SEMME2036

Carrying out maintenance on marine fuel systems and equipment

Overview

This standard identifies the competences you need to assist in conducting maintenance activities on marine fuel systems and equipment, such as for heavy fuel oil, diesel fuel oil, aviation fuel, lubricating oil and liquefied natural gas, without complete removal of the unit(s) for overhaul. You will be required to maintain a range of marine fuel system and equipment items, such as pipework, pumps, filters, strainers, separators, coalescors and isolating valves, in accordance with approved procedures. This will involve dismantling, removing and replacing faulty equipment, at unit or component level, on a variety of marine fuel systems and equipment assemblies.

You will be expected to apply a range of dismantling and assembling methods and techniques, such as proof marking to aid reassembly, dismantling components requiring pressure or expansion/contraction techniques, setting, aligning, adjusting and torque loading components, and making `off-load' checks before starting up the maintained equipment.

Your responsibilities will require you to comply with organisational policy and procedures for the maintenance activities undertaken and to report any problems with these activities, or with the tools and equipment used, that you cannot personally resolve or are outside your permitted authority, to the relevant people. You must ensure that all tools, equipment and materials used in the maintenance activities are removed from the work area on completion of the activities and that all necessary job/task documentation is completed accurately and legibly. 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. When working in a team, you must demonstrate a significant personal contribution to 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 enable you to adopt an informed approach to applying mechanical maintenance procedures to marine fuel systems and equipment. You will have an understanding of dismantling and reassembly methods and procedures and their application. You will know how the equipment functions, and the purpose of individual components, in adequate depth to provide a sound basis for carrying out any repair or

adjustment. In addition, you will have sufficient knowledge of these components to ensure that they are fit for purpose and meet the specifications, thus providing a sound basis for carrying out reassembly.

You will understand the safety precautions required when carrying out the marine maintenance activities, especially those for isolating the equipment. You will also understand your responsibilities for safety and the importance of 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 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 in the specified sequence and in an agreed time scale
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 maintenance records accurately and pass them on to the appropriate person
7. dispose of waste materials in accordance with safe working practices and approved procedures

Knowledge and understanding

You need to know and understand:

1. the health and safety requirements of the area in which the marine maintenance activity is to take place and the responsibility these requirements place on you
2. the isolation and lock-off procedure, or permit-to-work procedure that applies
3. the specific health and safety precautions to be applied during the marine maintenance procedure and their effects on others
4. hazards associated with carrying out maintenance activities on marine fuel systems and equipment (such as explosive fumes, rules on smoking, handling oils, greases, stored pressure/force, misuse of tools, using damaged or badly maintained tools and equipment, not following laid-down maintenance procedures)
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. how to recognise and deal with emergencies (including methods of safely evacuating and closing down of compartments in the case of fire or other major incident and methods of first aid fire fighting and resuscitation of personnel)
7. the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the maintenance process
8. how to obtain and interpret information from job instructions, drawings, specifications, manufacturers' manuals and other documents needed in the maintenance process
9. the procedure for obtaining replacement parts, materials and other consumables necessary for the maintenance
10. the methods and techniques used to dismantle/assemble mechanical equipment (such as release of pressures/force, proof marking, extraction, pressing, alignment)
11. methods of checking that components are fit for purpose, how to identify defects and wear characteristics and the need to replace `lifed' items (such as seals and gaskets)
12. the basic principles of how the equipment functions, its operating sequence, the working purpose of individual units/components and how they interact
13. the uses of measuring equipment (such as micrometers, verniers and other measuring devices)
14. how to make adjustments to components/assemblies to ensure that they

function correctly (such as setting working clearance, setting travel, setting backlash in gears, preloading bearings)
15. the identification and application of different types of locking devices
16. the importance of making `off-load' checks before running the equipment under power
17.
how to check that tools and equipment are free from damage or defects, are in a safe, tested and usable condition and are configured correctly for the intended purpose
18.
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
19. the importance of completing the relevant documentation and/or reports following the maintenance activity
20. the equipment operating and control procedures to be applied during the maintenance activity
21. how to use lifting and handling equipment in the maintenance activity
22. the problems that can occur when carrying out maintenance on marine fuel systems and what to do if they occur
23. the organisational procedure(s) to be adopted for the safe disposal of waste of all types of materials
24. the extent of your own authority and whom you should report to if you have a problem that you cannot resolve

Scope/range related to performance criteria

1.

Carry out all of the following during the maintenance of the marine fuel system/equipment:

- 1.1 undertake the maintenance activities, in conjunction with others involved, to cause minimal disruption to normal working
- 1.2 use the correct issue of drawings, job instructions and procedures
- 1.3 adhere to risk assessment, COSHH and other relevant safety standards
- 1.4 check that the equipment has been safely isolated (such as mechanical, electricity, gas, air or fluids)
- 1.5 maintain safe access and working arrangements for the maintenance area
- 1.6 carry out the maintenance activities, using appropriate techniques and procedures
- 1.7 help to re-connect and return the system to service, on completion of activities
- 1.8 leave the work area in a safe condition and to the prescribed category of cleanliness

2.

Carry out maintenance activities on two of the following types of marine fuel systems:

- 2.1 heavy fuel oil embarkation, transfer and disembarkation
- 2.2 diesel oil embarkation, transfer and disembarkation
- 2.3 lubricating oil embarkation, transfer and disembarkation
- 2.4 aviation fuel embarkation, transfer and disembarkation
- 2.5 liquefied natural gas embarkation, transfer and disembarkation

3.

Carry out maintenance activities on two of the following fuel system components:

- 3.1 separator
- 3.2 pump
- 3.3 filter/strainer
- 3.4 coalescor
- 3.5 isolating valve
- 3.6 system pipework

4.

Carry out all of the following maintenance activities:

- 4.1 dismantling equipment to the appropriate level
- 4.2 setting, aligning and adjusting components
- 4.3 proof marking/labelling of components
- 4.4 tightening fastenings to the required torque
- 4.5 checking components for serviceability
- 4.6 making `off-load' checks before starting up

4.7 replacing all `lifed' items (such as seals, gaskets)
4.8 replenishing oils and greases
4.9 replacing damaged/defective components
4.10 functionally testing the completed system

5.

Maintain marine fuel systems and equipment, 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 job cards
6.2 permit to work/formal risk assessment
6.3 maintenance log or report
6.4 other specific reporting 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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