



**CIVIL AVIATION GUIDANCE MATERIAL – 1821**

**MAINTENANCE TRAINING  
ORGANISATION  
APPROVAL**

**CAAM PART 147**

**CIVIL AVIATION AUTHORITY OF MALAYSIA**

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## Civil Aviation Guidance Material Components and Editorial practices

This Civil Aviation Guidance Material is made up of the following components and are defined as follows:

**Standards:** Usually preceded by words such as “*shall*” or “*must*”, are any specification for physical characteristics, configuration, performance, personnel or procedure, where uniform application is necessary for the safety or regularity of air navigation and to which Operators must conform. In the event of impossibility of compliance, notification to the CAAM is compulsory.

**Recommended Practices:** Usually preceded by the words such as “*should*” or “*may*”, are any specification for physical characteristics, configuration, performance, personnel or procedure, where the uniform application is desirable in the interest of safety, regularity or efficiency of air navigation, and to which Operators will endeavour to conform.

**Appendices:** Material grouped separately for convenience but forms part of the Standards and Recommended Practices stipulated by the CAAM.

**Definitions:** Terms used in the Standards and Recommended Practices which are not self-explanatory in that they do not have accepted dictionary meanings. A definition does not have an independent status but is an essential part of each Standard and Recommended Practice in which the term is used, since a change in the meaning of the term would affect the specification.

**Tables and Figures:** These add to or illustrate a Standard or Recommended Practice and which are referred to therein, form part of the associated Standard or Recommended Practice and have the same status.

**Notes:** Included in the text, where appropriate, Notes give factual information or references bearing on the Standards or Recommended Practices in question but not constituting part of the Standards or Recommended Practices;

**Attachments:** Material supplementary to the Standards and Recommended Practices or included as a guide to their application.

It is to be noted that some Standards in this Civil Aviation Guidance Material incorporates, by reference, other specifications having the status of Recommended Practices. In such cases, the text of the Recommended Practice becomes part of the Standard.

The units of measurement used in this document are in accordance with the International System of Units (SI) as specified in CAD 5. Where CAD 5 permits the use of non-SI alternative units, these are shown in parentheses following the basic units. Where two sets of units are quoted it must not be assumed that the pairs of values are equal and interchangeable. It may, however, be inferred that an equivalent level of safety is achieved when either set of units is used exclusively.

Any reference to a portion of this document, which is identified by a number and/or title, includes all subdivisions of that portion.

Throughout this Civil Aviation Guidance Material, the use of the male gender should be understood to include male and female persons.





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# 1 Application of Maintenance Training Organisation Approval (CAD 1821 2)

## 1.1 CAD 1821 2.2 – Application form

1.1.1 The application form (CAAM/AW/1821-01) and CAAM Form 4 (CAAM/AW/0104-00) shall be signed either by the Accountable Manager or of the new proposed Accountable Manager.

1.1.2 The scope of application for maintenance training organisation (MTO) may be either basic training, type/task training, or combination of both.

1.1.3 The applicant who intends to apply for Maintenance Training Organisation approval shall be subjected to the 5 Phases process as follow-

a) Pre-application phase;

- 1) Pre-application phase is an introductory process where the applicant who intended to acquire an MTO approval from CAAM shall be briefed on the procedures and processes involved prior to the approval.
- 2) The applicant shall provide a reasonable timeline that covers all related aspects of the processes until their expected date of getting the approval. The CAAM may advise on the duration of the process and may advise further on the timeline.
- 3) The applicant, at this phase, shall provide CAAM with a set of a company profile that contains the information but not limited to the status of the organisation, place of business, organisation structure, post holders, proposed qualified instructor, assessor and examiner, scope of training to be conducted, training programme, financial capability, prospective practical training and on-the-job training arrangement and any other information that could assist the applicant evaluation.
- 4) The applicant will be advised to further submit the formal application if the CAAM is satisfied with the pre-application phase.

b) Formal application phase;

- 1) This stage is a formal application process where the applicant will submit all required documents to CAAM.
- 2) The applicant shall submit the application form (CAAM/AW/1821-01) together with the appropriate fee and proof of payment shall be attached with the application.
- 3) The application shall be supported with declaration of compliance against CAD 1821 & CAD 1801, as applicable stating how the organisation complies with the CAAM requirements

