

Unit 78: Aviation Legislation

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| Unit code: | H/600/7245 |
| QCF Level 3: | BTEC Nationals |
| Credit value: | 10 |
| Guided learning hours: | 60 |

● Aim and purpose

This unit gives learners an understanding of the legislation and regulations that must be adhered to when manufacturing and maintaining aircraft.

● Unit introduction

This unit provides an overview of the regulatory framework, approval and certification issues and maintenance requirements for those who are engaged or wish to practice as licensed engineers in the field of civil aircraft maintenance engineering. The unit has been design to completely cover the knowledge requirements of European Aviation Safety Agency (EASA) Part-66 Module 10: Aviation Legislation. It includes material on the roles of the regulatory bodies, the aircraft maintenance requirements and the licensing and certification procedures that have a direct bearing upon the maintenance and operation of civil aircraft, within the UK and EU.

● Learning outcomes

On completion of this unit a learner should:

- 1 Understand about the regulatory framework of the national and international authorities and the relationship between them
- 2 Understand the role of Part-66 and Part-145 guidance material and their use in complying with the airworthiness requirements and maintenance regulations of EASA
- 3 Understand aircraft operation and certification requirements and the associated documentation
- 4 Understand the applicable national and international requirements and the EASA Part-M regulation for the continued airworthiness and maintenance of aircraft.

Unit content

1 Understand about the legislative and regulatory framework of the national and international aviation authorities and the relationship between them

Regulatory bodies: roles, responsibilities and relationships between the International Civil Aviation Organisation (ICAO), the European Aviation Safety Agency (EASA), the European Union member state National Aviation Authorities (NAA) and the Federal Aviation Administration (FAA)

The Civil Aviation Authority: the current and future role of the CAA as the UK's NAA eg Air Navigation Order (ANO), CAA safety regulation group, CAA implementation of European legislation, CAA responsibilities for approvals/certification of non-EU excluded aircraft, products and parts; the purpose and continued use of British Civil Airworthiness Requirements (BCAR) and the Joint Aviation Requirements (JAR)

EASA legislation and regulations: legislation and regulatory framework for the implementation of EU airworthiness regulations (eg 1592/2002 common airworthiness rules, 216/2008 basic regulation, 1702/2003 airworthiness and environmental certification rules, 2042/2003 continued airworthiness rules); relationship between JAR-OPS, Part-145, Part-66, Part-147 and Part-M

2 Understand the role of Part-66 and Part-145 guidance material and their use in complying with the airworthiness requirements and maintenance regulations of EASA

Nature of Part-66 compliance material for certifying staff licences: information contained in Part-66 guidance and compliance documentation; detailed requirements (knowledge, examination, experience, validity and privileges) eg for category 'A' licensed mechanic, category 'B1' (mechanical)/'B2' (avionic) and category 'C' licensed engineers

Nature, roles and responsibilities of Part-145 approved maintenance organisations: eg structure of an approved Part-145 organisation, role and responsibilities of key personnel, types of maintenance activities (line/hanger/workshop); Part-145 approval, certification and stores procedures (such as format of the company exposition, quality control, Certificate of Release to Service (CRS), Certificate of Maintenance Review (CMR), approved stores, bonded and quarantine stores)

3 Understand aircraft operation and certification requirements and the associated documentation

JAR-OPS commercial air transportation: nature of JAR-OPS regulations and documentation eg air operator's certificate, operator's responsibilities, documents to be carried, aircraft placarding (markings)

Aircraft certification rules and documentation: applicability and purpose of certification rules eg EASA certification specifications CS – 23/25/27/29, type certification, supplemental type certification, Part-21 design/production organisation approvals; aircraft certification documents eg certificate of airworthiness; certificate of registration; noise certificate; weight schedule; radio station licence and approvals

4 Understand the applicable national and international requirements and the EASA Part-M regulation for the continued airworthiness and maintenance of aircraft

Part-M continuing airworthiness requirements: purpose, applicability and implementation of requirements for organisations, personnel and specified EASA aircraft; nature and composition of Part-M (nine subparts) eg general, accountability, continuing airworthiness of aircraft, maintenance standards, component maintenance, maintenance organisation, continuing airworthiness management organisation, certificate of release to service, continuing validity of a certificate of airworthiness; implementation policy for Part-M, including approval of maintenance programmes for EASA aircraft operated commercially

Applicable national (UK) and international requirements: requirements for maintenance programmes, checks and inspections; associated documentation and dissemination of information eg master minimum equipment list, minimum equipment list, dispatch deviation list, airworthiness directives, service bulletins, manufacturers' service information, repair instructions, modification leaflets, maintenance manuals, structural repair manual, illustrated parts catalogue; other requirements eg for continuing airworthiness, test flights, ETOPS maintenance and dispatch, all weather operations, category 2/3 operations and minimum equipment requirements

