



GOVERNMENT OF INDIA

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

**CIVIL AVIATION REQUIREMENTS**

**SECTION 2 - AIRWORTHINESS**

**SERIES 'D' PART VI**

**27<sup>th</sup> APRIL, 1992**

**EFFECTIVE: FORTHWITH**

Subject : **Fixing of Routine Maintenance periods and of component's T.B.Os –  
'Initials' as well as 'Revision'.**

**1. APPLICABILITY:**

1.1 This part of CAR Series 'D' specifies the procedure for -

- i) Fixing initial periods of preventive "Maintenance Schedules" and overhaul of components of aircraft (TBOs); and
- ii) Revision of such periods.

**2. DEFINITION:**

**2.1 Maintenance :**

The action or a set of actions including inspection, servicing and determination of condition required to achieve a desired out-come which restores an aircraft part, equipment in serviceable condition.

**2.2 Hard Time :**

This is a failure preventive process in which deterioration of an item is limited to an level by the maintenance actions which are carried out at periods related to time in service (e.g. calendar time, number of cycles, number of landings). The prescribed actions normally include servicing and such other actions as overhaul, partial overhaul, replacement in accordance with instructions in the relevant manuals, so that the item concerned (e.g. system, component, portions of structure) is either replaced or restored to such a condition that it can be released for a further specified period.

**2.3 On Condition :**

This is also a failure preventive process but one in which the item is inspected or tested, at specific periods, to an appropriate standard in order to determine whether it can continue in service (such an inspection or test may reveal a need for servicing actions). The fundamental purpose of On-Condition is to remove an item before its failure in service. It is not a philosophy of 'fit' until failure or 'fit and forget it'.

2.4 Condition Monitoring :

This is a failure preventive process having neither Hard Time nor On-Condition elements but one in which information on items gained from operational experience is collected, analysed and interpreted on a continuing basis as a means of implementing corrective procedure.

2.5 PREVENTIVE MAINTENANCE means the work performed at pre-determined intervals to maintain an aircraft, aircraft components or aircraft systems in an airworthy condition.

3. FIXATION OF INITIAL PERIOD:

3.1 The basic principle to be followed in fixing initial periods is that the inspection checks or maintenance or overhaul be performed at periods well within the proven "service-life".

3.2 In determining what the proven "service-life" of an aircraft or any of its components might be, the following factors will be kept in view :-

- 1) Areas of operation (whether it is dusty/moist laden/corrosive etc.,).
- 2) Engine operating powers, procedures etc. (whether frequent full throttle/T.O. power utilised for effecting take-offs from short fields).
- 3) Stage lengths (No. of landings effecting on flight sectors, i.e, short-haul or long-haul operations).
- 4) Other operators service experience of similar equipment.
- 5) Applicant's own service experience on similar type of equipment.
- 6) manufacturer's recommendations.
- 7) known operational history of the component.
- 8) Modification status of the component (incorporation of latest service /modifications issued by manufacturers would mean higher reliability and would normally deserve fixation of higher life.

Note : The operator can change from one maintenance process to another e.g. from Hard Time Maintenance to On-Condition Maintenance or On Condition to Condition Monitoring or vice versa provided they have a sound maintenance programme. Such a programme will have to be approved by Regional Airworthiness Office and documented in the Quality Control Manual cum Maintenance System Manual.

- 3.3 Applications for fixation of initial periods shall be made by operators with substantiating data to Regional/Sub-regional Airworthiness Offices. Such periods shall be approved by DGCA headquarters on receipt of comments from Regional/Sub-regional Airworthiness officers in case of aircraft operated by Indian Airlines, Air India, Vayudoot and Pawan Hans Ltd. and for all other operators the Regional Airworthiness Office shall approve the periods.
- 3.4 Once the proposal is approved, then the maintenance periods (including TBOs) must be reflected in Maintenance System manual.
- 3.5 Wherever warranted "Hard Time Periods" (TBOs) and maintenance schedule periods must be expressed in terms of calendar periods too, besides in terms of operational hours/number of landings/number of cycles especially in cases of aircraft having low utilisation.
- 3.6 On Condition" maintenance concepts in respect of certain components may be accepted provided the applicant spells out adequate Insitu/Bench tests, in routine preventive maintenance schedules or separately, to determine continued serviceability of the components.
- 3.7 Condition Monitoring components have neither Hard Time nor On Condition Control standards and are operated to failure. No maintenance task is required to evaluate life expectancy or reliability degradation to replace the item before it fails. Replacement of Condition Monitored items is an unscheduled maintenance action.
4. REVISION OF INITIAL PERIODS (Planned life development) :
- 4.1 On the consideration of operating economy, operators desire to vary the "service-lives" of routine maintenance schedules or of components (Hard Time Periods/TBOs). Mostly on achieving satisfactory service performance the "revision" sought are upwards but there are occasions when unsatisfactory performance must automatically prompt operators to reduce the "service lives". Whereas upward revision (from "initial life" or from "revised life" ) requires prior approval of DGCA but reducing the life may be effected by an operator on its own under intimation to Regional/Sub-regional Airworthiness Offices. Subsequent upward revision of "reduced-lives" must also be done with prior concurrence of Regional Airworthiness Office.
- 4.2 A continued satisfactory performance of aircraft and aircraft components as stated below :
- i) Two consecutive major maintenance schedules (on the same aircraft or on different aircraft of the same type) reveal satisfactory condition of aircraft structure and its system and/or

- ii) The component premature removal rate is within 0.3/1000 hours continuously for 6 months. entitles an operator to submit proposals for upward revision of "maintenance periods"/TBOs.
- 4.3 An operator may submit a programme of life development, comprising of various stages at which the programme would be sampled, to Regional/Sub-regional Airworthiness Office. Considering the operational experience in general and commenting on seriousness of defects encountered, premature removal rates experienced, and the remedial measures initiated by the operator, Regional Airworthiness Office may forward such a programme to DGCA with their recommendations, for acceptance. Sub-regional Airworthiness Offices shall also send such programmes directly to DGCA with a copy to Regional Airworthiness Office.
- 4.4 Once a programme is approved, then Regional Airworthiness Office (not a sub-Regional Office, who will have to approach Regional Airworthiness Office for the purpose) may approve, (subject to satisfactory condition of "samples" and adequate remedial action having been taken in respect of deficiencies observed, with no life limiting features having been seen and manufacturers' recommendations having been taken note of) new "service lives" at various stages (within the approved programme) on its own, under intimation to headquarters.
- 4.5 An operator may operate remaining programmed aircraft/ aircraft components to the next stage of the approved life development programme after submitting the satisfactory "samples" at the previous stage, with the concurrence of Regional Airworthiness Office.
5. ADVANCE intimation shall be given to the Regional/Sub-regional Airworthiness Offices of the inspection of the "sample" and they may associate with the "inspection" at various stages of life development programme.
6. Regional/Sub-regional Airworthiness Offices may require an operator to submit "samples" to bench checking and in case of engines even to flight tests (like climb performance check) for determining the extent of deterioration, before approving revised life at any stage.

Sd/-

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