- 4) The applicant shall submit a complete draft of the exposition together with the (CAAM/AW/1821-08) checklist.
  - 5) The applicant shall submit complete draft of maintenance training programme or training needs analysis documents together with (CAAM/AW/1821-09) checklist.
  - 6) The applicant shall submit complete draft of examination papers together with examination question compliance checklist (CAAM/AW/1841-02) and examination paper approval form (CAAM/AW/1841-03).
  - 7) The applicant shall submit CAAM Form 4 for the accountable manager and nominated post holder(s). CAAM Form 4 shall be accompanied with curriculum vitae, supporting documents to show the experience and qualification and internal assessment record.
  - 8) The applicant shall submit details and background of each proposed qualified instructor, assessor and examiner and competency assessment records together with proof of their qualification, experience and training.
  - 9) The applicant shall present the timeline to the CAAM inspector for agreement. The timeline is however a living document and it might be changed from time to time, the applicant shall inform and update the CAAM inspector for his agreement.
- c) Document evaluation phase;
- 1) This is the phase where the CAAM inspector will review the organisation submitted documents and this includes the assessment on the accountable manager, the management personnel (nominated post holder), and the proposed qualified instructor, assessor and examiner.
  - 2) The process of reviewing the submitted documents will be carried out once the nominated post holders have been accepted by CAAM.
  - 3) The nominated post holder may be called for regular meetings to review the submitted documents.
  - 4) The documents review will cover the organisation's exposition and its supporting documents such as the procedure manual including forms and checklists.
- d) Demonstration and inspection phase; and
- 1) The organisation shall ensure that at this phase they are ready for the certification audit. This is where the evaluation of the organisation's readiness to function as maintenance training organisation will be performed by the CAAM inspector and/or a team of airworthiness inspectors.

- 2) Prior to that, an internal audit by the Quality System shall be carried out by the organisation and once ready, an official request shall be sent to the primary inspector for the certification audit scheduling.
  - 3) When the certification audit has been successfully carried out, the organisation will be issued a Provisional Certificate of Approval. This approval does not entitle the organisation to conduct examination and assessment, and to issue certificate of recognition.
  - 4) The Provisional Certificate of Approval is valid for 1 (one) year from the date of issue.
  - 5) To acquire a Certificate of Approval that reflects the organisation's privileges, a Technical Competency Audit will be carried out by the CAAM inspector. At this stage, the organisation should be able to demonstrate to the CAAM that they are competent as a maintenance training organisation.
- e) Certification phase.
- 1) Once the demonstration and inspection phase completed, the organisation will be issued with the Certificate of Approval reflecting the privileges that the organisation is deemed to have based on its capabilities.

## **1.2 CAD 1821 2.6 – Arrangement with approved maintenance organisation (AMO)**

- 1.2.1 In the case of basic training, the organisation shall furnish evidence of engagement with local approved maintenance organisation (AMO) to support the performance of practical training and on the job training for the trainee's practical hands-on activity and maintenance experience gathering.
- 1.2.2 For engagement with foreign AMO, concurrence from CAAM is required. The training organisation shall establish the agreement with the approved maintenance organisation(s) and should submit to CAAM.



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## **2 Organisational Requirements (CAD 1821 4)**

### **2.1 CAD 1821 4.1(d) – Facility requirements**

2.1.1 If training facilities such as training classroom, examination facility, workshop, storage facilities etc. are not owned by the MTO, an agreement shall be established and valid.

### **2.2 CAD 1821 4.1(i) – Library**

2.2.1 For approved basic maintenance training courses this means holding and ensuring reasonable access to copies of all Act, regulations, requirements., samples of typical aircraft maintenance manuals and service bulletins, Airworthiness Directives, aircraft and component records, release documentation, procedures manuals and aircraft maintenance programmes.

2.2.2 Except for the Act, regulations and requirements, the remainder of the documentation should represent typical examples for both large and other than large aircraft; cover both aeroplanes and helicopters as appropriate. Avionic documentation should cover a representative range of available equipment. All documentation should be reviewed and updated on a regular basis.

2.2.3 Where the organisation has an existing library of regulations, manuals and documentation required by another approved organisation, it is not necessary to duplicate such a facility subject to student access being under controlled supervision.

### **2.3 CAD 1821 4.2 – Personnel requirements**

2.3.1 CAAM Form 4 shall be completed for each person nominated to hold a position required by MTO including the Accountable Manager.

2.3.2 The MTO shall appoint a training manager with the responsibility of managing the training organisation on a day-to-day basis.

2.3.3 In addition, the accountable manager shall appoint a quality manager with the responsibility of managing the quality system as specified in CAD 1821 paragraph 4.7(b).

2.3.4 The MTO shall appoint an examination manager with the responsibility of managing the relevant CAAM Part 147 Examination as specified in CAD 1821 paragraph 4.8 for examination system.

