GOVERNMENT OF INDIA
OFFICE OF THE DIRECTOR GENERAL OF CIVIL AVIATION
TECHNICAL CENTRE, OPP SAFDURJUNG AIRPORT, NEW DELHI

CIVIL AVIATION REQUIREMENTS
SECTION 8 - AIRCRAFT OPERATIONS
SERIES 'S' PART I
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SUBJECT: REQUIREMENTS FOR EXTENDED DIVERSION TIME OPERATIONS (EDTO) FOR COMMERCIAL AIR TRANSPORT.

1. INTRODUCTION:

1.1 The purpose of initial ETOPS regulations were to provide very high level of safety while facilitating the use of twin engines on routes, which were previously restricted to three or four engine aeroplanes. ETOPS has now evolved to EDTO (Extended Diversion Time Operations) to encompass two or more engine aeroplanes and the intent of the current regulation is to avoid a diversion and if it occurs, to ensure that the diversion is safe. EDTO may be referred as ETOPS in some documents (AFM etc).

1.2 This Civil Aviation Requirement is issued under the provision of Rule 29C and 133A of the Aircraft Rules 1937 and lays down requirements for obtaining airworthiness and operational approval for EDTO.

2. APPLICABILITY:

2.1 This CAR is applicable to operators engaged in Commercial Air Transport Operations beyond the threshold time established by DGCA for EDTO and lays down the minimum requirements for turbine aeroplanes transiting oceanic areas or routes over land, registered in India, and engaged in EDTO. Operators shall not operate an aeroplane with two or more engines or an aeroplane of AUW more than 5700 kg beyond the threshold time unless approved by DGCA for EDTO.

2.2 To be eligible for EDTO the specified airframe/engine combination should have been certificated to the Airworthiness Standards of Transport Category aeroplanes by FAA of USA or EASA or by any other regulatory authority acceptable to DGCA

3. DEFINITIONS:

3.1 ***Alternate Aerodrome***. An aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to or to land at the aerodrome of intended landing where the necessary services and facilities are available, where aircraft performance requirements can be met and which is operational at the expected time of use. Alternate aerodromes include the following:

Take-off alternate. An alternate aerodrome at which an aircraft would be able to land should this become necessary shortly after take-off and it is not possible to use the aerodrome of departure.

En-route alternate. An alternate aerodrome at which an aircraft would be able to land in the event that a diversion becomes necessary while en route.

Destination alternate. An alternate aerodrome at which an aircraft would be able to land should it become either impossible or inadvisable to land at the aerodrome of intended landing.

3.2 ***Extended diversion time operations (EDTO).*** Any operation by an aeroplane with two or more turbine engines where the diversion time to an en-route alternate aerodrome is greater than the threshold time established by the DGCA.

3.3 ***EDTO Entry Point.*** The first point on the route of an EDTO flight; determined using a one-engine inoperative cruise speed under standard conditions in still air that is more than the threshold from an enroute alternate airport for airplanes with two engines and more than two engines.

3,4 ***EDTO critical fuel.*** 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.
Note: Attachment D to ICAO Annex 6 Part I contains guidance on EDTO critical fuel scenarios.

3.5 ***EDTO-significant system***. An aeroplane system whose failure or degradation could adversely affect the safety particular to an EDTO flight, or whose continued functioning is specifically important to the safe flight and landing of an aeroplane during an EDTO diversion.

3.6 ***Isolated aerodrome***. A destination aerodrome for which there is no destination alternate aerodrome suitable for a given aeroplane type.

3.7 ***Maximum diversion time***. Maximum allowable range, expressed in time, from a point on a route to an en-route alternate aerodrome.

3.8 ***Point of no return.*** The last possible geographic point at which an aeroplane can proceed to the destination aerodrome as well as to an available en route alternate aerodrome for a given flight.

3.9 ***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.

Note 1: The threshold time for EDTO established by DGCA is 60 minutes for two engine aeroplanes with maximum passenger seating capacity of more than 19 passengers and maximum AUW more than 45360 kgs and scheduled operators with two engine aeroplanes irrespective of AUW and passenger capacity.

Note 2: The threshold time for EDTO established by DGCA is 90 minutes for Non-scheduled operators (NSOPs) operating two engine aeroplanes with maximum passenger seating capacity of 19 or less passengers and maximum AUW less than 45360 kgs.

Note 3: The threshold time for EDTO established by DGCA is 120 minutes for more than two engine aeroplanes.

3.10 ***Auxiliary Power Unit (APU).*** A gas turbine engine intended for use as a power source for driving generators, hydraulic pumps and other aeroplane accessories, equipment and/or to provide compressed air for aeroplane pneumatic system.

3.11 **In - Flight Shutdown (IFSD).** When an engine ceases to function in flight and is shutdown, whether self-induced, crew initiated or caused by some other external influence (i.e. IFSD for all cases; for example due to flameout, internal failure, crew initiated shutoff, foreign object ingestion, icing, inability to obtain and/or control desired thrust etc.).

3.12 **Propulsion System.** A system consisting of power unit and all other equipment utilized to provide those functions necessary to sustain, monitor and control the power/thrust output of any one-power unit following installation on the airframe.

3.13 ***EDTO Configuration, Maintenance and Procedures (CMP) Standard.***The particular aeroplane configuration minimum requirements including any special inspection, hardware life limits, master minimum equipment list constraints and maintenance practices found necessary to establish the suitability of an airframe engine combination for an EDTO.

4. GENERAL REQUIREMENTS FOR EXTENDED DIVERSION TIME OPERATIONS (EDTO)

4.1 Unless the operation has been specifically approved by DGCA an aeroplane with two or more turbine engines shall not, be operated on a route where the diversion time from any point on the route, calculated in ISA and still air conditions at the one-engine inoperative cruise speed for aeroplanes with two turbine engines and at the all-engine operating cruise speed for aeroplanes with more than two turbine engines, to an en-route alternate aerodrome exceeds a threshold time established for such operations by the DGCA

Note1: When the diversion time exceeds the threshold time, the operation is considered to be an extended diversion time operation (EDTO).

Note2: For the purpose of EDTO, the take-off and/or destination aerodromes may be considered en-route alternate aerodromes.

4.2 The maximum diversion time, for an operator of a particular aeroplane type engaged in extended diversion time operations shall be approved by DGCA.

Note. — Guidance on the conditions to be used when converting diversion times to distances are contained in Attachment D to ICAO Annex 6 Part I.

