PROMT12
Modifying or rewiring electrical circuits

Overview

This standard identifies the competences you need to modify electrical circuits, in accordance with approved procedures. You will be required to modify, rewire and update circuits in accordance with specifications and latest issue drawings and standards. You will be expected to remove and replace cables, add new cables, change breakout points and change the routeing of cables. You will also be expected to change components, units and trays. You will need to show proficiency in using various tools and equipment for cutting, stripping, crimping and soldering, and in the installation of the various wires, cables and components that make up the electrical system and circuits worked on.

Your responsibilities will require you to comply with organisational policy and procedures for the modification or rewiring activities undertaken, and to report any problems with the activities, components or equipment that you cannot personally resolve, or that are outside your permitted authority, to the relevant people. You must ensure that all tools, equipment, and materials used in the modifying or rewiring activities are removed from the work area on completion of the activities, and that all necessary job/task documentation is completed accurately and legibly. You will be expected to work with minimal supervision, taking full 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 modification or rewiring procedures. You will understand the modification or rewiring to be carried out, and its application, and will know about the methods, tools and equipment to be used, in adequate depth to provide a sound basis for carrying out the activities, correcting faults and ensuring that the modification is carried out to the required specification and remains compliant with all standards and regulations.

You will understand the safety precautions required when carrying out the modification activities. 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:

P1	Work safely at all times, complying with health and safety and other relevant regulations and guidelines
P2	Obtain and follow the relevant modification specifications and job instructions
P3	Confirm and agree what modifications are to be carried out to meet the specification
P4	Prepare the electrical system for the required modification
P5	Carry out the system modification using approved materials, methods and procedures
P6	Complete the modification within the agreed timescale
P7	Ensure that the modified electrical system meets the specified operating conditions
P8	Produce accurate and complete records of all modification work carried out
P9	Deal promptly and effectively with problems within your control and report those that cannot be solved

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Knowledge and understanding

You need to know and understand:

K1	The specific safety precautions and procedures to be observed whilst carrying out the modifications or rewiring of the electrical systems (including any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)
K2	The health and safety requirements of the work area in which you are carrying out the modification or rewiring activities, and the responsibility these requirements place on you
K3	The hazards associated with carrying out modifications or rewiring of electrical systems, and how to minimise these and reduce any risks
K4	How to recognise and deal with victims of electric shock (to include methods of safely removing the victim from the power source, isolating the power source, and methods of first aid resuscitation)
K5	The personal protective equipment and clothing to be worn during the modification or rewiring activities
K6	How to obtain and interpret drawings, circuit and physical layouts, charts, specifications, manufacturers' manuals, graphical electrical symbols, BS7671/IEE wiring regulations, and other documentation used during the modification or rewiring activities
K7	The basic principles of how the system functions, the operating sequence, the working purpose of individual units/components, and how they interact
K8	The different types of cabling (such as multicore cables, single core cables, SWA cables, MI cables, screened cables), their fittings and their application
K9	The different types of electrical component (such as plugs, switches, lighting and fittings, junction boxes, consumer units)
K10	Preparations to be undertaken prior to the modification or rewiring of the system
K11	How to extract and insert new cables in wiring enclosures (such as conduit, trunking and traywork) without causing damage to other cables or components
K12	The methods and techniques to be used for soldering and de-soldering, and the importance of adhering to these procedures
K13	The methods and techniques to be used for crimping and heat shrinking, and the importance of adhering to these procedures
K14	The various mechanical fasteners that can be used, and their methods of installation or removal
K15	The procedure for obtaining replacement parts, materials and other consumables necessary for the modification or rewiring activities
K16	The importance of ensuring that the completed circuit is free from foreign objects, and that all terminations are electrically and mechanically sound and secure
K17	How to conduct any necessary checks to ensure that the completed

Knowledge and understanding

	modification or rewiring complies with all appropriate standards
K18	The methods and equipment used to transport, handle and lift components/cabling into position, and how to check that the equipment is within its current certification dates
K19	How to check that tools and equipment are free from damage or defect, are in a safe and usable condition, and are configured correctly for their intended purpose
K20	The problems that can occur with the modification or rewiring operations, and how these can be overcome
K21	The recording documentation to be completed for the activities undertaken
K22	The extent of your own authority and to whom you should report if you have problems that you cannot resolve

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Scope related to performance criteria

1 **Carry out all of the following during the modification and rewiring activities:**

1.1 obtain and use the correct issue of company and/or manufacturers' drawings and planning documentation
1.2 adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work
1.3 ensure the safe isolation of equipment (such as electricity, mechanical, gas, air or fluids)
1.4 provide and maintain safe access and working arrangements for the modification area
1.5 modify or rewire electrical circuits using approved techniques and procedures
1.6 apply safe working practices and procedures at all times
1.7 dispose of waste items in a safe and environmentally acceptable manner, and leave the work area in a safe condition

2 Carry out modifications or rewiring of six of the following electrical systems:

2.1 single-phase power circuits
2.2 three-phase power circuits
2.3 direct current power circuits
2.4 motors and starters
2.5 switchgear and distribution panels
2.6 control systems and components
2.7 electrical plant
2.8 wiring enclosures (such as conduit, trunking or tray work)
2.9 luminaires
2.10 other specific electrical equipment

3 Carry out six of the following types of modifications:

3.1 replacing cables of different size or length
3.2 changing or adding components to panels or sub-assemblies
3.3 changing the position or angle of breakout points
3.4 adding or removing components from circuits
3.5 changing the route of cables
3.6 adding further looms or mains circuits
3.7 making changes to looms or mains circuits
3.8 changing position of electrical units
3.9 fitting new electrical systems
3.10 removal of cables

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Scope related to performance criteria

3.11 addition of cables

4 Carry out at six of the following processes:

4.1 terminating mineral and armoured cables
4.2 bending and forming conduit
4.3 bending and forming trunking and trays
4.4 sealing and protecting cable connections
4.5 making mechanical/screwed/clamped connections
4.6 soldering and de-soldering
4.7 heat shrinking (devices and boots)
4.8 crimping (tags and pins)
4.9 stripping cable insulation/protection
4.10 removing cable end fittings
4.11 extracting/inserting components
4.12 allocating identification markings

5 Produce modified or rewired electrical systems in accordance with one of the following:

5.1 organisational guidelines and codes of practice
5.2 equipment manufacturers' operation range
5.3 BS7671/IEE wiring regulations
5.4 BS, ISO and/or BSEN standards

6 Complete the relevant paperwork, from one of the following, and pass it to the appropriate people:

6.1 job cards
6.2 maintenance log or report
6.3 company-specific documentation
6.4 permits to work/formal risk assessment and/or sign-on/off procedure
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