



DEPARTMENT OF DEFENSE  
**UNITED STATES AIR FORCE**

**MIL-HDBK-516C CHANGE NOTICE No. 516CN-2**

<p align="center"><b>AIRWORTHINESS BOARD DETERMINATION          MIL-HDBK-516C CHANGE NOTICE</b></p>	<p>1. DATE (YYYYMMDD) 20160510</p>
<p>2. AFLCMC/EZ POINT OF CONTACT Greg Schoeppner, EZFS</p>	<p>3. PHONE (DSN) 986-9921</p>
<p>4. BOARD SECRETARIAT Holli Bone, AFLCMC/EZSC</p>	<p>5. PHONE (DSN) 656-9557</p>
<p>6. SUMMARY OF AIRWORTHINESS BOARD DETERMINATION / MIL-HDBK-516C CHANGE          (See attached Airworthiness Board charts for more information.)</p> <p>MIL-HDBK-516C Section 5.7 (5.7.1 thru 5.7.5) Service Life Limit</p> <p>Change impacts:</p> <ul style="list-style-type: none"> <li>• New Section Header: Force Management</li> <li>• New Criterion: See attached charts.</li> <li>• New Standard: See attached charts.</li> <li>• New Method of Compliance: See attached charts.</li> </ul>	
<p>7. TAA SIGNATURE</p> <p><b>X</b> <u>K. J. Bone for</u> 19 May 16</p> <p>Jorge F. Gonzalez          Technical Airworthiness Authority</p>	<p>8. ORGANIZATION</p> <p>AFLCMC/EN-EZ</p>



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# USAF Airworthiness Change Notice Board



## Service Life Limit

### 27 May 15

**Greg Schoeppner**  
**AFLCMC/EZFS**  
**DSN: 986-9921**  
**gregory.schoeppner@us.af.mil**



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# Change Notice (CN) Overview



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- **Title: Service Life Limit**
- **Date Proposed: 29SEP2014**
- **POC: Schoeppner, EZFS, 656-9921**
- **Revision To: CN Proposal Revises MIL-HDBK-516C**

Paragraph(s) Impacted	Impact to C/S/MOC			
	Title	New	Modified	No Change
5.7	Header	X		
5.7.1	C, S, & MOC	X		
5.7.2	C, S, & MOC	X		
5.7.3	C, S, & MOC	X		
5.7.4	C, S, & MOC	X		
5.7.5	C, S, & MOC	X		

C = Criteria

S = Standard

MOC = Method of Compliance



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# Rationale for Change



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- **Rationale:** to establish and execute service life limits documented in the MTC or MFR



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# Proposed Criterion



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- **Proposed Criterion: 5.7 [Header], 5.7.1**
- 5.7 Force Management [Header]
- 5.7.1 Verify that a force structural maintenance plan (FSMP) defines the maintenance requirements to ensure structural integrity.



# Proposed Standard



- **Proposed Standard: 5.7.1**

1. The FSMP defines when, where, how, and the estimated costs of inspections and modifications and the recurring structural maintenance program (i.e., periodic, minor and major inspections, program depot maintenance, corrosion prevention and control, etc.) to ensure structural integrity.

2. The FSMP is updated when a new baseline operational spectrum is developed and updated based on data collected via the loads/environment spectra survey (L/ESS) program and updated durability and damage tolerance analysis is performed. The FSMP is also updated as dictated by damage discovered during scheduled inspections, surveillance sampling inspections such as Analytical Condition Inspection, structural teardown inspection programs, and/or normal maintenance of the aircraft.

FSMP = Force Structural Maintenance Plan

**Markup Key:** Current Text [~~Proposed Deletion~~] [Proposed Addition]



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# Proposed Method of Compliance



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- **Proposed Method of Compliance: 5.7.1**
- The FSMP report addresses each applicable standard.

FSMP = Force Structural Maintenance Plan

Markup Key: Current Text [~~Proposed Deletion~~] [Proposed Addition]



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# Proposed Criterion

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- **Proposed Criterion: 5.7.2**
- Verify that a system to perform a loads/environment spectra survey (L/ESS) is developed and implemented to obtain actual usage data that can be used to update or confirm the design spectrum.





# Proposed Standard



- **Proposed Standard: 5.7.2**
  1. A sufficient number of aircraft are instrumented to achieve a 20-percent valid data capture rate of the fleet usage data unless a different rate is documented in the approved Aircraft Structural Integrity Program (ASIP) Master Plan. L/ESS systems record time-history data such as vertical and lateral load factors; roll, pitch and yaw rates; roll, pitch, and yaw accelerations; altitude; Mach number; control surface positions; selected strain measurements; ground loads; aerodynamic excitations; etc. Data is collected to characterize the thermal and chemical environments within the aircraft and associated with aircraft basing.
  2. The actual usage data obtained by L/ESS can be used to update the original design spectrum. A new baseline operational loads spectrum is developed from the in-flight measurements and the predicted operational environment updated as necessary. The length of the initial survey period is based on evaluations of the mission types, mission mix, quantity of aircraft in service and amount of data required to develop a statistically significant sample of actual usage. The stability of mission types, mixes, and severity is evaluated to determine the need for periodic survey updates.

L/ESS = Loads/Environment Spectra Survey

**Markup Key:** Current Text [~~Proposed Deletion~~] [Proposed Addition]



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# Proposed Method of Compliance



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- **Proposed Method of Compliance: 5.7.2**
- Inspection of the L/ESS methodology report, and after flight operations begin the L/ESS data reports; verifies that the standards have been met.

