

Overview

This standard identifies the competences you need to install marine navigational equipment and systems, in accordance with approved procedures. You will be required to use appropriate installation drawings, specifications and documentation to install the various items of equipment. You will be expected to position, align and secure equipment in its correct locations, using specified/appropriate techniques and fastening devices. The equipment to be installed will include distance measuring equipment (DME), very high frequency omni-directional range (VOR), instrument landing system (ILS), auto direction finder (ADF), global positioning system (GPS), Doppler, long range navigation (LORAN), homing, inertial navigation system, navigational radar, electronic chart plotting systems, echo sounding systems retransmission systems, compass and gyro.

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 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 installation techniques and procedures to marine navigational equipment. You will understand the marine navigational systems being installed and their application and will know about the installation techniques, tools and methods, 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 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.

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. install, position and secure the equipment and components in accordance with the specification, using appropriate methods and techniques
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 working with marine navigational systems (including any specific legislation, regulations/codes of practice for the activities, equipment or materials)
2. the health and safety requirements of the work area where you are carrying out the activities and the responsibility these requirements place on you
3. the hazards associated with installing marine navigational 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 of compartments in the case of fire or other major incident, first aid, fire fighting and resuscitation of personnel)
5. the protective equipment that you need to use for both personal protection (PPE) and protection of the vessel and system
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. the interpretation of drawings, standards, quality control procedures and specifications used for the installation (including BS and ISO schematics, symbols and terminology)
10. how to carry out currency/issue checks of the specifications you are working with
11. the components to be installed and their function within the particular marine navigational systems
12. the various mechanical fasteners that will be used and their method of

installation

13. the importance of using the specified fasteners for the particular installation and why you must not substitute others

14. why securing devices need to be locked and labelled and the different methods that are used

15. the torque loading requirements on the fasteners and what to do if these loadings are exceeded or not achieved

16.

the quality control procedures to be followed during the installation operations

17.

the procedures for ensuring that you have the correct types of tools, equipment, components and fasteners for the activities

18. the techniques used to position, align, adjust and secure the components to the vessel, without damage to the structure or surrounding equipment

19.

methods of lifting, handling and supporting the components/equipment during the installation activities

20.

the use of seals, sealants, adhesives and anti-electrolysis barriers and the precautions that need to be taken

21. why electrical bonding is critical and why it must be both mechanically and electrically secure

22. how to conduct any necessary checks to ensure the system integrity, functionality, accuracy and quality of the installation

23. how to recognise installation defects (such as poor seals, misalignment, ineffective fasteners or terminations, damage or contamination)

24.

the importance of ensuring that the completed installation is to the category of cleanliness prescribed and of ensuring that any exposed components or pipe ends are correctly covered/protected and warning notices are fitted

25.

the tools and equipment used in the installation activities and their calibration/care and control procedures

26. 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

27. the problems that can occur with the installation operations and how these can be overcome

- 28. the procedure for the safe disposal of waste materials
- 29. the recording documentation to be completed for the activities undertaken and where appropriate, the importance of marking and identifying specific pieces of work in relation to the documentation
- 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 installation of the navigational equipment and systems:

- 1.1 use the correct issue of vessel/craft/structure installation drawings and technical documentation
- 1.2 use copies of relevant COSHH sheets, risk assessment and marine engineering standards
- 1.3 check the calibration dates of tools to be used
- 1.4 obtain clearance to work in the equipment and observe the power isolation and safety procedures
- 1.5 return all tools and equipment to the correct location on completion of the installation activities
- 1.6 leave the work area in a safe condition and to the prescribed category of cleanliness

2.

Install four of the following marine navigational systems:

- 2.1 distance measuring equipment (DME)
- 2.2 global positioning system (GPS)
- 2.3 long range navigation (LORAN)
- 2.4 electronic charting system
- 2.5 sounders and sonar
- 2.6 retransmission systems
- 2.7 very high frequency omni directional range (VOR/ILS)
- 2.8 doppler
- 2.9 inertial navigation system
- 2.10 compass
- 2.11 auto directional finder (ADF)
- 2.12 homing
- 2.13 navigation radar
- 2.14 gyro/rate gyro

3.

Install all of the following marine navigational system components:

- 3.1 aerials
- 3.2 receiver units
- 3.3 unit trays
- 3.4 indicator units
- 3.5 control units
- 3.6 transmitter units
- 3.7 interface network units

4.

Use all of the following installation methods and techniques:

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- 4.1 levelling and aligning
- 4.2 earth bonding
- 4.3 taking ESD precautions
- 4.4 screening
- 4.5 securing and locking

5.

Use three of the following types of mechanical securing connections:

- 5.1 threaded fasteners
- 5.2 locking devices
- 5.3 screws
- 5.4 torque load bolts
- 5.5 quick-release fasteners

6.

Make five of the following types of electrical connection:

- 6.1 co-axial
- 6.2 overall screened
- 6.3 terminal blocks
- 6.4 tri-axial
- 6.5 module blocks
- 6.6 free plugs and sockets
- 6.7 multicore cables
- 6.8 fibre-optics
- 6.9 multi-pin plugs/sockets
- 6.10 tray-mounted sockets
- 6.11 earth bonding points

7.

Produce installations which comply with one of the following standards:

- 7.1 BS or ISO standards and procedures
- 7.2 company standards and procedures
- 7.3 specific system requirements
- 7.4 customer (contractual) standards and requirements
- 7.5 IET Regulations (current issue)
- 7.6 recognised compliance agency/body's standards
- 7.7 other accepted international standards

8.

Complete the relevant documentation, to include one from the following, and pass it to the appropriate people:

- 8.1 installation records
- 8.2 system log
- 8.3 job cards
- 8.4 work authorisation documents
- 8.5 acceptance documentation
- 8.6 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

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