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

| Assessment and grading criteria | | |
|--|---|--|
| To achieve a pass grade the evidence must show that the learner is able to: | To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to: | To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to: |
| P1 describe the roles and responsibilities of the ICAO, EASA, member states, NAA, and FAA and the relationship between them | M1 define the three EASA Part-66 'knowledge levels' for certifying staff and explain the depth and breadth of understanding and subsequent training required to meet the requirements for each of these levels | D1 explain the nature, role and significance of the CRS and detail the circumstances under which it may be signed to release the aircraft to service |
| P2 explain the current and future role of the CAA, with respect to aircraft safety regulation, continuing airworthiness and the current and future use of the ANO, BCAR and JAR [IE4] | M2 explain the differences in the requirements necessary to practise as a category 'B' or category 'C' licensed engineer | D2 investigate and report on the changes that will need to be made by organisations when required to maintain their commercial aircraft to EASA Part M Subpart D maintenance standards. |
| P3 explain the nature of EASA implementing rule 2042/2003 and the relationship between JAR OPS, Part-145, Part-66, Part-147 and Part-M in implementing this rule [IE4] | M3 distinguish between the three different 'classes of store' and explain the circumstances under which each is used | |
| P4 list the type of information contained in Part-66 certifying staff documentation and explain the detailed requirements necessary to practice as a category 'A' certifying mechanic [IE4] | M4 explain how associated maintenance documents and manuals are controlled and amended to ensure they continue to meet national and international standards. | |
| P5 describe the structure of an approved Part-145 organisation and detail the roles and responsibilities of key personnel required to comply with the requirements | | |

| Assessment and grading criteria | | |
|--|---|---|
| To achieve a pass grade the evidence must show that the learner is able to: | To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to: | To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to: |
| P6 explain the nature of the documents carried by commercial air transport aircraft operating under the European JAR-OPS requirements | | |
| P7 explain the applicability and purpose of EACS – 23/25/27/29 rules and Part-21 approvals [IE4] | | |
| P8 explain the nature and use of the certificate of airworthiness and the certificate of release to service [IE4] | | |
| P9 explain the purpose, applicability and implementation of Part- M requirements for EASA aircraft and detail the composition of Part-M [IE4] | | |
| P10 explain the nature of the national and international standards for maintenance programmes, checks and inspections [IE4] | | |
| P11 detail the contents of the equipment lists and dispatch deviation list necessary to meet national and international requirements | | |
| P12 describe the requirements necessary for ETOPS maintenance and dispatch. | | |

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

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|------------|----------------------------|--------------------------|------------------------------|
| Key | IE – independent enquirers | RL – reflective learners | SM – self-managers |
| | CT – creative thinkers | TW – team workers | EP – effective participators |

Essential guidance for tutors

Delivery

This specialised unit has been designed to cover the knowledge requirements for the EASA Part-66 module 10: Aviation Legislation. As such the unit should be delivered towards the end of the programme. Tutors should currently be, or have recently been directly involved with aircraft maintenance engineering and be familiar with current JAR and EASA regulations, requirements and associated documentation.

The primary aim of this unit is to provide learners with a comprehensive knowledge of current maintenance and airworthiness legislation requirements. As such there is little room for anything other than a theoretical approach to delivery. There are, however, some opportunities to enhance learning by practically handling and gaining familiarity with airworthiness and maintenance documentation, in particular when delivering the learning material for learning outcomes 2 and 4.

The learning outcomes should be delivered in the order in which they appear. In this way learners will be led from the general over-arching regulations to the particular requirements, procedures and associated documentation necessary for the maintenance activities themselves.

Learning outcome 1 is concerned with the legislative framework and the regulatory authorities charged with overseeing compliance with such legislation. Learners could make good use of the internet when researching legislation and the related regulations.

For learning outcome 2, learners will need to gain a thorough understanding of the guidance material for personnel licensing (EASA Part-66) and for the approval of maintenance organisations (EASA Part-145). Copies of these documents should be readily available for reference and tutors should ensure that the current versions are used as the focal point of learning.

Learning outcome 3 covers the regulations governing the operation of commercial aircraft and the certification documents required to operate such aircraft (currently under the auspices of JAA legislation but soon to be completely within the remit of EASA). The current state of flux should be emphasised to learners and as soon as the definitive permanent guidance material is available learners should be made aware of it and future learning based on it. Tutors therefore need to be aware of any future amendments and should ensure that they have direct contact with or indeed belong to a Part-145 establishment, to ensure currency at the time of change. EASA documentation is not available in hard copy at present, due to language difficulties with all member states. However interim guidance and compliance documentation is available on line at the EASA website and again, learners should be given internet access.

