

CHAPTER : 5.3

ISSUE : 1

EFFECTIVE DATE: 11 MAY 87

SUBJECT: MANDATORY MODIFICATIONS/INSPECTIONS

1. INTRODUCTION

1.1 The owner/operator of an aircraft for which a Certificate of Airworthiness (C of A) is valid shall retain, as part of the required aircraft documentation, a current Electrical load Analysis (ELA) in respect of that aircraft. In respect of an aircraft for which application for a C of A is being made, the currency of the existing ELA must be verified, and shall be made available to the Director of Civil Aviation upon request.

2. GENERAL

2.1 The purpose of the ELA is to determine, for each major electrical source, the capacity required to provide adequate electrical power under the most extreme conditions. This is accomplished by evaluating and summarizing the average and maximum demands under various flight conditions.

The summary is used to:-

- (a) Relate the ELA to the system capacity.

- (b) Relate the ELA/system capacity to the probable duration of various normal and emergency conditions.

- (c) Provide essential data relating to the establishment of load shedding and emergency procedures.

- (d) Provide a permanent record of the electrical characteristics of all power generation and user installed in the aircraft.

(e) Provide a ready reference when considering additional system power requirements in respect of a proposed installation of additional electrical/avionics system(s).

3. **REQUIREMENTS OF ELA**

3.1 A complete ELA is normally provided as a permanent part of the aircraft documentation for each new aircraft prior to delivery to the customer, and it will normally have been compiled in consideration on the requirements of the following paragraph 3.2 and 3.3. Throughout the life of an aircraft, however, it is not unusual for the ELA to be frequently and significantly revised. The intent of paragraphs 3.2 and 3.3 is to provide minimum requirements which must be considered when any change is made to any aircraft system which may affect the electrical loading for that aircraft.

3.2 For normal operating conditions, the ELA shall establish that the continuous capacity and the overload capacity of the electrical supply system shall be adequate to ensure the satisfactory functioning of all normal and essential equipment in all probable combinations, and that in respect of:-

(a) **AIRCRAFT WITH MORE THAN ONE POWER UNIT**

In the even of the loss of one electrical source, the continuous and overload capacities of the supply system shall still be adequate to ensure the satisfactory functioning of all probable combinations of essential equipment, taking into account automatic load shedding and assuming that no further load shedding will be initiated by the crew for 5 minutes.

(b) **AIRCRAFT WITH ONE POWER UNIT**

The electrical supply system shall be such that following the loss of one electrical source, it will be possible for all combinations of essential systems, likely to be used in these circumstances, to function for at least 30 minutes.

3.3 Under emergency operating conditions, the ELA shall establish that for each condition which may arise during and after any possible combination of failure of power sources, and in regard to the possible duration of and the combinations of systems likely to be used during such conditions, each essential system is provided with the electrical power necessary to enable it to function for the necessary duration.

4. **MODIFICATIONS**

4.1 In accordance with Section 3, paragraph 3.1 of this Chapter, no modification to, or installation of any equipment which may affect the electrical load of the currently approved installation shall be made until it has been determined by reference to the ELA that under the new loading conditions, the current carrying capacity of all parts of the system, and the generating and storage capacity specified in the ELA are adequate.

4.2 Any modification to or installation or removal of any equipment which renders the previously approved ELA obsolete requires that a revision to the ELA be effected which will accurately reflect the revised electrical loading status for that aircraft.

NOTE: In accordance with Chapter 5.2 of these requirements, the revised ELA is required to be made available to the Director of Civil Aviation in support of any request for an avionics modification approval.

5. **REFERENCE**

Acceptable methods of preparing an ELA and related summaries are contained in BCAR, Section J - Electrical, Appendix No. 1 to Chapter J 2 - 1. These guidelines may also be used when preparing a revision to the existing ELA.

