SEMAE3104

Testing uninstalled aircraft assisted escape system (AAES) components

Overview

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

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 system components. You will understand the component 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 the aircraft assisted escape system components. 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 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 uninstalled aircraft assisted escape system components (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 testing the system components
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 uninstalled aircraft assisted escape system components and with the tools and equipment used and how to minimise them and reduce any risks
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/components 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 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 to be carried out on the uninstalled aircraft assisted escape systems (such as visual checks, continuity tests, no volt' tests, pressure leakage tests, system component tests andspecial-to-type' tests)
16. the methods and procedures to be used to carry out the various tests on the aircraft assisted escape system components
17. test equipment to be used and its application for particular tests
18. the calibration of test equipment (where applicable) and the

currency/issue checks to be done

19. the fault finding techniques to be used if the components fail 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
25. from whom to seek authorisation if you need to alter or change the test procedures
26. how to analyse the test results and 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 uninstalled aircraft assisted escape system components:
    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)
    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
    3. provide and maintain a safe working environment for the testing activities
    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
    5. obtain clearance to work on the component and observe all relevant isolation and safety procedures
    6. ensure that safe working distance procedures are set up (where appropriate)
    7. carry out the tests using the specified techniques and procedures
    8. return all tools and equipment to the correct location on completion of the testing activities
2. Test four of the following aircraft assisted escape system components:
    1. ejection guns
    2. barostatic time release units
    3. main beams
    4. breech type time delay units
    5. seat pans
    6. harness power retraction units
    7. drogue guns
    8. parachute deployment units
    9. mode selectors
    10. seat sequencing computer
    11. command ejection units
    12. personal equipment connectors
    13. remote rocket initiators
    14. gas operated firing units
    15. standard firing units
    16. automatic backup unit

17. power supply unit or battery units
18. other specific system components

3. Test aircraft assisted escape system components, using the following:

    1. 'special-to-type' test rigs

And two more of the following:
2. safety ohmmeter
3. air pressure gauges
4. multimeter
5. connecting equipment
6. other specific test devices

4. Carry out three of the following types of test:

    1. 'no volts' check
    2. system components tests
    3. continuity checks
    4. pressure leakage checks
    5. visual inspection
    6. 'special-to-type' tests

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

    1. equipment with no faults
    2. equipment with faults
    3. equipment with intermittent faults

6. Use two of the following fault finding techniques:

    1. six point
    2. input-to-output
    3. equipment self-diagnostics
    4. half-split
    5. function testing
    6. emergent problem sequence
    7. injection and sampling
    8. unit substitution

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

    1. the person who reported the fault
    2. sensory input (such as sight, sound, smell, touch)
    3. monitoring equipment
    4. fault records

5. investigation reports data sheets
6. equipment records/history
7. aircraft documentation
8. operation of the equipment

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

    1. Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
    2. Ministry of Defence (MoD)
    3. Military Aviation Authority (MAA)
    4. Aerospace Quality Management Standards (AS)
    5. Federal Aviation Authority (FAA)
    6. BS, ISO or BSEN procedures
    7. customer standards and requirements
    8. company standards and procedures
    9. manufacturer standards and procedures

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

    1. computer records
    2. record/history cards
    3. job cards
    4. aircraft service/flight log
    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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