交　通　部　民　用　航　空　局

民　　航　　通　　告

主旨 SUBJECT：航空器機體大/小修理之判斷指引 AIRFRAME MAJOR / MINOR REPAIR CLASSIFICATION		
發行日期 ISSUE DATE： 2016.05.09	編號 NO： AC 43-002A	發行單位 ISSUED BY： 飛航標準組 FLIGHT STANDARD DIVISION

一、目的 1. Purpose：

本通告旨在提供航空器結構修理分類為大/小修理之指引。大修理必須符合 06-01A「航空產品與其各項裝備及零組件適航維修管理規則」之相關規定。This advisory circular (AC) provides guidance for classifying repair to airframe structure as major or minor. Major repairs must comply with requirements in "06-01A Regulations of Airworthiness and Maintenance Management for Aviation Products, Appliances and Parts".

本通告並非強制性之法規，而是提供一種可接受之方法，但非惟一之方法，供航空器使用人建立作業準則。This material is neither mandatory nor regulatory in nature and does not constitute a regulation. It describes acceptable means, but not the only means, for aircraft operator to showing compliance with the applicable regulations

二、修正說明 2. Revision reason：

AC 43-001A:

（一）修訂 06-01A 規則名稱為「航空產品與其各項裝備及零組件適航

維修管理規則」Revise the name of regulation 06-01A to "Regulations of Airworthiness and Maintenance Management for Aviation Products, Appliances and Parts".

（二）修訂背景說明 (段落三) Revise the information in Background (section 3)

（三）修訂需求說明 (段落四) Revise the information in Requirements (section 4)

（四）修訂執行要點說明 (段落五) 及流程圖 (附件二) Revise the information contained in Implementation (section 5) and logic diagram (Attachment 2)

三、背景說明 3. Background：

長期以來，大修理與小修理之定義隨著各國民航主管機關、航空器原製造廠、及航空器使用人而有所差異。The definitions of major and minor repairs have historically been subject to widely varying application by various national aviation authority, aircraft manufacturers, and operators.

在美國聯邦法規架構下，航空器使用人需建立其大/小修理判斷流程，並經美國聯邦航空總署備查。此架構導致不同航空器使用人對於大/小修理有不同的判斷流程。Under the FAA system, it is up to each individual operator to develop a major/minor decision process that is worked out with their local FAA Certification Management Office. This process has resulted in each US operator with a unique characterization of major versus minor repair.

在歐盟法規架構下，僅有 EASA 及設計組織檢定證持有人得分類大修理與小修理，航空器使用人無權執行此分類作業。Under the EASA system, only EASA or an EASA Design Organization Approval (DOA) holder can classify repairs. This has left many operators in Europe without the authority to classify their own repairs.

美國與歐盟的法規差異持續困擾著航空器使用人對於大修理的定義與分類。Regardless of the regulatory oversight, there continues to be confusion over the interpretation of the rules on what is a major repair.

隨著航空器所有權及使用權移轉情形益加普遍，及大修理與其核准資料之相關規定，致使業界對於大修理定義一致性的需求亦與日俱增。As airplanes increasingly change ownership and/or operators, the requirements to have all repairs identified with the appropriate repair data is driving the need to have a consistent application of the definition of major repairs.

為減少航空器使用人有關大/小修理分類標準之差異性，本通告參考美國與歐盟的作法，提供航空器結構修理大/小修理分類之判斷準則，作為航空器使用人建立相關程序之指引。For the purpose of reducing difference over the interpretation of the rules on what is a major repair, this advisory circular (AC), with means of FAA and EASA system considered, provides guidance material for operator to develop major/minor repair classification procedures.

四、需求說明：4. Requirement

航空器使用人可依本通告，並考量其使用之航空器機型，建立航空器維護能力冊中有關結構大/小修理判定之程序，並報請民航局備查。Operator may using this guidance material with consideration of the aircraft type operated to develop major/minor repair classification procedures in GMM, and submit to CAA for accept.

五、執行要點說明：5. Implementation

（一）符合下列情況之機體結構修理為重大修理：Following repairs are considered airframe major repairs.

1、壓力艙蒙皮以補片方式執行之結構修理。(依據 CAA AD 2003-03-020A)。Repair with doubler installed on fuselage pressure boundary skin (CAA AD 2003-03-020A).

2、FAR Part 43 Appendix A (b) (1)所列之修理情況 (如附件一)。Repairs listed on FAA Part 43 Appendix A (b)(1) (Attachment 1).