2.3.5 The personnel as per paragraph 4.2(a), 4.2(b), 4.2(c) and 4.2(d) of CAD 1821:

- a) are subject to assessment by CAAM for their acceptance;
- b) should immediately be nominated at least 3 months before any of the above post holder tender his/her resignation, unless otherwise agreed by CAAM;

- 2.3.6 Should the organisation fail to comply with 2.3.5, the organisation approval may be affected.
- 2.3.7 The maintenance training organisation shall have a nucleus of permanently employed staff to undertake the minimum amount of maintenance training proposed but may contract, on a part-time basis, instructors for subjects which are only taught on an occasional basis.
- 2.3.8 Examiners shall demonstrate a clear understanding of the examination standard required by CAD 1821 paragraph 4.8 and have a responsible attitude to the conduct of examinations such that the highest integrity is ensured.
- 2.3.9 The qualification, experience, skills and competency of instructors, knowledge examiners and practical assessors shall be established and controlled in accordance with the criteria published in Appendix 4 of CAD 1821. The process and criteria shall be documented in the exposition.
- 2.3.10 Competency assessment for initial and subsequent assessment of the candidates must be conducted by the organisation in accordance with a procedure established in the exposition. Any qualified candidate for a position of instructor, assessor and examiner shall be listed in the proposed exposition Section 1.5 – List of instructor, examiner and assessor, or other means as acceptable by CAAM.
- 2.3.11 Prior to the approval of the exposition, the candidate shall be subjected to an assessment and acceptable to the CAAM.
- 2.3.12 Updating training should be a minimum of 35 hours duration appropriate to the scope of training of the organisation and particular instructors, knowledge examiners and practical assessors.
- 2.3.13 Records should show for each instructor, knowledge examiner and practical assessor when the updating training was scheduled and when it took place.
- 2.3.14 The updating training may be subdivided during the 24 months into more than one element and may include such activities as attendance at relevant lectures, training, courses and symposiums.
- 2.3.15 The organisation shall establish a training programme on the initial and updating training for each of its instructor, knowledge examiner and practical assessor including a procedure to ensure compliance with the relevant paragraphs of CAD 1821 requirement as the basis for issuing certification authorisation
- 2.4 CAD 1821 4.3 – Record of Instructors, Examiners and Practical Assessors**
- 2.4.1 The following minimum information relevant to the scope of activity should be kept on record in respect of each instructor, knowledge examiner and practical assessor:



- a) Name
- b) Date of Birth
- c) Employment No
- d) Approval no (if any)
- e) Experience
- f) Qualifications
- g) Training history (before entry)
- h) Subsequent / Updating Training
- i) Scope of training (to be updated within 24 months)
- j) Scope of approval
- k) Starting date of employment/ contract
- l) If appropriate – ending date of employment/ contract.
- m) If appropriate – contract with other MTO including date of employment/ contract.

2.4.2 The record may be kept in any format but should be under the control of the organisation's quality system.

2.4.3 Persons authorised to access the system should be maintained at a minimum to ensure that records cannot be altered in an unauthorised manner or that such confidential records become accessible to unauthorised persons.

2.4.4 The CAAM may investigate the records system for initial and continued approval or when the CAAM has cause to doubt the competence of a particular person.

2.4.5 Instructors, knowledge examiners and practical assessors should be provided with a copy of their terms of reference.

2.4.6 The organisation shall establish a system of record-keeping that allows adequate traceability of the process to issue, renew, vary, suspend or revoke the approval for instructor, practical assessor and knowledge examiner.

## **2.5 CAD 1821 4.4(a) – Synthetic training devices**

2.5.1 Synthetic training devices are working models of a particular system or component and include computer simulations.

2.5.2 A synthetic training device is considered beneficial for complex systems and fault diagnostic purposes.

**2.6 CAD 1821 4.4(c) – Aircraft parts**

- 2.6.1 An appropriate selection of aircraft parts means appropriate in relation to the particular subject module or sub-module of CAAM Part 66 being instructed. For example, the turbine engine module should require the provision of sufficient parts from different types of turbine engine to show what such parts look like, what the critical areas are from a maintenance viewpoint and to enable disassembly/assembly exercises to be completed.
- 2.6.2 Appropriate aircraft, engines, aircraft parts and avionics equipment means appropriate in relation to the particular subject module or sub-module of CAAM Part 66 being instructed. For example, category B2 avionic training should require amongst other equipment, access to at least one type of installed autopilot and flight director system such that maintenance and system functioning can be observed and therefore more fully understood by the student in the working environment.
- 2.6.3 All related instructional equipment as stated in 2.5 and 2.6 shall be clearly identified as use “for training purpose only”.

**2.7 CAD 1821 4.4(d) – Access to the appropriate aircraft type**

- 2.7.1 ‘Access’ may be interpreted to mean, in conjunction with the facilities requirement of CAD 1821 paragraph 4.1(d) that there may be an agreement with a maintenance organisation approved under Part-145 to access such parts, etc.

**2.8 CAD 1821 4.5 – Maintenance training material**

- 2.8.1 Training course notes, diagrams and any other instructional material should be accurate. Where an amendment service is not provided, a written warning to this effect should be given.

