



Civil Aviation Authority of Sri Lanka

AVIATION SAFETY NOTICE

ASN No 017	Ref No: AWS/2005/01	File Ref: AW/2/4
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- Recipients : 1.Holders of Air Operator Certificates issued by the DGCA
2 Prospective applicants for Air Operator Certificates
3. Approved Maintenance Organisations.
01. Subject : Approval Procedures – Modifications/Repairs.
02. Nature : Advisory.
03. Issue No : 02
04. Status : Amended
05. Effective Date : With immediate effect
06. Validity : Until further notice
07. Contact Person : Inquiries may be directed, preferably by letter to, Assistant Director (Airworthiness), Civil Aviation Authority, No. 64, Galle Road, Colombo 3, Sri Lanka. Telephone: 94 11 2391304.
08. Availability : A copy of this document is available for reference at the technical library of the Civil Aviation Authority. Copies can be collected at reproduction cost.
09. Applicability : All Aircraft registered in Sri Lanka Civil Aircraft Register.
10. Comments : Comments (if any) on the contents of this Aviation Safety Notice may be forwarded to the contact person. However the Aviation Safety Notice will come into effect on the date shown therein notwithstanding any objection or comment made by any person or party unless and until an amendment to the Aviation Safety Notice is issued afresh by the Director General.

11. Notice : Purpose of this ASN is to inform the requirements for approval procedure of Modifications and Repairs.
12. Action Required : For strict compliance by all aircraft operators, who has been registered their aircraft in Sri Lanka Civil Aircraft Register.
13. Checklist : Not applicable

H M C Nimalsiri,
Director General of Civil Aviation and
Chief Executive Officer

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APPROVAL PROCEDURE

MODIFICATIONS AND REPAIRS

Requirement contained in this ASN are based on ICAO Annex 6, Part 1, 8.6, which states; “All modifications and repairs shall be shown to comply with airworthiness requirements acceptable to the State of Registry. Procedures shall be established to ensure that the substantiating data supporting compliance with the airworthiness requirements are retained”.

Unless otherwise specified herein, all words, phrases and abbreviations in this document carry the same meaning as defined in the ICAO Doc.8400.

1. Major Modification

1.0 Definition of Major Modification

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

- a. A major modification means a change to the type design not listed in the aircraft, aircraft engine or propeller specifications:
 1. That might appreciably affect the mass and balance limits, structural strength, performance, power plant operation, flight characteristics or other qualities affecting airworthiness or environmental characteristics; or
 2. That will be embodied in the product according to non-standard practices.

1.1 General

The approval of a major modification by the Director General of Civil Aviation signifies that he is satisfied that the applicant has considered the Airworthiness and environmental standards and that the design changes comply with those standards. The approval is recorded by the issue of a document such as a Supplemental Type Certificate or a Service Bulletin approved by the Authority.

1.2 Compliance Programme

In order to ensure consideration and compliance with appropriate design standards on a modification the applicant should submit a compliance programme duly

authenticated by a qualified person, acceptable to the Director General of Civil Aviation.

1.3 Data Sources

Data sources that may be used to obtain approval are

Structural Repair Manual

Manufacturer of the product.

Design Organization approved by the Director-General of Civil Aviation

Airworthiness Authority of the State of Design

The final approval or acceptance of Data will be at the sole discretion of the Director-General of Civil Aviation. Modification to be carried out only by an organization approved by the Director General of Civil Aviation for the purpose. Each modification should carry a unique number allocated by the CAA airworthiness section. This number is given in a sequential order.

For example A340-300 aircraft modification is given as follows;
ADD/A343/MSN034/MOD- XXX.

Where; ADD- Aircraft Registration mark.

A343- Type of Aircraft

MSN034 – Manufacturer serial number.

MOD-XXX- No. given by CAA

1.4 Procedures for obtaining Approval

In case where a modification is not previously approved or accepted, the following procedures should be carried out by the applicant or his agent, in order to obtain the necessary approvals.