3、有 FAA Form 8110-3、FAA form 8100-9、EASA RDAS (Repair Design Approved Sheet, for Airbus)、EASA SRAS (Structural

Repair Approval Sheet, for ATR) 或其他航空器製造國民航主管機關簽署之大修理核准文件之結構修理者。Structural repair approved by FAA Form 8110-3, FAA form 8100-9, EASA RDAS (Repair Design Approved Sheet, for Airbus), EASA SRAS (Structural Repair Approval Sheet, for ATR) or other approval document endorsed by state authority responsible for oversight of aircraft manufacturer.

4、依據附件二所示之大/小修理流程圖判定為大修理者。Repair classified as major repair according to attachment 2 logic diagram

六、相關規定及參考文件：6. RELATED DOCUMENTS

（一）06-01A「航空產品與其各項裝備及零組件適航維修管理規則」。06-01A Regulations of Airworthiness and Maintenance Management for Aviation Products, Appliances and Parts

（二）FAR Part 43 Appendix A

（三）MD-80-SL-51-107-D (Equivalence number 737-SL-51-041-D, 747-SL-51-047-D, 777-SL-51-012-D, 787-SL-51-002-D, MD-90-SL-51-107-D) Major / Minor repair classification.

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AC 43-002A 附件1 Attachment 1

Appendix A to Part 43 - Major Alterations, Major Repairs, and Preventive Maintenance

(b) Major repairs

(1) Airframe major repairs. Repairs to the following parts of an airframe and repairs of the following types, involving the strengthening, reinforcing, splicing, and manufacturing of primary structural members or their replacement, when replacement is by fabrication such as riveting or welding, are airframe major repairs.

(i) Box beams.

(ii) Monocoque or semimonocoque wings or control surfaces.

(iii) Wing stringers or chord members.

(iv) Spars.

(v) Spar flanges.

(vi) Members of truss-type beams.

(vii) Thin sheet webs of beams.

(viii) Keel and chine members of boat hulls or floats.

(ix) Corrugated sheet compression members which act as flange material of wings or tail surfaces.

(x) Wing main ribs and compression members.

(xi) Wing or tail surface brace struts.

(xii) Engine mounts.

(xiii) Fuselage longerons.

(xiv) Members of the side truss, horizontal truss, or bulkheads.

(xv) Main seat support braces and brackets.

(xvi) Landing gear brace struts.

(xvii) Axles.

(xviii) Wheels.

(xix) Skis, and ski pedestals.

(xx) Parts of the control system such as control columns, pedals, shafts, brackets, or horns.

(xxi) Repairs involving the substitution of material.

(xxii) The repair of damaged areas in metal or plywood stressed covering exceeding six inches in any direction.

(xxiii) The repair of portions of skin sheets by making additional seams.

(xxiv) The splicing of skin sheets.

(xxv) The repair of three or more adjacent wing or control surface ribs or the leading edge of wings and control surfaces, between such adjacent ribs.

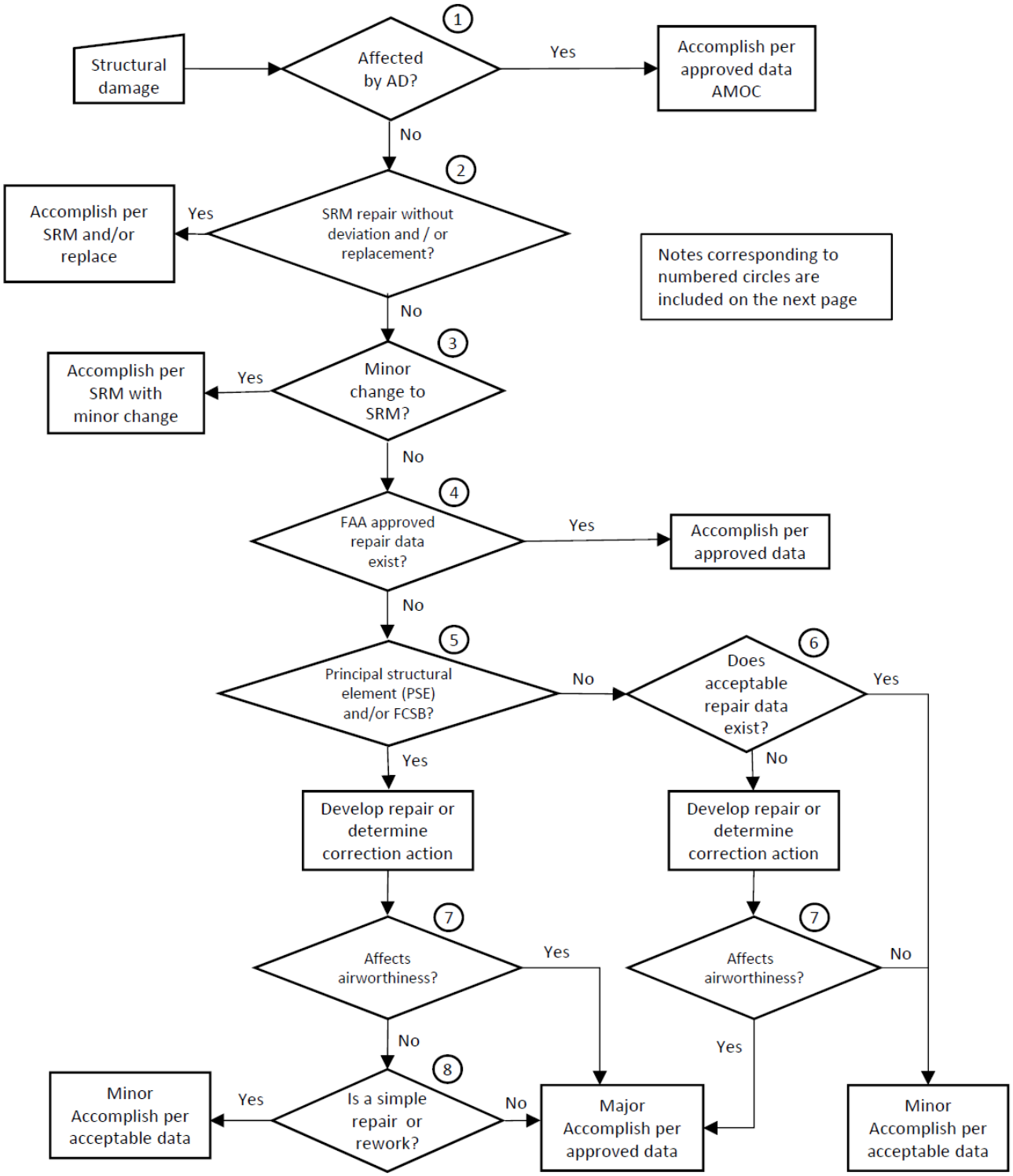
(xxvi) Repair of fabric covering involving an area greater than that required to repair two adjacent ribs.

