SEMME2031

Assisting in the installation of marine mechanical equipment

Overview

This standard identifies the competences you need to assist in the installation of marine mechanical equipment, in accordance with approved procedures. The installation activities will involve installing equipment at component or unit level, on a variety of marine mechanical assemblies and sub-assemblies such as gear boxes, stabilisers, pumps, propeller shafts (including controllable pitch propeller (CPP) systems), steering and rudder arrangements, aircraft lifts, ballast arrangements, engines, weapons equipment, sewage treatment, reverse osmosis and low pressure steam plant, pantry and galley equipment and other specific marine mechanical equipment.

Your responsibilities will require you to comply with organisational policy and procedures for the installation of the marine mechanical equipment and to report any problems with the installation activities that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You will be expected to work with either a high level of supervision, or as a member of a team. You will take personal responsibility for your own actions and for the quality and accuracy of the work that you carry out. Where team working is involved, you must demonstrate a significant personal contribution during the team activities in order to satisfy the requirements of the standard and competence in all the areas required by the standard must be demonstrated.

Your underpinning knowledge will be sufficient to provide a sound basis for your work and will provide an informed approach to applying the appropriate mechanical installation techniques and procedures. You will have an understanding of the basic knowledge behind the equipment being installed, and its application and will know about the installation equipment and fastening devices, in adequate depth to provide a sound basis for carrying out the activities to the required specification.

You will understand the safety precautions required when carrying out the installation of the marine mechanical equipment, especially those for isolating and/or depressurising the 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, both ashore and afloat.

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 drawings and specifications for the installation being carried out
3. use the correct tools and equipment for the installation operations and check that they are in a safe and usable condition
4. assist in the installation, positioning and securing of the equipment and components in accordance with the specification
5. ensure that all necessary connections to the equipment are complete
6. deal promptly and effectively with problems within your control and report those that cannot be solved
7. complete relevant documentation in accordance with organisational requirements
8. check that the installation is complete and that all components are free from damage

Knowledge and understanding

You need to know and understand:

1. the specific safety practices and procedures that you need to observe when installing marine mechanical equipment (including any specific legislation, regulations/codes of practice for the activities, equipment or materials)
2. the procedures to be carried out before starting work on the installation (such as obtaining permits to work, obtaining and complying with risk assessments and other health and safety requirements)
3. the health and safety requirements of the work area where you are carrying out the activities and the responsibility they place on you
4. the hazards associated with installing marine mechanical equipment and with the tools and equipment used and how these can be minimised
5. how to recognise and deal with emergencies and the procedures to be followed (such as methods of safely evacuating and closing down compartments in the case of fire or other major incident)
6. the protective equipment (PPE) that you need to use for both personal protection and protection of the equipment or system
7. how to obtain and interpret the job instructions, drawings, specifications and other documentation used for the installation activities
8. the basic operating principles of the marine mechanical equipment being installed
9. the components to be installed and their function within the particular marine mechanical equipment
10. the various mechanical fasteners that will be used and their method of installation (including threaded fasteners, special securing and locking devices)
11. the importance of using the specified fasteners and locking devices for the particular installation and why you must not substitute others
12. why securing devices need to be locked and labelled and the different methods that are used
13. what the torque loading requirements are on the fasteners and what to do if these loadings are exceeded or not achieved
14. the quality control procedures to be followed during the installation operations
15. procedures for ensuring that you have the correct tools, equipment, components and fasteners for the activities
16. the techniques used to position, align, adjust and secure the components,

without damage
17. methods of lifting, handling and supporting the components/equipment during the installation activities
18. the use of seals, sealant and adhesives and the precautions to be taken
19. why electrical bonding is critical and why it must be both mechanically and electrically secure
20. the procedure for the safe disposal of waste materials
21. the importance of ensuring that the completed installation is free from foreign object debris and that any exposed components or pipe ends are correctly covered/protected
22. the tools and equipment used in the installation activities and their care and control procedures
23. why tool/equipment control is critical
24. the problems that can occur with the installation operations and how these can be overcome
25. the recording documentation to be completed for the activities undertaken
26. 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 installation of the marine mechanical equipment:

1.1 use the correct issue of the structure/vessel/craft installation drawings and documentation
1.2 adhere to risk assessment, COSHH and other relevant safety standards
1.3 obtain clearance to work on the system and observe the appropriate power isolation and safety procedures
1.4 maintain safe access and working arrangements for the installation area
1.5 carry out the installation activities using appropriate techniques and procedures
1.6 leave the work area in the prescribed category of cleanliness on completion of the activities

2.

Take part in the installation of three of the following types of marine mechanical equipment:

2.1 propulsion gear box (single reduction, double reduction, V' orZ' drive)
2.2 pump jet propulsion unit
2.3 stabiliser (fixed or retractable)
2.4 pump (salt water, fresh water, fuel oil or lubricating)
2.5 propeller shaft (fixed blade or controllable pitch propeller (CPP) systems)
2.6 steering gear and rudder arrangements (hydraulic or mechanical)
2.7 thrusters (bow or stern)
2.8 clutch and coupling (gas turbine, steam turbine, diesel or steam reciprocating engine)
2.9 processing plant (sewage treatment, reverse osmosis, distillation or garbage compactor)
2.10 liquid ballast arrangements (pump or isolating valve)
2.11 engine (propulsion or power generation)
2.12 compressor (high pressure or low pressure)
2.13 pantry and galley equipment (boiling copper, oven, dish washer or garbage disposal unit)
2.14 low pressure steam plant (auxiliary boiler, calorifier, fuel or oil heater)
2.15 weapons equipment (gun mounting, missile mounting or weapon loading system)
2.16 lifting and handling equipment (replenishment rig, aircraft lift, cargo hatch, windlass or capstan)
2.17 other specific marine mechanical equipment

3.

Assist in carrying out eight of the following installation methods and techniques:

3.1 marking/setting out of locating and securing positions

3.2 lifting and handling
3.3 preparing holes (such as drilling, cleaning out threads)
3.4 lubricating
3.5 positioning equipment/components
3.6 making pipe connections
3.7 levelling equipment
3.8 connecting wires and cables
3.9 aligning equipment
3.10 securing using mechanical fixings
3.11 assembly/connection of components or sub-assemblies
3.12 securing using adhesives
3.13 setting timing
3.14 sealing
3.15 setting and adjusting equipment
3.16 applying screw fastening locking devices
3.17 torque setting of mechanical fasteners
3.18 ensuring system cleanliness (such as covering exposed pipe ends or components)
3.19 earth bonding

4.

Use six of the following types of fasteners and securing devices:

4.1 swing bolts
4.2 studs with nuts
4.3 screws
4.4 wing nuts
4.5 dowels
4.6 bolts
4.7 quick release fasteners
4.8 flexible bellows
4.9 locking devices (such as split, parallel, clevis or taper pin)
4.10 keys/keyways (such as slotted, semi-circular, woodruff, taper)

5.

Produce installations, in accordance with one of the following standards:

5.1 BS, EN or ISO standards and procedures
5.2 customer (contractual) standards and requirements
5.3 company standards and procedures
5.4 specific system requirements
5.5 recognised compliance agency/body's standards
5.6 other accepted international standards

6.

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

6.1 installation record

6.2 job cards
6.3 time sheets
6.4 system 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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