

ข้อกำหนดของสำนักงานการบินพลเรือนแห่งประเทศไทย

ฉบับที่ ๑๘

ว่าด้วยหลักเกณฑ์และวิธีการขอรับรองการแก้ไขเปลี่ยนแปลงและการซ่อมผลิตภัณฑ์ที่มีใบรับรองแบบ

อาศัยอำนาจตามความในมาตรา ๓๗ (๑) (ข) และ (ท) แห่งพระราชกำหนดการบินพลเรือนแห่งประเทศไทย พ.ศ. ๒๕๕๘ ซึ่งบัญญัติว่า ในการกำกับดูแลการบินพลเรือนและควบคุมกิจการการบินพลเรือน ให้สำนักงานการบินพลเรือนแห่งประเทศไทยมีอำนาจหน้าที่ออกข้อบังคับ ข้อกำหนด ประกาศ ระเบียบ คำสั่ง เพื่อกำหนดคุณสมบัติ หลักเกณฑ์ วิธีการ เงื่อนไข มาตรฐานและแนวทางปฏิบัติที่เกี่ยวข้องกับการบินพลเรือน ให้เป็นไปตามมาตรฐานสากลที่เป็นปัจจุบันและทันต่อเหตุการณ์ ผู้อำนวยการสำนักงานการบินพลเรือนแห่งประเทศไทยจึงออกประกาศเพื่อกำหนดหลักเกณฑ์และวิธีการขอรับรองการแก้ไขเปลี่ยนแปลงและการซ่อมผลิตภัณฑ์ที่มีใบรับรองแบบ เพื่อให้สอดคล้องกับมาตรฐานที่กำหนดไว้ในภาคผนวก ๖ การปฏิบัติการบิน และภาคผนวก ๘ ความสมควรเดินอากาศของอากาศยานและบทแก้ไขเพิ่มเติมแห่งอนุสัญญาว่าด้วยการบินพลเรือนระหว่างประเทศ ค.ศ. ๑๙๔๔ ไว้ ดังต่อไปนี้

ข้อ ๑ ข้อกำหนดนี้เรียกว่า “ข้อกำหนดของสำนักงานการบินพลเรือนแห่งประเทศไทย ฉบับที่ ๑๘ ว่าด้วยหลักเกณฑ์และวิธีการขอรับรองการแก้ไขเปลี่ยนแปลงและการซ่อมผลิตภัณฑ์ที่มีใบรับรองแบบ”

ข้อ ๒ ข้อกำหนดนี้ให้ใช้บังคับตั้งแต่วันประกาศในราชกิจจานุเบกษาเป็นต้นไป

ข้อ ๓ ในข้อกำหนดนี้

“ผลิตภัณฑ์” หมายความว่า อากาศยาน ส่วนประกอบสำคัญของอากาศยาน ชิ้นส่วนรับรองคุณภาพ ชิ้นส่วนมาตรฐาน หรือบริภัณฑ์ ที่มีใบรับรองแบบ

ข้อ ๔ เจ้าของหรือผู้มีสิทธิครอบครองผลิตภัณฑ์ ที่ประสงค์จะขอรับรองการแก้ไขเปลี่ยนแปลง/ซ่อมผลิตภัณฑ์ ให้ยื่นคำขอต่อผู้อำนวยการสำนักงานการบินพลเรือนแห่งประเทศไทย

การขอ การออก แบบ การรายงาน และการบันทึก ให้เป็นไปตาม Modifications and Repairs Approval Requirement แนบท้ายข้อกำหนดนี้

ประกาศ ณ วันที่ ๒๙ เมษายน พ.ศ. ๒๕๖๒

จุฬา สุขมานพ

ผู้อำนวยการสำนักงานการบินพลเรือนแห่งประเทศไทย



The Civil Aviation Authority of Thailand

Modifications and Repairs Approval Requirement

Revision No. : Original

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RECORD OF REVISIONS

Modifications and Repairs Approval Requirement

This CAAT Modifications and Repairs Approval Requirement was issued on xx April 2019. The record of revision are intended to be a summarised record of the main changes introduced by amendment of this requirement.

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LIST OF EFFECTIVE PAGES

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Chapter 1

General

1.1 Pursuant to Section 37 (1) (g) and (t) of Civil Aviation Of Thailand Emergency Decree, B.E. 2558, and the Announcement of The Civil Aviation Authority of Thailand (CAAT) on Rules and Procedure for Application of Modifications and Repairs Design Approval and Modifications and Repairs Approval and ICAO Annex 6, Part I, Chapter 8, 8.6, Annex 6, Part II, Chapter 2, 2.6.3, Annex 6, Part III, Chapter 6, 6.6 Modifications and Repairs, this Chapter prescribes the requirements for approval of modifications and repairs to aircraft, components and equipment.

1.2 All modifications and repairs on Thai registered aircraft which Type Certificate of Aircraft have been validated or accepted by CAAT shall comply with this requirements.

1.3 Definitions

Modification. A modification to an aeronautical product means a change to the type design which is not a repair.

Major modification – A type design change not listed in the aircraft, aircraft engine or propeller specifications that might appreciably affect the mass and balance limits, structural strength, performance, powerplant, operation flight characteristics or other qualities affecting airworthiness or environmental characteristics, or that will be embodied in the product using non-standard practices in accordance with appendix 1

Minor modification – A modification other than a major modification.

