

EFFECTIVE: FORTHWITH

Subject: **RELIABILITY PROGRAMME (ENGINES).**

1. APPLICABILITY :

This part of Series 'D' of the Civil Airworthiness Requirements specifies procedures for governing reliability of aircraft engines operated by Scheduled Public Transport Operators.

2. INTRODUCTIONS :

The engine reliability programme recognises inflight shut down rate as a measure of reliability and provides for immediate action should that rate become abnormally high.

3. PROCEDURE :

3.1 The reliability of the engines fitted to aircraft shall be measured in terms of the number and nature of all inflight 'shut down' (including flame outs) in relation to the number of engine flight hours.

Note: Measuring the number of inflight shut downs in relation to flight hours is straight forward; however, measuring in terms of their nature is not. This point is included to avoid misconception that pure numbers adequately measure reliability. Certain shut downs tend to reduce margin of safety more than others and through exercise of good judgement, the nature of shut downs should be weighed accordingly in programming corrective action.

3.2 Inflight shut downs are recognised in two categories, the sum of which will be used in establishing the operators shut-down rate.

(a) Critical shut-downs are those which cause aircraft structural damage, generate projections or fires, adversely affect the controllability of the aircraft and those which cannot be shut-down or feathered.

(b) Shut-downs not falling under the definition of critical (premeditated shut-downs for test or training are not to be included in the programme).

All inflight shut-downs (except those for test or training) are used in computing an operator's shut-down rate.

3.3 The operator will keep a current running record of the cause

of all inflight shut-downs and engine inflight hours and consolidate this data on a monthly basis. By the 10th day of each month the operator will report to the Regional Airworthiness Office, the shut-down rate, number of engines hours flown, number of inflight shut-downs and the reliability index.

- 3.4 By the 25th day of each month the above report will be supplemented by information listing the inflight shut-downs (classified as critical and not critical) for the previous month showing causes and preventive action taken, and will

also include part No., serial number, total time run, time since overhaul, time since inspection of the engine and units parts concerned. If information on the cause is not yet available, the symptoms observed that led to the shutdown will be given. The cause may be communicated later.

- 3.5 The Regional Airworthiness Offices will analyse the reports submitted (vide 3.3 and 3.4) and forward them to the DGCA.

- 3.6 If the operator's reliability index is above the alert value he will in addition to the information mentioned in para 3.4 submit a corrective programme to the Regional Airworthiness Office by the 25th day of the month.

- 3.7 These corrective programmes will outline the measures to be taken to improve the reliability, the effective dates of the completion, projected reliability and any other information relevant to the problem. Examples of a corrective programme will be:

- (i) Increased inspection frequency or amendment of inspection procedures.
- (ii) Changes in operational procedures or limits.
- (iii) Additional maintenance/flight training.
- (iv) Modification to the existing parts.
- (v) Reduction in overhaul times.

NOTE: Reliability is a function of many factors viz. basic design, operations, personnel training, maintenance, overhaul and many others. It is important that all aspects be considered while framing a corrective programme.

- 3.8 The operators corrective programme will be reviewed by the Regional Airworthiness Office for completeness and acceptability and an analysis will be made to determine the causes or factors causing the low reliability.

- 3.9 During the time the operator is in the 'Alert' area, the regional office will:-

- (a) monitor these corrective programme closely to determine their effectiveness and indicate the necessity of

amendment.

- (b) keep the Director General of Civil Aviation informed of the progress and effectiveness of the corrective programmes, so that the Director General of Civil Aviation may be in a better position to advise them to co-ordinate the problems with the other regions.

3.10 If the corrective programmes fails to improve the reliability, further analysis of the causes will be made and the Regional Airworthiness Office may take action that is appropriate for the improvement for the same.

NOTE : - For success of the programme, it is essential that both, the operator and the Regional Airworthiness Office face the responsibility of the situation. As a team they must be dedicated to the proposition that complete fairness in analysis is the only means of approaching solutions to problems of complexities expected in the application of this programme.

Sd/-  
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for Director General of Civil Aviation