
Overview

This standard identifies the competences you need to install ancillary systems and equipment in yachts or boats, in accordance with approved procedures. You will be required to use appropriate assembly/installation drawings, specifications and documentation to install the various items of equipment. You will be expected to select the appropriate tools and equipment to use, based on the operations to be performed and the ancillary equipment and components to be installed. The ancillary equipment and components to be installed will include items such as fuel, water, holding tanks and pipework; bow and stern thrusters; trim tabs; pumps (such as sea water, fresh water and jet); gear boxes; steering gear; bearing brackets; seals and propellers; battery charging equipment (such as wind generators and solar panels); lifting equipment (such as anchor windlass, winches and hoists).

The installation activities will include making all necessary checks and adjustments to ensure that the equipment/components are correctly positioned and aligned, have appropriate working clearances, are tightened to the correct torque and that they function as per the specification.

Your responsibilities will require you to comply with organisational policy and procedures for the installation activities undertaken and to report any problems with the installation activities, components or equipment that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You will be expected to ensure that all tools, equipment and materials used in the installation are correctly accounted for on completion of the activities and to complete all necessary job/task documentation accurately and legibly. 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 installation techniques and procedures for yacht or boat ancillary systems and equipment. You will understand the ancillary equipment being installed and its function. You will know about the relevant components, fastening and securing devices, in adequate depth to provide a sound basis for carrying out the activities, correcting faults and ensuring that the completed installation is to the required specification.

You will understand the safety precautions required when carrying out the installation operations. You will be required to demonstrate safe working practices throughout and will understand the responsibility you owe to 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 legislation, regulations, directives and other relevant 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. install, position and secure 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. check that the installation is complete and that all components are free from damage
8. complete relevant documentation in line with organisational procedures

Knowledge and understanding

You need to know and understand:

1. the specific safety practices and procedures that you need to observe when installing ancillary systems and equipment in yachts or boats (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 of the ancillary equipment (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 these requirements place on you
4. 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)
5. the hazards associated with installing yacht or boat ancillary systems and equipment and with the tools and equipment used and how they can be minimised
6. the protective equipment that you need to use for both personal protection (PPE) and protection of the equipment and the vessel/craft
7. what constitutes a hazardous voltage and how to recognise victims of electric shock
8. how to reduce the risks of a phase to earth shock (such as insulated tools, rubber matting and isolating transformers)
9. the interpretation of drawings, standards, quality control procedures and specifications used for the installation (including BS and ISO schematics, symbols and terminology)
10. the basic operating principles of the yacht or boat ancillary systems and equipment being installed
11. the various mechanical fasteners that will be used and their method of installation
12. the importance of using the specified fasteners for the particular installation and why you must not substitute others
13. why securing devices need to be locked and the different methods that are used
14. the torque loading requirements on the fasteners and why this is important
15. the quality control procedures to be followed during the installation operations

16. procedures for ensuring that you have the correct tools, equipment, components and fasteners for the activities
the techniques used to position, align, adjust and secure the ancillary equipment and components to the craft/vessel without damage
17. methods of lifting, handling and supporting the components/equipment during the installation activities
18. the use of seals, sealants 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. how to conduct any necessary checks to ensure the system integrity, functionality, accuracy and quality of the installation
22. how to recognise installation defects (such as, poor seals, misalignment, ineffective fasteners or contamination)
23. 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
24. the tools and equipment used in the installation activities and their calibration/care and control procedures
25. the problems that can occur with the installation of the ancillary equipment and how these can be overcome
26. the recording documentation to be completed for the activities undertaken
27. 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 yacht or boat ancillary systems and equipment:

1. use the correct issue of the vessel/craft assembly/installation drawings and planning documentation
2. adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations, lifting operations and lifting equipment regulations (LOLER)
3. check the calibration dates of tools and equipment to be used
4. obtain clearance to work on the equipment and observe the power isolation procedures
5. ensure that correct part numbers are used (including port or starboard items)
6. return all tools and equipment to the correct location on completion of the installation
7. leave the work area in a safe condition and to the prescribed category of cleanliness

2. Install yacht or boat ancillary equipment and components, to include **six** of the following:

1. bow thrusters
2. stern thrusters
3. trim tabs
4. anchor windlass
5. passerelle
6. generators
7. wind generator
8. solar panels
9. fuel tanks and pipework
10. p-brackets/a-brackets
11. propellers
12. water tanks and pipework
13. holding tanks and pipework
14. helm consoles
15. out drive/Z-drive
16. gearbox
17. steering gear (mechanical, wire, hydraulic, rudder
18. davits
19. jet pumps

20. deck wash
21. bathing platform
22. exhaust system
23. sea water pump
24. winches/hoists/lifting equipment
25. deck fittings (such as bollards, hand rails, rope lashings)
26. stern glands
27. deep sea seals
28. other specific equipment

3. Use **twelve** of the following installation methods and techniques:

1. marking/setting out of locating and securing positions
2. preparing holes (such as drilling, cleaning out threads)
3. positioning equipment/components
4. aligning of equipment
5. levelling of equipment
6. securing by using mechanical fixings
7. assembly/connection of components or sub-assemblies
8. shaft coupling (such as propellers, compressor or pump)
9. setting and adjusting equipment operating parameters (such as timings, working clearance, travel)
10. making flexible hose connections
11. making pipe connections
12. securing by using adhesives
13. torque setting of mechanical fasteners
14. applying screw fastener locking devices
15. sealing to prevent water ingress
16. flushing out pipes and components
17. lubricating components
18. connecting wires and cables
19. carrying out earth bonding
20. lifting and handling
21. ensuring the system cleanliness (such as covering exposed pipe ends or components)

4. Use **five** of the following types of fasteners and securing devices:

1. studs with nuts
2. swing bolts
3. screws
4. wing nuts
5. dowels
6. bolts
7. quick-release fasteners

8. locking devices (such as split, parallel, clevis or taper pin)
9. locking plates or wire locking
10. keys/keyways (such as slotted, semi-circular, woodruff, taper)

5. Install yacht or boat ancillary systems and equipment which comply with **one** of the following:

1. BS or ISO standards and procedures
2. customer (contractual) standards and requirements
3. company standards and procedures
4. specific equipment requirements/manufacturer's data
5. recognised compliance agency/body's standards (such as Lloyds, Boat Safety Scheme, BMEA Code)
6. other accepted international standards

6. Complete the relevant documentation in line with organisational procedures, to include **one** from the following and pass it to the appropriate people:

1. installation records
2. acceptance documentation
3. work acceptance documentation
4. job card
5. time sheet
6. system log
7. other specific recording method

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

Developed by	Enginuity
Version Number	3
Date Approved	31 Mar 2019
Indicative Review Date	29 Apr 2021
Validity	Current
Status	Original
Originating Organisation	Semta
Original URN	SEMME3207
Relevant Occupations	Marine Engineering Trades
Suite	Marine Engineering Suite 3
Keywords	Marine; engineering; yacht; boat; systems; equipment; installation; fastening; components; pumps; thrusters; batteries