4.3 When approving the appropriate maximum diversion time for an operator for a particular aeroplane type engaged in extended diversion time operations, DGCA shall ensure that:

(a) for all aeroplanes: the most limiting EDTO significant system time limitation, if any, indicated in the Aeroplane Flight Manual (directly or by reference) and relevant to that particular operation is not exceeded; and
(b) for aeroplanes with two turbine engines: the aeroplane is EDTO certified.

4.4 Notwithstanding the provisions in Para 4.3 above, DGCA may, based on the results of a specific safety risk assessment conducted by the operator which demonstrates how an equivalent level of safety will be maintained, approve operations beyond the time limits of the most time-limited system. The specific safety risk assessment shall include at least the

(a) capabilities of the operator;
(b) overall reliability of the aeroplane;
(c) reliability of each time limited system;
(d) relevant information from the aeroplane manufacturer; and
(e) specific mitigation measures

4.5 For aeroplanes engaged in EDTO, the additional fuel required by CAR Section 8 Series 'O' Part II Para 4.3.6.3 f) 2) shall include the fuel necessary to comply with the EDTO critical fuel scenario as established in this CAR.

4.6 A flight shall not proceed beyond the threshold time in accordance with Para 4.1 above unless the identified en-route alternate aerodromes have been re-evaluated for availability and the most up to date information indicates that, during the estimated time of use, conditions at those aerodromes will be at or above the operator's established aerodrome operating minima for the operation. If any conditions are identified that would preclude a safe approach and landing at that aerodrome during the estimated time of use, an alternative course of action shall be determined.

4.7 DGCA shall, when approving maximum diversion times for aeroplanes with two turbine engines, ensure that the following are taken into account in providing the overall level of safety intended by the provisions of ICAO Annex 8:

(a) reliability of the propulsion system;
(b) airworthiness certification for EDTO of the aeroplane type; and
(c) EDTO maintenance program.

Note: The Airworthiness Manual (Doc 9760) contains guidance on the level of performance and reliability of aeroplane systems

5. EDTO SPECIAL REQUIREMENTS

5.1 In addition to the standard flight planning and execution requirements, flights undertaking EDTO require special considerations as below;

5.1.1 Operational approval to conduct EDTO

While approving an operator with a particular aeroplane type for extended diversion time operations, DGCA will establish an appropriate threshold time and approve a maximum diversion time and in addition to the requirements previously set forth in this CAR, ensure that:

(a) specific operational approval is granted by DGCA;
(b) the operator's past experience and compliance record is satisfactory and the operator establishes the processes necessary for successful and reliable extended diversion time operations and shows that such processes can be successfully applied throughout such operations;
(c) the operator's procedures are acceptable based on certified aeroplane capability and adequate to address continued safe operation in the event of degraded aeroplane systems;
(d) the operator's crew training programme is adequate for the proposed operation;
(e) documentation accompanying the authorization covers all relevant aspects; and

(f) it has been shown (e.g. during the EDTO certification of the aeroplane) that the flight can continue to a safe landing under the anticipated degraded operating conditions which would arise from:
  (i) the most limiting EDTO significant system time limitation, if any, for extended diversion time operations identified in the Aeroplane's Flight Manual directly or by reference; or
  (ii) total loss of engine generated electric power; or
  (iii) total loss of thrust from one engine; or
  (iv) any other condition which DGCA considers to be equivalent in airworthiness and performance risk

5.1.2 **Maintenance programme**

Each operator's maintenance programme shall ensure that:

(a) the titles and numbers of all airworthiness modifications, additions and changes which were made to qualify aeroplane systems for extended diversion time operations are provided to DGCA;
(b) any changes to maintenance and training procedures, practices or limitations established in the qualification for extended diversion time operations are submitted to DGCA before such changes are adopted;
(c) a reliability monitoring and reporting programme is developed and implemented prior to approval and continued after approval;
(d) prompt implementation of required modifications and inspections which could affect propulsion system reliability is undertaken;
(e) procedures are established which prevent an aeroplane from being dispatched for an extended diversion time operation after engine shutdown or EDTO significant system failure on a previous flight until the cause of such failure has been positively identified and the necessary corrective action is completed. Confirmation that such corrective action has been effective may, in some cases, require the successful completion of a subsequent flight prior to dispatch on an extended diversion time operation;
(f) a procedure is established to ensure that the airborne equipment will continue to be maintained at the level of performance and reliability required for extended diversion time operations; and
(g) a procedure is established to minimize scheduled or unscheduled maintenance during the same maintenance visit on more than one parallel or similar EDTO significant system. Minimization can be accomplished by staggering of maintenance tasks, performing and/or supervising maintenance by a different technician, or verifying maintenance correction actions prior to the airplane entering an EDTO threshold.
(h) a procedure (through cockpit placard/external marking) is established to indicate to maintenance and flight crew EDTO status of the aeroplane.

Note.— The maintenance considerations applicable to extended diversion time operations are provided in the Airworthiness Manual *(Doc 9760).*

5.1.3 **Propulsion system reliability**

The operator should establish firm criteria as to what action has to be taken when adverse trend in propulsion system conditions are detected. When the propulsion system IFSD (computed on 12 month rolling average) exceeds 0.05/1000 engine hours for a 120 minute operation or exceeds 0.02/1000 engine hours for a 180 minutes operation, an immediate evaluation should be accomplished and a report on problems identified and corrective action taken must be forwarded to DGCA to consider additional corrective action or operational restriction. Further the operator should compile necessary data on propulsion system reliability which should include;

(a) A list of all engine shutdown events both on ground and in flight (excluding normal training events) for all causes including flame out.
(b) Unscheduled engine removal rate and summary
(c) Total engine hours and cycles.
(d) Mean time between failures of propulsion system components that affect reliability.
(e) IFSD rate based on 6 and 12 months rolling average.
(f) Any other relevant data.

