

Overview

This standard identifies the competences you need to carry out maintenance activities on aircraft lighting systems, in accordance with the approved aircraft maintenance manual, approved change documentation (service bulletin) and airworthiness requirements. It covers both fixed wing and rotary winged aircraft, and includes electrically powered units and components which provide for external and internal illumination, such as landing lights, taxi lights, position lights, rotating lights, ice lights, master warning lights, passenger reading and cabin dome lights, as applicable to the aircraft type. It does not include warning lights for individual systems or self illuminating signs. The maintenance activities will include the removal, fitting and testing of a range of lighting system components. You will be required to select the correct tools and equipment to use, based on the operations to be performed and the components to be removed or replaced. The aircraft lighting system components will include items such as light fixtures and fittings, rotating beacons, switches and wiring. You will remove the required components and fit approved replacements, as appropriate. You will then need to test and adjust the completed system to meet the aircraft maintenance manual, change documentation (service bulletin) and airworthiness requirements.

Your responsibilities will require you to comply with the specific practices and procedures identified in the aircraft manual, change/service bulletin documentation and airworthiness requirements for the maintenance activities undertaken, and to report any problems with these requirements that you cannot personally resolve, or that are outside your permitted authority, to the relevant people. You must ensure that all tools, equipment and materials used are correctly accounted for on completion of the activities, and that all necessary job/task documentation is completed thoroughly, accurately and legibly. You will be expected to work with a minimum of supervision, taking personal responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to applying the appropriate maintenance techniques and procedures to the aircraft lighting systems. You will understand the removal, fitting and testing methods and procedures, and their application, along with the system maintenance requirements. You will know how the equipment functions, the common problems that can occur, the purpose of the individual components and associated defects, in adequate depth to provide a sound basis for carrying out the maintenance

activities, correcting faults and for ensuring that the equipment is maintained to the required standard

You will understand the safety precautions required when working on the aircraft lighting systems, and when using the associated tools and equipment.

You will be required to demonstrate safe working practices throughout, and will understand your responsibility for taking the necessary safeguards to protect yourself and others in the workplace.

Notes:

1. This standard is designed to cover the practical experience requirements of the Airline Transport Association (ATA) Chapter 33 Lights.
2. To display competence in this standard, it is necessary to both remove and fit aircraft lighting system components. You must remove components; however, you may fit a replacement component where the original was previously removed by another person. You should also be aware of how to leave a system in a safe condition if maintenance tasks cannot be completed. This covers both the physical systems and the job documentation.

Performance criteria

You must be able to:

1. work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
2. follow the relevant maintenance schedules to carry out the required work
3. carry out the maintenance activities within the limits of your personal authority
4. carry out the maintenance activities, and replace components in the specified sequence and in an agreed timescale
5. report any instances where the maintenance activities cannot be fully met or where there are identified defects outside the planned schedule
6. complete relevant documentation in accordance with organisational requirements
7. dispose of waste materials in accordance with safe working practices and approved procedures
8. leave the aircraft and system in a safe and appropriate condition, free from foreign object debris on completion of the activities

Knowledge and understanding

You need to know and understand:

1. the specific safety practices and procedures that you need to observe when working with aircraft lighting systems (including any specific legislation, regulations/codes of practice for the activities, equipment or materials)
2. the importance of maintenance on aircraft lighting systems, and impact upon Extended Range Twin-Engine Operations Procedures (ETOPS) systems, Electrical Wiring Interconnect Systems (EWIS), legislation and local procedures
3. the hazards associated with removing, fitting and testing aircraft lighting system components, and with the tools and equipment used, and how to minimise them and reduce any risk
4. the requirements and importance of understanding and applying human factors as defined by the regulatory requirements and the potential impact if these are not adhered to
5. the protective equipment that you need to use for both personal protection (PPE) and protection of the aircraft
6. what constitutes a hazardous voltage and how to recognise victims of electric shock
7. how to reduce the risks of a phase to earth shock (such as insulated tools, rubber matting and isolating transformers)
8. the importance of aircraft husbandry and of ensuring that, throughout the maintenance activity, the aircraft and work area are maintained free from foreign objects, and the implications of FOD to the safety of the aircraft
9. how to extract and use information from aircraft manuals, log books, flight logs, charts, circuit and physical layouts, specifications, symbols used in aircraft lighting systems, and other documents needed in the maintenance process
10. how to carry out currency/issue checks on the specifications you are working with
11. terminology used in aircraft lighting systems, and the use of system diagrams and associated symbols
12. the principles of operation of the lighting system being worked on, and the

function of the various units within the system

13. the various mechanical fasteners that are used, and their methods of removal and replacement (such as threaded fasteners, special securing devices)

14. the importance of using the specified fasteners for the particular installation and why you must not substitute others

15. the various types of electrical connector that are used, methods of unlocking, orientation indicators and locating and locking-in of the connections

16. the techniques used to remove components from aircraft lighting systems without damage to the components or surrounding structure

17. the importance of applying electrostatic discharge (ESD) avoidance procedures when working on sensitive equipment or devices

18. the techniques used to position, align, adjust and secure the replaced components to the aircraft without damage to the components or surrounding structure

19. the need to check that replacement components have the correct part/identification markings and accompanying release documentation

20. procedures for ensuring that you have the correct tools, equipment, components and fasteners for the activities

21. why electrical bonding is critical, and why it must be both mechanically and electrically secure

22. the tools and equipment used in the maintenance activities and their calibration/care and control procedures

23. why tool/equipment control is critical and what to do if a tool or piece of equipment is unaccounted for on completion of the activities

24. the problems that can occur with the maintenance operations and how these can be overcome

25. how to recognise defects in the lighting systems (such as faulty switches, incorrectly seated plugs and sockets, ineffective fasteners, foreign object damage or contamination)