Repair. A design change to an aeronautical product intended to restore it to an airworthy condition and to ensure that the aircraft continues to comply with the design aspects of the airworthiness requirements used for the issuance of a Type Certificate for that aircraft type after it has been damaged or subjected to wear.

Major repair – Any repair of an aeronautical product that might appreciably affect the structural strength, performance, powerplant, operation, flight characteristics or other qualities affecting airworthiness or environmental characteristics, or that will be embodied in the product using non-standard practices in accordance with appendix 1

Minor repair – A repair other than a major repair.

Chapter 2

Procedure for Approval of Modifications

2.1 General Requirement

2.1.1 The approval of modifications by the Director General of CAAT is based largely on the acceptance and approval for installation of an existence design change (modification) approved by EASA, FAA, or Transport Canada as applicable. For other contracting states, CAAT may evaluate on case-by-case basis.

2.1.2 Modification

2.1.2.1 Except as specified in paragraphs 2.1.5 and 2.1.6, modifications that are classified as major require approval by the Director General of CAAT.

2.1.2.2 The approval in paragraph 2.1.2.1 shall be dependent upon the applicant demonstrating to the satisfaction of the Director General of CAAT that the modification has been approved by an EASA, FAA, Transport Canada or other contracting states to the applicable Type Certification standards identified on the Type Acceptance Certificate for the aircraft.

2.1.2.3 The applicant for approval shall ensure that:

2.1.2.3.1 There is sufficient technical evidence to demonstrate that the approval standard complies with the Type Acceptance Certificate against which the Certificates of Airworthiness was granted; and

2.1.2.3.2 There is appropriate approval documentation for the modification from the applicable National Aviation Authority (NAA) identified in paragraph 2.1.2.2; and

2.1.2.3.3 There is sufficient technical evidence of the applicability of the modification to the aircraft; and

2.1.2.3.4 There is sufficient technical evidence of interoperability and compatibility with the existing type design and repair status of the aircraft; and

2.1.2.3.5 There is a statement of compliance with the requirements of ICAO Annex 16 in respect of the modification; and

2.1.2.3.6 Continued airworthiness information for modifications and repairs is available and integrated into the appropriate maintenance programme.

2.1.2.4 Except as provided for in paragraphs 2.1.5 and 2.1.6, approval of the modification is signified by the issue of an approval document by the Director General of CAAT.

2.1.3 Minor Modification

2.1.3.1 Except as specified in paragraphs 2.1.5 and 2.1.6, modifications that are classified as minor require approval by the Director General of CAAT.

2.1.3.2 The applicant for approval of a minor modification shall provide, to the satisfaction of the Director General of CAAT, evidence that:

2.1.3.2.1 The modification data is approved by an organization approved by EASA, FAA, Transport Canada or other contracting states; or

2.1.3.2.2 The modification has been accepted or approved in accordance with the respective procedures of the applicable Type Certificate NAA.

2.1.3.3 The applicant for approval shall ensure that:

2.1.3.3.1 There is sufficient technical evidence of interoperability and compatibility with the existing type design and repair status of the aircraft; and

2.1.3.3.2 Continued airworthiness information for modifications and repairs are available and integrated into the appropriate maintenance programme.

2.1.3.4 Approval of the minor modification will be signified by the issue of an approval document by the Director General of CAAT except:

2.1.3.4.1 As provided for in paragraphs 2.1.5 and 2.1.6; or

2.1.3.4.2 Where the modification was performed by an authorization suitably approved by an EASA, FASA, Transport Canada or other contracting states and is approved in accordance with a minor modification approval process agreed with the Director General of CAAT.

2.1.4 Continued airworthiness responsibilities

2.1.4.1 The authorization under which the statement of compliance for a modification was issued shall undertake the continued airworthiness responsibilities required in respect of the modification.

2.1.4.2 Any issues of continued airworthiness including those initiated by a modification approved under this requirement shall be reported to the Director General of CAAT and the organization responsible for the design.

2.1.5 Acceptance of modifications by the issue of a Certificate of Airworthiness

2.1.5.1 When an aircraft is first transferred to register of the Kingdom of Thailand individual approval of each modification embodied on that aircraft is not required. All such modification may therefore be accepted by the issue of a Certificate of Airworthiness for that aircraft provided that:

2.1.5.1.1 The modification data is recorded in the maintenance records for the aircraft at the time of initial issue of the Certificate of Airworthiness; and

2.1.5.1.2 There is evidence that the modification meets the applicable airworthiness requirements; and

2.1.5.1.3 The transfer document or Certificate of Airworthiness for Export encompasses all such modifications incorporated on the aircraft.

2.1.5.2 Acceptance of a modification under paragraph 2.1.5.1 applies only to the modification embodied on the individual aircraft for which the Certificate of Airworthiness has been issued.

2.1.6 Service Bulletins

A modification covered by the issue of a Service Bulletin or equivalent document issued by the Type Certificate Holder is deemed to be approved by the Director General of CAAT without the need for a formal approval document to be issued provided that:

2.1.6.1 The modification data is approved by EASA, FAA, Transport Canada or other contracting states to the applicable Type Certification standards identified on the Type Acceptance Certificate for the aircraft; and

2.1.6.2 There is sufficient technical evidence of interoperability and compatibility with the existing type design and repair status of the aircraft; and

2.1.6.3 Continued airworthiness information for modifications and repairs is available and integrated into the appropriate maintenance programme.

