preceding segments.	
3. This oil consumption monitoring programme for EDTO should define a baseline consumption rate (normal usage) and detect oil consumption based on the previous flight results.	
4. The programme should ensure there were no sudden increases in consumption/loss and, if there were, to initiate proper corrective action.	
APU Inflight Starting Program	
1. The interval between the APU in-flight start tests	
2. in-flight start/run programme that is acceptable to the Authority, considering its own experience and any applicable national regulations or guidance	
3. The APU in-flight start tests	

Operational Information	
The applicant must establish EDTO Operating Practices and procedures should cover the following subjects:	To be completed by applicant EDTO operating Practices and Procedures are described in (add manual reference, chapter and sub-chapter):
Flight Preparation and In-flight Considerations	
Flight planning procedures (EDTO status of aeroplane, review of technical log, use of minimum equipment list (MEL), external inspections etc).	
EDTO aerodrome selection.	
Standard en route alternative aerodrome pre-departure weather.	
EDTO alternate aerodromes en route that are designated for operation	
En route procedures (cross checking procedures to identify navigation errors, selection of other navigation aids in case of loss of RNAV capability, use of INS/IRS navigation systems without automatic radio navigation updating, use of GPS, notification of ATC of navigation equipment problems, contingency procedures etc), minimum equipment at the EDTO entry point, alternate routings, position check before entering EDTO airspace, alternate airports, performance data, fuel and oil supply etc.	
Fuel and oil policy for EDTO operations.	
Minimum altitudes applicable to the routes to be flown and any diversionary routes.	
Maximum diversion time requested by the operator, and one-engine inoperative cruise speed.	
Confirmation that each EDTO en route alternative aerodrome that may be used will have facilities available to ensure the safety of passengers and crew.	
Passengers and crew member recovery plans for diversions to en route alternatives if relevant to the proposed operation.	
Procedures with respect to flight crew response to abnormal situations (response to non-normal events etc).	

Flight Crew Training and Qualification (*)	
1. The applicant is required to establish the Include the manual reference (chapter and subchapter) of relevant following information:	
2. Flight crew qualification requirements.	
3. Description of initial and recurrent training, checking and training-syllabi	

Application Package	Tick attachments
Documentation to be submitted to Authority	
Please indicate whether submission has been made in the boxes provided	
Compliance statement which shows how the criteria of aircraft eligibility have been satisfied(*).	
CMP Document (last version) (*).	
Sections of the AFM or AFM Supplements that document EDTO airworthiness approval.	
CMP compliance list showing compliance with the titles and numbers of all modifications, addition and changes which were made in order to substantiate the incorporation of the CMP standard in the aeroplane.	
EDTO Maintenance Manual (*).	
Supplements and revisions to the existing Maintenance Program and Maintenance Procedures (*).	
Flight crew EDTO training programmes and syllabi for initial and recurrent training (*).	
Operation manuals and checklists that include EDTO operating practices and procedures (*).	
Minimum Equipment List (MEL) that include items pertinent to EDTO operations (*).	

The undersigned certifies the above information to be correct and true and that aeroplane system installation, continuing airworthiness of systems, minimum equipment for dispatch, operating procedures and flight crew training comply with the requirements of EDTO manual, KCARs and approved Authority guidance

Name of the Designated Representative.....Signature:.....Date:.....

FOR AUTHORITY USE ONLY

Subject	Responsible	Date	Signature
Form EDTO Application and application package checked for completeness.	FOI/AWI		
Airworthiness Approval granted	AWI		
Operational Approval granted	FOI		
EDTO approval process administratively completed (OPS Update, Billing, and Exchange of Certificates).	FOI		
Approved (if no, please complete question below). Withdrawal of EDTO Approval reason.			

Withdrawal of EDTO Approval: Reason:

Name: _____ Date: _____ Signature _____

Inspectors Remarks
Air Worthiness Inspector
Name.....SignatureDate.....
Flight Operations Inspector
Name.....SignatureDate.....