5.1.4 **EDTO significant systems**

(a) EDTO significant systems may be the aeroplane propulsion system and any other aeroplane systems whose failure or malfunctioning could adversely affect safety particular to an EDTO flight, or whose functioning is specifically important to continued safe flight and landing during an aeroplane EDTO diversion.
(b) Many of the aeroplane systems which are essential for non-extended diversion time operations may need to be reconsidered to ensure that the redundancy level and/or reliability will be adequate to support the conduct of safe extended diversion time operations.
(c) The maximum diversion time shall not exceed the value of the EDTO significant system limitation(s), if any, for extended diversion time operations identified in the Aeroplane's Flight Manual directly or by reference, reduced with an operational safety margin specified as 15 minutes by DGCA
(d) When planning or conducting, extended diversion time operations, an operator and pilot in command, shall ensure that:
(i) when planning an EDTO flight, the minimum equipment list, the communications and navigation facilities, fuel and oil supply, en-route alternate aerodromes or aeroplane performance, are appropriately considered;
(ii) if an aeroplane engine shutdown, proceed to and land at the nearest (in terms of the least flying time) en-route alternate aerodrome where a safe landing can be made; and

(iii) in the event of a single or multiple failure of an EDTO significant systems or systems (excluding engine failure), proceed to and land at the nearest available en-route alternate aerodrome where a safe landing can be made unless it has been determined that no substantial degradation of safety results from any decision made to continue the planned flight.

Note: If no more than one engine is shut down for an aeroplane with more than two engines, the pilot-in-command may elect to continue beyond the nearest en-route alternate aerodrome (in terms of time) if he determines that it is safe to do so. In making this decision the pilot-in-command should consider all relevant factors.

5.1.5 **Aeroplane performance data**

An operator shall not dispatch an airplane on an EDTO flight unless it makes performance data available to its flight crewmembers and dispatchers that support all phases of EDTO operations, including divert scenarios. This performance data will contain the following information:

(a) Detailed one-engine inoperative performance data including fuel flow for standard and nonstandard atmospheric conditions, which should be demonstrated as a function of airspeed and power setting, where appropriate. This data will cover:

(i) Driftdown (includes net performance);
(ii) Cruise altitude coverage including 10,000 feet;
(iii) Holding; and
(iv) Altitude capability (includes net performance).

(b) Detailed all-engine-operating performance data, including nominal fuel flow data, for standard and nonstandard atmospheric conditions, which should be demonstrated as a function of airspeed and power setting, where appropriate. This data will cover:

(i) Cruise altitude coverage including 10,000 feet; and
(ii) Holding.

(c) Details of any other conditions relevant to EDTO that can cause significant deterioration of performance, such as ice accumulation on the unprotected surfaces of the airplane, RAM Air Turbine (RAT) deployment, and thrust reverser deployment if such data is available.

5.1.6 **EDTO critical fuel**

An aeroplane with two engines engaged in EDTO operations should carry enough fuel to fly to an en-route alternate aerodrome. This EDTO critical fuel corresponds to the additional fuel that may be required to comply with CAR Section 8 Series 'O' Part II, Para 4.3.6.3 f) 2). The following shall be considered, using the anticipated mass of the aeroplane, in determining the corresponding EDTO critical fuel:

(a) No operator may dispatch or release for flight or takeoff a turbine engine-powered airplane in EDTO unless, considering wind and other weather conditions expected, it has enough fuel to satisfy paragraphs (i) through (iv) below:

(i) The greater amount of fuel sufficient to fly to an en-route alternate under the following three scenarios:

a. Assuming a rapid decompression at the most critical point followed by descent to a safe altitude in compliance with the oxygen supply requirements, or

b. At the approved one-engine inoperative cruise speed assuming a rapid decompression and a simultaneous engine failure at the most critical point followed by descent to a safe altitude in compliance with the oxygen supply requirements, or

c. At the approved one-engine inoperative cruise speed assuming an engine failure at the most critical point followed by descent to the one-engine inoperative cruise altitude.

(ii) Upon reaching the alternate, hold at 1,500 ft above field elevation for 15 minutes and then conduct an instrument approach and land.

(iii) Add a 5 percent wind speed factor (that is, an increment to headwind or a decrement to tailwind) on to the actual forecast wind used to calculate fuel in paragraph (i) above to account for any potential errors in wind forecasting. If an operator is not using the actual forecast wind based on a wind model acceptable to the DGCA, the airplane must carry 5 percent of the fuel required for paragraph 1 above, as reserve fuel to allow for errors in wind data. A wind aloft forecast distributed worldwide by the World Area Forecast System (WAFS) is an example of a wind model acceptable to the DGCA.

(iv) After completing the calculation in paragraph (iii), compensate in paragraph (i) above with additional fuel for the greater of the following scenarios:

a. The effect of airframe icing during 10 percent of the time during which icing is forecast (including ice accumulation on unprotected surfaces, and the fuel used by engine and wing anti-ice during this period). Unless a reliable icing forecast is available, icing may be presumed to occur when the total air temperature at the approved one-engine cruise speed is less than +10 degrees Celsius, or if the outside air temperature is between 0 degrees Celsius and -20 degrees Celsius with a relative humidity of 55 percent or greater.

b. Fuel for engine anti-ice, and if appropriate wing anti-ice, for the entire time during which icing is forecast

(b) Unless the operator has a program established to monitor aeroplane in-service deterioration in cruise fuel burn performance, and includes in fuel supply calculations fuel sufficient to compensate for any such deterioration, increase the final calculated fuel supply by 5 percent to account for deterioration in cruise fuel burn performance.

(c) If the APU is a required power source, then its fuel consumption must be accounted for during the appropriate phases of flight.

(d) In computing the EDTO critical, advantage may be taken of driftdown computed at the approved one-engine inoperative cruise speed. Accounting of wing anti-ice as in paragraph (a)(iv) above may apply to some models of aeroplane based on their characteristics and the manufacturer's recommended procedures.

Note 1: For aeroplanes with more than two engines simultaneous engine failure and depressurization or depressurization alone, whichever is more limiting will be considered.
Note 2: The speed selected for the all-engine-operative diversion (i.e. depressurization alone) may be different from the approved one-engine-inoperative speed used to determine the EDTO threshold and maximum diversion distance;
Note 3: The speed selected for the one-engine-inoperative diversions (i.e. engine failure alone and combined engine failure and depressurization) should be the approved one-engine-inoperative speed used to determine the EDTO threshold and maximum diversion distance;

5.1.7 **Operational control**

Operational control refers to the exercise by the operator of responsibility for the initiation, continuation, termination or diversion of a flight

5.1.8 **Flight dispatch**

Flight dispatch procedures refer to the method of control and supervision of flight operations. This does not imply a specific requirement for approved flight dispatchers or a full flight following system. In applying the general flight dispatch requirements of CAR Section 8 Series 'O' Part II, particular attention should be paid to the conditions which might prevail any time that the operation is beyond threshold time to an en-route alternate aerodrome, e.g. systems degradation, reduced flight altitude, etc. For compliance with the requirement of CAR Section 8 Series 'O' Part II Para 4.7, at least the following aspects must be considered:

(a) identify en-route alternate airports;
(b) ensure that prior to departure the flight crew is provided with the most up-to-date information on the identified en-route alternate aerodromes, including operational status and meteorological conditions and, in flight, make available means for the flight crew to obtain the most up-to-date weather information;
(c) methods to enable two-way communications between the aeroplane and the operator's operational control centre;
(d) ensure that the operator has a means to monitor conditions along the planned route including the identified alternate airports and ensure that procedures are in place so that the flight crew are advised of any situation that may affect the safety of flight;
(e) ensure that the intended route does not exceed the established aeroplane threshold time unless the operator is approved for EDTO operations;

(f) pre-flight system serviceability including the status of items in the minimum equipment list;
(g) communication and navigation facilities and capabilities;
(h) fuel requirements;
(i) availability of relevant performance information for the identified en-route alternate aerodrome(s); and
(j) aerodrome rescue and fire fighting service (RFFS). One category below the aeroplane RFFS category, but not lower than RFFS Category 4 must be available at each aerodrome listed as an en-route alternate aerodrome in a dispatch or flight release. for aeroplanes with maximum certificated take-off mass of over 27 000 kg or not lower than Category 1 for all other aeroplanes, under the condition that aerodrome is in operation (applicable within India) and for outside India at least 30 minutes notice will be given to the aerodrome operator prior to the arrival of the aeroplane provided the State of Authority approved/accepted.
(k) The following items must be listed in the dispatch or flight release for all EDTO flights;
(i) EDTO alternates; and
(ii) The authorized EDTO diversion time under which the flight is dispatched or released.

5.19 **Operational procedures**

Operating procedures refer to the specification of organization and methods established to exercise operational control and flight dispatch procedures in the appropriate manual(s) and should cover at least a description of responsibilities concerning the initiation, continuation, termination or diversion of each flight as well as the method of control and supervision of flight operations

In addition, an operator shall develop unique EDTO flight crew procedures for each of the flight operations requirements pertaining to EDTO covered in this CAR. These procedures should be contained in the applicable manual or information provided to the flight crew. The manual or information provided to the flight crew should also contain procedural information necessary to interface with EDTO maintenance requirements such as;

(a) Fuel crossfeed valve operational check (if applicable);
(b) Special EDTO MEL requirements ;
(c) APU in-flight start procedures (if applicable);
(d) Engine Condition Monitoring (ECM) data recording procedures; and
(e) In-flight verification of EDTO significant systems.

5.1.10 **Training**

Training program refers to the training for flight crew and flight flight dispatchers in operations and maintenance personnel for maintenance programmes. Training programmes for flight crew and flight dispatchers should ensure requirements of are complied with such as but not limited to:

(a) route qualification;
(b) flight planning and preparation;
(c) concept of extended diversion time operations;
(d) criteria for diversions; and
(e) diversion decision making.

Note: Details of training and evaluation are given at Para 10.

5.1.11 **Enroute alternates**

Aerodrome(s) to which an aircraft may proceed in the event that a diversion becomes necessary while en route, where the necessary services and facilities are available, where aircraft performance requirements can be met, and which are expected to be operational if required, need to be identified any time that the operation is beyond the threshold to an en-route alternate aerodrome.

Operations conducted by aeroplanes with two turbine engines require that prior to departure and in flight, the meteorological conditions at identified en-route alternate aerodromes will be at or above the aerodrome operating minima required for the operation during the estimated time of use (planning minima for dispatch and authorized operating minima in flight) in accordance with CAR Section 8 Series'C' Part I (Table 9)

In addition to the en-route alternate aerodrome provisions described above the following apply:

(a) for route planning purposes, identified en-route alternate aerodromes need to be located at a distance within the maximum diversion time from the route and which could be used if necessary; and
(b) in extended diversion time operations, before an aeroplane crosses its threshold time during flight, there should always be an en-route alternate aerodrome within the approved maximum diversion time whose conditions will be at or above the operator's established aerodrome operating minima for the operation during the estimated time of use.

If any conditions, such as weather below landing minima, are identified that would preclude a safe approach and landing at that aerodrome during the estimated time of use, an alternative course of action should be determined such as selecting another en-route alternate aerodrome within the operator's approved maximum diversion time.

During flight preparation and throughout the flight the most up-to-date information should be provided to the flight crew on the identified en-route alternate aerodromes, including operational status and meteorological conditions.

Note: En-route alternate aerodromes may also be the take off and/or destination aerodromes.

For the purpose of converting diversion times to distances, an "approved one-engine-inoperative (OEI) speed" or "approved all-engine-operative (AEO) speed" is any speed within the certified flight envelope of the aeroplane.

For determining whether a point on the route is beyond threshold time (60/90 minutes for a twin engine aeroplane as applicable and 120 minutes for an aeroplane with more than two engines) to an en-route alternate, the operator should select an approved one-engine-inoperative (OEI) speed or an approved all-engine-operative (AEO) speed, as the case may be. The distance is calculated from the point of the diversion followed by cruise for 60/90/120 minutes as the case may be, in ISA and still air conditions. For the purposes of computing distances, credit for drift down may be taken.

5.1.12 **Minimum equipment list (MEL)**

The operator is required to submit its MEL, designed in accordance with the Master Minimum Equipment List (MMEL), appropriate to the requested level of EDTO. An operator's MEL may be more restrictive than the MMEL, considering the kind of EDTO proposed and the equipment and service problems unique to the operator. System redundancy levels appropriate to EDTO should be reflected in the MMEL. Systems considered to have a fundamental influence on flight safety may include, but are not limited to the following:

(a) Electrical, including battery,
(b) Hydraulic,
(c) Pneumatic,
(d) Flight instrumentation,
(e) Fuel,
(f) Flight control,
(g) Ice protection,
(h) Engine start and ignition,
(i) Propulsion system instruments,
(j) Navigation and communications,
(k) Auxiliary power units,
(l) Air conditioning and pressurization,
(m) Cargo fire suppression,
(n) Emergency equipment, and
(o) Any other equipment necessary for EDTO

5.1.13 **Communications Equipment (VHF/HF, Data Link, Satellite Communications)**

For all routes where voice communication facilities are available, the communication equipment required by operational requirements should include at least one voice-based system. At normal conditions of propagation and normal

one engine inoperative cruise altitude, reliable two-way voice communications between aeroplane and appropriate ATC unit over the planned route should be available.