2.1.7 In order for CAAT to determine the approval route, all modifications must be classified as major or minor prior to submission for approval. Assessment of modification classification shall be referred to the guidelines in EASA GM 21A.91

2.1.8 For major modification, application has to be substantiated by approved modification design data such as Supplement Type Certificate (STC) traceable to the standard of State of Design or any other States considered having equivalent safety standards. CAAT has the final decision on the modification classification.

2.1.9 The person responsible for the modification design must have sound knowledge of aircraft certification and design principles embodied in the aircraft type being modified and shall state any particular requirements to be observed when the modification is completed and before an aircraft, component or equipment is released for service. The following aspects shall be considered:

2.1.9.1 Whether tests or inspections during the progress or after the completion of the modification are necessary to ensure it complies with the specified requirements.

2.1.9.2 The qualifications of persons who may be required to assess completed work and certify that it complies with the approved design.

2.1.9.3 Whether significant changes in the weight and centre of gravity position of the aircraft will occur and if re-weighing or preparation of a new weight and balance report is necessary.

2.1.9.4 Whether the flight or operating characteristics of an aircraft may have been affected by the work and the necessity to have the aircraft inspected and certified as fit for flight and flight tested.

2.1.9.5 Whether amendments of particulars in the Certificate of Airworthiness or associated documents are required.

2.1.9.6 Whether amendments are necessary to the aircraft flight manual, maintenance programme, minimum equipment list or any other documents approved for maintenance or operation of the aircraft.

Note: All such amendments must be approved prior to the first flight after the modification is embodied. Such approvals must be applied separately but could be applied simultaneously with the modification approval.

2.1.9.7 Whether there are any amendments of instruction to continuing airworthiness and operational requirements in relation to the modification.

2.1.10 Compliance with each proposed certification basis of the type design and environmental protection requirements affected by modification must be clearly demonstrated.

2.1.11 All changes to an approved drawing or document may not require re-approval of the original. Aircraft Operator/ Owner has responsibility to follow up current revision of drawing or document.

2.1.12 Recommendation or No Technical Objection (NTO) from the manufacturer shall not be acceptable for grant of approval.

2.1.13 The Authorized Representatives/ Designated Engineering Representatives responsible for certifying modification/repair approved data shall be an employee of the organization holding DOA. Certifications by independent representative shall not be acceptable.

2.2 Submission of Modification Application

Applicant shall submit following information to CAAT

2.2.1 Official letter to request consent from CAAT for Modification permission.

2.2.2 Completed Modification Approval Application Form (Form AIR-DP-302) supported with a completed Modification and Repair Approval Application Report (Form AIR-DP-402) the applicant may submit only one Form AIR-DP-302 and Form AIR-DP-402 for more than one aircraft or the entire fleet as long as it is a combination of one aircraft family type and with similar configuration.

2.2.3 Modification design and supporting documents such as Supplemental Type Certificate (STC), Services Bulletin (issued by Design Organisation other than Type Certificate Holder) or other Modification data and other document related to such STC or SB or other document requested by CAAT.

2.3 Issuing letter of consent

Once CAAT review all Modification Approval Application Form (Form AIR-DP-302), Modification Approval Application Report (Form AIR-DP-402) and modification design and supporting documents submitted by applicant as specified in 2.2 and were found satisfactory CAAT may issue letter of consent to permit applicant install modification on their aircrafts to ensure that:

2.3.1 Applicant prepare suitable paper work for modification in accordance with modification data, instruction and related document.

2.3.2 Applicant/ Approved Maintenance Organisation (AMO) prepare appropriate parts, material and tool required for modification.

2.3.3 Applicant have appropriate contract with AMO for suitable rating and facilities.

2.3.4 Applicant/ AMO prepare for Flight Test, Ground Test or other test after modification (if required by Modification design data).

2.3.5 Applicant/ AMO prepare Certificate of Release to Service (CRS) including Logbook entry after modification.

2.4 Conformity Inspection/ Compliance Check

CAAT may require compliance checks during and/ or after the completion of the modification and before an aircraft, component or equipment is released for service. The modification approval applicant shall arrange for such checks to be carried out by CAAT.

2.5 Submission of Modification result for approval

Applicant shall submit following modification result for approval

2.5.1 Official letter to request Modification approval from CAAT.

2.5.2 Completed Modification data and package which may include copy of completed worksheet, Test Report, Airworthiness Approval Tag/ Certificate of Conformity, Certificate of Release to Service (CRS) including Logbook entry or other information requested by CAAT.

2.6 Issuing Modification Approval Certificate

A Major/ Minor Modification Approval Certificate (Form AIR-DP-102) shall only be granted by CAAT after it is shown that:

2.6.1 The modification meets the applicable certification basis and environmental protection requirements.

2.6.2 Any airworthiness provisions not complied with are compensated for by factors that provide an equivalent level of safety; and

2.6.3 No feature or characteristic makes the product unsafe for the uses for which certification is requested.

A Major/ Minor Modification Approval Certificate may be issued with some condition defined by CAAT.

