
Overview

This standard identifies the competences you need to assist in the installation of communication-electronic systems, in accordance with approved procedures. You will be required to use appropriate installation publications, orders and specifications to install the various systems, sub-systems or assemblies. You will be expected to assist in the positioning, alignment and connection of the electronic-communications systems, sub-systems or assemblies in their correct locations, using the specified or appropriate techniques.

Your responsibilities will require you to comply with organisational policy and procedures for the installation activities undertaken, and to report any problems with the activities, components or equipment that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You must check that all tools, equipment and materials used in the installation activities are removed from the work area on completion of the work, and that job/task documentation is completed accurately and legibly. You will be expected to work to instructions, alone or in conjunction with others, taking personal responsibility for your own actions, and for the quality and accuracy of the work that you carry out.

The installation activity may be carried out as a team effort but you must demonstrate a significant personal contribution to the installation activities, in order to satisfy the requirements of the standard, and you must demonstrate competence in all of the areas required by the standard.

Your underpinning knowledge will be sufficient to provide a sound basis for your work, and will provide an informed approach to applying installation techniques and procedures for communication-electronic equipment. You will have an understanding of the communication-electronic 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 installation process safely and effectively.

You will understand the safety precautions required when carrying out the installation activities, especially those for ensuring the safe isolation of services. 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.

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 instructions/documentation 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, using appropriate methods and techniques
5. carry out and/or assist in checking the installation, and make any adjustments in accordance with the specification
6. deal promptly and effectively with problems within your control and report those that cannot be solved
7. dispose of waste items in a safe and environmentally acceptable manner
8. assist in the completion of installation documentation

Knowledge and understanding

You need to know and understand:

1. the specific safety practices and procedures that you need to observe when assisting with the installation of communication-electronic 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 installation activities, and the responsibility these requirements place on you
3. the hazards associated with installing communication-electronic systems, and how they can be minimised
4. what constitutes a hazardous voltage and how to recognise victims of electric shock
5. the personal protective equipment (PPE) that you need to use during the installation activities
6. how to reduce the risks of a phase to earth shock (such as insulated tools, rubber mating and isolating transformers)
7. the procedures and precautions to be adopted to eliminate electrostatic discharge (ESD)
8. how to obtain and interpret information from job instructions and other documentation used in the installation activities (such as drawings, quality control procedures and specifications used for installation)
9. the components, communication-electronic systems, sub-systems and assemblies to be installed
10. the various mechanical fasteners that will be used, and their method of installation
11. the importance of using the specified fasteners for the particular installation, and why you must not substitute others
12. the torque loading requirements on the fasteners, and what to do if these loadings are exceeded or not achieved
13. the quality control procedures to be followed during the installation operations
14. procedures for ensuring that you have the correct tools, equipment, components and fasteners for the activities
15. the techniques used to position, align, adjust and secure the components of the communications-electronic systems, without damage
16. methods of lifting, handling and supporting the components/equipment during the installation activities
17. why electrical bonding is critical, and why it must be both mechanically and electrically secure
18. the procedure for the safe disposal of waste materials
19. how to conduct any necessary checks to ensure the system integrity, functionality, accuracy and quality of the installation

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20. the tools and equipment used in the installation activities, and their calibration/care and control procedures
 21. 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
 22. the problems that can occur with the installation operations, and how these can be overcome
 23. the recording documentation to be completed for the installation activities undertaken
 24. the extent of your own responsibility and to whom you should report if you have problems that you cannot resolve

Scope/range related to performance criteria

1. Carry out **all** of the following during the installation activity:

1. adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations
2. confirm that authorisation to carry out the installation activities has been given
3. check that safe access and working arrangements for the installation area have been provided
4. confirm that services have been safely isolated, ready for the installation (such as mechanical, electricity, gas, air or fluids)
5. check that all required installation consumables are available
6. follow all relevant instructions/documentation for the installation being carried out
7. report or take action with regard to any problems that require attention
8. dispose of waste items in a safe and environmentally acceptable manner
9. leave the work area in a safe condition and free from foreign object debris

2. Assist in the installation of systems that contain **three** communication-electronic sub-systems or assemblies (at least **two** of which must be selected from group **A**):

note: Any of the items below can be identified as a system, sub system or assembly in its own right

group A – communication-electronic

1. transmitters (such as HF, VHF, UHF, microwave)
2. transceivers (such as HF, VHF, UHF, microwave)
3. receivers (such as HF, VHF, UHF, microwave)
4. signal processing (analogue) (such as radar anti-clutter, comms audio and AGC stages)
5. signal processing (digital) (such as digital MTI, multiplexers, AGC)
6. aerial systems (such as phased arrays, long wire and parabolic reflectors)
7. transmission lines (such as optical fibres, co-axial, baluns, twin wire, waveguide)
8. display systems (such as CRT, Plasma, TFT, TV Tab, LED)
9. man-machine interface (such as IS/ICT equipment or peripherals: keypads, keyboards, microphones)
10. electro-optical systems (such as cameras, thermal imaging, targeting systems)
11. hydraulic-electrical systems (such as hydraulic motors, HSUs, and actuators)
12. cryptographic systems (such as data encryption and de-encryption)
13. built-in test equipment
14. data network systems (such as LANs, WANs)
15. data network interfaces (such as switch, router, bridging networks)

16. any other identifiable electronic system, sub-system or assemblies to LRU level

group B - associated equipment

17. environmental control systems (such as temperature, humidity, vibration, shock, alarm and protection)

18. electro/mechanical systems (such as servos, motors, relays, complex switches)

19. power generation systems (such as fixed/portable AC/DC generators, batteries)

20. power distribution systems (such as single phase/3-phase distribution panels)

21. power supply control systems (such as voltage/current, series shunt regulator/stabiliser)

22. hybrid systems (such as ADC, DAC)

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

1. levelling and aligning
2. earth bonding
3. taking electrostatic discharge (ESD) precautions
4. securing and locking

4. Make **three** of the following types of mechanical securing connections:

1. nuts and bolts
2. locking devices
3. screws
4. torque load bolts
5. quick-release fasteners

5. Make **three** of the following types of electrical connection:

1. co-axial
2. PCB headers (such as D10 type)
3. screened
4. quad
5. data cable
6. free plugs and sockets
7. earth bonding points
8. fibre-optic
9. other specific electrical connector

6. Produce installations which comply with **one** of the following standards:

1. customer standards and requirements
2. company standards and requirements
3. BS, ISO and/or BSEN standards
4. Ministry of Defence (MoD)

5. manufacturer's standards and requirements

7. Complete the relevant paperwork, to include **one** from the following, and pass it to the appropriate people:

1. job cards
2. specific deployment/installation report
3. build records
4. specific company documentation

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