SEMME3019

Setting to work, testing and trialling marine electrical rotating machines and domestic equipment

Overview

This standard identifies the competences you need to set to work, test and trial marine electrical rotating machines and domestic equipment, in accordance with approved procedures. You will be required to use appropriate drawings, specifications and test documentation to set up, test and trial the various types of equipment. You will be expected to use the specified/appropriate techniques to carry out the appropriate setting up, testing and trialling procedures. The equipment to be set up, tested and trialled will include single and three-phase motors of various power ratings, their starters and control/protection devices, as fitted to pumps, compressors, fans, winches and electrical components of domestic/auxiliary equipment such as heaters, refrigerators, dishwashers and laundry support facilities.

The tests to be carried out will include protective over-voltage and current limiters, resistance values, load current and earth checks. You will be expected to review the outcome of the tests, compare the results with appropriate standards, determine the action required and to record and report the results in the appropriate format.

Your responsibilities will require you to comply with organisational policy and procedures for the setting up, testing and trialling activities undertaken and to report any problems with these activities that you cannot personally resolve, or are outside your permitted authority, to the relevant people. 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 appropriate setting up, testing and trialling techniques and procedures on marine electrical rotating machinery and domestic equipment. You will understand the function of the electrical machine and equipment being set to work and tested and its application and will know about the test equipment and methods, in adequate depth to provide a sound basis for carrying out the activities, correcting faults and ensuring that the work output is to the required specification.

You will understand the safety precautions required when carrying out the set to work, testing and trialling operations, especially those for isolating the equipment and for taking the necessary safeguards to protect yourself against direct and indirect electric shock. You will be required to demonstrate safe and (in the case of food associated equipment) hygienic and 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 all relevant setting up and operating specifications for the products or assets being configured 3. follow the defined procedures and set up the equipment correctly ensuring that all operating parameters are achieved 4. set to work, test and trial machines and equipment using appropriate methods and techniques 5. deal promptly and effectively with problems within your control and report those that cannot be solved 6. check that the configuration is complete and that the equipment operates to specification 7. complete relevant documentation in line with organsiational procedures

Knowledge and understanding

You need to know and understand:

1. the specific safety practices and procedures that you need to observe when carrying out the setting up, testing and trialling activities on marine electrical rotating machines and domestic equipment (including any specific legislation, regulations and codes of practice for the activities, equipment or materials, such as IET regulations or food hygiene regulations)
2. the health and safety requirements of the work area where you are carrying out the activities and the responsibility they place on you
3. the safety procedures that must be carried out before work is started on setting up, testing and trialling the marine electrical rotating machines and domestic equipment
4. the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the testing and trialling activities
5. the hazards associated with testing marine electrical rotating machines and domestic equipment and with the tools and test equipment that is used and how they can be minimised
6. how to recognise and deal with emergencies and the procedures to be followed (such as methods of safely evacuating and closing down of compartments in the case of fire or other major incident, first aid, fire fighting and resuscitation of personnel)
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. how to obtain and interpret drawings, circuit and physical layouts, charts, test specifications, manufacturers' manuals, graphical electrical symbols and other documents needed in the setting and testing process
11. how to carry out currency/issue checks of the specifications you are working with
12. the correct operating procedures of the system being set up and tested
13.

the components to be set to work and their function within the particular unit
14. the adjustments/corrections/tuning required to bring the equipment/system to operational standard through full range parameters
15. electrical bonding, earthing and induced current specifications and their importance
16.
types of test equipment to be used and their selection for particular types of tests
17.
how to calibrate the test equipment to be used, or the organisational procedures for ensuring that the test equipment is maintained correctly calibrated
18. how to connect the appropriate test equipment for the measurement of resistance, current, voltage, power, capacitance, inductance, power factor and protective device disconnection/trip times
19. the various testing methods and procedures, as recommended in approved electrical codes of practice and how to apply them to different operating conditions
20. how to recognise defects (such as under or over performance)
21. the various fault finding techniques that can be used if the system fails the test
22. displaying/recording test results and the documentation to be used
23. how to interpret the test readings obtained and the significance of the readings gained
24. how to analyse test results using tables in approved electrical codes of practice
25. authorisation procedures for changes to test procedures
26. the importance of ensuring that test equipment is used only for its intended purpose and within its specified range and limits
27. potential problems or errors that could occur and which may affect the test results and how they can be avoided
28. the environmental control and company operating procedures relating to the testing activities
29. the documentation required and the recording procedures to be followed after the test
30. the extent of your own responsibility and whom you should report to if you have problems that you cannot resolve

Scope/range related to performance criteria

1.

Carry out **all** of the following during the setting to work, testing and trialling activities:

1.1
use the correct issue of the agreed setting and testing procedures and quality documentation
1.2
adhere to risk assessment, COSHH and other relevant safety standards
1.3 check that all tools and test equipment are within calibration dates
1.4 obtain clearance to work on the system and observe power isolation and safety procedures
1.5 provide safe access and working arrangements for the testing area
1.6 carry out the setting, testing and trialling activities, using safe and approved techniques and procedures
1.7 ensure that the testing equipment is operated within its specification range
1.8 return all tools and equipment to the correct location on completion of the activities
1.9 leave the work area in a safe condition and to the prescribed category of cleanliness

2. Set to work, test and trial **four** of the following types of electrical equipment:

1. single phase motors

1. three-phase motors
2. DC motors
3. pumps
4. fans
5. compressors
6. winches and hoists

3. Set to work, test and trial **three** of the following types of marine domestic equipment:

1. cooking ranges

1. fridge-freezer units
2. washers and driers
3. dish washers
4. extractors
5. garbage disposal units
6. microwave units
7. fryers

8. presses
9. heaters
10. vegetable preparation units
11. sanitary units

4. Use appropriate equipment to carry out **all** of the following tests, as applicable to the equipment being set to work:

1. insulation resistance values

1. load current
2. voltage levels
3. continuity and earth (pre-start)
4. resistance
5. capacitance
6. frequency values
7. power rating
8. safety device trip speed
9. control position calibrations
10. inductance
11. specialist tests (such as speed, sound, light, temperature)

5. Deal with **two** of the following complexities during the setting up and testing activities:

1. equipment with no faults

1. equipment with faults
2. equipment with intermittent faults

6. Use **three** of the following fault finding techniques:

1. half-split

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

7. Complete relevant documentation in line with organisational procedures using **one** of the following:

1. installation records

1. acceptance documentation
2. system log
3. job cards
4. other specific recording method

8. Set to work marine electrical rotating machines and domestic equipment which complies with **one** of the following standards:

1. BS or ISO standards and procedures

1. customer (contractual) standards and requirements
2. company standards and procedures
3. specific equipment requirements/manufacturer's data
4. recognised compliance agency/body's standards
5. other accepted international standards

Behaviours

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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