L/ESS = Loads/Environment Spectra Survey

Markup Key: Current Text [~~Proposed Deletion~~] [Proposed Addition]



# Proposed Criterion

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- **Proposed Criterion: 5.7.3**
- Verify that a program to perform individual aircraft tracking (IAT) is developed and implemented to obtain actual usage data that can be used to adjust maintenance intervals on an individual aircraft (“by tail number”) basis.



# Proposed Standard



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- **Proposed Standard: 5.7.3**

1. All aircraft have an IAT system that records sufficient usage parameters to determine the damage growth rates throughout the aircraft structure. The system has sufficient capacity and reliability to achieve a 90-percent minimum valid data capture rate of all flight data for the fleet throughout the service life of the aircraft unless a different rate is documented in the approved ASIP Master Plan. The system includes serialization of interchangeable/replaceable aircraft structural components, as required. The IAT Program acquires data at the beginning of initial flight operations.
2. The IAT Program is used to adjust the inspection, modification, overhaul, and replacement times based on the actual, measured usage of the individual aircraft throughout the service life of the aircraft. The IAT Program is used to determine damage growth in the appropriate environment as a function of the total measured usage and to quantify changes in operational mission usage. The IAT Program determines the equivalent flight hours (or other appropriate measures of damage such as landings, pressure cycles, etc.) and adjusts the required maintenance schedule for all critical locations on each individual aircraft. The IAT Program forecasts inspections and when aircraft structural component life limits will be reached.

ASIP = Aircraft Structural Integrity Program

IAT = Individual Aircraft Tracking

**Markup Key:** Current Text [~~Proposed Deletion~~] [Proposed Addition]



# Proposed Method of Compliance



- **Proposed Method of Compliance: 5.7.3**

Inspection of the IAT methodology report, and after flight operations begin the IAT data reports; verifies that the standards have been met.

IAT = Individual Aircraft Tracking

Markup Key: Current Text [~~Proposed Deletion~~] [Proposed Addition]



# Proposed Criterion

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- **Proposed Criterion: 5.7.4**
- Verify that a program to perform rotorcraft dynamic component tracking (RDCT) is developed and implemented to support condition-based maintenance.



# Proposed Standard

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- **Proposed Standard: 5.7.4**
  1. One hundred percent of rotorcraft are instrumented with systems that measure component responses to operations and that anticipate impending failures.
  2. The systems provide sufficient warning of impending failure to allow safe flight and landing.
  3. The RDCT Program is ready to acquire data at the beginning of initial flight operations.

RDCT = Rotorcraft Dynamic Component Tracking

**Markup Key:** Current Text [~~Proposed Deletion~~] [Proposed Addition]



# Proposed Method of Compliance



- **Proposed Method of Compliance: 5.7.4**
- Inspection of the RDCT methodology report, and after flight operations begin the RDCT data reports; verifies that the standards have been met.

RDCT = Rotorcraft Dynamic Component Tracking

Markup Key: Current Text [~~Proposed Deletion~~] [Proposed Addition]





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# Proposed Criterion

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- **Proposed Criterion: 5.7.5**
- Verify the aircraft structure service life limit.



# Proposed Standard



- **Proposed Standard: 5.7.5**

1. The aircraft structure service life limit is established in terms of equivalent flight hours (or other appropriate measures of damage such as landings, pressure cycles, etc.) and the IAT Program is used to determine when each aircraft reaches the limit.
2. The initial structure service life limit is based upon the design analyses correlated to full-scale ground and flight testing with supporting risk analysis. The initial aircraft structure service life limit does not exceed 50% of the full-scale airframe durability test demonstrated service life and is reduced to the value of the life limited components in which structural modifications are required to achieve the design service life requirement.
3. The aircraft structure service life limit may be extended provided that all of the following validate the increase and their combined results are documented in a service life limit extension verification report that justifies the extension: updated durability and damage tolerance analysis, updated corrosion assessment, updated risk analysis, and updated FSMP to include any additional Analytical Condition Inspection requirements. If teardown inspections of high-time aircraft and/or full-scale durability tests are not performed to validate the updated analyses, the justifications for these decisions are documented in the service life limit extension verification report.
4. The onset of widespread fatigue damage is the maximum service life limit for each affected aircraft structure component.

FSMP = Force Structural Maintenance Plan

IAT = Individual Aircraft Tracking

**Markup Key:** Current Text [~~Proposed Deletion~~] [Proposed Addition]



# Proposed Method of Compliance



- **Proposed Method of Compliance: 5.7.5**

Inspection of the Durability and damage tolerance analysis report, Corrosion assessment report, Risk analysis report, FSMP report, Durability and damage tolerance test report, Teardown inspection report (if conducted), and Service life limit extension verification report (if applicable) verifies that the standards have been met.

FSMP = Force Structural Maintenance Plan

**Markup Key:** Current Text [~~Proposed Deletion~~] [Proposed Addition]



# Specific Comments



- **Comment 1:** Concern that we are trying to put force management policy, and in particular actions which can only be accomplished on an operational fleet, into our design criteria.

**Organization:** Mr Randy Jansen, F-15

**Date Comment Received:** 29 May 15

**Response:** The wording in the standards has been modified to clarify applicability to developmental aircraft and operational fleets

- **Comment 2:** The MoC should indicate how the standard is met

**Organization:** Mr Gonzalez

**Date Comment Received:** 29 May 15

**Response:** The wording in the MoC has been modified to convey that inspection of the reports verifies that the standards have been met.



# Recommendation



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Organization	TA Coordination	Approve	Disapprove	Comment
AFLCMC/EZFS	Greg Schoeppner	X		The 2 comments have been addressed by modifying the Standards and MoC

- **Recommendation:**

Approve

Disapprove

- **Potential safety/design impact to currently fielded fleet:**

Significant

Insignificant

Checking 'Significant' above will help TAA determine need to inform program offices of urgent safety/design issue

- **Other notes:**