(xxvii) Replacement of fabric on fabric covered parts such as wings, fuselages, stabilizers, and control surfaces.

(xxviii) Repairing, including rebottoming, of removable or integral fuel tanks and oil tanks.

AC 43-002A 附件2 Attachment 2 (Ref MD-80-SL-51-107-D)

Major / minor repair logic diagram – airframe structure



The following notes correspond to the circle notes on the logic diagram:

1. If the damage or repair, no matter how minor, affects compliance to an Airworthiness Directive (AD), then an Alternate Method of Compliance (AMOC) approved by CAA is required.
2. Repair per SRM or replace damaged part with the drawing specified or an approved equivalent part.
3. An SRM repair with a minor change does not require further CAA approval. Refer to CAA AC F120-77 (FAA AC 120-77) for guidance regarding determination of a minor change.
4. Approved repair data may include:
   - Approved Service Bulletin Repair
   - FAA DER/AR (8110-3/8100-9) approved repair instructions applicable to subject airplane.
   - FAA SFAR 36 – (Special Federal Aviation Regulation) Repair previously approved
5. SRM chapter 51 for each model type has a listing of Principal Structural Elements (PSE) and Fatigue Critical Baseline Structure (FCBS).
6. Acceptable repair data may include, but not limited to following:
   - AOL - All Operator Letter
   - AML - Airplane Modification Letter
   - SL/SIL - Service Letter/Service Information Letter
   - AMM - Aircraft Maintenance Manual
   - CMM - Component Maintenance Manual
   - OHMM - Overhaul Maintenance Manual
   - SOPM - Standard Overhaul Practices Manual
   - Previous Original Equipment Manufacturer (OEM) communication (with structurally acceptable/satisfactory statement) or Repair and Deviation Record (RDR).
7. The repair (as installed) has a significant effect on:
   - Systems Performance – Structural repairs to any element of a system or adjacent to a system should be assessed for possible effects on the intended operation of the complete system.
   - Structural Performance – Repairs to any elements of the structure should be

assessed for their effect upon the structural performance of the airframe. Structural performance includes static strength, fatigue, damage tolerance, flutter and stiffness characteristics.

- Weight and Balance – The effects to be considered are related to overall aircraft CG and aircraft load distribution. Some control surfaces are particularly sensitive to changes that may affect stiffness, mass distribution and surface profile.
- Aircraft Performance – Repairs that may affect stall characteristics, handling characteristics, or performance lift/drag.

8. Simple repair/rework: blendout, oversizing, replacement, allowable damage extension, partial depth scarfing for composite repairs. Documentation required for simple repair/rework:

- OEM confirmation that condition is structurally acceptable or within certification limits, or;
- Analysis that shows the condition meets certification limits and is in compliance with FARs.