**2.9 CAD 1821 4.6 – Record-keeping**

- 2.9.1 The record-keeping system should ensure that all records are accessible to CAAM whenever needed within a reasonable time. These records should be organised in a consistent way throughout the organisation (chronological, alphabetical order, etc.)
- 2.9.2 All records containing sensitive data regarding examination and training should be stored in a secure manner with controlled access to ensure confidentiality of this kind of data.
- 2.9.3 All computer hardware used to ensure data backup should be stored in a different location from that containing the working data in an environment that ensures they remain in good condition. When hardware or software changes take place, special care should be taken that all necessary data continues to be accessible through the period specified in CAD 1821 paragraph 4.6(b).

**2.10 CAD 1821 4.7(a) – Training Procedure**

- 2.10.1 This guidance material provides some clarifications for the incorporation of new training methods and training technologies in the procedures for aircraft maintenance training.
- 2.10.2 The classic training method is a teacher lecturing the pupils in a classroom. Commonly the training tools are a blackboard and training manuals. New technologies make it possible to develop new training methods and use other training tools, e.g. multimedia-based training and virtual reality. A combination of several training methods/tools is recommended in order to increase the overall effectiveness of the training.
- 2.10.3 Simulation cannot be eligible as a sole training or assessment tool for basic hand skills such as wiring, welding, drilling, filing, wire locking, riveting, bonding or any other skill where competence may only be achievable by performing a hands-on activity.
- 2.10.4 Table 1 below provided to illustrate the possibilities for the use of different training methods and tools that may be selected for basic training.

Training tools		Description
1	Slideshow presentation	A structured presentation of slides.
2	Manuals	Comprehensive and controlled publication of a particular topic.
3	Computer (desktop PC, laptop, etc.)	An electronic processing device that can hold and display information in various media.
4	Mobile devices (such as, but not limited to, tablets, smart phones, etc.)	A mobile electronic processing device that can hold and display information in various media.
5	Videos	Electronic media for broadcasting moving visual images.
6	MSTD — Maintenance simulation training device	A training device that is intended to be used in maintenance training, examination, and/or assessment for a component, system or entire aircraft. The MSTD may consist of hardware and software elements.

7	Mock-up	A scaled or full-size replica of a component, system or entire aircraft that preserves (i.e. is an exact replica of) the geometrical, operational or functional characteristics of the real component, system or entire aircraft for which maintenance training is delivered with the use of such a replica.
8	Virtual reality	A computer-generated three-dimensional (3D) environment which can be explored and possibly interacted with.
9	MTD — Maintenance training device	Maintenance training device is any training device other than an MSTD used for maintenance training and/or examination and/or assessment. It may include mock-ups.
10	Real aircraft	<p>A suitable aircraft whose condition allows teaching a selection of maintenance tasks that are representative of the particular aircraft or of the aircraft category.</p> <p>‘Suitable’ means an aircraft of the type or licence (sub)category (if the licence (sub)category aircraft is outfitted with the same equipment subject to the particular lesson module(s) and is sufficiently similar so that the lesson objective(s) can be satisfactorily accomplished) for type training, or an aircraft representative of the licence (sub)category for basic training, and excludes ‘virtual aircraft’.</p> <p>‘Condition’ means that the aircraft is equipped with its main components and that the systems can be activated/operated when this is required by the learning objectives.</p>
11	Aircraft component	<p>A suitable aircraft component used to teach specific maintenance tasks off-the-wing. This may include but is not limited to tasks such as borescope inspections, minor repairs, testing, or the assembly/disassembly of sub-components.</p> <p>‘Suitable’ means that the condition of the component should fit the learning objectives of the tasks and, when appropriate, may feature existing defects or damages.</p>

12	Augmented reality	An enhancement (modification, enrichment, alteration or manipulation) of one's current perception of reality elements of a physical, real-world environment following user's inputs picked up by sensors transferred to rapid streaming computer images. By contrast, virtual reality replaces the real world with a simulated one.
13	Embedded training	A maintenance training function that is originally integrated into the aircraft component's design (i.e. a centralised fault display system).
14	Classroom	A physical, appropriate location where learning takes place.
15	Virtual classroom/SDL (Synchronous Distance Learning)	A simulated, not physical, location where synchronous learning takes place. SDL approval is required prior to start the training.

Table 1

*Note. – Synthetic training devices (STDs) is a generic term used for systems using hardware and/or software, simulating the behaviour of one or more aircraft systems or a complete aircraft, such as maintenance simulation training devices (MSTDs), maintenance training devices (MTDs) and flight simulation training devices (FSTDs). SDL only applicable during the pandemic situation announced by the Government and/or agreed by CAAM.*

## 2.11 CAD 1821 4.7(b) – Quality System

- 2.11.1 The independent audit procedure should ensure that all aspects of the organisation compliance should be checked at least once in every 12 months and may be carried out as one complete single exercise or subdivided over a 12-month period in accordance with a scheduled plan.
- 2.11.2 Where the organisation is also approved to another continuing airworthiness related organisation such as CAMO, AMO and LAMO requiring a quality system, then such quality systems may be combined.
- 2.11.3 When training or examination is carried out under the sub-contract control system:
- a) a pre audit procedure should be established whereby the CAAM Part 147 approved maintenance training organisation should audit a prospective sub-contractor to determine whether the services of the sub-contractor meet the intent of CAAM Part 147.
  - b) a renewal audit of the subcontractor should be performed at least once every 12 months to ensure continuous compliance with the CAAM Part 147 standard.

