SEMAE3110

Testing installed aircraft assisted escape systems (AAES)

Overview

This standard identifies the competences you need to test installed aircraft assisted escape systems (AAES), in accordance with approved procedures. It includes the testing of equipment and components associated with ejection seats, canopy jettison and fragmentation systems and other systems, as applicable to the aircraft type. You will be required to select the appropriate tools and equipment to use, based on the operations to be performed and the systems to be tested. The complexity of tests involved will include visual inspection, continuity checks, `no volt' checks, pressure leakage checks and system component tests.

Your responsibilities will require you to comply with organisational policy and procedures for the tests undertaken on aircraft assisted escape systems and to report any problems with the testing activities that you cannot personally resolve or that are outside your permitted authority, to the relevant people. You will be expected to work with a minimum of supervision and instruction, taking personal responsibility for your own actions and for the quality and accuracy of the tests that you carry out.

Your underpinning knowledge will provide a good understanding of your work and will provide an informed approach to applying test procedures for aircraft assisted escape systems. You will understand the escape system under test and its application and will know about the test equipment and test techniques, in adequate depth to provide a sound basis for carrying out the activities, correcting faults and ensuring that the tested system performs to the required specification.

You will understand the safety precautions required when testing aircraft assisted escape systems, in particular those associated with explosive devices, for which personnel must be authorised and fully conversant. You will be required to demonstrate safe working practices throughout and will understand the responsibility you owe to yourself and others in the workplace.

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 appropriate procedures for use of tools and equipment to carry out the required tests
3. set up and carry out the tests using the correct procedures and within agreed timescales
4. record the results of the tests in the appropriate format
5. review the results and carry out further tests if necessary
6. leave the aircraft and escape 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 testing aircraft assisted escape systems (such as any specific legislation, regulations/codes of practice for the activities, equipment or materials)
2. the health and safety requirements of the work area where you are carrying out the activities and the responsibility these requirements place on you
3. the safety procedures that must be carried out before work is started on the aircraft
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 clothing and equipment (PPE) to be worn and where it can be obtained
6. hazards associated with testing aircraft assisted escape systems and with the tools and equipment used and how to minimise them and reduce any risk
7. the precautions to be taken to prevent electrostatic discharge (ESD) damage to circuits and sensitive components (such as use of earthed wrist straps)
8. what constitutes a hazardous voltage and how to recognise victims of electric shock
9. how to reduce the risks of a phase to earth shock (such as insulated tools, rubber matting and isolating transformers
10. the correct operating procedures of the system being tested
11. electrical bonding specifications and their importance
12. how to extract and use information from engineering drawings and related specifications
13. how to obtain the required test schedules and specifications for the aircraft system being tested and how to check their currency and validity
14. how to read and interpret the test schedules and specifications
15. the types of test that are to be carried out on the installed assisted escape systems (such as visual inspections, continuity tests, no volt' tests, pressure leakage checks, and

special-to-type' tests)
16. the methods and procedures to be used to carry out the various tests on the aircraft assisted escape systems
17. the test equipment to be used and its application for particular tests
18. calibration of test equipment (where applicable) and the requirement for currency/issue checks
19. the fault finding techniques to be used if the system fails the tests
20. the techniques, methods and procedures to be used during the tests
21. 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
22. the principle of operation of the system under test and the function of the individual components within the system
23. the importance of carrying out the tests in the specified sequence
24. how to record the results of each individual test and the documentation that must be used for this
25. from whom to seek authorisation if you need to alter or change the test procedures
26. how to analyse the test results and how to make valid decisions about the acceptability of the system
27. problems that can occur with the testing activities and how they can be overcome
28. any required environmental controls relating to the testing
29. the documentation to be completed at the end of the testing activities
30. the extent of your own responsibility 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 testing of the aircraft assisted escape systems:

1.1 obtain and use the appropriate documentation (such as job instructions, test schedule, test procedures, history sheets, flight logbook, aircraft standards and other relevant documentation)
1.2 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
1.3 provide and maintain a safe working environment for the testing activities
1.4 obtain the correct tools and equipment for the activity and check that they are in a safe, tested and usable condition and within current certification/calibration date
1.5 obtain clearance to work on the aircraft and observe all relevant isolation and safety procedures
1.6 ensure that safe working distance procedures are set up (where appropriate)
1.7 carry out the tests using the specified techniques and procedures
1.8 return all tools and equipment to the correct location on completion of the testing activities

2.

Test two of the following aircraft assisted escape systems, to ensure that correct procedural operation occurs:

2.1 ejection seats
2.2 canopy jettison/fragmentation systems
2.3 night vision goggles (NVG) system
2.4 other specific system

3.

Test aircraft assisted escape systems using the following test equipment:

3.1 'special-to-type' test sets

plus two more from the following:

2. safety ohmmeter
3. air pressure gauges
4. connecting equipment
5. multi meter
6. other specific test device

1.

Carry out three the following types of test:

1.1 'no volts' check
1.2 system components tests
1.3 visual inspection
1.4 continuity checks
1.5 pressure leakage checks
1.6 'special-to-type' tests

2.

Deal with two of the following levels of complexity during the testing activities:

2.1 equipment with no faults
2.2 equipment with faults
2.3 equipment with intermittent faults

3.

Use two of the following fault finding techniques:

3.1 six point
3.2 input-to-output
3.3 equipment self-diagnostics
3.4 injection and sampling
3.5 half-split
3.6 function testing
3.7 emergent problem sequence
3.8 unit substitution

4.

Review and record the fault symptoms and history of problems, using four of the following sources:

4.1 the person who reported the fault
4.2 aircraft documentation
4.3 monitoring equipment
4.4 sensory input (such as sight, sound, smell, touch)
4.5 investigation reports data sheets
4.6 fault records
4.7 equipment records/history
4.8 operation of the equipment

5.

Carry out tests in accordance with one of the following standards:

5.1 Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
5.2 Ministry of Defence (MoD)
5.3 Military Aviation Authority (MAA)
5.4 Aerospace Quality Management Standards (AS)
5.5 customer standards and requirements
5.6 Federal Aviation Authority (FAA)
5.7 company standards and procedures
5.8 BS, ISO or BSEN standards and procedures
5.9 manufacturers standards and procedures

6.

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

6.1 computer records
6.2 record/history cards
6.3 job cards
6.4 aircraft service/flight log
6.5 other specific recording method

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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