6. EDTO OPERATIONAL APPROVAL – IN SERVICE EXPERIENCE METHOD

6.1 General

6.1.1 An in-service experience program is one method of obtaining EDTO operational approval. As a prerequisite to obtaining any operational approval, the operator needs to show that an acceptable level of propulsion system reliability has been achieved in service by the world fleet for that particular airplane-engine combination. The operator also should obtain sufficient maintenance and operation familiarity with the particular airplane-engine combination. Each operator requesting approval to conduct EDTO by the in-service method should have operational experience appropriate to the operation proposed.

6.1.2 The following paragraphs contain requirements for requisite in-service experience. These may be reduced or increased following review and concurrence on a case-by-case basis by DGCA. Any reduction or increase in in-service experience requirements will be based on an evaluation of the operator's ability and competence to achieve the necessary reliability for the particular airplane-engine combination in EDTO. For example, a reduction in in-service experience may be considered for an operator who can show extensive in-service experience with a related engine on another airplane that has achieved acceptable reliability. In contrast, an increase in in-service experience may be considered for those cases where heavy maintenance has yet to occur and/or abnormally low number of take-offs have occurred.

6.2 75/90 minutes operation

Approval to carry out EDTO with 75 minutes diversion time may be granted by DGCA to an operator with minimal or no in-service experience with particular airframe engine combination. This approval will be based on such factors as the proposed areas of operation, the operators demonstrated ability to successfully introduce aircraft into operation, and the quality of the proposed maintenance and operation program. Special case by case operational approval may be granted beyond 75 minutes diversion time (in steps of 15 minutes) with limited evaluation of service experience at the time of the application. For this approval, the service experience of Airframe-engine combination may be less than 2, 50,000 hours in the world fleet.

6.3 More than 75/90 minutes - 120 minutes operation

Each operator requesting approval to conduct EDTO with a maximum diversion time of 120 minutes (in still air) should have minimum of 12 consecutive months of operational in service experience with the specified airframe engine combination. Normally the accumulation of at least 2,50,000 engine hours in the world fleet (not necessarily on a particular airframe) will be necessary before the proposal is considered. Where the engine experience on another type of aeroplane is applicable to the candidate aeroplane, the candidate aeroplane should normally obtain a significant portion of the 2,50,000 engine hrs. experience. This number of engine hours may be reduced if sufficient data is available to prove reliability of the engine. In the event that a particular engine is derived from an existing engine the required operational experience is subject to establishing the degree of hardware commonalties and operating similarities.

6.4 **More than 120 minutes - 180 minutes operation**

Each operator requesting approval for maximum diversion time of 180 minutes (in still air) should have held current approval for 120 minutes, EDTO for a minimum period of 12 months with a corresponding high level of demonstrated propulsion system reliability.

6.5 **Procedure for seeking approval for EDTO (In Service Method)**

Any operator requesting approval for EDTO should submit the request with the supporting data to the Regional Airworthiness office of DGCA at least three months prior to the proposed start of EDTO with the specific airframe/engine combination. Each operator requesting approval to conduct EDTO should have operational in service experience as given above appropriate to the operation proposed. This data shall include the details of compliance of modifications, additions and changes in the maintenance practices, which were made to qualify the aeroplane system for EDTO. It should also be shown that an acceptable level of propulsion system reliability has been achieved in service by the world fleet for that particular airframe-engine combination. The operator must obtain sufficient maintenance and operations familiarity with the particular airframe engine combination in question before seeking approval.

Each applicant/operator for EDTO approval should show that the particular airframe/engine combination is sufficiently reliable. Systems required for EDTO should be shown by the operator to be continuously maintained and operated at levels of reliability appropriate for intended operation

EDTO approval of an aeroplane by the manufacturer/Regulatory Authority of the country of manufacture is normally reflected by a statement in the approved Aeroplane Flight Manual (AFM) / Type Certificate Data Sheet (TCDS) or

Supplemental Type Certificate (STC), which specifies the Configuration, Maintenance and Procedures (CMP) Standard requirements for suitability. The CMP standards shall be of latest revision. The standards and its revisions may require priority actions to be implemented before the next EDTO flight and other actions to be implemented according to a schedule acceptable to DGCA.

6.6 **Application for approval**

An applicant seeking approval for EDTO shall submit the proposal on the prescribed application given in Annexure 1. The operator should further furnish details of the procedure/instructions and methodology for continued capability to adhere to conditions laid down at the time of grant of approval in a separate EDTO Manual for use by personnel involved in EDTO. Any amendment to the EDTO manual requires DGCA approval.

6.7 **Contents of the EDTO manual**

EDTO Manual should include procedures and guidelines for the maintenance program and other requirements for EDTO. In addition, all EDTO requirements, including supportive programs, procedures, duties and responsibilities including actions to be taken in case of adverse trend, including IFSD rate, reliability level etc. should be identified and documented. This manual should be submitted two months in advance to the Regional Airworthiness office before seeking approval of EDTO flight. The operator should lay special emphasis on the following program: -

(a) Oil Consumption program: The operators oil consumption program should reflect manufacturer recommendations and be sensitive to oil consumption trends. It should consider the amount of oil added at the departing EDTO stations with reference to the running average consumption i.e the monitoring must be continuous up to and including oil added at the EDTO departure stations. Routine quality control checks and SOAP check where applicable to this make and model should be included in the program. If the APU is required for EDTO operation it should be added to the oil consumption program

(b) Engine Condition Monitoring: This program should describe the parameters to be monitored, method of data collection and corrective action process. This monitoring shall be used to detect deterioration at an early stage to allow for corrective action before safe operation is affected. This program should ensure that engine limit margins are maintained so that a prolonged single engine diversion may be conducted without exceeding approved engine limits at all approved power levels and expected environmental conditions.

(c) Reliability Program: An EDTO reliability program shall be developed by the operator or the existing reliability program supplemented. This program should be designed for early identification and prevention of EDTO related

(d) problems as the primary goal. This program should be event oriented and incorporate reporting and rectification procedures for significant events detrimental to EDTO flight. This information should be readily available for use by the operator and DGCA to help establish that the reliability level is adequate and to assess the operators competence and capability to safely continue EDTO. The operator shall intimate the office of DGCA within 48 hours the following reportable events;

(i) In flight shut downs.
(ii) Diversion or turn back.
(iii) Uncommented power changes or surges.
(iv) Inability to control the engine or obtain desired power.
(v) Problems with systems critical to EDTO.
(vi) Any other event detrimental to EDTO.