- c) the sub-contract control procedure should record audits of the sub-contractor and to have a corrective action follow-up plan.
- 2.11.4 The independence of the audit system should be established by always ensuring that audits are carried out by personnel not responsible for the function or procedure being checked.
- 2.11.5 The primary objective of the quality system is to enable the training organisation to satisfy itself that it can deliver properly trained students and that the organisation remains in compliance with current CAD 1801 and CAD 1821.
- 2.11.6 The independent audit is a process of routine sample checks of all aspects of the training organisation's ability to carry out all training and examinations to the required standards. It represents an overview of the complete training system and does not replace the need for instructors to ensure that they carry out training to the required standard.
- 2.11.7 A report should be raised each time an audit is carried out describing what was checked and any resulting findings. The report should be sent to the affected department(s) for rectification action giving target rectification dates. Possible rectification dates may be discussed with the affected department(s) before the quality department confirms such dates on the report. The affected department(s) should rectify any findings and inform the quality department of such rectification.
- 2.11.8 An organisation with the capacity to provide training for 50 students or more should have a dedicated quality audit group whose sole function is to conduct audits, raise finding reports and follow up to ensure that findings are being rectified.
- 2.11.9 The management control and follow up system should not be contracted to outside persons. The principal function is to ensure that all findings resulting from the independent audit are corrected in a timely manner and to enable the accountable manager to remain properly informed of the state of compliance. Apart from rectification of findings, the accountable manager should hold routine meetings to check progress on rectification except that in the organisation such meetings may be delegated on a day-to-day basis to the quality manager as long as the accountable manager meets at least once per year with the senior staff involved to review the overall performance.

## **2.12 CAD 1821 4.8 – Examinations**

- 2.12.1 Examinations may be computer-based (e-exam) or hard-copy-based or a combination of both. Procedures shall clearly define the way that the examinations are conducted.
- 2.12.2 The actual questions to be used in a particular examination should be determined by person responsible of managing the relevant CAAM Part 147 Examination as specified in CAD 1801 paragraph 5.2 (Appendix 2) and/or paragraph 5.3 (Appendix 3) for examination system.

2.12.3 The conduct of examination for other than its own student is not allowed unless approved by CAAM, subject to a controlled procedure established in the exposition.

2.12.4 The organisation shall obtain the approval prior to conduct the examination for other than its own student. The organisation shall establish the policy and procedures in the exposition.

**2.13 CAD 1821 4.8(f) and (g) – Occurrence report**

2.13.1 The organisation shall submit an immediate notification to CAAM as soon as practicable but not exceeding 48 hours from event of the occurrence. A complete report of the occurrence with remedial action shall be submitted within one calendar month.

**2.14 CAD 1821 4.9 – Assessment**

2.14.1 The assessment should aim at measuring the competency of the student by evaluating three major elements associated to the learning objective such as knowledge, skills and attitude.

2.14.2 If the organisation intent to conduct assessment for other than its own student, the organisation should establish a documented process which is acceptable to CAAM and clearly specified in the exposition.

**2.15 CAD 1821 4.9(e)(3) – Notification to CAAM on practical assessor’s misconduct**

2.15.1 The organisation shall submit an immediate notification to CAAM as soon as practicable but not exceeding 48 hours from event of the occurrence as specified in CAD 1821 paragraph 4.9 (e). A complete report of the occurrence with remedial action shall be submitted within one calendar month.

**2.16 CAD 1821 4.10 – Maintenance Training Organisation Exposition (MTOE)**

2.16.1 A recommended format of the exposition is included in CAGM 1821 Appendix 1.

2.16.2 When training is carried out under the sub-contract control system, the MTOE should contain a specific procedure on the control of sub-contractors and a list of sub-contractors as required by CAD 1821 paragraph 4.10 ~~(d)~~(a)(12).

2.16.3 The maintenance training programme should correspond to appropriate list of approved course(s) specified in organisation’s exposition.

2.16.4 Notwithstanding CAD 1821 paragraph 4.10(c), minor amendments to the exposition may be approved indirectly through an indirect approval procedure. The indirect approval procedure shall define the minor amendment eligible, be established by the organisation as part of the exposition and be approved by CAAM. Minor amendments such as typographical error and numbering list error

can be considered under the indirect approval and can be approved by a person as specified in CAD 1821 para 4.2(c).