26. how to carry out routine checks and servicing of the aircraft lighting system (including emergency lighting checks)

27. the need to check that cabin/cockpit switches and circuit breakers are in the correct position before applying any form of external power (such as electrical, hydraulic, air or vacuum)

28. the types of test to be carried out on the aircraft lighting system and the test equipment to be used

29. the methods and procedures to be used to carry out the various tests on the

lighting system

30. how to record the results of each individual test and the documentation that must be used

31. how to analyse the test results and how to make valid decisions about the acceptability of the lighting system

32. the procedures to be followed if the equipment or system fails to meet the test specification

33. the recording documentation to be completed for the activities undertaken and where appropriate, the importance of marking and identifying specific pieces of work in relation to the documentation

34. the procedure for the safe disposal of waste materials and scrap components

35. the extent of your own authority and to whom you should report if you have problems that you cannot resolve

Scope/range related to performance criteria

1.

Carry out all of the following during the maintenance of the aircraft lighting system:

- 1.1 ensure that appropriate authorisation to work on the aircraft is obtained, and observe all relevant isolation and safety procedures
- 1.2 obtain and use the correct documentation (such as job instructions, technical instructions, aircraft manuals and maintenance documentation)
- 1.3 obtain the correct tools and equipment for the activity, and check that they are in a safe, tested and usable condition and within current calibration dates
- 1.4 adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work
- 1.5 ensure that the relevant safety devices and mechanical/physical locks are in place (where appropriate)
- 1.6 where appropriate, apply electrostatic discharge (ESD) avoidance procedures
- 1.7 use approved removal, fitting and testing techniques and procedures at all times
- 1.8 return tools and equipment to the correct storage location on completion of the activities
- 1.9 ensure that work carried out is correctly documented and recorded
- 1.10 ensure that any outstanding tests are correctly documented

2.

Carry out maintenance on three of the following parts of aircraft lighting systems:

- 2.1 flight compartment and annunciator panel (such as direct and indirect illumination of work areas, panels and instruments)
- 2.2 passenger compartment (such as cabin dome lights, reading lights, toilet, galley, lounges and coat rooms)
- 2.3 cargo and service compartments
- 2.4 exterior lighting (such as landing, navigation, wing illumination, position indicating, rotating, taxi and courtesy)
- 2.5 additional lighting (such as search lights, spot lights, flood lights)
- 2.6 emergency lighting (such as low level, inertia flashlights, lanterns)

3.

Remove and fit six different lighting system components (at least four must be from group A):

Group A

1. rotating beacon
2. courtesy lights
3. master warning lights/attention getters

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4. strobe light
5. low level emergency lights
6. landing lights
7. portable emergency torches
8. cabin dome lights
9. wing illumination lights
10. ice lights
11. reading lights
12. position lights
13. strobe anti-collision lights and power/synchronising units
14. illuminated signs
15. navigation lights
16. taxi lights

Group B

17. switches
18. dimming equipment
19. relays
20. inertia flash lights
21. wires/cables
22. connectors/plugs/sockets
23. light fixtures
24. batteries
25. other specific components

1.

Carry out fifteen of the following maintenance activities:

- 1.1 removing access panels and covers to expose components to be removed
- 1.2 carrying out fault diagnosis and system checks
- 1.3 preparing the system for maintenance (such as isolating)
- 1.4 disconnecting electrical connections
- 1.5 refitting components in the correct position, orientation and alignment
- 1.6 removal of bonding
- 1.7 removing cable securing devices
- 1.8 setting and adjusting replaced components
- 1.9 removing securing devices and mechanical fasteners
- 1.10 making mechanical connections
- 1.11 supporting equipment to be removed
- 1.12 making electrical connections
- 1.13 dismantling equipment to an appropriate level
- 1.14 carrying out bonding
- 1.15 covering (protecting) exposed components and wires
- 1.16 installing cable securing devices
- 1.17 checking components for serviceability

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- 1.18 torque loading as required
- 1.19 replacing damaged/defective components
- 1.20 carrying out functional checks of the system
- 1.21 carrying out area inspections prior to task close down

2.

Service/check aircraft lighting systems, to include carrying out two of the following:

- 2.1 perform emergency lighting system check
- 2.2 check all flight compartment and passenger compartment lights and replace any found defective
- 2.3 check all cargo and service compartment lights and replace any found defective
- 2.4 check all exterior lighting and replace any found defective
- 2.5 check portable emergency torch lights

3.

Carry out two of the following tests/checks on aircraft lighting systems:

- 3.1 functional check
- 3.2 built in test equipment BITE test
- 3.3 emergency power failure checks
- 3.4 'special-to-type' tests

Using two of the following:

- 5. external power source
- 6. aircraft power source
- 7. 'special-to-type' test sets

1.

Complete the relevant paperwork, to include one from the following and pass it to the appropriate people:

- 1.1 job cards/work sheets
- 1.2 computer records
- 1.3 aircraft technical log
- 1.4 aircraft cabin log
- 1.5 aircraft log book

2.

Carry out maintenance on aircraft lighting systems in compliance with one of the following:

- 2.1 Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
- 2.2 Extended Range Twin-Engine Operations Procedures (ETOPS) (where appropriate)
- 2.3 Ministry of Defence (MoD)
- 2.4 Military Aviation Authority (MAA)
- 2.5 Aerospace Quality Management Standards (AS)

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- 2.6 Federal Aviation Authority (FAA)
- 2.7 aircraft maintenance manual/approved change documentation (service bulletin)
- 2.8 manufacturers standards and procedures

Behaviours

You will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as:

- strong work ethic
- positive attitude
- team player
- dependability
- responsibility
- honesty
- integrity
- motivation
- commitment

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