RA 5724 - Life Extension Programme

Rationale

Occasions may arise in which an Air System type is required to operate beyond its certified life. In such cases, Airworthiness Risks may increase if the Air System Products, Parts and Appliances exceed the life parameters against which they were tested and approved. A Life Extension Programme (LEP) can identify, mitigate and ultimately ►manage◄ these Risks.

Contents

Regulation 5724(1)

Requirement for a Life Extension Programme

5724(1) The requirement to extend the certified life of any UK military Air System type, in any parameter, **shall** be identified by the Type Airworthiness Authority (TAA)[1].

Acceptable Means of Compliance 5724(1)

Requirement for a Life Extension Programme

1. The TAA **should** undertake an LEP when it is identified that the operation of an Air System type needs to be extended beyond its current certified life (in terms of calendar time, flying hours, Fatigue Index, landings or pressure cycles).

2. Where the severity of In-Service usage is greater than that assumed in design, the implications upon service life **should** be assessed and any potential life extension requirement **should** be identified by the TAA.

3. The potential requirement for a life extension **should** be considered by the TAA no later than 10 years before the original Out of Service Date and **should** be reviewed annually thereafter.

4. ►A confirmed extension to an Air System's certified life **should** be treated as a Major Change to Type Design[2]. An application for a Major Change to Type Design **should** be made to the MAA by the TAA using a MAA Form 30[2].◄

Guidance Material 5724(1)

Requirement for a Life Extension Programme

5. Refer to the Manual of Air System Integrity Management (MASIM)[3] for related Guidance Material and other non-regulatory process.

Regulation 5724(2)

Development and Implementation of a Life Extension Programme

5724(2) When required to extend the certified life of a UK military Air System type, in any parameter, the TAA **shall** develop and implement an LEP to underwrite the Airworthiness of the Air System type for its extended life.

Acceptable Means of Compliance 5724(2)

Development and Implementation of a Life Extension Programme

LEP Scope

6. The TAA **should** determine the scope of the LEP using a Risk-based approach: all Structure, Systems components and propulsion components whose failure could compromise Airworthiness **should** be identified and considered for inclusion within the

[1] Where the Air System is not UK MOD-owned, Type Airworthiness management regulatory Responsibility by either the TAA or Type Airworthiness Manager (TAM) needs to be agreed within the Sponsor's approved model ; refer to RA 1162 – Air Safety Governance Arrangements for Civilian Operated (Development) and (In-Service) Air Systems or refer to RA 1163 – Air Safety Governance Arrangements for Special Case Flying Air Systems.
[2] ►Refer to RA 5820 – Changes in Type Design (MRP Part 21 Subpart D).◄
[3] Refer to MASIM Chapter 11: Life Extension Programme.

Acceptable Means of Compliance 5724(2)

LEP. The exclusion of any such components from the LEP **should** be identified and the rationale for their exclusion documented.

7. The TAA **should** ensure that an analysis of all components to be included in the LEP is undertaken, using appropriate evidence and inputs from all relevant stakeholders (including the Delivery Team (DT) and relevant Design Organization(s) (DO), maintainers and operators), to categorise each as either:

a. 'Non-extendable', where the life cannot be extended to meet the new requirement. A Component Replacement Plan **should** be developed to address all such components.

b. 'Extendable', where the life can be extended without further work. Revised life limits, including any associated caveats such as Maintenance actions, **should** be determined and promulgated for all such components.

c. 'Subject to LEP', where the life can potentially be extended subject to further LEP work. Revised life limits, including any associated caveats such as Maintenance actions, **should** be determined and promulgated for all such components.

Evidence Supporting an LEP

8. The additional evidence necessary to support life extension of the LEP components **should** be identified and documented. The LEP evidence requirements **should** include ►a review◄ of all Safety-relevant failure modes or mechanisms and reference to design, qualification and In-Service information sources.

9. The baseline LEP Configuration standard (or standards for different marks, block releases or 'fleets-within-fleets') **should** be identified for all 'Subject to LEP' components.

10. Validation **should** be undertaken of the Modification status of the fleet against the LEP baseline standards.

11. Validation **should** be undertaken of any Maintenance data used to make Airworthiness-related decisions within an LEP.

12. Information gained from Operational Loads Monitoring (OLM) / Operational Data Recording (ODR) programmes **should** be ►utilized◄ within the LEP to ensure that significant Structures, Systems and propulsion loads and usage are adequately understood. Where there is no OLM / ODR capability within the fleet, initiation of an OLM / ODR programme **should** be ►reviewed◄ as soon as possible to support the LEP.

13. A Widespread Fatigue Damage (WFD) assessment **should** be undertaken to identify areas of the Structure potentially susceptible to WFD and any remedial actions required to meet the proposed life extension.

14. A Repair Assessment Programme **should** be undertaken to identify any structural Repairs that require either additional fatigue substantiation or replacement to meet the proposed life extension.

15. A condition survey of a representative sample of fleet-leader Air System **should** be used to inform life extension activities.

16. The TAA **should** agree the DO's plans to meet the LEP evidence requirements. This evidence **should** be assembled, usually by the DO, as revised Certificates of Design (CofD)[4], together with any recommended caveats. The revised CofD **should** be reviewed and endorsed by the TAA.

17. The TAA **should** compile a Type Airworthiness Safety Assessment Report (TASAR)[5] detailing the scope, assumptions and results of the LEP which **should** be evaluated by a Suitably Qualified and Experienced Person who is independent of the DT. The TAA **should** formally submit the TASAR to the Aviation Duty Holder /

[4] Refer to RA 5103 – Certificate of Design.
[5] Refer to RA 5012 – Type Airworthiness Safety Assessment.

Acceptable Means of Compliance 5724(2)

Accountable Manager (Military Flying) for incorporation within the Air System Safety Case►6◄.

18. A revised Release To Service►7◄ / Military Permit To Fly (In Service)[8] (and, where applicable, Military Type Certificate) **should** be produced to reflect the revised life limits for the fleet.

Guidance Material 5724(2)

Development and Implementation of a Life Extension Programme

19. Refer to the MASIM[3] for related Guidance Material and other non-regulatory process.

[6] ►Refer to RA 1205 – Air System Safety Cases.
[7] Refer to RA 1300 – Release To Service.◄
[8] Refer to RA 1305 – Military Permit To Fly (In-Service), (Special Case Flying) and (Single Task).

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