## **2.17 CAD 1821 4.11 – Maintenance training programme**

- 2.17.1 A recommended format of the maintenance training programme is included in CAGM 1821 Appendix 2.
- 2.17.2 Each training course shall be established and identified with the individual maintenance training programme. The maintenance training programme should be prepared by a person who is the subject matter expert of the relevant training course.
- 2.17.3 The reference of each maintenance training programme should be reflected in the list of the approved course specified in Part 1.9 of the organisation's exposition.
- 2.17.4 Notwithstanding CAD 1821 paragraph 4.11(e), minor amendments to the maintenance training programme may be approved indirectly through an indirect approval procedure. The indirect approval procedure shall define the minor amendment eligible, be established by the organisation as part of the maintenance training programme and be approved by CAAM.
- 2.17.5 Minor amendments such as typographical error and numbering list error can be considered under the indirect approval specified in paragraph 2.17.4 and can be approved by a person as specified in CAD 1821 paragraph 4.2(c).



### **3 Approved Basic Training Course (CAD 1821 5)**

#### **3.1 CAD 1821 5.1(b) – Knowledge training element**

3.1.1 Each licence category or subcategory basic training course may be subdivided into modules or sub-modules of knowledge and may be intermixed with the practical training elements subject to the required time elements as specified in CAD 1821 paragraph 5.1(g) and paragraph 5.1(h) being satisfied.

#### **3.2 CAD 1821 5.1(d) – Practical training element**

3.2.1 Where the organisation sub-contract the practical training element in part to another organisation in accordance with CAD 1821 paragraph 4.1(d), the organisation should ensure all the practical training elements are properly carried out.

3.2.2 At least 30% of the practical training element should be carried out in an actual maintenance working environment.

#### **3.3 CAD 1821 5.1(g) – Duration of basic training course**

3.3.1 In order to follow pedagogical and human factors principles, the maximum number of training hours per day for the theoretical training should not be more than 6 hours. A training hour means 60 minutes of tuition excluding any breaks, examination, revision, preparation, and aircraft visit. In exceptional cases, CAAM may allow deviation from this standard when it is properly justified that the proposed number of hours follows pedagogical and human factors principles. These principles are especially important in those cases where:

- a) Theoretical and practical training are performed at the same time;
- b) Training and normal maintenance duty/ apprenticeship are performed at the same time.

3.3.2 The minimum participation time for the trainee to meet the objectives of the course should not be less than 90% of the tuition hours. Additional training may be provided by the training organisation in order to meet the minimum participation time. If the minimum participation defined for the course is not met, a certificate of recognition should not be issued.

#### **3.4 CAD 1821 5.1(h) – Duration of conversion courses**

3.4.1 Typical conversion durations are given below:

- a) The approved basic training course to qualify for conversion from holding a CAAM Part 66 aircraft maintenance licence in subcategory A1 to subcategory B1.1 or B2 should not be less than 1600 hours. The course should include between 60% and 70% knowledge training.

- b) The approved basic training course to qualify for conversion from holding a CAAM Part 66 aircraft maintenance licence in subcategory B1.1 to B2 or category B2 to B1.1 should not be less than 600 hours and should include between 80% and 85% knowledge training.
- c) The approved basic training course to qualify for conversion from holding a CAAM Part 66 aircraft maintenance licence in subcategory B1.2 to subcategory B1.1 should not be less than 400 hours and should include between 50% and 60% knowledge training.
- d) The approved basic training course to qualify for conversion from holding a CAAM Part 66 aircraft maintenance licence in one subcategory A to another subcategory A should not be less than 70 hours and should include between 30% and 40% knowledge training.

### **3.5 CAD 1821 5.2 – Basic knowledge examinations**

- 3.5.1 An organisation approved under CAAM Part 147 may conduct examination for students who did not attend an approved basic course at the organisation concern subject to the approval of CAAM.

### **3.6 CAD 1821 5.3(a) – Basic practical assessments**

- 3.6.1 Where the organisation approved under CAAM Part 147 sub-contracts the practical training element in part to another organisation in accordance with CAD 1821 paragraph 4.1(d) and chooses to nominate practical assessors from the other organisation, the organisation approved under CAAM Part 147 should ensure that the practical assessor is appropriately qualified and basic practical assessments are carried out in accordance with the organisation's exposition.

### **3.7 CAD 1821 5.3(b) – Assessments on students**

- 3.7.1 An assessed pass for each student should be granted when the practical assessor is satisfied that the student meets the criteria of CAD 1821 paragraph 5.1(e) and paragraph 5.1(f). This means that the student has demonstrated the capability to use relevant tools/ equipment/ test equipment as specified by the tool/ equipment/ test equipment manufacturer and the use of maintenance manuals in that the student can carry out the required inspection/ testing without missing any defects, can readily identify the location of components and is capable of correct removal/ fitment/ adjustment of such components. The student is only required to carry out enough inspection/ testing and component removal/ fitment/ adjustments to prove capability. The student should also show an appreciation of the need to ensure clean working conditions and the observance of safety precautions for the student and the product. In addition, the student should demonstrate a responsible attitude in respect to flight safety and airworthiness of the aircraft.