Chapter 3

Procedure for Approval of Repair

3.1 General Requirement

3.1.1 Major repairs

3.1.1.1 A repair that is not covered by existing approved maintenance data shall be designed and subject to approval as a modification in accordance with Chapter 2.

3.1.1.2 A type Certificate holders approved major repair scheme is considered to be type approved data and therefore does not need further approval by the Director General of CAAT.

3.1.1.3 The installer of a Type Certificate holder's major repair scheme shall ensure that:

3.1.1.3.1 There is sufficient technical evidence of interoperability and compatibility with the existing type design and repair status of the aircraft; and

3.1.1.3.2 Any continued airworthiness information for a repair scheme is available and integrated into the appropriate maintenance programme.

3.1.2 Approval of minor repairs

3.1.2.1 A minor repair that is covered by existing approved maintenance data is acceptable to the Director General of CAAT when it has been demonstrated that the repair does not conflict with any existing repairs.

3.1.2.2 A Type Certificate holder's approved minor repair scheme is considered to be type approved data and therefore does not need further approval by the Director General of CAAT.

3.1.2.3 A minor repair that is not covered by existing approved maintenance data but has been approved in accordance with the respective procedures of by EASA, FAA, or Transport Canada will be approved in accordance with Chapter 2 as a change to the approved Design Standard.

3.1.3 Continued airworthiness requirements

3.1.3.1 An accomplished repair that by design requires continued inspection of further work shall be recorded in the aircraft records in a manner acceptable to the Director General of CAAT.

3.1.3.2 Any continued airworthiness requirements associated with an accomplished repair shall be integrated into the approved Maintenance Programme for the aircraft.

3.1.3.3 Details of accomplished repairs and continued airworthiness instructions shall be recorded.

3.1.4 The design approval holder must classify the repair as major or minor. Assessment of repair classification shall be referred to the guidelines in EASA 21A.435(a). All repair design should have been classified prior to submission to CAAT.

3.1.5 CAAT will only approve repair design data traceable to approval from States considered having equivalent safety standards to the State of Design.

3.1.6 For repair approval application, it is reminded that one application form is effective for one aircraft only.

3.1.7 The person responsible for the repair design must have sound knowledge of aircraft certification and design principles embodied in the aircraft type being repaired.

3.1.8 Where the repair has been a matter of urgency, work may commence on production of a suitable sketch and aircraft release may be granted, however the repair scheme shall be submitted without delay for approval.

3.1.9 Recommendation or No Technical Objection (NTO) from the manufacturer shall not be acceptable for grant of approval.

3.1.10 The Authorized Representatives/ Designated Engineering Representatives responsible for certifying modification/repair approved data shall be an employee of the organization holding DOA. Certifications by independent representative shall not be acceptable.

3.2 Submission of Repair Application

Applicant (Aircraft Owner/ Operator) shall submit following information to CAAT

3.2.1 Official letter to request consent from CAAT for Repair permission.

3.2.2 Completed Repair Approval Application Form (Form AIR-DP-302) supported with a completed Repair Approval Application Report (Form AIR-DP-402).

3.2.3 Repair design/ Repair scheme and supporting documents such as Repair Design Approval Sheet (issued by Design Organisation Approval other than Type Certificate Holder) or other Repair data and related document or other document requested by CAAT.

3.3 Issuing letter of consent

Once CAAT review all Repair Approval Application Form (Form AIR-DP-302), Repair Approval Application Report (Form AIR-DP-402) and repair design and supporting documents submitted by applicant as specified in 3.2 and were found satisfactory CAAT may issue letter of consent to permit applicant to perform repair on their aircraft to ensure that:

3.3.1 Applicant prepare suitable paper work for repair in accordance with repair design data, instruction and related document.

3.3.2 Applicant/ Approved Maintenance Organisation (AMO) prepare appropriate parts, material and tool required for repair.

3.3.3 Applicant have appropriate contract with AMO for suitable rating and facilities.

3.3.4 Applicant/ AMO prepare for additional test or inspection after repair (if required by Repair design data).

3.3.5 Applicant/ AMO prepare Certificate of Release to Service (CRS) including Logbook entry after repair.

3.4 Conformity Inspection/ Compliance Check

CAAT may require compliance checks during and/ or after the completion of the repair and before an aircraft, component or equipment is released for service. The repair approval applicant shall arrange for such checks to be carried out by CAAT.

3.5 Submission of Repair result for approval

Applicant shall submit following repair result for approval

3.5.1 Official letter to request Repair approval from CAAT.

3.5.2 Completed Repair data and package which may include copy of completed worksheet, Test/ Inspection Report, Certificate of Release to Service (CRS) including Logbook entry or other information requested by CAAT.

3.6 Issuing of Modification Approval Certificate

A Major/ Minor Repair Approval Certificate (Form AIR-DP-103) shall only be granted by CAAT after it is shown that:

3.6.1 The repair meets the applicable certification basis and environmental protection requirements.

3.6.2 Any airworthiness provisions not complied with are compensated for by factors that provide an equivalent level of safety; and

3.6.3 No feature or characteristic makes the product unsafe for the uses for which certification is requested.

A Major/ Minor Repair Approval Certificate may be issued with some condition defined by CAAT.

