

Extended Range with Two-Engine Aeroplanes (ETOPS) Maintenance Requirements

1. INTRODUCTION

1.1 The Civil Aviation Directive SCAA CAD AIRW/10 and SCAA CAD AIRW/11 incorporates Annex I and Annex II (Part M and Part 145) to the European Commission Regulation (EC) No 1321/2014 of 26 November 2014, as amended, as the technical standard applicable in the Seychelles for the continuing airworthiness of aircraft and aeronautical products, parts and appliances.

1.2 This Airworthiness Notice sets out to give general guidance on the procedure to be followed by operators/organizations conducting Extended Twin Engine Operations (ETOPS). The acceptable means in complying with the maintenance requirements to obtain authorisation for two-engine aeroplanes to operate over a route that contains a point farther than one hour flying time at the approved one-engine-inoperative-cruise speed (under standard condition in still air) from an adequate airport.

2. Applicability

2.1 Compliance with Specific Criteria of EASA [AMC 20-6](#) is required for the purposes of this Notice.

2.2 To be eligible for extended range operation, the specified airframe/engine combination should have been certified to the airworthiness standards of Transport Commercial Aeroplane and should have been evaluated considering the **Concepts** in Chapter I Section 5, evaluated considering the **Type Design** consideration in Chapter II, evaluated considering **In-Service Experience For ETOPS Type Design** discussed in Chapter II section 6.1, **Operational approval** consideration concepts outlined in Chapter III of the EASA AMC 20-6 as amended.

Notwithstanding the above, the continuing airworthiness and the maintenance requirements of this Notice shall also be considered.

3. Requirements

3.1 General.

The maintenance programme should contain the standards, guidance and direction necessary to support the intended operation. Maintenance and personnel involved should be made aware of the special nature of ETOPS and have the knowledge, skills and ability to accomplish the requirements of the programme.

3.2 ETOPS Maintenance Programme.

The basic maintenance programme for the aircraft being considered for ETOPS is the continuous airworthiness maintenance schedule currently approved for that operator, for the make and model airframe/engine combination. This schedule should be reviewed to ensure that it provides an adequate basis for development of ETOPS maintenance requirements. These should include maintenance procedures to preclude identical action being applied to multiple similar elements in any ETOPS critical system (eg. fuel control change on both engines).

a. ETOPS related tasks should be identified on the operator's routine work forms and related instructions.

All ETOPS requirements, including supportive programme procedures, duties and responsibilities, should be identified and be subject to revision control. The maintenance Programme should be submitted to the Authority 60 days before implementation of ETOPS flights

b. ETOPS related procedures, such as involvement of centralized maintenance control, should be clearly defined in the operator's programme.

c. An ETOPS service check should be developed to verify that the status of the aeroplane and certain critical items are acceptable. This check should be accomplished by a qualified and authorised person prior to an ETOPS flight.

d. Log books should be reviewed and documented, as appropriate, to ensure proper MEL procedures, deferred items and maintenance checks, and that system verification procedures have been properly performed.

3.3 ETOPS Manual.

The operator should develop a manual for use by personnel involved in ETOPS. This manual need not include but should at least reference the maintenance programme and other requirements described by this Airworthiness Notice and clearly indicate where they are located in the operator's manual system.

Alternatively, the operator may include this information in existing manuals used by personnel involved in ETOPS.

3.4 Oil Consumption Programme.

The operator's oil consumption programme should reflect the manufacturer's recommendations and be sensitive to oil consumption trends. It should consider the amount of oil added at the departing ETOPS stations with reference to the running average consumption; i.e. the monitoring must be continuous up to, and including, oil added at the ETOPS departure station. If oil analysis is meaningful to this make and model, it should be included in the programme. If the APU is required for ETOPS operation, it should be added to the oil consumption programme.