Learning outcome 4 introduces learners to the requirements for the continuing airworthiness and maintenance of aircraft. As with learning outcome 3, this subject is at the time of writing about to change from JAR/BCAR requirements to EASA Part-M requirements. The overarching legislation for this subject (Part-M) is given first in the syllabus and the present national/international detailed requirements for maintenance follows. The content of this part of the learning outcome is unlikely to change substantially, however as soon as Part-M, subparts D and G etc. are available, all future teaching and learning should be based on them. Again the delivery of this learning outcome will be substantially enhanced by using the internet as a resource, not only to gain information but also to ensure its currency and to research information for possible assignment work.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan demonstrates one way in planning the delivery and assessment of this unit.

| Topic and suggested assignments/activities and/assessment |
|--|
| <p><i>Whole-class teaching:</i></p> <ul style="list-style-type: none">• explain role of regulatory bodies• explain role and responsibilities of CAA• explain EASA and relevant regulations. <p><i>Small group work:</i></p> <ul style="list-style-type: none">• case study investigation of regulatory body and its role. |
| Preparation and carrying out Assignment 1: Legislative and Regulatory Framework (P1, P2 and P3). |
| <p><i>Whole-class teaching:</i></p> <ul style="list-style-type: none">• explain role and purpose of part-66 compliance• explain nature role and purpose of part 145 approved maintenance organisations. |
| Preparation and carrying out Assignment 2: Part-66 and Part-145 Requirements (P4, P5, M1, M2, M3). |
| <p><i>Whole-class teaching:</i></p> <ul style="list-style-type: none">• explain nature of JAR-OPS regulations and documentation• explain applicability and purpose of certification rules• explain aircraft certification documents. |
| Preparation and carrying out Assignment 3: Operational and Certification Requirements (P6, P7, P8). |
| <p><i>Whole-class teaching:</i></p> <ul style="list-style-type: none">• explain part-M requirements for organisations, personnel and specified EASA aircraft• explain national and international requirements for maintenance programmes, checks and inspections. <p><i>Individual learner activity:</i></p> <ul style="list-style-type: none">• research national and international legislation. |
| Preparation and carrying out Assignment 4: National and International Requirements (P9, P10, P11, P12). |
| Preparation and carrying out Assignment 5: Part-M regulations and the nature of the CRS (M4, D1, D2). |
| Feedback on assessment and unit evaluation. |

Assessment

It is expected that only a limited range of assessment methods will be used for this unit. Principally, evidence may be gathered from written responses to assignments and formal, timed assessments. One way of expanding the range of assessment may be to integrate it with other units (eg various practical activities on aircraft supported by full paper-based case study prepared by learners to determine and explain the regulations, documentation and associated implications of the work carried out).

To achieve a pass, learners must know about the roles and responsibilities of national and international regulatory authorities. In particular learners will need to know about the new role of EASA as the regulatory authority and standards setter for all matters relating to aircraft safety, operation, airworthiness and maintenance. They will also need to know about the role of member states and their NAAs in ensuring that EU regulations are requirements are met. Learners need to be aware of the current and future role of the CAA as EASA takes over full responsibility for aircraft safety regulation. The regulatory structure and statements of the implementing rules and their interrelationship also need to be known. An internet research assignment, or formal written assessment could be used to provide the necessary evidence to meet criteria P1, P2 and P3.

Learner will also need to have an understanding of EASA Part-66 and Part-145 requirements gained through studying the guidance material. Evidence for P4 and P5 might best be obtained from the written responses to a short, formal written assessment. This could be an 'open book' assessment, where hard copies of the guidance material are made available for use at the time of the assessment.

P6, P7 and P8 assess learners' knowledge of aircraft operation and certification. In view of the impending EASA takeover of these requirements, answers to a research-based assignment using the internet, might be the most appropriate way of obtaining the necessary evidence.

Learners must also have an understanding of the current applicable national/international and Part-M requirements for continuing airworthiness and associated maintenance. Again in view of the full implementation of Part-M in the very near future, the written responses to a computer-based assignment (where the latest information may be obtained) might be the best way of obtaining the evidence for P9, P10, P11 and P12.

To achieve a merit grade, learners need to build on their understanding of the Part-66 and Part-145 requirements. In particular learners need to demonstrate a detailed understanding of the EASA 'knowledge levels' and training required to meet these levels (M1). They will need to be able to identify and explain the differing requirements needed to practice as a category 'B' or category 'C' engineer (M2). Learners will also need to demonstrate their knowledge of the requirements for the control and segregation of aircraft stores (M3). Evidence for M1, M2 and M3 may be best obtained through a formal written assessment that could be combined with the assessment for P4 and P5.

