Australian Government
Civil Aviation Safety Authority

Advisory Circular

AC 66-4(0) DECEMBER 2011

MAINTENANCE OF AIRCRAFT COMPOSITE STRUCTURES IN A MAINTENANCE ORGANISATION

CONTENTS

1. REFERENCES

Civil Aviation Safety Regulations 1998 (CASR) Parts 66 and its Manual of Standards (MOS).

2. PURPOSE

This AC provides CASR Part 66 - Guidance Material relating to carrying out maintenance of aircraft composite structures in either a Part 145 Approved Maintenance Organisation (AMO) or *Civil Aviation Regulations 1988* (CAR 30) Maintenance Organisation, for the aircraft previously specified as Group 7 aircraft.

3. STATUS OF THIS ADVISORY CIRCULAR

This is the first Advisory Circular (AC) to be issued on this subject.

Advisory Circulars are intended to provide advice and guidance to illustrate a means, but not necessarily the only means, of complying with the Regulations, or to explain certain regulatory requirements by providing informative, interpretative and explanatory material.

Where an AC is referred to in a 'Note' below the regulation, the AC remains as guidance material. ACs should always be read in conjunction with the referenced regulations.

This AC has been approved for release by the Executive Manager Standards Development and Future Technology Division.

4. ACRONYMS

AAC Airworthiness Advisory Circular
AC Advisory Circular
AME Aircraft Maintenance Engineer
AMO Approved Maintenance Organisation
AQF Australian Qualifications Framework
CAR Civil Aviation Regulations 1988
CASA Civil Aviation Safety Authority
CASR Civil Aviation Safety Regulations 1998
CoA Certificate of Approval
CRS Certificate of Release to Service
LAME Licensed Aircraft Maintenance Engineer
MOS Manual of Standards
MSA Manufacturing Skills Australia
MTO Maintenance Training Organisation
RPL Recognition of Prior Learning

5. BACKGROUND

5.1 This guidance information supports section 66.A.20 Privileges of the Part 66 MOS.

5.2 Under the previous CAR 1988 aircraft maintenance engineer (AME) licence system, aircraft of fibre reinforced plastic composite construction not covered by a CAR 31 Airframe Category Group 20 rating, could be classified under a specific aircraft lower group rating (previously specified by CASA and listed in Airworthiness Advisory Circular (AAC) 9-91).

5.3 This lower group rating (known as *'Group 7 composite aircraft'*) was the rating required by a CAR 31 Airframe Category licence holder to carry out and certify for maintenance of composite structures to those aircraft listed in Table 1 of AAC 9-91 and reproduced in the table below:

Table 1 – Aircraft that required a Group 7 rating and previously listed within AAC 9-91			
Aerodesign Pulsar	Diamond DA42	Jabiru LSA	Rutan Long Eze
Buchanan BAC 204	Eagle X/XTS Series	Lancair/Columbia Series	Rutan Vari Eze
Cirrus SR20/SR22	Extra 300/300S	Liberty XL2	Stoddard Hamilton Glasair Series
CoZ Cosy	Grob 520 Egrett	Quickie Q1/Q2 Series	Stoddard Hamilton Glastar
Diamond DV22/DA22	Grob G115	Quickie Q200	III Sky Arrow 650
Diamond HK-36	Gyroflug SC01B-160	Rutan Defiant	
Diamond DA40	HOAC DV 20 Katana/Diamond DA 20A1	Rand KR2	

5.4 During the transition from Regulation 31 of the CAR 1988 to Part 66 of CASR 1998 this set of aircraft will continue to have their composite structures maintained in the same manner as previously established under Regulation 31.

5.5 Civil Aviation Order 100.5 — *General requirements in respect of maintenance of Australian aircraft;* states that composite maintenance on a ***specified aircraft*** must be carried out by:

- a Part 145 organisation; or
- a CAR 30 maintenance organisation.

5.6 A ***specified aircraft*** is defined in paragraph 7A.1 of CAO 100.5 as an aircraft specified in Table 1 (of CAO 100.5).

6. MANAGING COMPOSITE STRUCTURE MAINTENANCE OF SPECIFIED AIRCRAFT WITHIN A CAR 30 MAINTENANCE ORGANISATION

6.1 If composite maintenance is carried out on a specified aircraft by a CAR 30 maintenance organisation, the organisation must ensure that only a ***specially qualified person***, employed by the organisation, performs the maintenance.

Note: *Apart from the separate privileges of a Part 145 organisation, composite maintenance of a specified aircraft may only be performed by a qualified person employed by a CAR 30 maintenance organisation. Therefore, such maintenance may* ***not*** *be carried out by a person referred to in paragraph 42ZC (4) (b) of CAR 1988, sometimes known as an independent LAME or a LAME employed by an independent LAME.*

6.2 A ***specially qualified person*** is defined in paragraph 7A.1 of CAO 100.5 as a person who:

(a) holds a category B1 licence issued under Part 66 of the *Civil Aviation Safety Regulations 1998*; and

(b) is also 1 of the following:

(i) a person who at any time before 27 June 2011 was a Group 7 LAME, provided that the person's licence had not been cancelled by CASA; or

Note: The relevant rating may or may not have expired, and may or may not have been renewed as long as it had once been held and the licence has not been cancelled.

(ii) a person to whom regulation 202.342 of the *Civil Aviation and Civil Aviation Safety Amendment Regulations 2010 (No. 1)* applies who would have been a person mentioned in subparagraph (b) (i) but for the suspension of his or her licence on or before 26 June 2011, provided that the suspension has been revoked by CASA; or

(iii) a person for whom CASA determines under regulation 202.343 or 202.344 of the *Civil Aviation and Civil Aviation Safety Amendment Regulations 2010 (No. 1)* that it would have issued an aircraft maintenance engineer licence under regulation 31 of CAR 1988, endorsed with a category airframes Group 7 rating as described in Civil Aviation Order 100.91; or

(iv) a person who holds at least 1 of the following:

(A) AQF qualification MEA405B;

(B) a Transport Canada AME licence endorsed with an 'S' rating;

(C) a New Zealand AME licence endorsed with an aeroplane Group 4 rating;

(D) another qualification approved in writing by CASA as an appropriate qualification for performing composite maintenance.

6.3 A ***Group 7 LAME*** is a LAME who held an aircraft maintenance engineer licence issued under regulation 31 of CAR 1988 which was endorsed with a category airframes Group 7 rating as described in Civil Aviation Order 100.91.

7. MANAGING COMPOSITE STRUCTURE MAINTENANCE WITHIN A CASR PART 145 APPROVED MAINTENANCE ORGANISATION (AMO)

7.1 Within a Part 145 AMO, maintenance carried out to the composite structure of aircraft has been classified as specialist maintenance. *Specialist maintenance* means that maintenance described in paragraph 145.A.30 (f) of the Part 145 MOS, and includes composite repairs.

Note: Specialist maintenance only applies to specialised maintenance tasks or processes carried out in a Part 145 AMO and does not apply in a CAR 30 organisation.

7.2 Personnel performing maintenance to the composite structure of aircraft must be appropriately qualified to carry out that specialist maintenance task and be authorised by the Part 145 AMO (under section 145.A.35 of the Part 145 MOS) as a specialist maintenance certifying employee. The qualification and authorisation requirements apply whether or not the person holds a Part 66 licence – and the authorisation by the Part 145 AMO is separate from any other authorisation as a licence holder.

7.3 Carrying out Maintenance and Certification. Maintenance to aircraft composite structures, including maintenance to the composite structures of the specified aircraft listed in Table 1 of CAO 100.5, and certification for completion of that specialist maintenance task could be carried out by either:

- The holder of a B1 licence issued under Part 66 of CASR 1998 who has the required qualifications and competency with respect to aircraft composite structures (see paragraph 6.2) and has been granted a certification authorisation for composite repairs by the Part 145 AMO; or
- A non-licensed specialist maintenance employee who has the required qualifications and competency with respect to aircraft composite structures (see paragraph 6.2) and has been granted a certification authorisation for composite repairs by the Part 145 AMO.

7.4 A non-licensed person who has been granted a certification authorisation for specialist maintenance by an AMO does not need a LAME to provide maintenance certification for their work.

Note: *Any maintenance certification authorisation issued by the Part 145 AMO for specialist maintenance work (such as composite repairs) is restricted to the specified specialist maintenance.*

7.5 Certificate of Release to Service (CRS). Following the completion of specialist and other maintenance tasks the aircraft must be released back to service by the provision of a Certificate of Release to Service (CRS). Under section 66.A.20 of the Part 66 MOS, a CRS can only be issued by one of the following:

- A Category A licence holder working for a Part 145 AMO endorsed with a subcategory may issue a CRS for line maintenance if:
  (i) the maintenance was carried out by the person; or
  (ii) the maintenance and its maintenance certification were carried out by another person who holds a Category A licence with the appropriate subcategory; and
  (iii) the maintenance was line maintenance of a kind mentioned in Appendix II of the Part 145 MOS; and
  (iv) the aircraft being maintained is covered by the subcategory of licence held;
- A Category B1 licence holder working for a Part 145 AMO endorsed with a subcategory may issue a CRS for aircraft covered by a subcategory endorsed on the licence, after maintenance of the aircraft, if the maintenance was not base maintenance carried out on a large aircraft;
- A Category B2 licence holder working for a Part 145 AMO may issue a CRS for aircraft covered by the licence if the maintenance was not base maintenance carried out on a large aircraft; and
- A Category C licence holder working for a Part 145 AMO may issue a CRS for base maintenance carried out on a large aircraft for the aircraft in its entirety, if:
  (i) the maintenance was carried out on a large aircraft; and
  (ii) the Category C holder's licence is endorsed with the type rating for the large aircraft.

Note: *A composite repair may be classified as Base maintenance due to the facilities required for carrying out that maintenance task.*

Executive Manager
Standards Development and Future Technology

December 2011

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APPENDIX A

CURRENT AUSTRALIAN QUALIFICATIONS FRAMEWORK (AQF) COMPETENCIES WITH COMPOSITE COVERAGE

Competency Unit required (as per Appendix IV of Part 66 MOS) to gain a B1 licence

MEA339B: Inspect, repair and maintain aircraft structures
This unit covers the competencies required to inspect, repair and maintain aircraft structure. It requires application of procedures and techniques associated with the inspection and maintenance of aircraft structure and with the performance of a limited range of metal and composite repairs.

Competency Units that if held - may be relied upon by a Part 145 AMO when authorising personnel for composite repairs

MEA405B: Repair/modify aircraft composite material structure/components
This unit covers the competencies required for the repair or modification of fixed and rotary wing aircraft structural components that are made from composite materials. Topic coverage includes work on:

- identifying composite component applications in aircraft structures;
- identifying various aircraft composite materials/resins and their basic properties by interpretation of markings and visual means;
- handling and storing of composite materials to industry standards;
- assessing composite component damage using visual and tap test methods;
- performing composite component repairs using external patch, scarf, stepped, wet lay up and composite fastener hole repairs; and
- metal to metal and metal to composite bonding.

MEA401B: Inspect aircraft structures *(MEA401B is a prerequisite of MEA405B)*
This unit covers the competencies required for the inspection of fixed and rotary wing aircraft structures. Structural inspections, in particular pressurised aircraft, in accordance with aircraft and procedures manuals are also covered in this unit. Inspection of damage and assessment of composite components/structures for impact damage and fatigue is provided.

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APPENDIX B

THE COMPETENCY BASED TRAINING SYSTEM UNDER THE AUSTRALIAN QUALIFICATIONS FRAMEWORK (AQF) – COMPOSITES

Training requirements for Part 66 licensing

CASA has integrated its licensing requirements with the nationally endorsed competency-based training package under the AQF arrangements. This competency based system replaces the CASA administered theory examinations and practical schedule of experience requirements (SOE), although this avenue will still be available for four years to allow for those already working through the CASA system to complete their training. For Part 66 licensing, CASA will only recognise training outcomes from CASA approved and oversighted CASR Part 147 Maintenance Training Organisations (MTO). The MTO will provide training and assessments for category, subcategory and aircraft type rating training.

A person who has previous qualifications and/or experience in carrying out maintenance to aircraft composite structures (including experience and qualifications from another country) can be assessed as being competent through RPL by a Part 147 MTO. An MTO that has been approved by CASA as having an RPL process in their exposition can conduct an RPL assessment against the AQF Aeroskills Training Package Competency Standards to determine whether a person's qualifications and experience meet the competency requirements to perform any specialist maintenance - on behalf of and for the AMO.

Manufacturing Skills Australia (MSA)

MSA is the national Industry Skills Council recognised by the Australian Government and the manufacturing industry to ensure that the skills needs of enterprises are being met. MSA has responsibility for the development, implementation and continuous improvement of aircraft maintenance qualifications. These qualifications support the development of comprehensive skills for aerospace personnel involved in the maintenance, repair and overhaul of aircraft and aircraft components, and play a critical role in supporting CASA's licensing arrangements.

Aeroskills Training Packages

Within the Certificate IV in Aeroskills (mechanical) training package, endorsed by the AQF, there are various qualifications covering the Aviation Maintenance Sector of the Australian aerospace industry. The qualifications that lead to the issue of CASA B1 licences have coverage for inspection, repair and maintenance of aircraft structures. The competency unit common to the B1 sub categories of licence is MEA339B.

Similarly, competency units required for gaining a Certificate IV in Aeroskills (Structures) have coverage for inspection of aircraft structures MEA401B, and the repair and modification of aircraft composite material structure/components - MEA405B. Detail of these competencies and coverage is outlined in Appendix A.

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