The report should identify the following :-

a. The aircraft identification including make and serial number.
b. Engine identification make and serial number.
c. Total time, cycles and time since last shop visit.
d. For systems, time since overhaul or last inspection of the defective unit.
e. Phase of flight
f. Corrective action

(d) The APU installation, if required, for EDTO, should meet all the requirements necessary to demonstrate its ability to perform the intended functions and if certain EDTO necessitate in flight start and run of the APU after prolonged cold soaking, it must be substantiated that the APU has adequate reliability for that operation.

(e) Propulsion System Monitoring: The operator shall lay down actions to be taken when adverse trends in propulsion system conditions are detected. When the IFSD exceeds 0.05/1000engine hours for 120-min operation or exceeds 0.02/1000 engine hours for a 180-minute operation, an immediate evaluation shall be accomplished with the problem identified and corrective action taken. Regional Airworthiness Office of DGCA shall be provided with information in this regard.

(f) Aeroplane dispatch and verification procedures: Procedures and centralized control processes should be established which would preclude an aeroplane's being dispatched for EDTO after propulsion system shutdown or primary aircraft system failure on a previous flight, or significant adverse trends in system performance, or engine/major engine module without appropriate corrective action having been taken. Confirmation of such action as being appropriate may, in some cases, require successful completion of verification in a

flight. Such verification may be accomplished in a non-revenue flight or a revenue flight with non-EDTO. This verification flight can be combined with regular EDTO revenue flight provided verification phase is documented as satisfactorily completed upon reaching the EDTO entry point.

(g) Maintenance Training: The operator should evolve a maintenance-training program for all the maintenance engineers engaged in the maintenance of aircraft approved for EDTO focussing on the special nature of EDTO. This program shall be included in the normal maintenance-training program. The object of this program is to ensure that all personnel involved in EDTO are provided with the necessary training on the special nature of EDTO maintenance requirements.

(h) EDTO Parts Control Program: The operator shall evolve a program that ensures that proper parts and configuration are maintained for satisfactory EDTO operation while borrowing / procuring/ pooling parts. The programme. should also cover those parts used during repair or overhaul to maintain the necessary EDTO configuration

(i) Aircraft Performance Monitoring: The continued airworthiness Program should cover Aircraft Performance Monitoring to assess any degradation in the aircraft performance. This monitoring programme should form part of EDTO manual.

(j) Sub-Contract Maintenance:- When maintenance is sub-contracted, the operator must ensure that;

(i) The maintenance personnel of the sub-contractor involved are qualified for EDTO.
(ii) All airworthiness flight dispatch procedures and additional maintenance requirements as identified in the operators maintenance system manual is complied with.

(k) Centralized Control Process: The operator conducting EDTO (regardless of the size of its EDTO fleet) must have a centralized entity responsible for monitoring of the EDTO maintenance activities. The certificate holder must develop and clearly define in its EDTO maintenance document specific procedures, duties, and responsibilities for involvement of their centralized maintenance control personnel in their EDTO operation.

7. EDTO OPERATIONAL APPROVAL – ACCELERATED METHOD

7.1 General

An operator may initiate EDTO when the operator establishes the processes

necessary for successful and reliable EDTO operations and proves to the DGCA that such processes can be successfully applied throughout the applicant's EDTO operations. This may be achieved by thorough documentation and analysis of processes and process validation, or demonstration on another airplane/validation (as described under process validation in this section, below) or a combination of these processes.

7.2 **EDTO Processes**

The airplane-engine combination for which the operator is seeking accelerated EDTO operational approval must be EDTO (ETOPS) type design-approved (except for two-engine EDTO at 75-minute) and be capable of operating at a satisfactory level of reliability before commencing EDTO. The operator seeking accelerated EDTO operational approval must demonstrate to the DGCA that it has an EDTO program in place that consists of all the following applicable EDTO process elements:

(a) The applicable process elements defined as the EDTO maintenance and operations requirements in this CAR.

(b) Documentation of the following elements as appropriate:

(i) Technology new to the operator and significant difference in primary and secondary power (engines, electrical, hydraulic, and pneumatic) systems between the airplanes currently operated and the two-engine airplane for which the operator is seeking EDTO operational approval.

(ii) The plan to train flight and maintenance personnel to the differences identified in the maintenance subparagraph above.

(iii) The plan to use proven manufacturer-validated training and maintenance and operations manual procedures relevant to EDTO for the two-engine airplane for which the operator is seeking accelerated EDTO operational approval.

(iv) Changes to any previously proven validated training, maintenance or operations manual procedures used in previous non-EDTO operations or in previous EDTO with a different airplane-engine combination and/or geographic area of operations. Depending on the nature and extent of any changes, the operator may be required to provide a plan for validating such changes.

(v) The validation plan for any additional operator unique training and procedures relevant to EDTO.

(vi) Details of any EDTO program support from the airframe manufacturer, engine manufacturer, other operators or any other outside person.

(vii) The control procedures when maintenance or flight dispatch support is provided by an outside person as described above.

7.3 **Process validation methodology**

(a) Paragraph 7.2 (a) identifies those process elements that should be proven before EDTO approval is granted by the DGCA under the accelerated EDTO approval program. For a process to be considered proven the process should first be defined. Typically, this will include a flow chart showing the various elements of the process. Roles and responsibilities of the personnel who will be managing this process should be defined including any training requirement. The operator should demonstrate that the process is in place and functions as intended. The operator may accomplish this by thorough documentation and analysis, or by demonstrating on an aeroplane, that the process works and consistently provides the intended results. The operator should define the necessary evaluation duration to validate the process and also show that a feedback loop exists to illustrate need for revision of the process, if required, based on in-service experience.

(b) Normally the choice to use or not to use demonstration on an aeroplane as a means of validating individual processes should be determined by the operator. Process validation may be done with the airframe-engine combination that will be used in EDTO. It can also be done with a different aeroplane type from that for which EDTO approval is being sought, including an aeroplane with more than two engines, if it can be shown that the particular airplane-engine combination in the operator's EDTO program is not necessary to validate a process. With sufficient preparation and dedication of resources, such validation may not be necessary to assure processes that produce acceptable results. However, if the plan proposed by the operator to prove processes is determined by the DGCA to be inadequate or the plan does not produce acceptable results, validation of the processes with an aeroplane will be required.