Chapter 4

Compatibility of Modifications and Repairs

4.1 Consideration should be given during the design process to compatibility between the proposed design change and other existing design changes, such as modifications, repairs and airworthiness directives (AD).

4.2 The Aircraft owner/ operator has responsibility to inform the design approval holder for any airworthiness deficiencies discovered in service which relate to the design change. The design approval holder has responsibility to assist the operator and the approving airworthiness authority to correct such deficiencies being informed.

4.3 The installer of the modifications or repairs on the aircraft has responsibility to verify compatibility with other existing modifications and repairs before installing any design change.

4.4 The Aircraft owner/ operator has the overall responsibility to ensure the compatibility of all design changes incorporated in their aircraft. The operator should report any design change incompatibilities detected during installation or in service to the design approval holder, to the installer and to the approving airworthiness authority.

Chapter 5 Records

5.1 Introduction

The objective of this Chapter is to provide requirement to aircraft operators/ owners by setting out acceptable procedures for the retention of modification and repair data and records.

In general case, the holder of the design approval and the aircraft operator may be different. ICAO Annex 6 Part I and III place responsibility for the retention of modification and repair data and records on both the approval holder and the operator. In the case where the aircraft operator is also the design holder, the operator must retain both sets of records.

5.2 Responsibilities of Aircraft Operators/ Owners

It is required by the CAAT that the aircraft operator retain records identifying any modification or repair incorporated on the aircraft, together with records of design approval and return-to-service approval. Retention of the records is required so that the modification and repair status of the aircraft may be readily established at any time. This may be necessary if an airworthiness deficiency is detected with a modification or repair requiring corrective measures or inspections and to ensure compatibility when making additional design changes to the aircraft.

The records required will vary with the complexity of the design change. In addition to the records of design approval and return-to-service approval, the following lists the kind of data that may be included, as applicable:

- (a) a master drawing list and the individual drawings, photographs, specifications and records which identify the design change and locate it on the Aircraft;
- (b) mass and moment change records; and
- (c) a record of any change in electrical load caused by incorporation of the design change.

Part of the records should include a Supplemental Type Certificate (STC) or equivalent document, or service bulletin or structural repair manual reference or repair design approval sheet or equivalent document, if applicable.

Appendix 1

Major Modifications and Major Repairs Classification

(a) Major modifications -

(1) Airframe major modification. Modification of the following parts and modification of the following types, when not listed in the aircraft specifications issued by State of Design or the CAAT, are airframe major modification:

(i) Wings.

(ii) Tail surfaces.

(iii) Fuselage.

(iv) Engine mounts.

(v) Control system.

(vi) Landing gear.

(vii) Hull or floats.

(viii) Elements of an airframe including spars, ribs, fittings, shock absorbers, bracing, cowling, fairings, and balance weights.

(ix) Hydraulic and electrical actuating system of components.

(x) Rotor blades.

(xi) Changes to the empty weight or empty balance which result in an increase in the maximum certificated weight or center of gravity limits of the aircraft.

(xii) Changes to the basic design of the fuel, oil, cooling, heating, cabin pressurization, electrical, hydraulic, de-icing, or exhaust systems.

(xiii) Changes to the wing or to fixed or movable control surfaces which affect flutter and vibration characteristics.

(2) Powerplant major modification. The following modification of a powerplant when not listed in the engine specifications issued by the CAAT, are powerplant major modification.

(i) Conversion of an aircraft engine from one approved model to another, involving any changes in compression ratio, propeller reduction gear, impeller gear ratios or the substitution of major engine parts which requires extensive rework and testing of the engine.

(ii) Changes to the engine by replacing aircraft engine structural parts with parts not supplied by the original manufacturer or parts not specifically approved by the Administrator.

(iii) Installation of an accessory which is not approved for the engine.

(iv) Removal of accessories that are listed as required equipment on the aircraft or engine specification.

(v) Installation of structural parts other than the type of parts approved for the installation.

(vi) Conversions of any sort for the purpose of using fuel of a rating or grade other than that listed in the engine specifications.

(3) ***Propeller major modification.*** The following modification of a propeller when not authorized in the propeller specifications issued by State of Design or the CAAT are propeller major modification:

(i) Changes in blade design.

(ii) Changes in hub design.

(iii) Changes in the governor or control design.

(iv) Installation of a propeller governor or feathering system.

(v) Installation of propeller de-icing system.

(vi) Installation of parts not approved for the propeller.

(4) ***Appliance major modification.*** Modification of the basic design not made in accordance with recommendations of the appliance manufacturer or in accordance with State of Design or CAAT Airworthiness Directive are appliance major modification. In addition, changes in the basic design of radio communication and navigation equipment approved under type certification or a Technical Standard Order that have an effect on frequency stability, noise level, sensitivity, selectivity, distortion, spurious radiation, AVC characteristics, or ability to meet environmental test conditions and other changes that have an effect on the performance of the equipment are also major modification.

(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.

(2) *Powerplant major repairs.* Repairs of the following parts of an engine and repairs of the following types, are powerplant major repairs:

(i) Separation or disassembly of a crankcase or crankshaft of a reciprocating engine equipped with an integral supercharger.

(ii) Separation or disassembly of a crankcase or crankshaft of a reciprocating engine equipped with other than spur-type propeller reduction gearing.

