

## Overview

This standard identifies the competences you need to install marine weapons equipment and systems, in accordance with approved procedures. It covers both surface and underwater vessels and includes units and components associated with guns, missiles, torpedoes, depth charges and other systems, as applicable to the vessel type. You will be required to select the appropriate tools and equipment to use, based on the operations to be performed and components to be installed.

The weapon components to be installed will include items such as laser and radar, visual and sonar guidance, weapons carriers/deliverers, wiring looms, fusing units, firing units, mechanical and electrical controls and safety devices. The installation activities will include making all necessary checks and adjustments, to ensure that components are correctly positioned and aligned, have appropriate travel and/or working clearances and are tightened to the correct torque.

Your responsibilities will require you to comply with organisational policy and procedures for the activities undertaken 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 ensure that all tools, equipment and materials used in the installation are correctly accounted for on completion of the activities and that all necessary job/task documentation is completed 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 installation procedures to marine weapons systems. You will understand the weapon system and its application and will know about the components, tools and equipment used and the installation requirements, 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 working on the armament system and with its associated tools and equipment. You will be required to demonstrate safe working practices throughout and will understand the responsibility you owe to yourself and others in the workplace.

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## 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 weapon 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 weapon 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 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, anti-static mats, special packaging and handling areas)
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 use and extract information from engineering drawings and related specifications (to include symbols and conventions to appropriate BS or ISO standards) in relation to work undertaken
10. how to interpret first and third angle drawings, imperial and metric systems of measurement
11. how to carry out currency/issue checks of the specifications you are working with
12. the components to be installed and their function within the particular weapon system
13. the various mechanical fasteners that will be used and their method of installation
14. the importance of using the specified fasteners for the particular installation and why you must not substitute others

## Installing marine weapons equipment and systems

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15. why securing devices need to be locked and labelled and the different methods that are used
16. the torque loading requirements on the fasteners and what to do if these loadings are exceeded or not achieved
17. the quality control procedures that need to be followed during the installation operations
18. the procedures for ensuring that you have the correct tools, equipment, components and fasteners for the activities
19. the techniques used to position, align, adjust and secure the components to the vessel/craft/structure, without damage
20. methods of lifting, handling and supporting the components/equipment during the installation activities
21. how to minimise stress on pipework/connections and the importance of supporting at suitable intervals
22. the use of seals, sealants, adhesives and anti-electrolysis barriers and the precautions that need to be taken
23. why electrical bonding is critical and why it must be both mechanically and electrically secure
24. how to conduct any necessary checks to ensure the system integrity, functionality, accuracy and quality of the installation
25. how to recognise installation defects (such as leaks, poor seals, misalignment, ineffective fasteners or terminations, damage or contamination)
26. the importance of ensuring that the completed installation is to the prescribed category of cleanliness and of ensuring that any exposed components or pipe/cable ends are correctly covered/protected
27. the tools and equipment used in the installation activities and their calibration/care and control procedures
28. 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
29. the problems that can occur with the installation operations and how these can be overcome
30. the procedure for the safe disposal of waste materials
31. 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

32. the extent of your 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 weapons 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 on the equipment/system and observe all relevant isolation and safety procedures
- 1.5 return all tools and equipment to the correct location on completion of the activities
- 1.6 leave the work area in a safe condition and to the prescribed category of cleanliness

2.

Install two of the following marine weapon systems:

- 2.1 surface-to-surface missile
- 2.2 guidance equipment
- 2.3 weapons hoists
- 2.4 surface-to-air missile
- 2.5 weapons carriers
- 2.6 surface decoys
- 2.7 gunnery systems
- 2.8 depth charge
- 2.9 subsurface decoys
- 2.10 launcher equipment
- 2.11 torpedo
- 2.12 subsurface missile
- 2.13 armament supply equipment

3.

Apply installation methods and techniques, to include three from:

- 3.1 positioning and aligning
- 3.2 setting travel or working clearance
- 3.3 torque setting and locking of fasteners
- 3.4 earth bonding
- 3.5 making electrical connections
- 3.6 screening

4.

Install marine weapon components, which include five of the following:

- 4.1 laser guidance
- 4.2 heat seeking units
- 4.3 firing units
- 4.4 control units

Installing marine weapons equipment and systems

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- 4.5 radar units
- 4.6 magazine equipment
- 4.7 wiring looms
- 4.8 fusing units
- 4.9 sonar equipment
- 4.10 electrical mechanisms (solenoids, indicators, motors, switches)
- 4.11 cylinders/actuating mechanisms
- 4.12 mechanical controls (plungers, springs, rollers)

5.

Use three of the following types of mechanical securing devices:

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

6.

Make five of the following types of electrical connection:

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

7.

Produce installations which comply with one of the following standards:

- 7.1 BS or ISO standards and procedures
- 7.2 customer (contractual) standards and requirements
- 7.3 company standards and procedures
- 7.4 specific system 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 acceptance documentation
- 8.3 system log
- 8.4 job cards
- 8.5 work authorisation documents

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

Installing marine weapons equipment and systems

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