(c) If an operator currently is conducting EDTO with a different airplane-engine combination, it may be able to document that it has proven EDTO processes in place with only minimal further validation required. If the operator has similar non-EDTO operations and can simulate or demonstrate proven EDTO processes in such operations, credit can be given for such successful evaluations. In either case, the operator should demonstrate that the means are in place to assure equivalent results with the airplane-engine combination being proposed for EDTO operational approval. The following elements may aid in justifying a reduction in the validation requirement of EDTO processes:

(i) Experience with other airframes and/or engines,

(ii) Previous EDTO experience,

(iii) Experience with long range, overwater operations with two-, three-, or four-engine airplanes, and

(iv) Experience gained by flight crewmembers and maintenance and flight dispatch personnel while working with other EDTO-approved operators.

7.4 Procedure for seeking approval for EDTO (Accelerated Method)

The operator seeking accelerated EDTO operational approval should submit an Accelerated EDTO operational approval plan to the DGCA six months before the proposed start of EDTO. This will provide sufficient time for the operator and the DGCA to validate the effectiveness of all EDTO process elements ("proven process"). The operator's application for EDTO should:

(a) State the EDTO time category requested. Define proposed routes and the EDTO diversion time necessary to support these routes and the aeroplane-engine combination to be flown.

(b) Define processes and related resources being allocated to initiate and sustain EDTO operations in a manner that demonstrates commitment by management and all personnel involved in EDTO maintenance and operational support.

(c) Provide a documented plan for compliance with requirements listed in this section for Accelerated EDTO.

(d) Define Review Gates. A review gate is a milestone- tracking plan to allow for the orderly tracking and documentation of specific provisions of this CAR. Each review gate should be defined in terms of the process elements to be validated. Normally, the review gate process will start six months before the proposed start of EDTO and should continue until at least six months after the start of EDTO. The review gate process will help ensure that the proven processes comply with the provisions of this CAR and are capable of continued EDTO operations.

7.5 Validation of process elements

When the operators accelerated EDTO plan receives approval by the DGCA (DAW and FSD), a validation of the process elements of the accelerated EDTO plan should begin. Close coordination between the operator and the DGCA is necessary for a successful validation of the EDTO plan. All process elements required should be validated

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(a) Before the start of the validation of the process elements, the following information should be part of the Accelerated EDTO plan submitted to the DGCA:

(i) Validation periods, including start dates and proposed completion dates.

(ii) Definition of airplane(s) to be used in the validation. List should include registration numbers, manufacturer and serial number and model of the airframes and engines.

(iii) Description of the areas of operation (if relevant to validation objectives) proposed for validation and actual EDTO.

(iv) Definition of designated EDTO validation routes. The routes should be of duration necessary to ensure process validation occurs.

(b) Process validation reporting. The operator should compile results of EDTO process validation. The operator should:

(i) Document how each element of the EDTO process was utilized during the validation.

(ii) Document any shortcomings with the process elements and measures in place to correct such shortcomings.

(iii) Document any changes to EDTO processes that were required after an IFSD, unscheduled engine removals, or any other significant operational events.

(iv) When there is concurrence between the operator and the DGCA that a process element has been successfully proven, the review gate should be closed and confirmation documented.

(v) Provide periodic process validation reports to the DGCA. This should be addressed during the review gates.

(c) The operator should include a final review gate prior to final EDTO approval that is the validation flights described in the DGCA APM and FOI Manual. This review gate should ensure that all EDTO processes have been proven.

(d) Any validation program should address the following:

(i) The operator should show that it has considered the impact of the EDTO validation program with regard to safety of flight operations. The operator should state in its application any policy guidance to personnel involved in the EDTO process validation program. Such guidance should clearly state that EDTO process validation exercises should not be allowed to adversely impact the safety of operations especially during

periods of abnormal, emergency, or high cockpit workload operations. It should emphasize that during periods of abnormal or emergency operation or high cockpit workload EDTO process validation exercises may be terminated.

(ii) The validation scenario(s) should be of sufficient frequency and operational exposure to validate maintenance and operational support systems not validated by other means.

(iii) A means must be established to monitor and report performance with respect to accomplishment of tasks associated with EDTO process elements. Any recommended changes to EDTO maintenance and operational process elements should be defined.

7.6 **Final approval for accelerated EDTO authority**

At the successful completion of the operator's accelerated EDTO validation program all process elements should have been validated and appropriate review gates closed. Report of a successful completion of review gates will be forwarded by DAW to FSD. Upon final concurrence and approval, the applicant should forward to the DGCA a plan for final validation flights to be conducted over proposed routes in the EDTO area of operation and in the airframe-engine combination listed in the operator's application. This DGCA witnessed EDTO validation flight or flights will be conducted in accordance with APM and FOI Manual. The purpose of these flights is for the operator to demonstrate to the DGCA that it has the competence and capability to safely conduct and adequately support the intended EDTO operation.

8. CONTINUED AIRWORTHINESS PROGRAM

8.1 Operators intending to carry out EDTO, should have the ability to maintain aeroplane in a continuous state of airworthiness and adhere to the well-defined programs and procedures.

8.2 The basic maintenance program for the aeroplane being considered for EDTO is the continued airworthiness maintenance program currently approved for that operator. This will cover the particular model airframe engine combination.

The Continued Airworthiness program should contain the standards, guidance and direction necessary to support the intended operations. The maintenance personnel involved in effecting this program should be made aware of the special nature of EDTO and have the knowledge, skills and ability to accomplish the requirement of the program. EDTO maintenance requirements will be approved as supplemental requirements. The operator should adhere to a policy of avoiding maintenance by the same maintenance staff on both units of a dual

system or on similar system which are critical to EDTO operation, such as engines during a single maintenance visit. (e.g. fuel control change on both engines.)

However at outstations a single maintenance crew action may be verified by suitable ground tests including BITE tests, functional checks or operational checks etc

8.3 EDTO related tasks should be identified on the operators routine work procedures and related instructions.

8.4 The operator should develop EDTO maintenance checks to ensure that the status of the aeroplane and critical items related to EDTO operations are acceptable. This check should be accomplished and certified by an EDTO qualified maintenance person prior to an EDTO flight.

8.5 The operator shall develop a program for prompt implementation of modifications and inspections, which could affect propulsion system reliability.