(iii) Special repairs to structural engine parts by welding, plating, metalizing, or other methods.

(3) *Propeller major repairs.* Repairs of the following types to a propeller are propeller major repairs:

(i) Any repairs to, or straightening of steel blades.

(ii) Repairing or machining of steel hubs.

(iii) Shortening of blades.

(iv) Retipping of wood propellers.

(v) Replacement of outer laminations on fixed pitch wood propellers.

(vi) Repairing elongated bolt holes in the hub of fixed pitch wood propellers.

(vii) Inlay work on wood blades.

(viii) Repairs to composition blades.

(ix) Replacement of tip fabric.

(x) Replacement of plastic covering.

(xi) Repair of propeller governors.

(xii) Overhaul of controllable pitch propellers.

(xiii) Repairs to deep dents, cuts, scars, nicks, etc., and straightening of aluminum blades.

(xiv) The repair or replacement of internal elements of blades.

(4) ***Appliance major repairs.*** Repairs of the following types to appliances are appliance major repairs:

(i) Calibration and repair of instruments.

(ii) Calibration of radio equipment.

(iii) Rewinding the field coil of an electrical accessory.

(iv) Complete disassembly of complex hydraulic power valves.

(v) Overhaul of pressure type carburetors, and pressure type fuel, oil and hydraulic pumps.

Appendix 1

Major Modifications and Major Repairs Classification

(a) Major modifications -

(1) Airframe major modification. Modification of the following parts and modification of the following types, when not listed in the aircraft specifications issued by State of Design or the CAAT, are airframe major modification:

(i) Wings.

(ii) Tail surfaces.

(iii) Fuselage.

(iv) Engine mounts.

(v) Control system.

(vi) Landing gear.

(vii) Hull or floats.

(viii) Elements of an airframe including spars, ribs, fittings, shock absorbers, bracing, cowling, fairings, and balance weights.

(ix) Hydraulic and electrical actuating system of components.

(x) Rotor blades.

(xi) Changes to the empty weight or empty balance which result in an increase in the maximum certificated weight or center of gravity limits of the aircraft.

(xii) Changes to the basic design of the fuel, oil, cooling, heating, cabin pressurization, electrical, hydraulic, de-icing, or exhaust systems.

(xiii) Changes to the wing or to fixed or movable control surfaces which affect flutter and vibration characteristics.

(2) Powerplant major modification. The following modification of a powerplant when not listed in the engine specifications issued by the CAAT, are powerplant major modification.

(i) Conversion of an aircraft engine from one approved model to another, involving any changes in compression ratio, propeller reduction gear, impeller gear ratios or the substitution of major engine parts which requires extensive rework and testing of the engine.

(ii) Changes to the engine by replacing aircraft engine structural parts with parts not supplied by the original manufacturer or parts not specifically approved by the Administrator.

(iii) Installation of an accessory which is not approved for the engine.

(iv) Removal of accessories that are listed as required equipment on the aircraft or engine specification.

(v) Installation of structural parts other than the type of parts approved for the installation.

(vi) Conversions of any sort for the purpose of using fuel of a rating or grade other than that listed in the engine specifications.

(3) ***Propeller major modification.*** The following modification of a propeller when not authorized in the propeller specifications issued by State of Design or the CAAT are propeller major modification:

(i) Changes in blade design.

(ii) Changes in hub design.

(iii) Changes in the governor or control design.

(iv) Installation of a propeller governor or feathering system.

(v) Installation of propeller de-icing system.

(vi) Installation of parts not approved for the propeller.

(4) ***Appliance major modification.*** Modification of the basic design not made in accordance with recommendations of the appliance manufacturer or in accordance with State of Design or CAAT Airworthiness Directive are appliance major modification. In addition, changes in the basic design of radio communication and navigation equipment approved under type certification or a Technical Standard Order that have an effect on frequency stability, noise level, sensitivity, selectivity, distortion, spurious radiation, AVC characteristics, or ability to meet environmental test conditions and other changes that have an effect on the performance of the equipment are also major modification.

(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.

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- (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.

(2) ***Powerplant major repairs.*** Repairs of the following parts of an engine and repairs of the following types, are powerplant major repairs:

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(ii) Separation or disassembly of a crankcase or crankshaft of a reciprocating engine equipped with other than spur-type propeller reduction gearing.

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(3) ***Propeller major repairs.*** Repairs of the following types to a propeller are propeller major repairs:

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(ii) Repairing or machining of steel hubs.

(iii) Shortening of blades.

(iv) Retipping of wood propellers.

(v) Replacement of outer laminations on fixed pitch wood propellers.

(vi) Repairing elongated bolt holes in the hub of fixed pitch wood propellers.

(vii) Inlay work on wood blades.

(viii) Repairs to composition blades.

- (ix) Replacement of tip fabric.
- (x) Replacement of plastic covering.
- (xi) Repair of propeller governors.
- (xii) Overhaul of controllable pitch propellers.
- (xiii) Repairs to deep dents, cuts, scars, nicks, etc., and straightening of aluminum blades.
- (xiv) The repair or replacement of internal elements of blades.