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(Date of Issue)

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(for Director of Civil Aviation)

CHAPTER 5.4

EFFECTIVE DATE :

SUBJECT : MINIMUM EQUIPMENT LIST - DESPATCH DEVIATIONS MANUAL

1. INTRODUCTION

- 1.1 This chapter specifies the procedure for framing, approval and use of the minimum equipment list (MEL) for aircraft operated by scheduled and non-scheduled operators.
- 1.2 Occasions may arise when facilities for rectification of certain defects encountered during operation of an aircraft may not exist at route stations. Since modern transport aircraft have inherent safeguards introduced into them at design stage in the form of duplicated systems and components, these aircraft may be permitted to continue their flights from route stations to the bases where adequate maintenance facilities are available. This practice not only reduces unnecessary maintenance cost but also avoids inconvenience to the passengers associated with delays to services. However, use of aircraft by invoking MEL for periods longer than absolutely necessary will result in strain on the aircraft as well as the operating crew and, therefore, has to be avoided.

2. DEFINITION

Minimum equipment list (MEL) is a document approved by the Director of Civil Aviation, containing those units and systems which may be inoperative during flight for a limited period, without adversely affecting the airworthiness and safety of aircraft.

3. FRAMING OF MEL

- 3.1 The MEL shall be so drawn as to contain the list of inoperative aircraft system, items of equipment or components with which an aircraft can be operated with an acceptable level of safety by observing appropriate operating level of safety by observing appropriate operating limitations and within the manufacturer's recommendations on the subject.
- 3.2 MEL need not include items like wings, flight controls or complete engines or landing gear etc., the airworthiness and correct functioning of which are absolutely essential before any flight. Additionally it may not include items like galley equipment,

passenger convenience systems and entertainment systems, which do not affect airworthiness of an aircraft.

- 3.3 All items which affect the airworthiness of aircraft or safety of those carried on board, and are not included in MEL, are automatically required to be operative.

4. **USE OF MEL**

- 4.1 An operator shall indicate in the company manual as to when or where an inoperative item shall be required to be replaced.

- 4.2 The operators shall be responsible for exercising necessary control to ensure that no aircraft is despatched with multiple items as inoperative, thus resulting in reduction in the level of safety and/or increase in crew work load.

- 4.3 Notwithstanding the contents of the MEL, an A.M.E need not release the aircraft for flight nor a pilot need accept the aircraft for flight if it is considered to be unsafe.

- 4.4 The A.M.E responsible for releasing the aircraft, after invoking the provisions of the M.E.L shall inform the commander of the aircraft of the same and also make a mention of it in the technical log book and placard the inoperative system suitably.

- 4.5 The M.E.L is normally applicable to all transit and route stations. No aircraft should, therefore, be normally operated from a parent base with defects covered under M.E.L. However, under exceptional circumstances, defects encountered soon before the departure of the first flight of the day from the parent base may be carried forward if it comes under the purview of the M.E.L. Such cases shall, however, be reported to this Department in writing, within 24 hours.

- 4.6 As a normal practice the defects carried forward under the M.E.L shall be rectified and deficiencies made good at the first available opportunity where facilities exist and in any case when the aircraft returns to the main base. The M.E.L is not intended to provide for continued operation of the aircraft with inoperative items for an indefinite period, but to permit the operation of an aircraft with inoperative equipment within acceptable safety standards and sound maintenance system. The operator should, therefore, spell out the guidelines in the preamble of the M.E.L for each type of aircraft operated, for guidance of all concerned.

5. **APPROVAL OF M.E.L**

M.E.L shall be compiled by the operator and submitted to the Director of Civil Aviation for approval. Similarly all amendments to the M.E.L shall also be submitted to this Department for approval.

6. An aircraft may be permitted to fly from a transit station with an item of equipment not included in the M.E.L as inoperative provided:-
 - (i) the chief of operations and chief of engineering as nominated by the operator in the company manual concur after ensuring that the airworthiness of aircraft and safety of its operations shall not be jeopardized by the action.
 - (ii) prior approval of this De [Department is obtained.
7. Whenever the provisions of para 6 above are invoked, the Director of Civil Aviation may, consider inclusion of such items in the M.E.L on receipt of a request from the operator.
8. The operator shall maintain a record, monthwise of all defects carried forward in terms of M.E.L and analyse the same to determine if the servicing facilities require to be strengthened at en route stations in an effort to rectify the reported defects at the earliest. Result of such analyses shall be notified to this Department, every month.

Date of Issue:

C RAMPHUL
for Director of Civil Aviation