- a) Conduct all analysis, calculations and ground tests, flight test to determine compliance with Airworthiness and environmental standards.
- b) Prepare all documentation
- c) Determine that modification can be installed in the product in accordance with drawings and instructions
- d) Determine that operating and maintenance instructions are adequate for safe operation and continuing Airworthiness of the product.
- e) Forward all above and any other relevant data with an application for approval of the modification.
- f) Necessary application (Figure 1) and ECO (Engineering Change Order– Appendix-1) to be submitted to Airworthiness Section for review and subsequent approval. The Airworthiness Section allocates a unique number for the Modification as per the procedure described under Paragraph 1.3 – Data Source.

1.5 Flight Tests

It may be necessary to flight test a modified aircraft if changes to the following have resulted by the modification.

- i) Flight characteristics
- ii) Performance
- iii) Flight Deck Design
- iv) Flight Guidance Systems
- v) Navigation Systems
- vi) System Operation not listed above

1.6 Flight Manual

Changes to Flight Manual may be required if

- a) Operating limitations are changed
- b) Changes to formal, abnormal or Emergency Procedures are required
- c) Performance characteristics have changed

1.7 Documentation

The applicant for modification approval must prepare all necessary documentation, which may include –

- a) Master Documentation list detailing individual drawings and specifications
- b) Drawings and instructions required for installation
- c) Compliance Programme
- d) Engineering reports used to determine compliance of modified product with approval basis
- e) Record of change in Mass and Balance and Moment Arm after modification
- f) Changes in electrical load if applicable
- g) Changes to flight manual if applicable
- h) Maintenance Instructions, instructions for continuing airworthiness and repair instructions.
- i) Submission of ECO (Engineering Change Order) and application to obtain the DGCA approval for the modification.

2. MAJOR REPAIRS

2.0 Definition of Major Repair

A major repair to an aeronautical product means a design change intended to restore it to an airworthy condition after it has been damaged or subjected to wear.

- a. A major repair means a design change, which is intended to restore an aeronautical product to an airworthy condition:
 1. Where the damage being repaired might appreciably affect the structural strength, performance, power plant operation, flight characteristics, or other qualities affecting airworthiness or environmental characteristics; or
 2. That will be embodied in the product using non-standard practices.

2.1 General

A major repair is carried out to restore an aeronautical product to an airworthy condition after it has been damaged or subjected to wear.

2.2 Compliance

Compliance must be shown with the approval basis of the Aeronautical Product. In order to ensure compliance with the approval basis, all applicable factors included in the original approval must be addressed. This may require reference to the original type design holder.

2.3 Data Source

Structural Repair Manual
Manufacture of aircraft, product or system.
Design organization approved by the Director General of Civil aviation.
Airworthiness Authority of the State of Design.

The final approval or acceptance of data will be at the sole discretion of the Director General of Civil Aviation. Any Major Repair to be carried out only by an organization approved by the Director General of Civil Aviation for the purpose. Each Major Repair should carry a unique number allocated by the CAA airworthiness section. This number is given in a sequential order.

For example A340-300 aircraft Major Repair is given as follows;
ADD/A343/MSN034/REP- XXX.

Where; ADD- Aircraft Registration mark. A343- Type of Aircraft
 MSN034 – Manufacturer serial number.
 REP-XXX- No. given by CAA

2.4 Procedures for obtaining approval

A major repair to an aeronautical product should be in accordance with design data. The Structural Repair Manual of the manufacturer approved by the Airworthiness Authority is generally accepted for this purpose.

If the repair is not already approved or accepted, then the applicant should –

- a. Conduct all analysis, calculations and tests to ensure compliance with Airworthiness and Environmental Standards.
- b. Prepare all documentation
- c. Determine design conformity with drawings and instructions
- d. Ensure adequate instructions are provided for continuing airworthiness.
- e. Necessary application (Figure 1) and ECO (Engineering Change Order–Appendix 1) to be submitted to Airworthiness Section for review and subsequent approval. The Airworthiness Section allocates a unique number for the Major Repair as per the procedure described under Paragraph 2.3 – Data Source

6. Service Limitations for Repairs

Pending completion of a permanent repair it may be necessary to restore a damaged aeronautical product. Such a repair may be permissible under controlled operating conditions, subject to approval of the Director-General of Civil Aviation

Interim Repairs

Interim Repairs, which comply with design standards, may be carried out for a limited time with the approval of the Director-General of Civil Aviation. However, such repairs should not have long-term effects, which could compromise regulatory requirements.