(4) ***Appliance major repairs.*** Repairs of the following types to appliances are appliance major repairs:

- (i) Calibration and repair of instruments.
- (ii) Calibration of radio equipment.
- (iii) Rewinding the field coil of an electrical accessory.
- (iv) Complete disassembly of complex hydraulic power valves.
- (v) Overhaul of pressure type carburetors, and pressure type fuel, oil and hydraulic pumps.

Appendix 2 Modification and Repair Approval Application Form

1. Applicant Details			
1.1 Applicant's Reference (If applicable)			
1.2 Company Name			
1.3 Company Address			
1.4 Contact person			
1.5 Telephone			
1.6 Fax			
1.7 E-mail			
2. Classification			
<input type="checkbox"/> Minor Modification	<input type="checkbox"/> Major Modification	<input type="checkbox"/> Minor Repair	<input type="checkbox"/> Major Repair
3. Applicability			
3.1 TC Holder			
3.2 Aircraft Model (s)			
3.3 Registration Mark (s) / Serial Number (s)			
3.4 Foreign Approval Reference (If applicable)			

Modifications and Repairs Approval Requirement

4. Description	
4.1 Title	
4.2 Description	
5. Certification Basis	
5.1 Original Certification Basis	
5.2 Propose Certification Basis	
5.3 Affected Manuals	
6. Eligibility and classification justification	

Modifications and Repairs Approval Requirement

7. Additional Information	
8. Applicant's Declaration I declare that all information contain here is correct and complete.	
8.1 Name of applicant	
8.2 Position of applicant	
8.3 Signature	
8.4 Date of applicant (dd/mm/yy)	
***This application must be submit with Modification and Repair approval application report.	
FOR CAAT INSPECTOR ONLY	
<input type="checkbox"/> Accept <input type="checkbox"/> Reject	
Reason for reject : _____	

Modifications and Repairs Approval Requirement

Instruction for filling Form AIR-DP-302 “Modification and Repair Approval Application Form”

Item	Insert Comment Text
1.1	Enter your own reference number (e.g. letter reference) for application project (option).
1.2-1.3	Enter the register company name and address.
1.4-1.7	Enter the name, telephone, fax and e-mail of the contact person for this application.
2	Classify the application in accordance with Modifications and Repairs Approval Requirement, Appendix 1. (Tick only one box)
3.1	Enter the name of type certificate holder.
3.2	Enter aircraft type and model.
3.3	Enter aircraft registration mark and serial number. (for repair approval one form for one aircraft)
3.4	If this modification or repair has previous been approved by state of design or design organization approval (DOA), etc. Enter the approve reference here.
4.1	Enter the title of modification or repair.
4.2	Provide the brief of description of modification or repair.
5.1	Enter the original certification basis.
5.2	Propose the certification basis of the type design affected by the modification or repair.
5.3	Identify all the manuals affected by the modification or repair.
6	Provide justification for the design organization’s eligibility (e.g. demonstration of its capability such as EASA DOA approval reference, etc.)
7	Provide additional information such as all the technical data list, letter of STC authorization, previous approved by CAAT, etc.
8.1-8.4	Enter the name, position, signature of the application with the date of application (dd/mm/yy).

Appendix 3

Modification and Repair Approval Application Report

Submission format

The application report must be structured to cover the required information under at least the suggested subject headings listed in the “Application Report Paragraphs” listed below. If any particular item is not applicable to the application then a brief statement to indicate why this is so must be recorded. This listing as a whole should not be considered to be exhaustive, it is conceivable that some additional information may be requested in order to substantiate, investigate and review any unusual design features of the modification or repair.

The application report and all documents referenced in the application report shall have proper document control, such as by means of the document holder, document reference number, revision status/date and etc

Application Report Paragraphs

COVER PAGE

Application Report Number:

Company Name:

Aircraft Type/Model:

Aircraft Registration:

Aircraft Serial Number:

Name of applicant:

Position of applicant:

Date:

Signature:

PARAGRAPHS & CONTENTS

1. Description of Modification/Repair.

This paragraph describes how the modification/repair will be performed.

2. Reason/Purpose for Modification/Repair.

This paragraph explains why the modification/repair is required.

3. Existing Modification/Repair Approval

This paragraph shall contain any previously approved proprietary items such as STC, DOA approval reference, Airbus RAS, FAA Form 337, etc.

4. Classification of Modification/Repair

This paragraph shall contain a written assessment of the classification. Assessment of the modification and repair classification shall be documented using the guidelines given in Modifications and Repairs Approval Requirement Appendix 1.

Modifications and Repairs Approval Requirement

5. Certification Basis

Original Product Type Certificate (TC)

This paragraph contains the State of Design and its TC and TCDS number.

Original Certification Basis

This paragraph shall state the original certification basis when the aircraft was type accepted in Thailand. It shall include at least the top level certification basis with applicable amendment level.

Example for Airbus A320-231(referenced in EASA TCDS EASA.A.064 paragraph 1.3.1.2):

- JAR 25 Change 11 (except paragraph 25.207 which remains at Change 10) as elected by the Manufacturer*
- A320 Special Conditions, Experience Related Conditions and Harmonization Conditions.*

Proposed Certification Basis

This paragraph shall state the proposed certification basis for the modification/repair design. The proposed certification basis shall include all applicable paragraphs of the following requirements:

- Basic design (CS 25-29, CS-E, CS-P, etc)*

- Environmental Requirements:*

ICAO Annex 16 Volume I Aircraft Noise and ICAO Annex 16 Volume II Aircraft Engine Emissions

- Design Requirements Associated with Operational Approvals*

ETOPS, RNP/MNPS, RVSM, AWO, etc.