## **4 Aircraft Type/ Task Training Course (CAD 1821 6)**

### **4.1 CAD 1821 6.1 – Aircraft type/ task training**

- 4.1.1 Aircraft type training may be sub-divided in airframe and/or powerplant systems type training courses. An organisation approved under CAAM Part 147 may be approved to conduct airframe type training only, powerplant type training only or any combination thereof.
- a) Airframe type training course means a type training course including all relevant aircraft structure and electrical and mechanical systems excluding the powerplant.
  - b) Powerplant type training course means a type training course on the bare engine, including the build-up to a quick engine change unit.
  - c) The interface of the engine/airframe systems should be addressed by either airframe or powerplant type training. In some cases, such as for general aviation, it may be more appropriate to cover the interface during the airframe course due to the large variety of aircraft that can have the same engine type installed.



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## **5 Privileges of the Organisation (CAD 1821 7)**

### **5.1 CAD 1821 7.2(c) – Subcontract**

5.1.1 The contract between the organisation approved under CAAM Part 147 and the sub-contractor should contain:

- a) a provision for the CAAM to have right of access to the sub-contractor;
- b) a provision for the sub-contractor to inform the organisation of any change that may affect its organisation approval, before any such change takes place.

5.1.2 The pre audit procedure should focus on establishing compliance with the training and examination standards set out in CAAM Part 147 and CAAM Part 66.

### **5.2 CAD 1821 7.2(d) – Subcontract of type training**

5.2.1 In the case of type training and examination, the reason for allowing only subcontracting to powerplant and avionics systems is that the related subjects can generally also be imparted by certain organisations specialised in these domains such as the Type Certificate Holder of the powerplant or the OEMs of these avionics systems. In such a case, the type training course should make clear how the interfaces with the airframe are addressed and by whom (the subcontracted organisation or the CAAM Part 147 organisation itself).



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## 6 Appendices

### 6.1 Appendix 1 – Maintenance training Organisation Exposition (MTOE)

- 1 The following subject headings form the basis of the MTOE required by CAD 1821 paragraph 4.10
- 2 Whilst this format is recommended, it is not mandatory to assemble the MTOE in this manner as long as a cross-reference index is included in the MTOE as an Appendix and the Part 1 items remain in Part 1.
- 3 Part 2, 3 and 4 materials may be produced as separate detailed manuals subject to the main exposition containing the Part 2, 3 and 4 fundamental principles and policy on each item. It is then permitted to delegate the approval of these separate manuals but this fact and the procedure should be specified in paragraph 1.10.

#### 1. **PART 1 – MANAGEMENT**

- 1.1. Corporate commitment by accountable manager
- 1.2. Management personnel
- 1.3. Duties and responsibilities of management personnel, practical assessor, knowledge examiners and instructors
- 1.4. Management personnel organisation chart
- 1.5. List of instructional, practical assessor and knowledge examiner

*Note.* – A separate document may be referenced

- 1.6. List of approved addresses
- 1.7. List of sub-contractors (if applicable)
- 1.8. General description of facilities at paragraph 1.6 and 1.7 addresses
- 1.9. Specific list of courses and examinations approved by CAAM
- 1.10. Notification procedures regarding changes to organisation
- 1.11. Exposition and associated manuals amendment procedure

#### 2. **PART 2 – TRAINING AND EXAMINATION PROCEDURES**

- 2.1. Organisation of courses
- 2.2. Preparation of course material
- 2.3. Preparation of classrooms and equipment
- 2.4. Preparation of workshops/maintenance facilities and equipment
- 2.5. Conduct of theoretical training & practical training (during basic knowledge training and type/task training)
- 2.6. Records of training carried out
- 2.7. Storage of training records
- 2.8. Training at locations not listed in paragraph 1.6

- 2.9. Organisation of examinations
- 2.10. Security and preparation of examination material
- 2.11. Preparation of examination rooms
- 2.12. Conduct of examinations (basic knowledge examinations and type/task training examinations)
- 2.13. Conduct of basic or/and type/task practical assessments (during basic knowledge training and type/task training)
- 2.14. Marking and record of examinations
- 2.15. Storage of examination results and records
- 2.16. Examinations at locations not listed in paragraph 1.6
- 2.17. Preparation, control & issue of basic training course certificates
- 2.18. Control of sub-contractors

### **3. PART 3 – TRAINING SYSTEM QUALITY PROCEDURES**

- 3.1. Audit of training
- 3.2. Audit of examinations
- 3.3. Analysis of examination results
- 3.4. Audit and analysis remedial action
- 3.5. Accountable manager annual review
- 3.6. Qualifying the instructors
- 3.7. Qualifying the knowledge examiners and practical assessors
- 3.8. Records of qualified instructors, knowledge examiners and practical assessors
- 3.9. Qualifying audit personnel