Temporary Repair

Do not fully restore damage, but restore to a condition acceptable for Ferry flight with appropriate restrictions.

Minor Modifications and Minor Repairs

1. Minor Modification

A minor modification means a modification other than a major modification

2. Minor Repair means a repair other than a major repair

A Minor Modification / Minor Repair should be supported by data acceptable to the Director General of Civil Aviation.

The DGCA must be informed with the list of all kind of Modifications and Repairs carried out on aircraft registered in Sri Lanka Civil Aircraft Register on frequent intervals acceptable to the DGCA.

Acceptable Data

1. Documents published by the manufacturer on subject modification or repair
2. Repair Schemes derived from Manufacturers approved Structural Repair Manual
3. Previous approvals granted by the Director General of Civil Aviation

In case of doubts the Approved Maintenance Organization / Operator shall seek clarification from the Director General of Civil Aviation

APPENDIX - 1

THE CONTENTS OF ECO (ENGINEERING CHANGE ORDER)

The Airworthiness Section shall review the contents of the ECO in order to check adequate coverage of following items and to issue a unique number for the Modification and Repairs.

- a) The Title page application is properly filled and signed by operator. All the pages of the ECO bear page and ECO number in the top right hand column as:
ECO Number
Issue number
Date
Page Number as "-----of-----"
Type of the aircraft
ATA chapter reference
- b) SUBJECT/TITLE:-
This item in the ECO shall have the title of the ECO, indicating Type of the aircraft and /or ATA Chapter
- c) BACKGROUND/DESCRIPTION:
Under this heading background details pertaining to this request for ECO are presented briefly that why operator is raising this ECO. What is to be accomplished on the aircraft
- d) REFERENCES
Listing of references related to ECO is given under this item.
- e) PUBLICATIONS AFFECTED
Listing of all affected pages, figures, drawings (WDM, IPC etc)
Part number or quantity changes if any
Configuration drawing changes, if any
- f) ACTION
The actions, which are required to be taken by the operator for incorporation of this ECO, are given under this heading.
- g) EFFECTIVELY
The Registration Number of the affected aircraft by this ECO is given under this heading as: -
AP-XXX and /or
MSN (Manufacturer Serial Number).
- h) REASON
Reason for the ECO, which may be either of these:
Airworthiness/ safety requirement

Standardization

Improvement in reliability

Operator's internal requirement, Improvement in Economics, Obsolescence.

- i) **APPROVAL**
This should contain the statement of the airworthiness approvals of the Engineering content, or part thereof, from any other regulatory agency (such as FAA, CAA (UK) etc) as applicable. This part will include a formal request from the DGCA to approve this ECO.
- j) **MANPOWER**
This item presents details of the Manpower required to accomplish ECO on aircraft such as Number of Engineers, Number of Technicians etc. Total man-hours and elapsed time is also given under this heading.
- k) **MATERIAL & AVAILABILITY**
Material required and its Availability details are given under this heading.
- l) **SPECIAL TOOLS**
Special Tools required for accomplishment of this ECO are given, if applicable.
- m) **WEIGHT & BALANCE**
Weight and Balance Changes created by this ECO are given under this item.
- n) **ELECTRICAL LOAD CHANGES**
Electrical Load increases or decreases are given in Watts or Kilowatts for DC and KVA for AC.
- o) **STRUCTURE STRESS ANALYSIS**
Structure Stress Analysis is given, if applicable
- p) **MATERIAL INFORMATION**
All kits, material required is tabulated along-with part no and quantity required per aircraft. Any disposition of old parts such as re-work, modification or discard is to be mentioned as well.
- q) **ACCOMPLISHMENT INSTRUCTIONS**
Step by step procedure for accomplishment of the engineering changes is given under this heading. Check for proper reference to attached ECO Drawings and Figures.
- r) **ENGINEERING DRAWINGS**
Numbers of the Engineering drawings being used in this ECO are given here. Review the ECO Engineering Drawings for adequacy of incorporation on aircraft.