6. Compliance with the Certification Basis

Compliance with each proposed certification basis must be clearly demonstrated in this paragraph.

Examples of acceptable means of compliance are:

- TC holder's support along with approval issued by the State of Design, e.g. Airbus RAS or RDAS, Boeing FAA Form 8110-9, etc.*

- Stress analysis report*

- Electrical load analysis*

- Substantiation report*

- Compliance statement*

- Test report*

7. Modification/Repair Procedures and Accomplishment Instructions

This paragraph shall list out the document reference for the procedures and accomplishment instructions such as Service Bulletin, Engineering Order, Technical Disposition, Master Drawing List, etc.

8. Equipment Approval/Component listing

Equipment and components to be installed must be approved. This paragraph shall contain a list of the equipments and components with their associated approval reference (such as EASA Form ONE, FAA Form 8130-3, FAATSO/ EASATSO & Class, Flammability compliance, etc).

Modifications and Repairs Approval Requirement

9. Environmental Issues

Consideration of environmental issues such as noise, engine emissions, cooling, vibration, contamination risks, etc. must be addressed in this paragraph.

10. Aircraft Flight Manual Supplement (AFMS)

As a result of the modification/repair embodiment, if any AFMS is introduced, it must be stated in this paragraph.

11. Electrical Load Analysis (ELA)

This paragraph shall contain the assessment of the ELA for each aircraft. An updated ELA draft shall be provided.

12. Weight and Balance Schedule (W&B) Amendment

Assessment on W&B schedule amendment must be addressed in this paragraph.

13. MMEL/MEL Amendment

This paragraph shall list out the proposed MMEL/MEL amendment.

14. Instruction to Continued Airworthiness (ICA) and Operational Requirements

This paragraph shall detail the ICA and operational requirements with its associated supporting document/drawings amendment as follows:

- *Aircraft Maintenance Manual (AMM)*
- *Illustrated Parts Catalogue (IPC)*
- *Aircraft Wiring Manual (AWM)*
- *Component Maintenance Manual (CMM)*
- *Layout of Passenger Accommodation (LOPA)*
- *Emergency Equipment Layout*
- *Maintenance Programme (MP)*
- *Airworthiness Limitations*
- *Special Inspection Technique*
- *Protective Treatment after inspection*
- *Provisioned parts, toolings and equipments*
- *Reliability Assessment*
- *Operations manuals*
- *Etc*

15. Crew Notices, Labels, Placards, Ground Service Instructions and Passenger Information

This paragraph shall contain a list of information to fulfill operational requirements. This information includes but not limited to notice to flight crew and cabin crew, additional labels and placards, instructions for ground service, information for passenger, etc.

16. Interface Considerations

Effects on other systems, previous modifications/repairs, operating procedures, must be stated in this paragraph.

Modifications and Repairs Approval Requirement

17. Limitations

This paragraph shall detail out any limitations affecting the approval, such as limited cycles, flight hours, calendar time, operating limitation (airspeed, flight rule and etc.), Airworthiness Limitations (mandatory inspections), required equipment, number of crew/passenger, etc.

18. Post Installation Ground Checks

For design verification, any conformity inspection, operational and functional ground checks must be stated in this paragraph.

19. Flight Test Requirements

This paragraph shall consist of an approved flight test schedule in order to verify the design with regard to performance and system functions.

20. Attachments

All referenced documents shall be listed and attached to the report in order of reference in the report.

Below is an example of the listing reference documents:

#	Document Description	Issuer	Doc #	Issue Date	Rev
1	Modification approval	ABC Design	DOA-1234	01-Feb-2012	B
2	Modification classification assessment	ABC Design	DOA-1234	01-Feb-2012	B
3	Modification Instruction Sheet	ABC Design	MIS-456	15-Jan -2012	A
4	Engineering Order	XYZ Airline	EO 25-05	15-Mar-2012	1
5	Engineering Order	XYZ Airline	EO 23-08	15-Apr-2012	2
6	EASA Form ONE	PPP Ltd	D.1234-56	01-Aug-2011	--
7	Flammability Report	TT Fabric Ltd	FR-9876	10-July-2011	A
8	ELA report	XYZ Airline	ELA-0001	01-Apr-2012	00
9	IPC Supplement	ABC Design	IPCS-8888	20-Jan-2012	C
10	MP amendment	XYZ Airline	MP TR-15	15-Apr-2012	1
11	Notice to cabin crew	XYZ Airline	CC-3456	20-Apr-2012	00
...

Appendix 4 Major/ Minor Modification Approval Certificate



The Civil Aviation Authority of Thailand

Major/Minor Modification/Repair Approval Certificate

Reference:

Pursuant to Section 37 (1) (g) and (t) of Civil Aviation of Thailand Emergency Decree, B.E. 2558,
The Civil Aviation Authority of Thailand (CAAT) hereby approves this to:

Operator/ Owner:

Aircraft Type, Registration and Serial Number:

Associated Technical Documentations:

Conditions and Limitations:

.....
Director General
The Civil Aviation Authority of Thailand

Date of issued: