

Revision 6

2 October 2023

### Aircraft Maintenance Engineer Licence— General

#### General

Civil Aviation Authority (CAA) advisory circulars (ACs) contain information about standards, practices, and procedures that the Director has found to be an **acceptable means of compliance** with the associated rule.

Consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices, or procedures are found to be acceptable they will be added to the appropriate AC.

#### Purpose

This AC describes an acceptable means of compliance to enable the issue of aircraft maintenance licences, certificates and ratings and the privileges and limitations of those licences, certificates and ratings.

#### Related Rules

This AC relates specifically to Civil Aviation Rule Part 66.

#### Change Notice

Revision 6 of this AC adds a note on the online application process and updates the sections on rule 66.7, *Application for licences, certificates, and ratings*, rule 66.9(a)(1) - *Fit and proper person (FPP) test* and rule 66.203, *Eligibility requirements*, to refer to online applications. It also updates information in the section *Forms*. Lastly, it adds forms CAA 24066-11 and 24FPP to the section on rule 66.7.

#### Version History

The main changes are outlined below:

AC Revision No	Effective Date	Summary of changes
AC66-1 Rev 0	1 April 1997	The initial issue of this AC
AC66-1 Rev 1	1 Dec 2008	Introduced a major change to basic Aircraft Maintenance Engineer Licence (AMEL) examination requirements and syllabi.  The syllabus for each subject was reviewed and published, in objectivised format, in separate ACs in the 66-2.x series.

AC Revision No	Effective Date	Summary of changes
		Included expanded detail on an acceptable means of compliance for demonstrating compliance with practical experience requirements, a number of editorial changes and updated Appendices.
AC66-1 Rev 2	4 Feb 2014	Amended the reference to annual review of airworthiness to the current term review of airworthiness.
AC66-1 Rev 3	22 Jan 2021	<p>Provided information on changes to Part 66 relating to matters including:</p> <ul style="list-style-type: none"> <li>• the issue of licences, certificates and ratings</li> <li>• competence, complexity</li> <li>• the recent experience requirements</li> <li>• medical requirements</li> <li>• drug and alcohol requirements</li> <li>• examinations</li> <li>• effect of convictions and other conduct on the fit and proper person (FPP) test</li> <li>• re-currency training</li> <li>• training for aircraft maintenance, engineer ratings, supervision requirements, and</li> <li>• changes to Appendices B and C.</li> </ul> <p>As well as existing Appendices A to C, additional Appendices 1-6 were added.</p>
AC66-1 Rev 4	27 June 2022	<ul style="list-style-type: none"> <li>• Updated the applicable email address for the CAA Licensing Team and online payment methods.</li> <li>• In Subpart B, updated competency standards for maintenance on aircraft principally constructed of FRP and ratings for engineers in E,I&amp;R categories.</li> <li>• In Subpart C, relating to type ratings courses, added notes on appropriate training and type ratings course for E, I&amp;R related system work, depending on the complexity of the E,I&amp;R system.</li> <li>• In Subpart D, clarified eligibility requirements for a Certificate of Maintenance Approval (MA) and MA renewal applications.</li> </ul>

AC Revision No	Effective Date	Summary of changes
		<ul style="list-style-type: none"> <li>• In Subpart E, clarified eligibility requirements for a Certificate of Inspection Authorisation (IA) and IA applications.</li> <li>• In Appendix 1, added FRP to Group 1 and 2, updated competency standards for doing maintenance on aircraft principally constructed of FRP, and added notes on appropriate training and type ratings course for E,I&amp;R related work, depending on the complexity of the E,I&amp;R system.</li> <li>• In Appendix 2, added a detailed description of category demarcation.</li> </ul>
AC66-1 Rev 5	6 April 2023	<p>In Subpart C, <i>Aircraft Maintenance Engineer Ratings</i>, added a section under Rule 66.103(3), <i>Foreign B1 Training Courses (Limited powerplant platform ratings)</i> which enables acceptance of foreign B1 courses to allow for a limited powerplant rating to be awarded when fitted to the specified airframe platform.</p> <p>Deleted section <i>Transitional Arrangements</i>.</p> <p>Made stylistic changes to align with current AC format and fixes minor errors.</p>
AC66-1, Rev 6	2 Oct 2023	<p>Adds a note on the online application process.</p> <p>Updates the sections on rule 66.7, <i>Application for licences, certificates, and ratings</i>, rule 66.9(a)(1) - <i>Fit and proper person (FPP) test</i> and rule 66.203, <i>Eligibility requirements</i>, to refer to online applications.</p> <p>Updates information in the section <i>Forms</i> and adds forms CAA 24066-11 and 24FPP to the section on rule 66.7.</p>

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## Glossary of Terms

The terms listed below are as used in this AC and the context of their use is explained.

**Aircraft Maintenance** – Part 1 definition: in relation to an aircraft or aircraft component, means all work and inspections performed to ensure the continued airworthiness of the aircraft or aircraft component, and all modifications.

**AMEL** – Aircraft Maintenance Engineer Licence.

**ASPEQ** – (formerly ASL) a New Zealand company providing examination services internationally, delegated and contracted to provide assessment services for CAA.

**Competence (Competent)** – having the necessary ability, knowledge, skill and qualification to carry out required maintenance tasks.

**Currency** – a means of providing tangible evidence for competence.

**Electrical, instrument or radio (E, I&R) system** – systems which are not complex but may be part of an integrated system. Definition is as per Rule Part 66 Appendix B – Group and Type Ratings, B.1 Groups: check under (d) for electrical, (e) for instruments and (f) for radio for the definitions for Electrical Group 1, Instrument Group 1 and 2, and Radio Group 1, 2 and 3.

**Electrical, instrument or radio (E I&R) COMPLEX system** – a group or system of different parts or an amalgamation of E, I&R categories that are interconnected or interfaced in an atypical manner. It is a software-reliant integrated system where a possible failure condition could propagate from one component to another, which may influence the correct functioning of another system.

Generally, the complexity would become apparent within E, I&R systems when considering:

- Emerging technologies (due to uniqueness)
- RPAS (due to autonomous operating systems and Part 66 maintenance)
- OEM (new or unusual configurations and/or platform structure), and/or
- Retrofits (STC) (i.e. major E, I&R modification or repairs excluding those detailed within AC43-14).

For further explanation please refer the section under rule 66.103(3), **Complex E, I&R Systems Requiring Type-Specific Ratings v Integrated E, I&R Systems**.

**Electrical, instrument or radio INTEGRATED system** – an aircraft system which combines two or more, or a mixture of two or more electrical, instrument and/or radio sub-systems (i.e. within the E, I&R categories) in its physical or operational architecture such that defects in, or removal of, components/parts from one sub-system may affect other sub-systems.

- Integrated systems may be stand-alone units with all subsystems in the single unit or multiple modules interconnected via discrete wiring and/or data busses, e.g.:
  - Single or multi-screen EFIS may include external or internal sensors and Nav/Comm/GPS antennas
  - Single panel NAV/COMM/GPS systems
  - ADS-B Systems – Stand alone or modular Mode S Transponder and GPS, or

- EFIS/remote controlled Electronic Circuit Breaker modules.

**Familiarity** – reasonable knowledge and experience of an aircraft, system, component etc. The term in this AC applies to the IA certificate holder and not the performance of maintenance as in rule 43.53(1).

**LAME** – Licenced Aircraft Maintenance Engineer

**LRU** – a Line Replaceable Unit, sometimes referred as an 'Avionics LRU' is an aircraft electrical, instrument and/or radio part that satisfies all the following requirements:

1. it must have no mechanical input from, or output to, another part or mechanism, other than an anchoring point, that would require rigging with a duplicate inspection, and
2. it must contain only electrical, electronic, instrument or radio parts, or software, or a combination of any such part or parts and software, designed to provide control, monitor or display functions, or a combination of such functions, and
3. when applicable the licensed engineer must be competent with the following:
  - specialist knowledge or techniques
  - specialised equipment, or
  - functional testing or adjustment, using specialised equipment external to the aircraft or brought on board the aircraft, to ensure that it is functioning properly.

**Note 1:** *The process of updating/transferring software data, using data loaders (whether portable or onboard), is treated as an electrical, instrument and/or radio LRU replacement, if LRU replacement serviceability can be established by using a simple test. Software transfer is not to be treated as an LRU replacement if the software installation does not have a discrete test outcome/result or if affected systems serviceability cannot be verified.*

**Note 2:** *Component software loading is considered an LRU for electrical, instrument and/or radio when associated with a component removal/installation task, BUT the repair, rebuilding and major modification of system software is not. This remains the responsibility of the respective electrical, instrument and/or radio category LAME.*

**Note 3:** *A simple test for the above may be described in approved maintenance data and meet the following criteria:*

- *the serviceability of the system can be verified using aircraft controls, switches, built-in test equipment (BITE), central maintenance computer or external test equipment not involving special training, and*
- *the outcome of the test is a unique go/no-go indication or parameter, which can be a single value or a value within an allowable interval tolerance. No interpretation of the test result or interdependence of different values is allowed, and*
- *if performing troubleshooting steps outlined in approved maintenance data within an electrical, instrument and/or radio ATA chapter, which includes a wiring check if data does not stipulate a 'specific' result or finding (e.g. continuity, 28vdc, 500 ohms or between a range of figures or values), then any outcome of the test is open to interpretation (i.e. not a go/no-go result) and therefore does NOT meet the simple test criteria.*

**Medical Condition** – refer to the explanatory notes below at rule 66.19.

**Radio System** – any system which transmits or receives is not a hand-held communication unit and would be required to be included on the form CAA 2129 (see AC43-10). Such systems would include:

- Communication equipment
- Navigation equipment
- Radar equipment
- Identification transmitting and receiving equipment
- Removable and fixed emergency locator transmitters
- Intercom systems
- Cellular telephones (fixed).

**Recurrent or Acceptable Training** – for the purpose of upskilling with technological advancement and for maintaining current skills. Such training may be conducted by an Aircraft and equipment manufacturer, a Part 145 Maintenance Organisation or a Part 147 Maintenance Training Organisation as a Familiarisation course, Differences course or something similar. The purpose is to refresh basic knowledge for the rating to be able to carry out the privileges safely and competently.

**RTS** – Release to Service

**Special Test Equipment** – refer to notes below at rule 66.55(c).

## Introduction

Part 66, Aircraft Maintenance Personnel Licensing, prescribes the rules relating to the issue of licences, ratings, certificates, and authorisations issued by the Director.

This AC provides information about some of the rules in Part 66 and describes the policies of CAA in administering those rules. Because some of the rules are obvious in their application, not all rules are detailed in this AC.

This AC also specifies the examinations required for the issue of documents under Part 66.

**Note:** From 2 October 2023 it will be possible to apply online for aircraft maintenance engineer licences through **MyAviation**, CAA's online portal for licensing requests, instead of filling in paper forms. **MyAviation** is CAA's preferred way to submit applications and is the equivalent of using the applicable paper form. Click the 'Online services' button on the CAA home page to get started.

## General

Readers should refer to Part 66 for references to the rule. Rule numbers have been used here to identify paragraphs that relate to those rules.

### Rule 66.1 Applicability

Part 66 prescribes the specific requirements for the issue of aircraft maintenance engineer licences, ratings, certificates of MA, and certificates of IA. It also describes the privileges and



limitations of these documents. It is important that this AC is read in conjunction with Part 66.

### **Rule 66.7 Application for licences, certificates, and ratings**

Most applications may be completed online using **MyAviation**, CAA's online portal for licensing requests. Click the 'Online services' button in the top right corner of the CAA home page to get started.

Where it is not possible to apply online, select **Forms** from the CAA home page and search for:

Application for inspection authorisation – Course initial or refresher CAA 24066-11

Fit and Proper Person Questionnaire 24FPP

Alternatively, where it is not possible to apply online, please contact CAA to request a form at:

[licensing@caa.govt.nz](mailto:licensing@caa.govt.nz)

or

Licensing and Standards  
Civil Aviation Authority  
PO Box 3555  
Wellington 6140, New Zealand

The appropriate fees, as prescribed by the current Civil Aviation Charges Regulations (and specified on the applicable application form) should be paid online at <https://sec.caa.govt.nz/onlinepayment>. The receipt emailed to you is to be attached and emailed together with the completed application form to [lic.applications@caa.govt.nz](mailto:lic.applications@caa.govt.nz). Alternatively, if applying online, please upload a copy of the receipt when prompted to by **MyAviation**.

Where practical experience details are required, they should be documented in a suitable **Practical Training Record (PTR)** and be as complete and detailed as possible to allow prompt assessment of the application.

CAA does not offer a pre-assessment service. All applications for pre-assessment should be sent to ASPEQ for a fixed fee assessment.

Application fees for non-approved assessments by either CAA or ASPEQ will not be re-credited to the applicant.

### **Rule 66.9 Issue of licences, certificates and ratings**

The appendices to this circular contain information on the following:

- Appendix 1 - description of AMEL category groups and ratings
- Appendix 2 – description of the Category demarcations

Note: For information regarding the lists for various type ratings, refer to the CAA website, **Licensing & Certification/ Type ratings for AMEL holders**.

This rule requires the applicant to satisfy the Director that the following requirements are met:

### **Rule 66.9(a)(1) - Fit and proper person (FPP) test**

Holders of an aviation document must pass an FPP test. Initial applicants for licences or certificates issued under this part will be required to complete a *Fit and Proper Person Questionnaire* that meets the requirements of this test.

Applicants who use **MyAviation** to apply online will be prompted to declare whether they have previously completed an FPP questionnaire, and whether their circumstances have changed since. If a participant declares they have not previously completed a questionnaire, or their circumstances have changed, they will be directed to the 24 FPP Questionnaire. Applicants who are unable to apply online need to complete CAA form 24FPP.

The criteria for the FPP test are in section 10 of the Civil Aviation Act 1990 (the Act). Section 10(2) of the Act allows the Director to also consider additional matters such as factors specified in the Rules. Section 11 of the Act defines the rights of individuals and requires a set procedure in case of adverse determinations.

#### **Criminal Offences and Charges including those involving alcohol or drugs**

These requirements have been modernised and a wider view taken of matters relevant to the Director in determining whether a document holder or applicant is an FPP in accordance with section 10 of the Act.

Relevant factors for the Director to consider are whether the document holder or applicant has any criminal convictions, including those under the Clean Slate Act 2004, whether he or she has any criminal charges against them or any criminal charges pending, in addition to convictions for offences relating to alcohol or drugs. There is a duty on the document holder or applicant to report to the Director any conviction or charge of this type as soon as practicable after the person becomes aware of them. The provisions of sections 10, 11, 17 and 18 of the Act may apply and ultimately such a conviction or charge may result in a refusal to grant a licence or suspension or revocation of a licence.

For more FPP information please go to the CAA webpage at:

<https://www.aviation.govt.nz/licensing-and-certification/fit-and-proper-person-process/>

### **Rule 66.9(a)(2) - English language test**

The applicant's English Language ability will be determined through the written and oral examinations carried out to qualify for the licence or certificate. Normally this is via the Air Law subjects 020 and 021. The determination may occur during initial licence issue, foreign licence recognition process, with recency after five years of licence inactivity or as directed by the Director.

An applicant for whom English is not their first language, and who is unable to pass Air Law oral subject 021 will need to sit and pass a Level 4 English proficiency test conducted through ASPEQ, prior to resitting Subject 021.

### **Rule 66.9(a)(3) - Eligibility requirements**

This refers to the requirements in rules 66.53, 66.103, 66.153, and 66.203, and relates to examinations and practical experience.

The acceptable method of demonstrating completion of suitable practical experience is to submit a **Practical Training Record (PTR)**. This should be set out, so the experience is readily identifiable to that applicable licence/category/rating or certificate that is being applied for.

### **Rule 66.9(a)(4) - Interest of aviation safety**

The granting of a licence or certificate must not be contrary to the interests of aviation safety. To satisfy this requirement, the personal records of each applicant for a licence, or certificate, will be reviewed. The Director can only review records in the possession of CAA.

For the granting of a group or rating normally both experience and examinations are required or a training course with the appropriate combination acceptable to the director.

### **Rule 66.9(a)(5) – Medically fit to exercise privileges**

To comply with the requirements to be medically fit to exercise the privileges of an aircraft maintenance engineer licence, the applicant, as part of the FPP process, may be asked to supply a signed declaration that they do not have a medical condition, as detailed under rule 66.19, that will create a risk of harm to themselves or to other persons while exercising their LAME privileges.

### **Rule 66.9(b) - Foreign AMEL recognition**

Applicants for the grant of licences, ratings, or certificates, issued based on a *current* licence or certificate issued by a foreign ICAO Contracting State accepted by CAA, should apply online using **MyAviation** referring to the CAA website for the application requirements.

The application will be assessed:

- to ensure that the licence or certificate has been issued by an ICAO Contracting State, where CAA understands that state's licensing system and that state's system meets the requirements of Annex 1 to the ICAO Convention, and
- to ensure that the document is valid and current, as part of this process the issuing State is to verify this to CAA, and
- to determine the extent of any limitations and rating coverage, and
- to determine which AMEL examinations are required to be passed. As a minimum this will include Human Factors (subject 17) and both the Air Law, written and oral examinations (subjects 20 and 21), and
- to ensure that the applicant meets the recent experience requirements of rule 66.57, and
- to ensure that the applicant meets the FPP requirement in accordance with section 10 of the Act.

#### **Notes:**

- *Examination credits are not accepted.*

- *CAA does not transfer foreign licence privileges, only the applicable and equivalent New Zealand type rating/s as endorsed on the licence and if they are currently on the New Zealand aircraft register.*
- *The FAA A & P Certificate, or other ICAO state Certificates based on the FAA Certificate, are not recognised.*
- *EASA/JAA Category A licences are not recognised.*
- *Applicants will be required to complete the Fit and Proper Person Questionnaire (either online using **MyAviation**, or by filling in CAA 24FPP), and satisfy the Director that the issue of the document is not contrary to the interests of aviation safety.*

### **Rule 66.9(b)(2) - FPP test**

Refer to explanatory notes for rule 66.9(a)(1) above.

### **Rule 66.9(b)(5) – Medical condition that creates risk or harm**

Same as explanatory notes for rule 66.9(a)(5) above.

### **Rule 66.9(b)(6) - English language test**

Refer to explanatory notes for rule 66.9(a)(2) above.

### **Rule 66.9(c) - Australian licence recognition**

Holders of licences and certificates issued by the Civil Aviation Safety Authority of Australia who apply for recognition in New Zealand to gain a New Zealand licence are required to:

- pass examination subject 020 – Written Air Law (but are not required to pass subject 021), and
- provide evidence of aircraft type/rating experience, and
- have CASA verify the licence and/or certificates to CAA, and
- complete the Fit and Proper Person Questionnaire (*either online using **MyAviation**, or by filling in CAA 24FPP*) to satisfy the Director that the issue of the document is not contrary to the interests of aviation safety.

### **Trans-Tasman Mutual Recognition Act (TTMRA)**

Holders of Australian licences and certificates may apply for recognition of their Australian privileges to exercise equivalent New Zealand privileges in New Zealand on New Zealand registered aircraft in accordance with NZ Civil Aviation Rule Part 43. However, prior to exercising such privileges, the Australian licence and/or certificate must be registered with CAA (NZ), using **MyAviation**.

This process allows for the Australian licences and certificates holder to use their Australian qualification privileges on New Zealand registered aircraft.

**Important note:** *It is the responsibility of the engineer to ensure they hold the appropriate ratings and privileges under the Australian system to certify release to service (RTS) and ensure that all maintenance and certification of New Zealand registered aircraft for which*

*they are responsible is carried out in accordance with New Zealand Civil Aviation Rules. Australian regulations do not apply.*

#### **Rule 66.11 Duration of licences and certificates**

A licence is issued under Part 66 for the lifetime of the holder. It is, therefore, important that licence and certificate holders advise the Director when they change their personal details, such as contact details or name. This is a requirement of the Act.

Licences, certificates of maintenance approval, and certificates of inspection authorisation do not need to be forwarded to the Director with applications for amendment, such as rating issue or renewal. On receipt of the new or replacement document, responsibility falls upon the holder to destroy and dispose of the expired or superseded document.

Certificates of maintenance approval may be issued for any period up to five years. The period of issue will depend on the purpose for which the certificate has been issued. Where an approval is issued to allow practical experience to be gained, it will be issued for the minimum time required for that experience.

Certificates of inspection authorisation may be issued for any period up to five years.

Any licence, certificate of maintenance approval, or certificate of inspection authorisation that has been suspended or revoked is to be forwarded to the Director. "As soon as practicable" means without delay, having regard for the circumstances of the holder.

#### ***Lost or stolen documents***

If a licence or certificate is lost, or is stolen, the document may be replaced. You will need to apply online using **MyAviation**, pay the appropriate fee and produce written evidence that the loss, or theft, has been reported to the local police.

#### **Rule 66.13 Examinations**

This rule requires examination candidates to produce documented proof of their identity to the examination invigilator. All means of identification must be current and valid. The types of photographic identification that are acceptable to the Director for purposes of rule 66.13(a)(1) are:

- A New Zealand or foreign passport,
- Photographic identity cards issued by the New Zealand Defence Force, New Zealand Police, New Zealand Fire Service, New Zealand Transport Agency; or CAA Airport Identity Card,
- New Zealand Firearms Licence, or
- Statutory declaration of photographic identity made in accordance with the Oaths and Declarations Act 1957.

The minimum pass mark for all written examinations is 70%. Applicants should ensure that they retain course certificates or examination result notices until the licence, rating, or certificate the examination or course relates to, has been issued.

Written examination passes are valid for the lifetime of the holder, except for the Written Air Law examination (subject 20) which is valid for five years from the date it was passed. This means an applicant must apply and have the licence issued within five years of completing the Air Law examination (subject 20). If an applicant fails to have the licence

issued within five years of sitting the Air Law examination, that subject must be re-sat and passed.

Before sitting the Oral Air Law examination (subject 21) the applicant must have completed all written examinations required for the licence issue and have completed the required practical experience listed in rule 66.53(a)(4).

Any examination, written or oral, failed three times in succession requires a three-month stand down period for that examination from the date of the last attempt. This is to allow the candidate to suitably review the subject material prior to a further sitting.

#### **Rule 66.14 Re-examination of licences**

The holder of Part 66 document may be re-examined to establish competency if the Director considers such an action as necessary. This was an existing rule reprinted from the revoked rule 19.401.

Competency may be demonstrated by means as described in rule 66.57 'Currency' below. However, the Director may also elect to have a written or oral examination, or an interview to determine the level of competency. As a result of the re-examination the Director may vary or cancel the holder's document.

#### **Rule 66.15 Cheating or other unauthorised conduct**

Copying from another candidate, referring to an unauthorised source of information, communicating during an examination, taking an examination on behalf of another candidate, illicitly recording an examination, removal of propriety information or any form of cheating during any examination, or failure to comply with any direction given to candidates from the examination invigilator/facilitator will result in the examination being terminated for the candidate, with no refund of fees.

If the facilitator believes that a person has attempted, committed or has procured another person to sit an examination, the candidate may be liable to prosecution and fines in accordance with the Act or the Crimes Act 1961. The candidate will not be permitted to undertake any further AMEL examinations for a period of 12 months. The candidate may ultimately face suspension or revocation of any licence or certificate issued in accordance with the Act.

However, before any action is taken, the Director will reasonably inform the person in writing of the details of the alleged conduct.

#### **Rule 66.17 Offences involving alcohol or drugs**

Refer to the CAA website Safety/Health and Safety – Drugs and alcohol.

<https://www.aviation.govt.nz/safety/health-and-safety/drugs-and-alcohol/>

Alcohol affects the central nervous system, slowing down the messages between the brain and the body. It affects concentration and coordination and slows the ability to respond to unexpected situations. The effect is directly proportional to the concentration of alcohol in the blood. Hence it presents a safety issue for the affected and those around them.

A conviction relating to drugs or alcohol or refusal to lawfully submit to a test brings a person's fit and proper status into question. Such a conviction may result in the suspension, revocation or refusal to grant a licence.

**Rule 66.19 Medical Requirements**

No Part 66 document holders should perform the privileges of their licence if they have a known medical condition in contravention of section 10(1)(d) of the Act. A Part 66 document holder should report to CAA any medically significant changes that may have an impact on their FPP status.

Upon receipt of a notification, CAA will follow its standard process for assessing whether appropriate interventions, if any, are needed, such as restrictions on a licence. CAA will use its risk-based and professional, regulatory skills to determine the appropriate intervention, in line with its Regulatory Operating Model.

A medical condition is a condition that could or is likely to interfere or reduce the safe exercise of the privileges or the safe performance of the duties relevant to the holder's licence. It may include but is not restricted to:

- an illness or injury, infirmity or incapacity, mental infirmity or incapacity,
- any sequela from an illness, infirmity or incapacity,
- an abnormal psychological state, or
- drug addiction and drug dependence.

Please also refer to Appendix 6 of this AC for more detail.

## Subpart B - Aircraft Maintenance Engineer Licence (AMEL)

### Rule 66.53 Eligibility requirements

#### Rule 66.53(a)(2) - Examinations

For the issue of a licence, this rule requires that the examinations that have been passed are acceptable to the Director and are relevant to the duties and responsibilities of an aircraft maintenance engineer in the category of licence sought. Appendix 5 details the structure and layout of the examination syllabi.

Table 1 details the examinations requirements for each category. The table identifies each subject number (column 2) and name (column 3) and indicates the AC that contains the syllabus and other relevant material for each subject (column 1). The numbers of examinations to be passed in respect of each category are as follows:

**Table 1**

AMEL Basic Examination requirements										
Advisory Circular	Subject	Subject Name	Licence Category							
			Aeroplane	Rotorcraft	Power plant		Electrical	Instrument	Radio	LTA
					Piston	Turbine				
AC66-2.1A	1A	Aero. Science - Maths & Physics	X	X	X	X	X	X	X	X
AC66-2.1B	1B	Aero. Science - Electrical Fund.	X	X	X	X	X	X	X	
AC66-2.2	2	Aircraft Engineering Knowledge	X	X	X	X	X	X	X	
AC66-2.3	3	Aircraft Materials	X	X	X	X	X	X	X	
AC66-2.4	4	Aeroplanes I	X		2		X	X	X	
AC66-2.5	5	Aeroplanes II	1							
AC66-2.6	6	Rotorcraft		X	2					
AC66-2.7	7	Piston Engines			X					
AC66-2.8	8	Turbine Engines				X				
AC66-2.11	11	Avionics I	X	X	X	X	X	X	X	
AC66-2.12	12	Avionics II					3	4	5	
AC66-2.13	13	Electrical Systems					3			
AC66-2.14	14	Instruments Systems						4		
AC66-2.15	15	Radio Systems							5	
AC66-2.16	16	Compass Compensation	X	X				X		
AC66-2.17	17	Human Factors	X	X	X	X	X	X	X	X
AC66 -2.18	18	Lighter-Than-Air								X
AC66-2.20	20	Air Law – Written	X	X	X	X	X	X	X	X
AC66-2.21	21	Air Law – Oral	X	X	X	X	X	X	X	X
Number of examinations			10	10	10	10	9	10	9	5

**Notes:** – prior to issue in following categories stated exams required



1	Aeroplane	Prior to the issue of a pressurised aircraft type rating in <b>Groups 5 or 6</b> , a pass in Subject 5 is required.
2	Powerplant – Aeroplane/ Rotorcraft	Prior to the issue of category, either subjects 4 or 6 <b>and</b> either subjects 7 or 8 required, dependent upon the aspirations of the candidate. Candidates only need to take <b>one each</b> of the paired subjects. All four subjects must be taken for all four rating specialities
3	Electrical	Prior to the issue of a type rating in <b>Group 2</b> a pass in subjects 12 & 13 is required
4	Instrument	Prior to the issue of a rating in <b>Group 2 or 3</b> a pass in subjects 12 & 14 is required
5	Radio	Prior to the issue of a rating in <b>Groups 2, 3 or 4</b> a pass in subjects 12 & 15 is required

### ***Grandfather provisions***

The skills and training to maintain Aeroplane rating categories Group 4 are largely the same as those for Groups 1 and Group 2, except for some specialised training required for FRP in Group 4. This similarity is expected to become greater in the future as new aircraft construction material is introduced, phasing out the older materials of Group 4. Therefore, the training for construction materials for Group 4 is also covered in Groups 1 and Group 2, making Group 4 redundant.

Holders of Aircraft Group 4 ratings will be able to continue with the privilege of maintenance and RTS currently enjoyed for the aircraft that would formerly have fallen in this category, regardless of holding a Group 1 or 2 rating. However, no further Group 4 ratings will be granted, and those holding a Group 4 licence will not automatically be granted either Group 1 or Group 2 ratings.

### **Rule 66.53(a)(3) - Oral Air Law Examination**

Rule 66.53(3) requires the successful completion of an oral examination covering *the applicant's understanding and practical application of the duties and responsibilities exercised by the holder of an aircraft maintenance engineer's licence including all aircraft documentation.*

The Oral Air Law examination, subject 21, is acceptable for this. A pass grade in this examination is required before the initial issue of an aircraft maintenance engineer's licence in any category. The examination is only required to be taken and passed once for the first category.

### **Rule 66.53(a)(4) - Practical experience and training**

#### ***Licence issue experience***

Practical aviation experience requirements for licence issue vary depending on the method by which the applicant has gained training:

- An engineer who has completed a traineeship in an aviation technical trade will be required to complete four years of practical aviation experience. These four years include the time spent in formal technical training. The training could comprise a range of formal block courses or a continuous non-integrated training course. RNZAF training may be considered to meet some of this requirement.
- Engineers who have successfully completed a traineeship in an allied engineering trade require three years of aviation-related practical experience. This is in addition

to any practical experience gained when qualifying for the allied trade qualification. An allied trade is a technical trade similar in nature to aviation trades such as: automotive engineering, general engineering, and electronic engineering, and

- An engineer that has not undertaken any formal engineering training but has completed the required examinations through self-study methods will be required to complete five years of practical aviation engineering experience
- Engineers that undertake a course of training conducted by a certificated Part 147 organisation that holds the appropriate Certificate ratings (E1 – E4) will need to show three years of aviation-related experience which includes the time spent on integrated aviation training. The course will need to include supervised training and practical experience.

### ***Category experience***

A period of two years of practical experience is required relating to the specific category being sought. For example, an applicant for a powerplant category is required to show two years of powerplant maintenance experience. The balance of the required experience may consist of experience in any of the other categories.

Practical experience for two or more categories may be gained concurrently if the nature of the job allows for this. For example, typically in a general aviation hangar, a tradesperson would work on both aeroplane and powerplant category type maintenance concurrently.

Rule 66.53(c)(2) provides that if an engineer has exercised the privileges of an AMEL for 10 years or more, the holder is entitled to an additional category of licence if they have completed one year of appropriate experience.

### ***Documenting practical experience***

Practical experience for the issue of an AME Licence and Categories should be documented in a suitable Practical Training Record (PTR). This should be set out or highlighted so the experience can be readily linked to the applicable licence and/or category that is being applied for.

The format of any acceptable PTR should:

- provide an overview of experience /employment in the aviation industry, detailing relevant qualifications, training and courses
- list experience that must be detailed, accurate, comprehensive and verifiable, and
- list specific tasks completed, being countersigned by a supervising LAME, and
- provide details of the dates and the specific aircraft or components worked on.

As a guide, a typical PTR format has been included in Appendix 4.

### **Rule 66.55 Privileges and limitations**

To exercise the privileges of an AMEL the holder must be appropriately rated. A list of ratings is detailed on the CAA website under **Licensing & Certification/ Type ratings for AMEL holders**.

The demarcations between each licence category are published in Appendix 2 of this AC.

### ***Integrated and Complex E, I&R Release to Service (RTS)***

Maintenance and certification of RTS of integrated electrical, instrument or radio systems must be completed by a person or persons who hold the applicable category and group for each of the subsystems within the integrated system. In such instances more than one person holding the appropriate category and group licence may be required for the RTS ~~release to service~~.

An integrated (electrical, instrument or radio) system does not imply the system is complex. However, a system deemed as a complex (electrical, instrument or radio) system will require a specific type course and rating to certify the RTS.

A complex and/or integrated (electrical, instrument or radio) system will require a rating for each category included within the system for RTS. An example of a complex RTS would be an aircraft with an Emergency Autoland System, that was integrated with GPS & VHF Comm. This would require certification at installation using two ratings, a complex instrument rating and a complex radio rating. (The complex rating refers to a type rating.)

**Note:** *The Limited Privileges detailed in Part 66 Appendix C include stand-alone and integrated systems but **do not** include any complex electrical, instrument or radio systems and their respective component/parts.*

Installation of a complex system into an existing aircraft via an approved design change (STC) will create a new configuration that requires type-specific ratings to carry out RTS of maintenance on the systems, including the initial release of the installation. This must be considered as part of the planning for the installation and the approach to approve the installation discussed with CAA to ensure availability of personnel with Type-Ratings or Maintenance Approvals as appropriate.

### **Rule 66.55(a) - Part 145 Demarcation**

Rule 43.54 details the maintenance that must be carried out under the authority of, and according to the provision of, a maintenance organisation certificate issued under Part 145. Aircraft and aircraft components maintained under this Part may only be released to service by a person authorised to do so by the certificated maintenance organisation. Ratings covering aircraft and aircraft components that are required to be maintained by a Part 145 maintenance organisation may be added to an AMEL issued under Part 66. Before annotating such a rating, the appropriate experience and examinations acceptable to the Director must be obtained.

**Note:** *Except for that prescribed in rule 66.211, Savings Provisions, and previous NZ Rules Parts Leaflets, these ratings alone do not provide release-to-service privileges – such privileges are conferred by an authorisation issued by the Part 145 certificated maintenance organisation.*

These ratings:

- have been retained as a method of indicating examination and practical experience qualification in a transportable manner, and
- are restricted to aircraft, or system, type and component groups and are described in Part 66 Appendix B.2, and in the list of ratings detailed on the CAA website under **Licensing & Certification/ Type ratings for AMEL holders**.

## Rule 66.55(b) - Competency

Before exercising the privileges of an AMEL, the engineer must be competent with the *specific aircraft, system or component being maintained*.

This is applicable to all ratings, be it a Group rating or Type rating.

For Group ratings, the engineer should be competent with at least two or three different types, representative of the Group, e.g. Group 1 Aeroplane - Cessna 152 and Fletcher FU-24 series, or Group 2 Rotorcraft - Bell 206 and AS350.

For Type ratings, the engineer should be competent with the specific variants or models with the type rating.

*E.g. - Powerplant Type Ratings, where the type may cover Full Authority Digital Engine Control (FADEC) and Engine Electronics Control Unit (EECU) variants with no manual control reversion. The engineer must have completed specific training on the EECU or FADEC system or models.*

The engineer should have a thorough knowledge of the appropriate maintenance manual, and other Instructions for Continued Airworthiness (ICA), and understand the acceptable standards and practices required by Part 43. The engineer should have practical experience of the task to be performed, or of a task of similar nature.

Demonstration of competency is shown in a similar manner as currency, which is covered in rule 66.57 below.

## Rule 66.55(c) - Special Test Equipment

Special Test Equipment may be identified when one or more of the following is evident:

- it is identified in the maintenance task or inspection instructions as Special Test Equipment required for the activity rather than General Test Equipment.
- it requires manufacturers or other specialist training to operate and produce results required by a maintenance task or inspection. This includes:
  - Test equipment where incorrect fitment or operation may result in:
    - damage to the system under test, or
    - false readings that could incorrectly be deemed to be acceptable for the task or inspection, or
  - Test Equipment where the incorrect fitment or operation is not obvious by the design of the equipment without prior training.
- it requires interpretation of results or reading to determine the acceptability of the indication or parameter, i.e. test equipment where the outcome of the test is not:
  - a unique go/no go indication, or
  - a parameter which is a single value, or
  - a parameter value within an interval tolerance.

### Examples of Special Test Equipment

- Pitot static test equipment
- Transponder ATC test equipment
- Nav com ramp test equipment

- Data loader

### Examples of General Test Equipment

- Multi meter

- Vacuum gauge
- Dead weight tester

Persons using test equipment to carry out the limited privileges specified in Part 66 Appendix C should ensure that they are adequately trained, are competent with the equipment and, in the case of special test equipment, have evidence of the required training.

Any training would need to be specific with respect to the test equipment type, type of use, and aircraft or aircraft types where it is intended to be used. Training would include knowledge of the (aircraft) systems and interpretation of results. Following initial training the AME is to ensure competence/currency is maintained.

This evidence may be a certificate, or letter, from:

- an appropriately rated AMEL holder
- a person authorised to conduct training on the equipment under Part 145 or 147, or
- the test equipment manufacturer or their technical representative.

**Note:** *The limited privileges only apply while using the specific equipment detailed on the certificate/ letter.*

#### **Rule 66.57 Recent experience requirements**

Recent experience requirements may be shown by a licence holder if, for a period of six months within the previous two-year period, the holder has:

- exercised the privileges of their licence
- supervised the maintenance of aircraft
- performed a technical training function, or
- a combination of the above.

A licence holder who does not have recent experience must sit and pass an oral examination covering their understanding and practical application of the duties and responsibilities exercised by the holder of an AMEL. This may be the Air Law - oral examination subject 21, or another means acceptable to the Director.

#### **Currency**

Currency shall be understood as consisting of two elements, duration and nature of the experience. The minimum to meet the requirements for these elements may vary depending on the size and complexity of the aircraft/engine/component and type of operation and maintenance. The experience acquired/recorded on a specific aircraft/component/engine/APU type may also be used to demonstrate having or maintaining the experience on a similar aircraft /component/engine/APU type.

**Note:** *Experience gained on a similar A/C, Engine, component technology in a non-NZ environment may also be used.*

Currency and proficiency relevant to the ratings held by the licence holder may be shown by maintaining an experience log. For the purpose of upskilling in areas incurring technological advancement, or if over the previous two-year term the licenced holder has not exercised the privileges of their ratings, they may consider completing recurrent or acceptable training conducted by an aircraft or component manufacturer, a Part 145 or 147 Certificated Training Organisation, a foreign authority, or by the Director prior to exercising the rating privileges.

Currency may be shown by using a log like the PTR system and should provide:

- an overview of experience /employment in the aviation industry, detailing relevant seminars attended, further qualifications obtained, training events and courses
- evidence of experience that is accurate and verifiable, and
- details of dates, job number, the specific aircraft, category and ratings used.

## Subpart C - Aircraft Maintenance Engineer Ratings

### Rule 66.103 Eligibility requirements

To be eligible for the grant of an AMEL rating, the applicant must hold a current AMEL and meet the practical experience and examination, or course requirements detailed below.

### Rule 66.103(2) - Practical experience

The rule specifies a minimum time of six months practical experience on the type or group of aircraft sought. Alternate, specific practical training by the aircraft or component manufacturer, a Part 145 or 147 Certificated Training Organisation or other experience acceptable to the Director is acceptable. This should be completed within the immediate two years before application to demonstrate competency and currency.

#### ***Documenting experience - Practical Training Record (PTR)***

To demonstrate that six months practical experience has been completed for the issue of a rating, the experience should be documented in a suitable PTR. This should be set out or highlighted so the experience is readily identifiable as relevant to the applicable rating that is being applied for.

Due to the maintenance requirements of modern aircraft, either consolidated, accelerated, simulated or specific type rating courses, that include an approved practical experience schedule for type, may be an acceptable means of compliance for the six months practical experience required to grant a rating.

For documenting practical experience refer to rule 66.53(a)(4) - Practical experience and training, above. As a guide, a typical PTR page has been included in **Appendix 4**.

Only experience specific to the rating(s) sought should be included or highlighted in some way in the PTR. The range and depth of the relevant experience should be readily evident from an assessment of the PTR.

#### ***Rating experience requirements***

Practical experience should comprise a broad cross section of maintenance tasks at both **Line** and **Base** (Hangar) Maintenance Levels and should be across all relevant systems (appropriate ATA Chapters) for the category or categories being applied for.

Typically, this should include:

- Completing all aspects of several line and base level routine inspections
- For transport category type rated aircraft, a minimum of three; and different C level type checks, and
- A cross section of the following representative tasks on various aircraft systems:
  - trouble shooting
  - repair
  - adjustments and rigging
  - component and module changes
  - functional/operational checks, and
  - use of special tooling and test equipment.

Appendix 3 lists typical tasks by aircraft systems, so it is recommended that this be referred to, in planning and documenting practical experience requirements.

### ***Group Ratings***

As a guide, acceptable practical experience for group ratings should include the following:

#### ***Aeroplane and rotorcraft categories***

- Minimum of three periodic inspections including avionic systems
- Minimum of two aircraft weighings or weight and balance calculations for the first aeroplane and the first rotorcraft rating
- Rectification of defects and component changes including avionic components
- Compass compensation for the first rating
- Functional testing and servicing of aircraft systems
- Main and tail rotor balancing
- Dynamic component balancing if applicable
- Rigging of controls, and
- System troubleshooting.

#### ***Powerplant category***

- Minimum of three periodic inspections
- Rectification of defects and component changes
- Functional testing and servicing of powerplant systems including propulsion engine ground running
- Rigging of controls
- Establishing piston engine reference RPM after either an engine or propeller change
- Hot section inspections if applicable
- Piston engine cylinder replacement
- Engine performance or power assurance testing
- Engine condition monitoring if applicable
- Minimum of two aircraft weight and balance calculations for the first powerplant rating, and
- System troubleshooting.

#### ***Electrical category***

- Periodic inspection and testing
- Defect analysis and rectification including component changes
- Modification installation
- System troubleshooting, and
- Minimum of two aircraft weight and balance calculations for the first electrical rating.



**Instrument category**

- Instrument periodic inspection and testing
- Defect analysis and rectification including component changes
- Modification installation
- Compass compensation for the issue of the first rating
- Pitot static testing and rectifications
- Minimum of two aircraft weight and balance calculations for the first instrument rating, and
- System troubleshooting.

**Radio category**

- Radio periodic inspection and testing
- Defect analysis and rectification including component changes
- Modification installation
- Minimum of two aircraft weight and balance calculations for the first radio rating, and
- System troubleshooting.

**Lighter-than-air category**

- Periodic inspections
- Fabric repairs and other rectification, and
- System troubleshooting.

**Note:** *If insufficient experience is shown for a group rating and this is due to the inability of the applicant to be exposed to more than one type within a group, the applicant may apply to have that type issued as a restricted type rating within a group. It is not intended for this to be usual practice, but the provision is included for cases of genuine need. If a genuine need cannot be substantiated, then the application will be declined.*

**Type Ratings**

For the issue and assessment of type ratings, practical experience and any specific on the job training (OJT) should be documented in an appropriate aircraft and/or powerplant specific type rating PTR that details/sets out the experience under the relevant systems (ATA Chapters).

‘Consolidated’ training which is completed either as a training course or as OJT is accepted only after the CAA Standards and Licensing team have assessed the program as acceptable regardless of being or not being approved by a foreign national aviation authority (NAA). This allows the individual LAME’s professional experience and the sophistication of aircraft type to be taken into consideration.

For Group 5 and 6 Aeroplanes and Group 3 Rotorcraft, the PTR will normally be developed by the Part 145 Certificated Maintenance Organisation as part of their company authorisation procedures. It should clearly detail or set out an acceptable cross section of

specific tasks across the relevant systems that must be completed prior to the issue of a company authorisation. Compass compensation and weight and balance may not be applicable for the issue of a rating for aeroplanes in Aeroplane Group 6 for experience requirements.

Type rating PTRs may also be developed by a Part 147 aviation training organisation for their type rating courses.

### **Rule 66.103(3) - Examinations and courses**

#### ***Type Ratings Courses***

Type ratings for individual aircraft or component types require the completion of an approved or acceptable course. A course must be:

- conducted by the manufacturer of the applicable aircraft or component, or
- conducted by a Part 147 maintenance training organisation or a Part 145 maintenance organisation certificated (rule 145.11(a)(10)) with the appropriate E1 rating, or
- approved by the competent NAA of a foreign ICAO Contracting State, where CAA understands that state's licensing system and that state's system meets the requirements of Annex 1 to the ICAO Convention, or
- conducted by a training organisation acceptable to the Director, or
- conducted by the Director.

Additionally, courses must:

- be developed/packaged to the current industry recognised standard such as - ATA Specification 104 - Guidelines for Aircraft Maintenance Training - Level III (Line and Base Level Maintenance), or an equivalent standard
- cover all the relevant systems (ATA chapters) for the privilege of the category of licence, and
- cover the series of aircraft or powerplants for which the rating provides privileges.

#### ***ATA Specification 104 Level III states, Theoretical***

At the completion of Level III Line, Base and MRO Maintenance theoretical training, the student will be able to:

1. Identify and discuss the safety precautions linked to Line/Base/MRO Maintenance activities to be observed when working on the aircraft and its systems
2. Identify the principal systems and subsystems
3. Discuss the purpose of those principal systems and sub-systems
4. Locate those systems and sub-systems
5. Locate controls & indications associated with those systems and subsystems
6. Explain in detail the normal function/operation of those systems and sub-systems including terminology and nomenclature

7. Explain system and subsystem failure indications
8. Discuss system servicing requirements
9. Discuss proper ground handling procedures including controls, accesses, and communication interfaces
10. Discuss Line/Base/MRO tooling/support equipment
11. Discuss MEL/CDL/NEF requirements.

### ***Powerplant Addition***

In addition to the Spec 104 level III, as it is a powerplant rating and to comply with the requirements to cover all the skills for a rating, the student will need to be able to:

- Identify and discuss the safety precautions linked to engine start, engine run-up
- Discuss applicable regulatory requirements associated with engine start, engine run-up
- Identify the principal systems and subsystems associated with engine start, engine run-up
- Locate controls and indications associated with those systems and subsystems
- Describe the normal/abnormal engine and systems operation associated with engine start, engine run-up
- Describe emergency procedures associated with engine start, engine run-up
- Discuss applicable engine test procedures.

### ***Foreign B1 Training Courses (Limited powerplant platform ratings)***

Many aeroplane courses provided by foreign NAA-approved Part 147 organisations (that is, organisations approved by CASA, EASA, Transport Canada and similar) and OEMs include both the airframe and limited powerplant content within the aircraft type course. Though the airframe content is usually sufficient to be granted a rating, the powerplant information often falls short of the requirements for the full powerplant rating. This is because the course has been designed to satisfy the requirements for the issue of a foreign B1 rating and is often classified as an airframe/engine rating. As a result, the course content only relates to the engine when the engine is fitted to the airframe that is specified in the course.

The dilemma for New Zealand LAMEs, however, is that in the New Zealand licencing system powerplant courses have to cover all variants and platforms in order for LAMEs to gain the full rating. No provision has been allowed to grant a rating under a B1 structure.

When a B1 course is completed with sufficient powerplant content and a specific powerplant course is not available, provision is made to allow for a reduced or limited powerplant rating for those LAMEs who qualify for both the airframe and powerplant rating. What this means in practice, is that those LAMEs will hold ratings in both the aeroplane/rotorcraft and the powerplant categories. The limited powerplant rating cannot be gained without the airframe rating and cannot be gained subsequently to the airframe rating, without re-sitting the full B1 course.

In addition, when a rated on aeroplane/ rotorcraft type LAME sits and passes a 'Differences' course that includes an alternate powerplant, and they provide an adequate PTR, they may apply for the alternate limited powerplant platform rating to be added to their licence.

**Note:** Before sitting for a course or applying for the limited powerplant platform rating, check with the CAA Licensing and Standards unit that the course content would be accepted. Content would include the above recommendations for type rated courses and CAA would need to be provided the syllabus, ATA coverage, areas of differences and integration, and instruction time for each subject.

To be granted a sole powerplant rating, the LAME will need to complete the full powerplant rating course, but this allows them to carry out an RTS of the type across all platforms. By contrast, the limited powerplant rating allows for normal maintenance to the engine only while it is fitted to the nominated airframe platform.

Upon application and assessment, the rating can be annotated to a LAME's licence. For example, if a Bombardier CL600 aircraft is fitted with the General Electric CF34 powerplant, then, assuming the course for the Bombardier includes sufficient content of the powerplant for a limited powerplant rating, the LAME may apply for the airframe rating and the limited powerplant rating. The ratings would be annotated on the licence as 'CL-600' (the airframe rating) and 'CL-600(CF34)' (the powerplant rating).

### **General**

Type rating courses should be completed within two years to ensure competency and currency on type. If more than two years has expired since course completion, the currency of type course may be satisfactory if the holder can show continuous or significant recent practical experience on the type since completion of the course.

In cases where approved courses are not available and the provisioning of an oral or written examination is within the capabilities of CAA or ASPEQ, a written or on-aircraft examination may be conducted by ASPEQ.

For primarily constructed fibre reinforced plastic (FRP) Group 5 and 6 aeroplanes and Group 3 rotorcraft, separate training or experience may not be required if FRP maintenance is part of a specific type rating course; or if the applicant has completed a specific course relating to FRP maintenance acceptable to the Director. Contact CAA's Licensing and Standards team for details of acceptable courses.

Aircraft containing complex electrical, instrument or radio systems require the document holder to have completed a type rating course and have a type-specific rating annotated on their licence.

**Note:** *New Zealand Defence Force specific type training that meets the manufacturer's requirements may be acceptable to the Director, subject to assessment and acceptance by CAA and the aircraft type currently being included on the New Zealand register.*

### **Aircraft and Component Required Courses**

Rule Part 66 Appendix B details which aircraft and components require type rating courses. These include:

- Pressurised aeroplanes

- Group 3 rotorcraft
- Turbine power plants
- E, I&R systems and equipment installed in pressurised aeroplanes with MCTOW more than 5700kg
- Components overhaul and maintenance specified in Rule 43.54(b) and (c), and
- Complex E, I&R systems and equipment:
  - Installation of a complex (electrical, instrument or radio) system into an existing aircraft via an approved design change (STC) will create a new configuration that requires type-specific ratings to carry out RTS of maintenance on the systems, including the initial release of the installation.

### ***Complex E, I&R Systems Requiring Type-specific Ratings v Integrated E, I&R Systems***

Amendment 7 of Part 66 Appendix B.1(d), (e) and (f) for E, I&R systems on aircraft <5700kg introduces the term "... - complex systems require type-specific ratings".

This phrase is not defined elsewhere, so this section is intended to provide guidance to determine if a particular system may require a type-specific rating that is not already covered by the group ratings defined in these paragraphs.

Type-specific ratings are appropriate when the E, I&R system in question contains airframe specific and or engine specific configurations that may be atypical. Such a system requires suitable configuration specific training and experience. Where an E, I&R system has *direct* control of primary motive power or flight controls and has high levels of automation, it is likely that a type-specific rating is appropriate.

A number of aircraft 'avionics' system suppliers produce integrated modular avionics (IMA) systems (DO-297/ED-124 standards), IE: EFIS/ECAM systems. These systems or platforms can be installed by the airframe manufacturer or retrofitted via STC and may appear sophisticated in nature.

The majority of the systems normally incorporate a standard core architecture with configuration options available that are generic in nature with little or no airframe specific or engine specific configurations other than for system monitoring. Where they interface into aircraft or engine systems for primary motive power or flight control, they do so using generic servos or similar methods that are designed to assist control but can be overridden and disconnected by the pilot to minimise risks from system failures.

These systems, although sophisticated in nature, are generally supported by the manufacturers with appropriate installation and maintenance instructions that cover a wide range of (OEM or STC) installations. Hence type-specific ratings for these systems are not likely to be required. For the purposes of this AC and the rule, such systems are not considered as Complex E, I&R systems.

Integrated modular avionic systems that introduce a configuration that contains high levels of autonomy and remove direct control of primary flight or engine controls without manual backup or reversion (i.e. fly-by-wire and/or FADEC) would be considered candidates for type-specific ratings. For example, auto-flight systems that can re-configure the aircraft and carry out autonomous landing, such as the Garmin Autoland system, would (if fitted to an

aircraft <5700kg) be considered appropriate to have type-specific ratings for their various electric, instrument or radio subsystems.

A system such as a fly-by-wire or an Autoland system will have type-specific configurations that need to be fully understood by those maintaining them to retain the level of safety designed into the configuration by the 'systems integrator' (i.e. the type certificate or STC holder). As an example, the airframe integration of an Autoland system would be different for a Cessna C172 (fixed gear) versus a Cessna C210 (retractable). Hence a separate type rating for each is required and appropriate training on the different configurations of the E, I&R system interface is needed, even though the same branded Autoland system may be installed. The training could be in the form of differences training covering the different interface for those engineers where a similar type specific rating is held.

When a new aircraft type or STC appears to introduce a complex E, I&R system, coordination with the CAA Licencing and Standards Team is recommended in determining if a type specific rating is required.

### **1. Electrical – complex systems requiring a type-specific course and rating.**

Defined as: Aircraft electrical systems that contain high levels of automation where, due to system architecture or software, failures can propagate within the system or connected systems or be difficult to isolate. The complex systems are configured to a specific airframe type. The systems may be integrated into other aircraft systems and may directly control or provide aircraft primary motive power or flight controls.

Examples include but are not limited to:

- Electrically powered propulsion systems, including associated energy storage, distribution, control and monitoring systems. Does not include the propeller or rotor.
- Hybrid Electrical propulsion systems, including associated energy generation, distribution, control and monitoring systems. Does not include the propeller or rotor.
- Aircraft electrical systems which use fuel cells or fuel cells combined with lithium-ion batteries as the primary source of electrical power.

### **2. Instrument – complex systems requiring a type-specific course and rating**

Defined as: Aircraft instrument systems that contain high levels of automation where due to system architecture or software, failures can propagate within the system or connected systems or be difficult to isolate. The complex systems are configured to a specific airframe type. The systems may be integrated into other aircraft systems and may directly control or provide aircraft primary motive power or flight controls.

Examples include but are not limited to:

- Autonomous flight control systems, including subsystems needed for autonomous operation, motion planning and virtual environment systems. Applicable to manned (passenger) autonomous aircraft or large unmanned aircraft where the Part 102 operator requires the aircraft to be maintained by a Part 66 license holder.
- Autonomous taxi systems including sensor or data fusion and machine learning.
- Autoland flight control systems, including Garmin Emergency Autoland System.

- Remotely Piloted Aircraft Systems (RPAS) flight control systems in manned RPAS or large unmanned RPAS where the Part 102 operator requires the aircraft to be maintained by a Part 66 license holder.
- Electronic primary flight control systems (fly by wire), with no manual control reversion.
- Engine Electronic Control Unit (EECU) and Full Authority Digital Engine Control systems (FADEC), with no manual control reversion.
- Multirotor eVTOL flight control systems.
- Sensor or data fusion systems integrated into autonomous, RPAS or Autoland systems.

### **3. Radio – complex systems requiring a type-specific course and rating**

Defined as: Aircraft radio systems that contain high levels of automation where due to system architecture or software, failures can propagate within the system or connected systems or be difficult to isolate. The complex systems are configured to a specific airframe type. The systems may be integrated into other aircraft systems and may directly control or provide aircraft primary motive power or flight controls.

Examples include but are not limited to:

- Remote Pilot Command and Control data link (C2 datalink) systems in manned RPAS or large unmanned RPAS where the Part 102 Operator requires the RPAS to be maintained by a Part 66 licence holder
- Radio systems integrated into complex instrument systems, i.e. position source data systems integrated into autonomous, RPAS or Autoland systems.

#### ***Group Ratings***

Group ratings require the completion of acceptable rating examinations. Acceptable examinations for group ratings are detailed in Appendix 1.

Should an acceptable course be available covering a specific rating group, or individual aircraft in Aeroplane Category Group 5, the applicant may qualify for the rating by successfully completing the approved course and meeting the practical experience requirements.

**Note:** *Applicants should check with CAA before attending a course to ensure it is acceptable.*

For an aeroplane rating in Group 5 (restricted) rating, apply to ASPEQ for the appropriate rating examination. If no examination is available, then an aircraft oral examination will be conducted for the type rating. To be granted a group 5 (restricted) aeroplane rating, a pass in AC66-2.5 subject 5 *Aeroplanes II* is required.

## Subpart D - Certificate of Maintenance Approval (MA)

### Rule 66.153 Eligibility requirements

The certificate is issued to suitably qualified persons to permit the performance of maintenance and the RTS of aircraft or aircraft components within the limitations annotated on the certificate. Any associated tasks to perform the required maintenance need to be listed as these also may require a maintenance approval. Certificates of MA are not issued as a replacement document for an AMEL. Therefore, justification for the need of the MA is required.

Restrictions may be placed on the certificate that include the limiting of privileges to specific aircraft, employer, inspection levels or components or require the direct supervision by a fully qualified person. For the issue of a certificate of MA the rule requires the applicant to:

- provide evidence of appropriate practical experience, and
- hold a pass in acceptable examinations or an approved course, as appropriate.

Examination requirements may include the full suite of examinations required for the issue of an AMEL or they may be any lesser number that the Director may determine. This will depend on the extent of the privileges to be granted, the technical background of the applicant, and the extent of the applicant's aviation related practical experience.

### Amateur-built aeroplanes

In the case of amateur-built aeroplanes issued with a special category, amateur airworthiness certificate, the primary constructor will be required to undertake a minimum number of examinations.

This is based on the assessment that the education process involved in the construction of the aircraft is considered an acceptable level of knowledge on aircraft of that construction type. The examination (subject 180) will cover maintenance requirements, and Air Law. If weight and balance, and compass compensation, privileges are required, further examination on these subjects will be required.

The minimum requirements for an applicant who is not the primary constructor of an amateur-built aircraft are either:

- to complete examination subjects 02, 03, 04 07, 20 and 21. (In addition, subject 16 is required for compass compensation privileges), or
- to complete an acceptable course and examination (apply to ASPEQ for subject 180).

### Specific Maintenance Tasks

The minimum examination standard required for non-AMEL is either:

- a successful pass of a composite examination covering the technical aspects of the certificate of MA coverage and Air Law, or



- an approved course covering the technical aspects and a pass in a test of relevant Air Law acceptable to the Director for the maintenance task or tasks to be undertaken.

**Note 1:** *On application, proof of training and of competence is required. The template syllabus IE “Part 66 maintenance approval oral/Practical examination syllabus [DOCX 40KB]” found on the CAA website at <https://www.aviation.govt.nz/licensing-and-certification/engineering/maintenance-engineer-licensing/part-66-ame-licence-syllabuses/> may be adapted to help create an appropriate syllabus for the training. The approved instructor would certify for the training and competence of the trainee.*

MA renewal applications require:

- retraining of the tasks requested, and
- proof of practical experience and RTS documentation.

**Note 2:** *An MA renewal is not guaranteed.*

## **Practical Experience for LAME**

To gain the full practical experience required for a rating, rule 66.155(b)(1) provides for a LAME to be eligible for issue of a certificate of MA. The prerequisite is that the examination or type-course requirements for the rating have been met and a minimum acceptable level of practical experience has been gained already, or

A successful pass in a composite examination covering the technical aspects of the certificate of MA coverage, acceptable to the Director.

The practical experience required before the issue of a certificate of MA will vary, depending on the limitations to be applied to the certificate, previous experience, and existing licence coverage. The following should be considered when demonstrating appropriate practical experience of aircraft or aircraft component maintenance to gain certificate issue:

### **General**

Experience levels should include periodic inspections, defect analysis and rectification, component replacement, servicing, and functional testing.

### **Supervision**

Performance of maintenance on the specific aircraft or component covered by the certificate of MA must be under the supervision of a fully qualified person, that is:

- a rated aircraft maintenance engineer
- an approved training organisation
- a manufacturer’s technical representative, or
- a foreign operator approved by the competent authority of that State,

which may be acceptable as grounds for a reduced level of required practical experience for certificate issue.

This supervision should be carried out on site during maintenance tasks: remote supervision is not acceptable.

***Similar existing rating coverage***

Evidence of limited experience on type, plus evidence of experience or a rating on similar aircraft or aircraft components may be acceptable grounds for a reduction in the required practical experience for certificate issue. An example is a turbine engine of an earlier model that has the same basic technology but different components.

***New aircraft, aircraft component or Complex E, I&R introduction***

Due to the introduction of a new type of aircraft, aircraft component, or Complex E, I&R, new ratings must be issued or gained. The necessary experience period is accommodated by the Director issuing certificates of MA in the interim.

When a certificate of MA is required, the individual, or organisation introducing the aircraft or aircraft component should submit a schedule of intended course training and practical training or OJT to CAA. This will be assessed for acceptance before commencement of the training.

## Subpart E - Certificate of Inspection Authorisation (IA)

### Rule 66.203 Eligibility requirements

To be eligible for a certificate of IA the applicant must meet the requirements of rule 66.203. It is important to note that the applicant must hold a group or type rating on a current aircraft maintenance engineer licence:

- For the Mechanical IA - Aeroplane/Rotorcraft and Powerplant, or
- For the Avionic IA – Electrical Group 1, Instrument Group 1&2, and Radio Group 1,2,3.

Applicants must:

- have held the licence for at least five years
- have recent and current experience, and
- complete an IA Initial course.

**Note 1:** *Aeroplane, Rotorcraft or Powerplant rated LAMEs would not perform conformity of complex avionics modifications and repairs.*

**Note 2:** *E I&R-rated LAMEs would only be permitted to perform the conformity of avionics modifications and repairs.*

**Note 3:** *A completed Fit and Proper Person Questionnaire is required when applying for the issue of an Inspection Authorisation Certificate. Applicants who use **MyAviation** to apply online will be prompted to declare whether they have previously completed an FPP questionnaire, and whether their circumstances have changed since. If a participant declares they have not previously completed a questionnaire, or their circumstances have changed, they will be directed to the 24 FPP Questionnaire. Applicants who are unable to apply online need to complete the CAA form 24FPP.*

The *course of instruction* in rule 66.203(b)(4) is an IA Initial Issue Course that is specific to the certificate of inspection authorisation and is conducted by the Director, or a Part 147 training organisation. The examination is developed from the AC66-2.32 Aircraft Maintenance Engineer Licence – Certificate of Inspection Authorisation (Subject 025).

### Rule 66.205 Privileges and limitations

The IA certificate entitles:

- Mechanical IA holders to perform and certify the review of airworthiness in accordance with Part 43 Subpart D and conformity of major repairs and modifications except complex avionics, and
- Avionic IA holders to only certify conformity against technical data after completion of avionics modifications and repairs in accordance with Part 43 Subpart E. The conformity would not include any surrounding non-avionics structure

**Note:** *Unless the IA holder is rated and qualified for both the Mechanical and Avionics IA certificate and because the Avionics IA is unable to certify for surrounding structure, some modifications and repairs may require, in addition to the Avionics IA, a Mechanical IA certification. Such certification may be carried out with a supplemental form CAA337.*

### ***Familiarity***

The rule does not specifically require that the holder of a certificate of IA be rated on each aircraft on which the holder performs a review of airworthiness or conformity.

However, like the competence requirements of rule 66.55(b) to exercise the privileges of the AMEL, and rule 43.53(1) for the performance of all maintenance, the holder of a certificate of IA *must be at least familiar with the specific aircraft type to perform a review of airworthiness*. Without being familiar, the holder of an IA cannot be reasonably assured that all the requirements for the performance of the review of airworthiness or the conformity have been met.

Holders of IAs who are not familiar on type cannot perform a review of airworthiness to an acceptable standard to meet the requirements of Rule Part 43 Subpart D.

Familiarity with a modification or repair will be required to exercise the privileges of the Certificate for large, complicated avionics, or Complex E, I&R modifications and repairs. Conformity of avionics major modifications requires knowledge and understanding of the installation process regarding the approved or accepted technical data. Such process includes but is not limited to:

- wiring terminations
- calibrated tooling and techniques
- wire marking
- wire routing
- functional and EMC testing and results
- software version
- lengths and loss requirements of antenna feeders
- antenna location and separation requirements
- compatibility with interfaced equipment, and
- pre-existing modifications.

Non-Avionics rated IA holders would not certify for conformity of Complex E, I&R modifications or repairs.

### **Rule 66.207 Recent experience requirements**

This rule prescribes the recent experience requirements concerning the certificate. It is emphasised that performing the routine or 100-hour inspection does not count towards maintaining recent experience for a certificate of inspection authorisation. However, the 100-hour inspection would conform to the requirement of rule 66.207(2) where the holder of an IA certificate has exercised their AMEL privileges for a period of six months over the last two years.

A couple of options are available to maintain the recency requirements for a certificate of inspection authorisation if the IA certificate holder has been unable to gain the allotted RAs or conformity inspections over the preceding 12 months. Such options include a 'Refresher Course' of at least eight hours or an examination which would be like a subject

025 (mentioned above in the section on rule 66.203) required for the initial issue of the certificate.

**Note 1:** *To apply for a new certificate issue rule 66.203 must be satisfied.*

**Note 2:** *CAA does not send reminders to holders of expiring Certificates of IA.*

## Part 66 Appendices

### Appendix A - Reserved

### Appendix B – Group and Type Ratings

1. Aeroplane Group 4 as a stand-alone category rating has been merged into Aeroplane Groups 1 and 2. Refer Note 1 and 2 in Appendix 1 of this AC.
2. Rotorcraft Group 3 includes all twin turbine engine aircraft by individual type and requires an aircraft type-specific course.
3. Powerplant Group 3 includes all turbine engines by individual type and requires an engine type-specific course.
4. A Powerplant LAME with a Group or Rating may apply for a Maintenance Approval (MA) to carry out normal maintenance or installation and removal of an electric motor powered powerplant. An Electrical Group 2 rated LAME may also apply for an MA to remove and fit the motor only after the qualified Powerplant LAME or holder of an applicable MA has removed the propeller, coolant systems and any other associated connected parts or components. A group 2 electrical rating is required for trouble shooting the motor, and monitoring and control system. This method of using an MA will alleviate short gaps from evolving technologies.
5. A 'retrofitted' STC, modification, repair, being a complex (electrical, instrument or radio) system into an aircraft that previously was considered as not having complex electrical, instrument or radio systems may require a rating course for the newly installed equipment conjoined to the aircraft type.

This may be carried out by a component OEM training course or other approved familiarisation, of the applicable system being integrated within the specific aircraft type. Annotation of the aircraft type rating is required on the AME licence.

Approved training and familiarisation courses may be conducted by:

- the manufacturer of the applicable aircraft or component system
- a Part 147 aviation training organisation, a Part 145 maintenance organisation certificated (rule 145.11(a)(10)) with the appropriate E1-E4 rating
- an organisation or person approved by the competent national aviation authority (NAA) of a foreign ICAO Contracting State
- a training organisation acceptable to the Director, or
- the Director.

## Appendix C – Limited Privileges

An AME holding a category licence can exercise limited privileges in other categories except where special test equipment is required. This is because maintenance tasks requiring special test equipment normally require in-depth background knowledge to the level expected of an appropriate licence and rating holder. For example, the Aeroplane, Rotorcraft, Powerplant, Electrical and Instrument rated LAMEs are limited with regard to ANY radio system existing and of future design, to the maintenance and functional testing of certain systems or parts, and replacement of LRUs, but do not have the privilege of modification and installation of the radio equipment. Holders of E, I&R Category ratings are limited to perform weight and balance re-calculations but not the actual weight and balance task which uses weighing equipment.

For the relevant limited privileges listed in Appendix C of the rule, the LAME however must be competent and needs to have access to any special test equipment where required to carry out the limited privilege. Appropriate training and currency of the test equipment would be required.

**Note 1:** *The Limited Privileges detailed in Part 66 Appendix C include stand-alone and integrated systems but not any complex electrical, instrument or radio systems and their respective component/parts. The privilege for the 'RTS' for complex electrical, instrument or radio systems requires a type rating.*

*Competency for gaining limited privileges may be shown by using a log similar to the PTR system and should detail relevant training to hold this privilege, including but not limited to dates of training or experience, job number, notes on the specific aircraft category and other details, as relevant.*

**Note 2:** *In addition to the appendices B and C, above, some additional appendices with general guidance have been included in this AC.*

## APPENDIX 1 - Categories and Ratings described

Category	Rating Group - Ref Rule Part 66 for full Group description	Examinations / Course req.
<b>Aeroplane</b>	Group 1 Metal & FRP skin, unpress, < 5700kg, fixed u/c	60 Written
	Group 2 Metal & FRP skin, unpress, < 5700kg, not Grp 1	62 Written
	Group 3 Wood or Tube structure, fabric cover	64 Written
	Group 5 Specific Type - Press, < 5700kg	5 + rating exam / course
	Group 6 Specific Type - Press, > 5700kg	5 + type rating course
<b>Rotorcraft</b>	Group 1 Piston engine rotorcraft other than Grp 3	80 written
	Group 2 Turbine engine rotorcraft other than Grp 3	82 written
	Group 3 Specific Type - considered other than Grp 1 or 2	type rating course
<b>Powerplant</b>	Group 1 Normally aspirated piston engine	7 + 70 written
	Group 2 Turbo, supercharged & radial piston engine	7 + 72 written
	Group 3 Specific Type - Turbines	8 + type rating course
<b>Electrical</b>	Group 1 Electrical systems	90 written
	Group 2 Specific Type and elec. a/c with Complex elec systems	12,13 + type rating course
<b>Instrument</b>	Group 1 General a/c Inst. systems	93 written
	Group 2 Auto flight & Nav systems	12,14 + 95 written
	Group 3 Specific Type and a/c with complex inst systems	12,14 + type rating course
<b>Radio</b>	Group 1 Airborne Comms. systems	101 written
	Group 2 Airborne Nav. systems	12,15 + 103 written
	Group 3 Airborne Radar systems	12,15 + 105 written
	Group 4 Specific Type and a/c complex radio systems	12,15 + type rating course
<b>LTA Aircraft (balloons)</b>	Group 1 Hot air free balloons and airships	18 + OEM/Industry course or 200 oral
	Group 2 Gas filled airships and components	18 + OEM/Industry course or 201 oral
<b>Legend – endorsed on licence</b>		
X - Group Ratings		
R - Individual Type Ratings		



**Note 1:** *To certify maintenance on an aeroplane or rotorcraft principally constructed of fibreglass reinforced plastic (FRP) the holder must hold the specific type rating or applicable group rating, and be able to demonstrate an appropriate level of competency. As a guide to obtain competency - experience may be gained on other FRP aircraft or workshop, a certificate of competency from a similar skilled industry conducted course such as boat building or at least six hours of equivalent on-line training.*

**Note 2:** *For primarily constructed FRP Group 5 and 6 aeroplanes and Group 3 rotorcraft, separate training or experience may not be required if FRP maintenance is part of the specific type rating course; or if the applicant has completed a specific course relating to FRP maintenance acceptable to the Director. Contact CAA's Licencing and Standards Team with details of desired course to ensure this is acceptable.*

**Note 3:** *On application the holder of an Aeroplane, Rotorcraft or Powerplant Group 2 rating will be granted the applicable Group 1 rating.*

**Note 4:** *For an aeroplane rating in Group 5 (restricted) apply to ASPEQ for the appropriate rating examination. If no examination is available, then an on-aircraft oral examination will be conducted for the type rating. To be granted a Group 5 (restricted) aeroplane, a pass in AC66-2.5 subject 5, Aeroplanes II, is required.*

**Note 5:** *To release to service an LTA balloon or airship subject 18 and an oral examination is required. For a restricted rating, an approved OEM/ industry course may be attained in lieu of the oral. Contact CAA's Licencing and Standards Team with details of desired course to ensure if acceptable.*

## APPENDIX 2 - Category Demarcations

To determine which areas / systems of an aircraft are the responsibility of the various licence categories and groups, the following demarcations apply. It is the responsibility of all certifying engineers to ensure that, where there is an overlap of responsibility with other licence categories, a holder of the appropriate licence is notified of the subsequent work required before the aircraft or aircraft component is returned to service.

Subject to their groups and ratings, an AME licence permits the holder to perform an RTS for maintenance on:

- An aeroplane and rotorcraft AME licence - aircraft structure and mechanical systems, electrical subsystems (i.e. electrical parts, appliances and motors) and instrument subsystems (i.e. transmitters, sensors etc) within the mechanical systems
- A powerplant AME licence – powerplant systems and accessories, and associated electrical subsystems (i.e. electrical parts, appliances and motors) and instrument subsystems (i.e. transmitters, sensors etc) within the powerplant systems
- An electrical AME licence – electrical systems, subsystems and electrical tasks within the powerplant and mechanical systems. The electrical systems include cables, coaxial cables and connectors. Privileges include:
  - continuity, insulation and bonding techniques and testing
  - connector pin removal and insertion
  - all wire terminations including soldering, crimping and testing of crimped joints, and
  - wiring protection techniques.
- An instrument AME licence – instrument systems, subsystems and instrument tasks within the powerplant, mechanical and radio systems.
- A radio AME licence - radio systems, subsystems and radio tasks within the instrument systems.

The category Aeroplane and Rotorcraft may certify for a 'daily' or manufacturer's equivalent inspection and the check for condition and security of attachment, of wiring, plumbing, parts, and appliances. The holder can also certify maintenance of electrical and instrument components which form part of the mechanical structural system limited to mechanical adjustment for correct operation, and replacement of components connected by electrical plugs, terminal connections, or pipelines. Maintenance on compass systems is limited to the compensation of direct and remote reading magnetic compasses with a mechanical link to the compass card, and component changes in direct reading compass systems. Plus, the holder can certify for all the physical and calculated aircraft weight and balance tasks.

The category Powerplant may certify for the calculation only of weight and balance changes within the powerplant system.

The category E, I&R holder may certify for closing of cowlings and removal/installation of quick access inspection panels associated with their applicable maintenance. The holder

can also certify for a 'daily' or manufacturer's equivalent inspection and the check for condition and security of attachment, of wiring, plumbing, parts, and appliances. Plus, the holder can certify for the calculation only of weight and balance changes within the E, I&R systems.

**Note:** Where an ATA chapter in the below table is designated, the category and specific group holder has full maintenance privileges within the chapter, however the E, I&R category and specific group holder has privileges for the electrical and instrument aspects of the mechanical system. Likewise, where an ATA chapter is designated for the E, I&R category and specific group holder, the mechanical holder has privileges for any mechanical aspects of the system.

CATEGORY AEROPLANE	CATEGORY ROTORCRAFT
<p>Encompasses all parts of the aeroplane other than those stated as being the responsibility of other licence categories and includes the relevant parts of the following:</p> <ol style="list-style-type: none"> <li>1. weight and balance (ATA08)</li> <li>2. pressurisation systems (ATA21)</li> <li>3. air conditioning systems (ATA21)</li> <li>4. cabin and cockpit furnishings (ATA25)</li> <li>5. emergency equipment (ATA25)</li> <li>6. fire protection systems (ATA26)</li> <li>7. flight control systems excluding fly-by-wire (ATA27)</li> <li>8. fuel and other liquid tanks and plumbing not forming part of the engine installation (ATA28)</li> <li>9. hydraulic systems (ATA29)</li> <li>10. de-icing and anti-icing systems (ATA30)</li> <li>11. windshield clear vision systems (ATA30)</li> <li>12. landing gear systems, wheels and brakes (ATA32)</li> <li>13. lighting (ATA33)</li> <li>14. oxygen systems (ATA35)</li> <li>15. pneumatic systems (ATA36)</li> <li>16. vacuum systems (ATA37)</li> <li>17. waste water (ATA38)</li> <li>18. nitrogen generation system or inert gas system (ATA47);</li> <li>19. APU (auxiliary power unit) systems interface (ATA49)</li> <li>20. cargo and accessory compartments (ATA50)</li> </ol>	<p>Encompasses all parts of the rotorcraft other than those stated as being the responsibility of other licence categories and includes the relevant parts of the following:</p> <ol style="list-style-type: none"> <li>1. weight and balance (ATA08)</li> <li>2. vibration and noise analysis (ATA18)</li> <li>3. air conditioning systems (ATA21)</li> <li>4. cabin and cockpit furnishings (ATA25)</li> <li>5. emergency equipment (ATA25)</li> <li>6. fire protection systems (ATA26)</li> <li>7. flight control systems excluding fly-by-wire (ATA27 and 67)</li> <li>8. fuel and other liquid tanks and plumbing not forming part of the engine installation (ATA28)</li> <li>9. hydraulic systems (ATA29)</li> <li>10. de-icing and anti-icing systems (ATA30)</li> <li>11. wind shield clear vision systems (ATA30)</li> <li>12. landing gear systems, wheels and brakes (ATA32)</li> <li>13. lighting (ATA33)</li> <li>14. oxygen systems (ATA35)</li> <li>15. pneumatic systems (ATA36)</li> <li>16. vacuum systems (ATA37)</li> <li>17. nitrogen generation system or inert gas system (ATA47)</li> <li>18. APU (auxiliary power unit) systems interface (ATA49)</li> <li>19. cargo and accessory compartments (ATA50)</li> </ol>

<p>21. aircraft structure and control surfaces (ATA51-57)</p> <p>22. role equipment.</p>	<p>20. aircraft structure and control surfaces (ATA51-57)</p> <p>21. transmissions and drive systems, excluding rotorcraft reduction gear boxes or power input coupling gear boxes provided by the engine manufacturer (ATA61)</p> <p>22. rotor hubs, blades, drives, tail rotor and drive, folding blades and pylon (ATA 62-66)</p> <p>23. role equipment.</p>
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CATEGORY POWERPLANT	CATEGORY ELECTRICAL
<p>Encompasses all parts of the powerplant including the following:</p> <ol style="list-style-type: none"> <li>1. weight &amp; balance calculation (ATA08)</li> <li>2. electrical power generation (generator/constant speed drive/IDG systems) (ATA24)</li> <li>3. engine controls, including variable intake, propeller, fuel, oil, anti-icing, de-icing, and other controls associated with engine operation and cowling (ATA30)</li> <li>4. APU (auxiliary power unit) systems (ATA49)</li> <li>5. engine and propeller (ATA60-61, 71-72)</li> <li>6. engine mounting and firewalls (ATA71)</li> <li>7. engine cowlings (ATA71)</li> <li>8. components and items of equipment attached to or driven by the engine but excluding rotorcraft transmission and drive systems (ATA 72 and 83)</li> <li>9. ignition, fuel, oil, fire extinguisher, anti-icing and de-icing systems, air systems and control, and other systems associated with engine operation (FADEC, EECU etc), but excluding fuel and water-methanol tanks and associated plumbing not forming a part of the engine installation (ATA73-76 and 79)</li> <li>10. compressor bleed air systems contained within the engine installation sections (ATA75)</li> <li>11. engine indicating system (ATA77)</li> <li>12. engine exhaust system, including thrust reversers, reheat, tail pipe assemblies and exhaust-type cabin heating units (ATA78)</li> <li>13. starting systems (ATA80)</li> <li>14. supercharging and power augmentation systems (ATA81-82).</li> </ol>	<p>Encompasses all parts of the aircraft electrical system including the following:</p> <ol style="list-style-type: none"> <li>1. weight &amp; balance calculation (ATA08)</li> <li>2. aircraft batteries (ATA24)</li> <li>3. all parts of the electrical power generation (generator/IDG systems), supply, distribution, and control systems (ATA24)</li> <li>4. de-icing and anti-icing systems (ATA30)</li> <li>5. Lighting (ATA33)</li> <li>6. electric engine (ATA71-72)</li> <li>7. starting systems (ATA80)</li> <li>8. all other electrical systems and components associated with the electrical installation, excluding instruments and radio but including multiplex systems and EICAS.</li> </ol>

CATEGORY INSTRUMENT	CATEGORY RADIO
<p>Encompasses all parts of the aircraft instrument system including the following:</p> <ol style="list-style-type: none"> <li>1. weight &amp; balance calculation (ATA08)</li> <li>2. vibration and noise analysis (ATA18)</li> <li>3. cabin pressurisation and air conditioning control systems (ATA21)</li> <li>4. flight director, air data computer system (ATA22)</li> <li>5. automatic pilots, auto-flight control systems, and integrated flight control systems operation (ATA22&amp;27)</li> <li>6. multiplex systems (ATA23)</li> <li>7. gyro instruments (ATA31)</li> <li>8. indicating and recording systems (ATA31)</li> <li>9. instrument panels, shock mounts, bonding, cables, and looms (ATA31)</li> <li>10. EICAS (ATA31)</li> <li>11. EFIS (ATA31)</li> <li>12. vacuum, pressure, and electrically operated instruments (ATA31, 37)</li> <li>13. direct and remote reading magnetic compasses, including compensation (ATA34)</li> <li>14. inertial navigation systems (ATA34)</li> <li>15. GPWS (ATA34)</li> <li>16. GPS (ATA34)</li> <li>17. oxygen systems (ATA35)</li> <li>18. integrated modular avionics (ATA42)</li> <li>19. cabin systems (ATA44)</li> <li>20. central maintenance system (ATA45)</li> <li>21. information systems ATIMS, Network server (ATA46)</li> <li>22. FADEC/EECU etc control (ATA73).</li> </ol>	<p>Encompasses all parts of the aircraft radio system including the following:</p> <ol style="list-style-type: none"> <li>1. weight &amp; balance calculation (ATA08)</li> <li>2. radio communications systems, ELT and ULB (ATA23)</li> <li>3. audio intercommunication and passenger address-entertainment systems, and multiplex systems (ATA23)</li> <li>4. EFIS (ATA31)</li> <li>5. radio navigation systems (ATA34)</li> <li>6. radar navigation and alerting systems (ATA34)</li> <li>7. GPWS (ATA34)</li> <li>8. GPS (ATA34)</li> <li>9. integrated modular avionics (ATA42)</li> <li>10. cabin systems (ATA44)</li> <li>11. radio racks, shock mounts, bonding, cables, and looms</li> <li>12. radio system instruments and power supplies.</li> </ol>

**CATEGORY LIGHTER-THAN-AIR AIRCRAFT**

Encompasses all parts of the aircraft other than those stated as being the responsibility of other licence categories and includes the relevant parts of the following:

- |  |   |
|--|---|
| 1. aircraft structure including envelope | 9. landing gear systems   |
| 2. control surfaces                      | 10. fuel and other liquid tanks, gas bottles, and plumbing not forming part of the engine |
| 3. control systems                       | 11. fire protection systems   |
| 4. hydraulic systems                     | 12. cabin and cockpit furnishings   |
| 5. pneumatic systems                     | 13. role equipment  |
| 6. envelope pressurisation systems       | 14. wind shield clear vision systems  |
| 7. air conditioning systems              | 15. emergency equipment installation  |
| 8. oxygen systems.                       | 16. weight & balance calculation.   |

## APPENDIX 3 - List of typical maintenance tasks

- 5 Time limits/Maintenance checks**  
100-hour check (general aviation aircraft).  
“B” or “C” check (transport category aircraft).  
Review records for compliance with airworthiness directives.  
Review records for compliance with component life limits.  
Procedure for Inspection following heavy landing.  
Procedure for Inspection following lightning strike.
- 6 Dimensions/Areas**  
Locate component(s) by station number.  
Perform symmetry check.
- 7 Lifting and Shoring**  
Assist in:  
Jack aircraft nose or tail wheel.  
Jack complete aircraft.  
Sling or trestle major component.
- 8 Levelling/Weighing**  
Level aircraft.  
Weigh aircraft.  
Prepare W & B amendment.  
Check aircraft against equipment list.
- 9 Towing and Taxiing**  
Tow aircraft.  
Be part of aircraft towing team.
- 10 Parking and mooring**  
Tie down aircraft.  
Park, secure and cover aircraft.  
Position aircraft in dock.  
Secure rotor blades.
- 11 Placards and Markings**  
Check aircraft for correct placards.  
Check aircraft for correct markings.
- 12 Servicing**  
Refuel aircraft.  
Defuel aircraft.  
Check tire pressures.  
Check oil level.  
Check hydraulic fluid level.  
Check accumulator pressure.  
Charge pneumatic system.  
Grease aircraft.  
Connect ground power.  
Service toilet/water system  
Perform pre-flight/daily check.
- 18 Vibration and Noise Analysis**  
Analyse helicopter vibration problem.  
Analyse noise spectrum.
- 21 Air Conditioning**  
Replace combustion heater.  
Replace outflow valve.  
Replace vapour cycle unit.  
Replace air cycle unit.  
Replace cabin blower.  
Replace heat exchanger.  
Replace pressurisation controller.  
Clean outflow valves.  
Check operation of air conditioning/heating system  
Check operation of pressurisation system  
Troubleshoot faulty system.
- 22 Auto flight**  
Install servos.  
Rig bridle cables  
Replace controller.  
Replace amplifier.  
Check operation of auto-pilot.  
Check operation of auto-throttle.  
Check operation of yaw damper.  
Check and adjust servo clutch.  
Perform autopilot gain adjustments.  
Perform mach trim functional check.  
Troubleshoot faulty system.  
Check autoland system  
Check flight management systems  
Check stability augmentation system.
- 23 Communications**  
Replace VHF com unit.  
Replace HF com unit.  
Replace existing antenna.  
Replace static discharge wicks.  
Check operation of radios.  
Perform antenna VSWR check.  
Perform Selcal operational check.  
Perform operational check of passenger address system.  
Functionally check audio integrating system.  
Repair co-axial cable.  
Troubleshoot faulty system.
- 24 Electrical Power**  
Charge lead/acid battery.  
Charge ni-cad battery.  
Check battery capacity.  
Deep-cycle ni-cad battery.  
Replace generator/alternator.  
Replace switches.
- Replace circuit breakers.  
Adjust voltage regulator.  
Amend electrical load analysis report.  
Repair/replace electrical feeder cable.  
Troubleshoot faulty system.
- 25 Equipment/Furnishings**  
Replace carpets  
Replace crew seats.  
Replace passenger seats.  
Check inertia reels.  
Check seats/belts for security.  
Check emergency equipment.  
Check ELT for compliance with regulations.  
Repair toilet waste container.  
Repair upholstery.  
Change cabin configuration.
- 26 Fire protection**  
Check fire bottle contents.  
Check operation of warning system.  
Check cabin fire extinguisher contents.  
Check lavatory smoke detector system.  
Install new fire bottle.  
Replace fire bottle squib.  
Troubleshoot faulty system.  
Inspect engine fire wire detection systems.
- 27 Flight Controls**  
Replace horizontal stabiliser.  
Replace elevator.  
Replace aileron.  
Replace rudder.  
Replace trim tabs.  
Install control cable and fittings.  
Replace flaps.  
Replace powered flying control unit  
Replace flap actuator  
Adjust trim tab.  
Adjust control cable tension.  
Check control range and sense of movement.  
Check for correct assembly and locking.  
Troubleshoot faulty system.
- 28 Fuel**  
Replace booster pump.  
Replace fuel selector.  
Replace fuel tank cells.  
Check filters.  
Flow check system.



- Check calibration of fuel quantity gauges.  
Check operation feed/selectors  
Troubleshoot faulty system.
- 29 Hydraulics**  
Replace engine driven pump.  
Replace standby pump.  
Replace accumulator.  
Check operation of shut off valve.  
Check filters.  
Check indicating systems.  
Perform functional checks.  
Troubleshoot faulty system.
- 30 Ice and rain protection**  
Replace pump.  
Replace timer.  
Install wiper motor.  
Check operation of systems.  
Troubleshoot faulty system.
- 31 Indicating/recording systems**  
Replace flight data recorder.  
Replace cockpit voice recorder.  
Replace clock.  
Replace master caution unit.  
Replace FDR.  
Perform FDR data retrieval.  
Troubleshoot faulty system.  
Implement ESDS procedures  
Inspect for HIRF requirements.
- 32 Landing Gear**  
Build up wheel.  
Replace main wheel.  
Replace nose wheel.  
Replace shimmy damper.  
Rig nose wheel steering.  
Replace shock strut seals.  
Replace brake unit.  
Replace brake control valve.  
Bleed brakes.  
Test anti-skid unit.  
Test gear retraction.  
Change bungees.  
Adjust micro switches.  
Charge struts.  
Troubleshoot faulty system.  
Test outbrake system.
- 33 Lights**  
Repair/replace rotating beacon.  
Repair/replace landing lights.  
Repair/replace navigation lights.  
Repair/replace interior lights.  
Repair/replace emergency lighting system.  
Perform emergency lighting system checks.  
Troubleshoot faulty system.
- 34 Navigation**  
Calibrate magnetic direction indicator.  
Replace airspeed indicator.  
Replace altimeter.  
Replace air data computer.  
Replace VOR unit.  
Replace ADI.  
Replace HSI.  
Check pitot static system for leaks.  
Check operation of directional gyro.  
Functional check weather radar.  
Functional check Doppler.  
Functional check TCAS.  
Functional check DME  
Functional check ATC Transponder  
Functional check flight director system.  
Functional check inertial nav system.  
Complete quadrantal error correction of ADF system.  
Update flight management system database.  
Check calibration of pitot static instruments.  
Check calibration of pressure altitude reporting system.  
Troubleshoot faulty system  
Check marker systems  
Compass replacement direct/indirect  
Check Satcom  
Check GPS  
Test AVM.
- 35 Oxygen**  
Inspect on board oxygen equipment.  
Purge and recharge oxygen system.  
Replace regulator.  
Replace oxygen generator.  
Test crew oxygen system.  
Perform auto oxygen system deployment check.  
Troubleshoot faulty system.
- 36 Pneumatic systems**  
Replace filter.  
Replace compressor.  
Recharge desiccators.  
Adjust regulator.  
Check for leaks.  
Troubleshoot faulty system.
- 37 Vacuum systems**  
Replace vacuum pump.  
Check/replace filters.  
Adjust regulator.  
Troubleshoot faulty system.
- 38 Water/Waste**  
Replace water pump.  
Replace tap.  
Replace toilet pump.  
Troubleshoot faulty system.
- 45 Central Maintenance System**  
Retrieve data from CMU.  
Replace CMU.  
Perform Bite check.  
Troubleshoot faulty system.
- 49 Airborne Auxiliary power**  
Install APU.  
Inspect hot section.  
Troubleshoot faulty system.
- 51 Structures**  
Sheet metal repair.  
Fibre glass repair.  
Wooden repair.  
Fabric repair.  
Recover fabric control surface.  
Treat corrosion.  
Apply protective treatment.
- 52 Doors**  
Rig/adjust locking mechanism.  
Adjust air stair system.  
Check operation of emergency exits.  
Test door warning system.  
Troubleshoot faulty system.
- 56 Windows**  
Replace windshield.  
Replace window.  
Repair transparency.
- 57 Wings**  
Skin repair.  
Recover fabric wing.  
Replace tip.  
Replace rib.  
Check incidence/rig.
- 61 Propeller**  
Assemble prop after transportation.  
Replace propeller.  
Replace governor.  
Adjust governor.  
Perform static functional checks.  
Check operation during ground run.  
Check track.  
Check setting of micro switches.  
Dress out blade damage.  
Dynamically balance prop.  
Troubleshoot faulty system.

- 62 Main Rotors**  
 Install rotor assembly.  
 Replace blades.  
 Replace damper assembly.  
 Check track.  
 Check static balance.  
 Check dynamic balance.  
 Troubleshoot.
- 63 Rotor Drive**  
 Replace mast.  
 Replace drive coupling.  
 Replace clutch/freewheel unit  
 Replace drive belt.  
 Install main gearbox.  
 Overhaul main gearbox.  
 Check gearbox chip detectors.
- 64 Tail Rotors**  
 Install rotor assembly.  
 Replace blades.  
 Troubleshoot.
- 65 Tail Rotor Drive**  
 Replace bevel gearbox.  
 Replace universal joints.  
 Overhaul bevel gearbox.  
 Install drive assembly.  
 Check chip detectors.
- 67 Rotorcraft flight controls**  
 Install swash plate.  
 Install mixing box.  
 Adjust pitch links.  
 Rig collective system.  
 Rig cyclic system.  
 Rig anti-torque system.  
 Check controls for assembly and locking.  
 Check controls for operation and sense.  
 Troubleshoot faulty system.
- 71 Power Plant**  
 Build up ECU.  
 Replace engine.  
 Repair cooling baffles.  
 Repair cowling.  
 Adjust cowl flaps.  
 Repair faulty wiring.  
 Troubleshoot.
- 72 Piston Engines**  
 Remove/install reduction gear.  
 Check crankshaft run-out.  
 Check tappet clearance.  
 Check compression.  
 Extract broken stud.  
 Install helicoil.  
 Perform ground run.  
 Establish/check reference RPM.  
 Troubleshoot.
- 72 Turbine Engines**
- Replace module.  
 Hot section inspection.  
 Engine ground run.  
 Establish reference power.  
 Trend monitoring/gas path analysis.  
 Troubleshoot.
- 73 Fuel and control, piston**  
 Replace engine driven pump.  
 Adjust AMC.  
 Adjust ABC.  
 Install carburettor/injector.  
 Adjust carburettor/injector.  
 Clean injector nozzles.  
 Replace primer line.  
 Check carburettor float setting.  
 Troubleshoot faulty system.
- 73 Fuel and control, turbine**  
 Replace FCU.  
 Replace engine driven pump.  
 Clean/test fuel nozzles.  
 Clean/replace filters.  
 Adjust FCU.  
 Troubleshoot faulty system.
- 74 Ignition systems, piston**  
 Change magneto.  
 Change ignition vibrator.  
 Change plugs.  
 Test plugs.  
 Check H.T. leads.  
 Install new leads.  
 Check timing.  
 Check system bonding.  
 Troubleshoot faulty system.
- 74 Ignition systems, turbine**  
 Check glow plugs/igniters.  
 Check H.T. leads.  
 Check ignition unit.  
 Replace ignition unit.  
 Troubleshoot faulty system.
- 76 Engine Controls**  
 Rig thrust lever.  
 Rig RPM control.  
 Rig mixture HP cock lever.  
 Rig power lever.  
 Check control sync (multi-eng).  
 Check controls for correct assembly and locking.  
 Check controls for range and sense of operation.  
 Adjust pedestal micro-switches.  
 Troubleshoot faulty system.
- 77 Engine Indicating**  
 Replace engine instruments(s).  
 Replace oil temperature bulb.  
 Replace thermocouples.  
 Check calibration.
- Troubleshoot faulty system.
- 78 Exhaust, piston**  
 Replace exhaust gasket.  
 Inspect welded repair.  
 Pressure check cabin heater muff.  
 Troubleshoot faulty system.
- 78 Exhaust, turbine**  
 Change jet pipe.  
 Change shroud assembly.  
 Install trimmers.
- 79 Oil**  
 Change oil.  
 Check filter(s).  
 Adjust pressure relief valve.  
 Replace oil tank.  
 Replace oil pump.  
 Replace oil cooler.  
 Replace firewall shut off valve.  
 Perform oil dilution.  
 Troubleshoot faulty system.
- 80 Starting**  
 Replace starter.  
 Replace start relay.  
 Replace start control valve.  
 Check cranking speed.  
 Troubleshoot faulty system.
- 81 Turbines, piston engines**  
 Replace PRT.  
 Replace turbo-blower.  
 Replace heat shields.  
 Replace waste gate.  
 Adjust density controller.
- 82 Engine water injection**  
 Replace water/methanol pump.  
 Flow check water/methanol system.  
 Adjust water/meth. control unit.  
 Check fluid for quality.  
 Troubleshoot faulty system.
- 83 Accessory gear boxes**  
 Replace gearbox.  
 Replace drive shaft.  
 Check chip detector.

## APPENDIX 4 - Acceptable Practical Training Record (PTR) format

### Documenting practical experience

Practical experience for the issue of an AME Licence, Categories and Ratings should be documented in a suitable PTR.

The format of any acceptable PTR should have the following features:

- a section that provides an overview of experience /employment in the aviation industry, detailing relevant qualifications, training and courses
- an experience record section that lists specific tasks completed, and:
  - details the dates and the specific aircraft or component worked on, and
  - is countersigned by a supervising LAME.

### Example of experience record page

Below is an example of the typical format that should be used in the experience record section to document practical experience.

Experience should be recorded in a separate section for the appropriate rating group or specific type rating of the relevant category section.

There should be sufficient detail to describe the task to allow an assessor to see that a range of various maintenance tasks have been completed for the unit standard (U.S.), category, or rating being applied for.

In the ‘**Details of maintenance task**’ column indicate one of the following actions has been carried out:

- (P) - Personally performed the task*
- (A) - Taken an active interest in*
- (T) - Received instruction or on the job training.*

### Section 3.1 - Practical Experience Record - *Aeroplane Category* \_\_\_\_\_ *Rating* \_\_\_\_\_ page of \_\_\_\_\_

Date	ATA No. and/or U.S. No.	A/C and Job No.	Reg. A/C Type or Component	Details of Maintenance Task	Hrs	Validating Eng. No. &Initials

## APPENDIX 5 - AMEL Examination Syllabus Structure

### Definitions

Each syllabus subject is described in a separate AC as detailed in Table 1, on page 11. Performance verbs used in the basic examination syllabuses are as follows:

Verb	Description	Knowledge Level		
		1	2	3
Apply	To employ a formula, theorem or principle.		X	
Assess	To fix the size, quantity, amount, value or quality		X	X
Calculate	To determine or ascertain mathematical methods.		X	
Categorise	To place in a class or division.	X	X	
Compare	To establish similarities or dissimilarities.	X	X	
Construct	To build an entity by fitting parts together		X	
Convert	To change into others of a different kind.		X	
Decode	To interpret in plain language.		X	
Define	To state the exact meaning or give the limits.		X	
Derive	To trace from a source or deduce			X
Describe	To give a description or state the characteristics.	X	X	
Detail	To deal with things item by item.			X
Determine	To resolve or establish precisely			X
Diagnose	To identify the cause of a mechanical fault			X
Differentiate	To identify the difference between two items.	X	X	
Distinguish	To make the difference recognisable.		X	X
Estimate	To give an approximate judgement		X	
Evaluate	To critically interpret and appraise in various contexts			X
Explain	To make known in detail.		X	X
Extract	To derive from.		X	X
Graph	To draw a graph as representing a given function.		X	X
Identify	To establish individuality of an item.	X	X	
Illustrate	To give specific examples of a general case.	X	X	
Interpret	To put in plain words.	X		
List	To record a number of connected items.	X		
Match	To join two or more things so they correspond.	X		
Name	To use the word by which an item is known.	X		
Outline	To draw or describe the essential parts only.	X	X	
Perform	To carry out a task.	X	X	
Plot	To mark or connect points on a graph.	X	X	
Reproduce	To produce again, to produce copies or representations.		X	
Round	To approximate to a specified degree of accuracy.	X		
Select	To choose for suitability from a list	X		
Show	To demonstrate.		X	
Simplify	To make easier to do or understand.		X	X
Solve	To determine the answer to a problem.	X	X	
Specify	To provide details of design, materials or conditions	X	X	
State	To express in words or number.	X		
Trace	To follow the course, development, history of.	X		

## Numbering

Each syllabus is set out by topics (except for subject 18), then every main topic in each syllabus is divided into sub-topics then into sub-sub-topics and, where applicable, paragraphs. The three-digit sub-sub-topic numbers shown in the left-hand column of the syllabus table are used in the 'knowledge deficiency reports' (KDRs) to provide feedback on individual examinations.

## Objective description

The middle column of each syllabus table objectively describes each sub-sub-topic by plainly stating its subject matter and the type of performance or activity required. The objectives are intended to be simple, unambiguous, and clearly focussed, outcomes to aid learning.

## Knowledge levels

The right-hand column of the syllabus table specifies the knowledge level for the sub-topic headings. The levels indicate the depth of knowledge required and are defined as follows:

- LEVEL 1:** A familiarisation with the principal elements of the subject.
- LEVEL 2:** A general knowledge of the theoretical and practical aspects of the subject.  
The applicant should have the ability to apply their knowledge.
- LEVEL 3:** A detailed knowledge of the theoretical and practical aspects of the subject.  
The applicant should have the capacity to combine and apply the separate elements of knowledge in a logical and comprehensive manner.

Note that the knowledge levels indicate the depth of knowledge required NOT its safety importance.

## APPENDIX 6 - Guidance Material for rule 66.19 *Medical requirements*

*“A holder of a licence or certificate issued under the Act and this Part must not exercise the privileges of that licence or certificate while that person has a known medical condition, that creates a risk of harm to that person or to any other person resulting from the holder’s exercising of privileges under this Part.”*

**General** - An AMEL, or holder of a Certificate of MA, or Certificate of IA issued under Part 66 (aviation documents) allows the holder to exercise certain privileges relating to maintenance and modification activities.

It is the responsibility of the aviation document holder to ensure that they are fit to exercise the privileges of these documents. They should not report for duty or certify any maintenance work if they are medically unfit or impaired due to factors such as fatigue to operate safely.

Individuals also have responsibility under the [Health and Safety at Work Act 2015](#) (HSWA), whether as an officer or worker, conducting business as a person conducting a business or undertaking (PCBU), refer to sections 36, 44 and 45 of the HSWA.

Please also refer to the [Health and Safety at Work \(General Risk and Workplace Management\) Regulations 2016](#), specifically Part 1 General duties, and Part 3 Duties relating to exposure monitoring and health monitoring

In most professions there is a duty of care by the individual to assess their own fitness to carry out their professional duties. Although CAA doesn’t prescribe medical standards and certification for LAMEs, CAA encourages them to take a professional attitude towards their physical and mental health. Cases of subtle physical or mental illness may not always be apparent to the individual themselves, but as engineers often work as a member of a team any sub-standard performance or unusual behaviour should be quickly noticed by colleagues or supervisors, as well as family members and friends, and hopefully they should discuss with the individual so that appropriate support, medical and counselling action can be taken. A decrease in mental fitness in many cases may be related to stress from within the working environment or to the personal circumstances of the individual.

Instances of aggressive behaviour, vagueness, and slippage of personal standards (cleanliness, appearance etc.) may be indicative of more serious mental health issues. Such issues may bring into question the ability of the individual to be trusted or to maintain the necessary levels of concentration to take appropriate decisions on airworthiness matters.

**Alcohol** - Alcohol has similar effects to tranquillisers and sleeping tablets and may remain circulating in the blood for a considerable time. It should be kept in mind that a person may not be fit to go on duty even after eight hours after drinking large amounts of alcohol. Alcohol-related impairment on returning to duty may relate to a still elevated blood alcohol level or hangover effects. Individuals should therefore anticipate such effects upon their next duty period. Special note should be taken of the fact that combinations of alcohol and sleeping tablets, or antihistamines, can form a highly dangerous or even lethal combination.

If you believe you are impaired by your use of alcohol or other drugs do not report for work.

If you are concerned that you may have a problem with alcohol it is strongly recommended that you seek help from your GP, an alcohol counsellor, peer support group e.g. AA, or a workplace alcohol and other drugs programme if your employer has one.

**Anaesthetics** - It should be remembered that even small doses of anaesthetics used for local surgery or dental work may affect your cognitive ability and a period of rest should be taken before returning to duty. This period will vary depending upon individual circumstances but may even extend to 24 or 48 hours. Any doubts should be resolved by seeking appropriate medical advice.

**Drugs** – The use of illicit or non-prescribed drugs is totally unacceptable where aircraft maintenance safety is concerned.

If you are concerned that you may have a problem with drugs, illegal or prescribed, it is strongly recommended that you seek help from your GP, a drug counsellor, peer support group e.g. AA/NA, or a workplace alcohol and other drugs programme if your employer has one.

**Eyesight** - A reasonable standard of eyesight is needed for any aircraft engineer to perform their duties to an acceptable degree. Many maintenance tasks require a combination of both distance and near vision. Such consideration must be made where there is a need for the close visual inspection of structures or work related to small or miniature components. The use of glasses or contact lenses to correct any vision problems is perfectly acceptable and indeed they must be worn as prescribed. Frequent checks should be made to ensure the continued adequacy of any glasses or contact lenses. In addition, colour discrimination may be necessary for an individual to drive in areas where aircraft manoeuvre or where colour coding is used, e.g. in aircraft wiring. Organisations should identify any specific eyesight requirement and put in place suitable procedures to address these issues.

**Fatigue** - Tiredness and fatigue can adversely affect performance. Excessive hours of duty and shift work, particularly with multiple shift periods and/or additional overtime, can lead to fatigue. Organisations and individuals should be fully aware of the dangers of impaired performance due to fatigue and of their corporate and personal responsibilities. Organisations should consider if a fatigue risk management system is appropriate.

**Hearing** - The ability to hear an average conversational voice in a quiet room at two metres from the examiner is recommended as a routine test. Failure of this test would require an audiogram to be carried out to provide an objective assessment. If necessary, a hearing aid may be worn but consideration should be given to the practicalities of wearing the aid during routine tasks demanded of the individual.

**Medication** - Any form of medication, whether prescribed by a doctor or purchased over the counter and particularly if being taken for the first time, may have consequences in the aviation maintenance environment unless the basic questions can be answered satisfactorily by the individual:

1. How does the condition I am taking medication for affect my fitness for work?
2. Must I take medicines at all? If so:
  - a. Have I given this medication a personal trial for at least 24 hours before going on duty, to ensure that it will not have adverse effects on my ability to work and make sound decisions?
  - b. Do I really feel fit for work?

Confirming the absence of adverse effects may need expert advice. GPs and pharmacists will be able to assist in this matter.

**Stress** - Everyone is subject to various stresses in their life and work. Stress can often be stimulating and beneficial, but prolonged exposure to chronic stress (high levels or differing stress factors) can produce strain and cause performance to suffer allowing mistakes to occur. Stress factors can be varied, physical – e.g. heat, cold, humidity, noise, vibration. They can be due to ill-health or worries about possible ill-health, from problems outside the workplace – e.g. bereavements, domestic upsets, financial or legal difficulties.

A stress-related problem can manifest itself by signs of irritability, forgetfulness, sickness absence, mistakes, or alcohol or drug abuse. Organisations have a duty to identify work designs and practices that minimise work related stresses. Organisations should have systems in place (e.g. Policies, EAP/ good leadership) to support individuals who may be suffering from stress and to minimise workplace stresses. Individual cases can be helped by sympathetic and skilful leadership, and counselling which allows a return to effective work and maintenance duties.

**Note:** *Fatigue and Stress are two of the “[Dirty Dozen](http://www.system-safety.com/)” - This concept was originated by Gordon Dupont (<http://www.system-safety.com/>) and according to the FAA they are implicated in about 80% of maintenance mistakes.*