8.6 Minimum Equipment List (MEL): The operators should develop MEL for EDTO operations which may be more restrictive than MMEL considering the nature of operation proposed and service problems that may be encountered and unique to the operator.

8.7 Flight Report Books should be reviewed and documented as appropriate to ensure proper MEL procedures deferred items, maintenance checks and that system verification procedure has been properly performed.

8.8 A separate defect report should be submitted to the DGCA on all defects experienced on EDTO sectors as soon as practicable.

8.9 Procedure to be established to ensure that the airborne equipment will continue to be maintained at the level of performance and reliability required for EDTO.

9. OPERATIONS SPECIFICATIONS

An operator's aircraft should not be operated on an EDTO flight unless approved by DGCA for both maintenance and operations and endorsed on the Air Operators Permit as part of the operations specifications. The operators shall, therefore, evolve an Operations Specification for EDTO, which should cover at least the following before seeking approval;

(a) Airframe-engine combination
(b) Authorised area of operation
(c) Maximum diversion time at the approved one engine cruise speed.
(d) Threshold time

Note: The threshold time and maximum diversion time may also be listed in distance (NM),

10. CREW TRAINING AND EVALUATION

10.1 Operator shall evolve a training program for the flight crew covering initial and recurrent training. This training should cover various aspects including standby generator as the sole power source. Established contingency procedures should be emphasised for each area of operation intended to be used. In addition, special, initial and recurrent training should be given to prepare flight crews to evaluate probable engine and airframe system failures. The object of this training should be to establish crew competency in dealing with most probable operating contingency (diversion decision making).

10.2 The training should also cover proficiency check in performance like flight planning, procedure on diversion, abnormal and emergency procedures, air start of propulsion system, crew incapacitation etc.

10.3 The flight crew-training program shall be submitted to the Flight Standards Directorate (FSD) of DGCA for approval. The training and checks of the crew shall be carried out as approved by the FSD.

10.4 The EDTO approved training program for ETOPS shall include training that describes the unique aspects of ETOPS. That training should include, but not be limited to;

(a) Diversion Decision Making. The operator's training program should prepare flight crewmembers to evaluate probable propulsion and airframe systems malfunctions and failures. The goal of this training should be to establish flight crewmember competency in dealing with the most probable operating contingencies.

(b) Specific ETOPS Requirements. The operator's EDTO training program should provide and integrate training for flight crewmembers and dispatchers (if applicable), as listed below. The DGCA will periodically evaluate a cross-section of these items.

(i) Flight planning, including contingency data, that is engine failure, decompression, and diversion equal time point.

(ii) Flight progress monitoring and fuel tracking.

(iii) Operational restrictions associated with dispatch under the minimum equipment list (MEL)

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(iv) Non-normal procedures including:

a. Abnormal and emergency procedures.

b. Systems failures and remaining airplane capability as it relates to the decision to divert or to continue.

c. Diversion.

d. Crewmember incapacitation.

e. A simulated approach and missed approach with only an alternate power source available, if the loss of two main alternating current electrical power sources with no APU electrical source available results in significant degradation of instrumentation to either pilot.

(v) Use of equipment specifically required for EDTO operations such as cold weather gear and SATCOM as applicable.

(vi) Procedures to be followed in the event that there is a change in conditions at an EDTO alternate listed on the dispatch/flight release that would preclude a safe approach and landing.

(vii) Procedures to be followed in the event that there is a change in conditions at other potential en route diversion airports that would preclude a safe approach and landing.

(viii) Understanding and effective use of approved additional or modified equipment required for EDTO.

(ix) Fuel quantity comparison: the operator's training program should identify fuel management procedures to be followed during the en route portion of the flight. These procedures should provide for an independent crosscheck of fuel quantity indicators, for example, fuel used, subtracted from the total fuel load, compared to the indicated fuel remaining.

(x) Fuel management: accounting for discrepancies between planned fuel remaining and actual fuel remaining for example estimated time of arrival ahead of or behind plan, gross weight, and/or altitude differences.

(xi) Flight crew procedures unique to EDTO as listed above in this CAR.

11. AEROPLANE FLIGHT MANUAL INFORMATION

Operators holding EDTO approval shall ensure that the applicable flight manual

contain at least the following information

(a) The maximum flight time with one power–unit inoperative, for which the systems reliability has been approved in accordance with the airworthiness requirements established for EDTO;

(b) A list of additional equipment installed to meet the airworthiness requirements for EDTO.

(c) Additional performance data, including limitations, and flight procedures appropriate to EDTO; and

(d) Statement to the effect that the aeroplane systems associated with EDTO meet the required airworthiness and performance criteria but that the meeting of such criteria does not by itself constitute approval to conduct EDTO.

12. OPERATIONS APPROVAL

When the operational proving flight has been evaluated and found acceptable then the operator may be authorised to conduct EDTO with the specified airframe engine combinations. Approval to conduct EDTO is made by the issuance of operation specification by the DGCA containing appropriate limitations

13. CONTINUING SURVEILLANCE

The fleet average IFSD rate for the specified airframe engine combination shall continue to be monitored in accordance with propulsion system reliability assessment and EDTO maintenance requirements. As with all other operations the Regional Airworthiness office will also monitor all aspects of the EDTO. The DGCA is authorised to ensure that the operation continues to be conducted safely. In the event that an acceptable level of reliability is not maintained, significant adverse trend exists or if significant deficiencies are detected in the conduct of EDTO operation, the Regional Airworthiness Office will initiate a special evaluation, impose operational restriction if necessary, to resolve the problem in a timely manner so as to ensure safe EDTO operations.

(B S Bhullar)
Director General of Civil Aviation

Annexure 1

GOVERNMENT OF INDIA
OFFICE OF THE DIRECTOR GENERAL OF CIVIL AVIATION

APPLICATION FOR GRANT OF APPROVAL FOR EXTENDED DIVERSION TIME OPERATIONS (EDTO)

Name of the operator:

Aircraft registration number:

Type and Serial Number of the Aircraft:

Type and model of the Engines fitted:

Route of operation, Maximum diversion time, Minimum altitude to be flown:

Diversion/ En route alternate airport desired:

Copy of the EDTO Manual:

Details of Crew Training:

Applicants in service operational experience:

Total engine hours of the type in the world fleet:

Proof of propulsion system reliability in the world fleet:

Propulsion system reliability of the applicant in terms of IFSD:

Maximum diversion time certified by the manufacture for the applicants aircraft:

Any other additional data as required in the CAR:

Date Signature of the operator