

---

## Overview

This standard identifies the competences you need to assist in the installation of marine electrical and electronic equipment, in accordance with approved procedures. The installation activities will involve installing equipment at component or unit level, on a variety of marine electrical assemblies and sub-assemblies, such as single, three phase and direct current power supply and control systems, motors and starters, switchgear and distribution panels, control systems, communication systems, computer systems, weapon systems, navigation systems, sensor systems, computer control systems, lighting and alarm systems, electrical plant, luminaires and domestic electrically powered equipment.

Your responsibilities will require you to comply with organisational policy and procedures for the installation of the marine electrical 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 electrical and electronic 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 electrical and electronic equipment, especially those for ensuring that any power supplies are correctly isolated and locked. 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 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)
2. the health and safety requirements of the work area where you are carrying out the installation activities and the responsibility these requirements place on you
3. the hazards associated with the installation of marine electrical equipment and systems, and with the tools and equipment used and how they can be minimised
4. 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)
5. the protective equipment that you need to use for both personal protection (PPE) and protection of the equipment or system being installed
6. the precautions to be taken to prevent electrostatic discharge (ESD) damage to circuits and sensitive components (such as use of earthed wrist straps)
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. how to obtain and interpret the job instructions, drawings and specifications used for the installation
10. the items, circuits and components to be installed and their function within the particular marine equipment/system being installed
11. the various mechanical fasteners that will be used and their method of installation (including threaded fasteners, special securing and locking devices)
12. the importance of using the specified electrical terminations/connections/fasteners for the particular installation process, and why you must not substitute others
13. why securing devices need to be locked and identified and the different methods that are used
14. the quality control procedures to be followed during the installation operations
15. procedures for ensuring that you have the correct tools, equipment, electrical components and fasteners for the activities
16. the techniques used to position, align, adjust and secure the equipment, components and circuitry to the vessel/compartment structure without damage
17. methods of lifting, handling and supporting the components/equipment during the installation activities

- 
18. the use of seals, sealant, adhesives and anti-electrolysis barriers and the precautions to be taken
  19. why unit electrical bonding/earth prevention and continuity 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 to the category of cleanliness prescribed, that any exposed components or pipe ends are correctly covered/protected and that warning notices are fitted
  22. 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
  23. the problems that can occur with the installation operations and how these can be overcome
  24. the recording documentation to be completed for the activities undertaken
  25. 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 electrical equipment:
  1. use the correct issue of the structure/vessel/craft installation drawings and documentation
  2. adhere to risk assessment, COSHH and other relevant safety standards
  3. obtain clearance to work on the system and observe the appropriate power isolation and safety procedures
  4. maintain safe access and working arrangements for the installation area
  5. carry out the installation activities, using appropriate techniques and procedures
  6. leave the work area in the prescribed category of cleanliness on completion of the activities
2. Take part in the installation of two of the following types of marine electrical equipment:
  1. power generation and distribution equipment and systems
  2. computer equipment and systems
  3. weapons equipment and systems
  4. communication equipment and systems
  5. rotating electrical machines and domestic equipment
  6. navigational equipment and systems
  7. lighting, alarm, detection and monitoring systems
  8. sensor equipment and systems
3. Assist in carrying out eight 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. levelling of equipment
  5. aligning of equipment
  6. securing by using mechanical fixings
  7. connecting wires and cables
  8. earth bonding
  9. cable banding
  10. equipment screening
4. Assist in the installation and connection of five of the following types of electrical components:
  1. wiring looms and cables

- 
2. electrical unit/components
  3. alarms
  4. switches/contactors
  5. power supplies
  6. detection devices
  7. connectors
  8. motors and starters
  9. monitoring devices
  10. overload protection devices
  11. distribution panels
  12. sensors and actuators
  13. back-up battery system
  14. luminaires
  15. electro-mechanical devices
  16. junction boxes
  17. recording devices
  18. computer equipment/peripheral devices
  19. display units
5. Make electrical connections on four of the following cables/terminations:
1. co-axial
  2. overall screened
  3. terminal blocks
  4. tray-mounted sockets
  5. tri-axial
  6. module blocks
  7. multi-pin plugs/sockets
  8. earth bonding points
  9. multicore cables
  10. fibre-optics
  11. crimping
  12. soldering/brazing
  13. steel wired armoured
6. Make two of the following types of mechanical connections:
1. threaded devices
  2. locking devices
  3. screws
  4. torque loaded bolts
  5. quick release fasteners
7. Produce installations which comply with one of the following standards:
1. BS, EN or ISO standards and procedures
  2. customer (contractual) standards and requirements

- 
3. company standards and procedures
  4. specific system requirements
  5. recognised compliance agency/body's standards
  6. other accepted international standards
8. Complete the relevant paperwork, to include one of the following, and pass it to the appropriate people:
1. installation record
  2. job cards
  3. time sheets
  4. system log
  5. 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



SEMME2005

Assisting in the installation of marine electrical and electronic equipment



Developed by	Enginuity
Version Number	2
Date Approved	28 Feb 2018
Indicative Review Date	01 Feb 2021
Validity	Current
Status	Original
Originating Organisation	Semta
Original URN	SEMME2005
Relevant Occupations	Engineering, Engineering and Manufacturing Technologies
Suite	Marine Engineering Suite 2
Keywords	Engineering; marine; assist; install; power supply; control system; distribution panels; motor; starter; switchgear