3.5 Engine Condition Monitoring.

This programme should describe the parameters to be monitored, method of data collection and corrective action process. The programme should reflect manufacturer's instructions and industry practice. This monitoring will be used to detect deterioration at an early stage to allow for corrective action before safe operation is affected. The programme should ensure that engine limit margins are maintained so that a prolonged single-engine diversion may be conducted without exceeding approved engine limits (i.e. rotor speeds, exhaust gas temperature) at all approved power levels and expected environmental conditions. Engine margins preserved through this programme should account for the effects of additional engine

loading demands (e.g. anti-icing, electrical, etc.) which may be required during the single-engine flight phase associated with the diversion.

3.6 Verification Programme After Maintenance.

The operator should develop a verification programme or procedures should be established, to ensure corrective action following an engine shutdown, primary system failure or adverse trends for any prescribed events which require a verification flight or other action and establish means to assure their accomplishment. A clear description of who must initiate verification actions and the section or group responsible for the determination of what action is necessary should be identified in the programme. Primary systems or conditions requiring verification actions should be described in the operator's ETOPS manual.

3.7 Reliability Programme.

An ETOPS reliability programme should be developed or the existing reliability programme supplemented. This programme should be designed with early identification and prevention of ETOPS related problems as the primary goal. The programme should be event-orientated and incorporate reporting procedures for significant events detrimental to ETOPS flights. This information should be readily available for use by the operator and Authority to help establish that the reliability level is adequate, and to assess the operator's competence and capability to safely continue ETOPS. The Authority should be notified within 96 hours of events reportable through this programme.

a. In addition to the items required to be reported by national regulations, the following items should be included:

- (i) in-flight shutdowns;
- (ii) diversion or turnback;
- (iii) uncommanded power changes or surges;
- (iv) inability to control the engine or obtain desired power; and
- (v) problems with systems critical to ETOPS.

b. The report should identify the following:

- (i) aircraft identification;
- (ii) engine identification (make and serial number);
- (iii) total time, cycles and time since last shop visit;
- (iv) for systems, time since overhaul or last inspection of the defective unit;
- (v) phase of flight; and
- (vi) corrective action.

3.8 Propulsion System Monitoring.

The operator's assessment of propulsion systems reliability for the extended range fleet should be made available to the Authority (with the supporting data) on at least a monthly basis, to ensure that the approved maintenance programme continues to maintain a level of reliability necessary for extended range operation.

The assessment should include, as a minimum, engine hours flown in the period, in flight shutdown rate for all causes and engine removal rate, both on a 12 month moving average basis. Where the combined extended range fleet is part of a larger fleet of the same aircraft/engine combination, data from the operator's total fleet will be acceptable. However, the reporting requirements of paragraph 5 of Appendix I in [AMC 20-6](#) must still be observed for the extended range fleet.

Any adverse sustained trend would require an immediate evaluation to be accomplished by the operator in consultation with the Authority. The evaluation may result in corrective action or operational restrictions being applied.

NOTE: Where statistical assessment alone may not be applicable, e.g. when the fleet size is small, the operator's performance will be reviewed on a case-by-case basis.

3.9 Maintenance Training Programme.

Maintenance training should focus on the special nature of ETOPS. This programme should be included in normal maintenance training. The goal of this programme is to ensure that all personnel involved in ETOPS are provided with the necessary training so that the ETOPS maintenance tasks are properly accomplished and to emphasize the special nature of ETOPS maintenance requirements. Qualified maintenance personnel are those that have completed the operator's extended range training programme and have satisfactorily performed extended range tasks under supervision, within the framework of the operator's approved procedures for Personnel Authorisation.

3.10 ETOPS Part Control.

The operator should develop a parts control programme with support from the manufacturer that ensures that proper parts and configuration are maintained for ETOPS. The programme includes verification that parts placed on ETOPS aircraft during parts borrowing or pooling arrangements, as well as those parts used after repair or overhaul, maintain the necessary ETOPS configuration for that aircraft.

4. EFFECTIVITY

This Notice becomes effective from the date of issue and supersedes any other notices on the same subject.