### **4. PART 4 – APPENDICES**

- 4.1. Example of documents and forms used
- 4.2. Syllabus of each training course

*Note.– A separate document may be referenced to Maintenance Training Programme*

- 4.3. Cross-reference index - if applicable



## 6.2 Appendix 2 – Maintenance Training Programme

- 1 The development of a training programme, should be based on a training need analysis for each basic training or type training course offered and contains the applicable elements described in CAD 1801 Appendix 1, 2 or Appendix 3
- 2 Additionally, it should be based on a systematic approach whereby trainee's competencies and performance criteria are defined, the training is based on the competencies identified, and assessments developed to determine whether the competencies have been achieved.
- 3 The outcome of training needs should enable the training organisation to address the purpose of the training, contents and objective for each subject, the depth of knowledge and duration of each topics.
- 4 Whilst the following structure is recommended, it is not mandatory to assemble the training programme in this manner as long as a cross-reference index is included.
- 5 Maintenance training programme structure:

### **0. Part 0 – Document Overview**

- 0.1. Name and address of the organisation.
- 0.2. Detail of the individual basic or type training course package, or differences aircraft type training
- 0.3. Appropriate referencing from the exposition document (MTOE Section 1.9)
- 0.4. Signed statement by the appropriate post holder
- 0.5. Policies and procedures for the amendment of training programme
- 0.6. List of effective pages
- 0.7. Revision status and summary of amendment
- 0.8. Table of Content

### **1. Part 1 – Training Program**

- 1.1. Training specification; the information that described the purpose of training, the requirements that should be fulfilled when designing the training and the requirements that should be fulfilled when designing the training. The training specification is the output of TNA

*Note: The TNA review process should include the identification of the purpose of the training required and the associated operational, technical, regulatory and organizational tasks, and any other requirements that is applicable.*

- 1.2. Training milestone/ overview of training course programme
- 1.3. Training pre-requisite (if any)
- 1.4. Total training course program duration (hours/ days & ratio)
- 1.5. Training/ Lesson plan;

Comprising of syllabus (theoretical and practical elements), depth of training, level of knowledge, tuition hours, composition and structure, and training needs.

- (a) Learning objective for each subject
- (b) Syllabus composition & structure
- (c) Level and depth for each subject
- (d) Time distribution for each modules/ subject/ ATA chapter
- (e) Delivery method and sequence
- (f) Training aid, instructor and assessment guide or guidance material

The training plan may be subdivided into theoretical section and practical section.

1.6. Training materials used in the training following the training plan which includes, training notes, manuals, presentations, simulated exercises, etc.

1.7. List of practical training and its associated documents.

*Note: For basic training at least 30% of the practical training element should be carried out in an actual maintenance working environment.*

1.8. Practical training worksheet/ task related

1.9. Operational Suitability Data (OSD) elements in the maintenance training programme, if applicable.

1.10. Cross referencing of aircraft maintenance experience logbook / practical training logbook.

## **2. Part 2 – Assessment and examination**

2.1. Assessment plan

An information that details the list of assessment, assessment events, assessment tools, assessment guide, competency checklist, competency standard and assessment form, etc.

- (a) final competency standard; the final competency standard is the level of competency associated with the final assessment of the training
- (b) list of assessment
- (c) assessment method
- (d) assessment schedule
- (e) assessment tools; which may include assessment checklist, assessment guides, practical training logbooks, oral assessment.
- (f) competency standard

2.2. Examination plan

- (a) examination schedule after the delivery of the entire course.

- (b) examination standard & its associated level and depth of knowledge
  - (c) list of examination paper reference
- 2.3. System to allow failed students to re-attempt course or specific subjects of the course before proceeding with other activities.

### **3. Part 3 – Facility and personnel**

- 3.1. Instructional staff and capability matrix specific to each particular training course
- 3.2. The facility for the subcontracted practical training and associated agreement with other organisation for the aircraft access. Reference to the agreement.
- 3.3. Facility that includes any of the following activity (if applicable);
- (a) workshop practices
  - (b) examinations and assessments
  - (c) practical training
  - (d) industry aircraft visits

### **4. Part 4 – Evaluation and feedback**

- 4.1. The evaluation of the training must be a continuous process and should involve data collection by various means such as:
- (a) independent audits;
  - (b) feedback from students;
  - (c) feedback from instructors and assessors;
  - (d) performance review events between the training department and operational department; and
  - (e) course results (passing rates, grades, etc.).
- 4.2. Course report; the evaluation data collected must be analysed and improvement actions formulated and implemented. To determine the effectiveness of the improvement actions, data should be continuously collected and compared against past data before the implementation of improvement.



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