Learners finally need to demonstrate a thorough knowledge and understanding of the care and control of maintenance documentation and manuals needed to meet national and international standards (M4). Evidence of meeting this criterion may best be provided from answers to a research based assignment that could be set independently or more appropriately be combined with an assignment covering criteria D1 and D2.

To achieve a distinction grade learners will need to demonstrate an in-depth understanding of the Part-M regulations and in particular the nature and significance of the CRS, including the competence requirements of those people who may sign it (D1). They will also need to show their understanding of the requirements and corresponding documentation concerned with the transfer from JAR/BCAR to EASA Part M requirements (D2). Evidence of achievement of D1 and D2 could be achieved through a research assignment, that may or may not include M4, as suggested above.

Programme of suggested assignments

The table below shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the assessment and grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Edexcel assignments to meet local needs and resources.

| Criteria covered | Assignment title | Scenario | Assessment method |
|--------------------|--|---|-------------------|
| P1, P2, P3 | Legislative and Regulatory Framework | Learner investigation of CAA and regulatory bodies. | Written report. |
| P4, P5, M1, M2, M3 | Part-66 and Part-145 Requirements | Learner investigation of Part-66 certification and Part-145 approval. | Written report. |
| P6, P7, P8 | Operational and Certification Requirements | Learner investigation of JAR-Ops and aircraft certification requirements. | Written report. |
| P9, P10, P11, P12 | National and International Requirements | Investigation of relevant national and international regulations. | Written report. |
| M4, D1, D2 | Part-M regulations and the nature of the CRS | Research investigation. | Written report. |

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC Engineering sector suite. This unit has particular links with:

| Level 1 | Level 2 | Level 3 |
|---------|---------|---|
| | | Aircraft Workshop Principles and Practice |
| | | Aircraft Maintenance Practices |

This unit covers the knowledge and understanding associated with the European Aviation Safety Agency (EASA) aircraft maintenance licence Part-66 syllabus for module 10: Aviation Legislation.

Essential resources

Centres will need to provide internet access and hard copies of as many of the relevant regulations as possible.

Employer engagement and vocational contexts

Much of the work for this unit can be set in the context of learners' work placements or be based on case studies of local employers. Further information on employer engagement is available from the organisations listed below:

- Work Experience/Workplace learning frameworks – Centre for Education and Industry (CEI – University of Warwick) – www.warwick.ac.uk/wie/cei/
- Learning and Skills Network – www.vocationallearning.org.uk
- Network for Science, Technology, Engineering and Maths Network Ambassadors Scheme – www.stemnet.org.uk
- National Education and Business Partnership Network – www.nebpn.org
- Local, regional Business links – www.businesslink.gov.uk
- Work-based learning guidance – www.aimhighersw.ac.uk/wbl.htm

Indicative reading for learners

Websites

www.caa.co.uk

www.easa.eu.int/

Publications and guidance material (in hard or electronic copy)

Air navigation order (ANO)

Air Transport Association I 00 system (Aircraft maintenance manuals, illustrated parts catalogues, structural repair manual)

Aircraft operator and maintenance organisation documentation

Airworthiness directives (AD)

Airworthiness notices (AWN)

Certifying specifications 23, 25, 27, 29 (for general aviation aeroplanes, large aeroplanes, small rotorcraft and large rotorcraft, respectively)

EASA Implementing rules: Part-21 (Airworthiness and environmental certification of aircraft and related products, parts and appliances and certification of design and production organisations)

EASA Part-66 Certifying staff

EASA Part-145 Maintenance organisation approvals

EASA Part-147 Training organisation requirements

EASA Part-M (when fully available) Continuing airworthiness requirements

JAR-OPS Commercial air transport (general)

Manufacturers' service information, repair instructions and modification leaflets

Service bulletins (SB)

Delivery of personal, learning and thinking skills

The table below identifies the opportunities for personal, learning and thinking skills (PLTS) that have been included within the pass assessment criteria of this unit.

| Skill | When learners are ... |
|------------------------------|---|
| Independent enquirers | analysing and evaluating information relating to aviation legislation, judging its relevance and value. |

Although PLTS are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

| Skill | When learners are ... |
|----------------------------|---|
| Reflective learners | setting goals with success criteria for their development and work. |

● Functional Skills – Level 2

| Skill | When learners are ... |
|---|--|
| ICT – Find and select information | |
| Access, search for, select and use ICT-based information and evaluate its fitness for purpose | using a range of ICT-based aviation legislation information |
| English | |
| Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts | describing and explaining the nature of a range of aviation legislation and regulations |
| Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions | researching and investigating aviation legislation |
| Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively | describing and explaining the nature of a range of aviation legislation and regulations. |