SEMRET316

Carry out replacement of components from telecoms equipment

Overview

This standard identifies the competencies you need to carry out the replacement of components from telecoms systems and equipment as part of maintenance or fault finding. The telecoms equipment in this standard can be for overground or underground rail transportation systems.

You will be required to use the appropriate tools and equipment throughout the replacement activities, apply a range of connection methods and techniques to safely replace the components in the equipment and make safe any connections as appropriate to the components replaced. Where appropriate, you may also assist in working with computers or electronic controllers, making connections and replacing hardware components. The replacement activities will include making sure that any replacement telecoms components are approved and fit for purpose. This may include identifying and assessing the difference in like-for-like replacement parts and may range from superseded part numbers or descriptions, through modification stages, to functionally equivalent parts, which are sourced from different manufacturers.

On completion, you will ensure the work area is cleared of all tools, equipment, and materials, and complete job documentation accurately.

You will be expected to work to instructions in conjunction with others or alone. The replacement activity may be carried out as a team effort, but you must demonstrate a significant personal contribution to the activities to satisfy the requirements of the standard and you must demonstrate competence in all the areas required by the standard.

You will understand the safety precautions required when carrying out the replacement activities, especially those for ensuring the safe isolation of services. Safety is a key theme; you must practice and demonstrate safe working methods, understanding and implementing necessary precautions to protect yourself and others.

Performance criteria

You must be able to:

P1 maintain safe working practices and comply with all relevant health and safety regulations, directives, and guidelines
P2 identify and analyse any necessary changes to safety requirements on arriving at site, including prompt reporting to the relevant person(s)
P3 source and interpret all relevant diagrams and specifications
P4 obtain all the required component(s) and ensure that they are in a suitable condition for replacement and fit for purpose
P5 check the replacement component(s) to ensure compliance with the required specification including confirming that the replacement component is compatible with the equipment/system
P6 take adequate precautions to prevent damage to component(s) during replacement, including electrostatic protection
P7 replace the component(s) in the correct sequence using appropriate tools and techniques
P8 ensure that authorised practices are used where existing instructions are insufficient
P9 ensure that the replacement is complete and that all components are free from damage including checking that all necessary connections to the equipment are complete
P10 ensure that interference with other systems is minimised, and equipment and systems other than those being maintained are not disturbed without authority
P11 make any necessary settings or adjustments to the component(s) to ensure they will function according to the manufacturer's specifications
P12 complete the replacement integrity checks in accordance with appropriate standards and that the completed work is to specification
P13 observe sufficient operations of the equipment to confirm it is functioning as expected
P14 address problems within your control and report unresolved issues
P15 complete all relevant documentation in accordance with your organisation's procedures

Knowledge and understanding

You need to know and understand:

K1 the relevant health and safety regulations, directives, guidelines, and safe working practices and procedures defined by your organisation, as appropriate to the activity and your working area
K2 how to locate and access the site
K3 how to locate and identify the equipment to be worked on
K4 the isolation and lock-off procedure or permit-to-work procedure that applies to the system (such as electrical isolation, locking off switchgear, placing of warning notices, proving the isolation has been achieved and secured)
K5 the classification of different voltage levels and the authority requirements for working on them
K6 what constitutes a hazardous voltage/current and how to recognise victims of electric shock
K7 how to reduce the risks of an electric shock (such as insulated tools, rubber mating and isolating transformers)
K8 the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the removal activities
K9 hazards associated with carrying out telecom component replacement activities (such as stored voltages, radio frequency radiation, electrical supplies, electrical/electronic interfaces, using damaged or ill-maintained tools and equipment, not following laid-down procedures), and how to minimise these and reduce any risks
K10 how to source, interpret and apply relevant technical information, standards, diagrams, instructions, specifications and schedules for maintenance of telecoms equipment
K11 how to obtain and assess the required component(s) and ensure that they are fit for purpose, including assessing the compatibility of like-for-like components
K12 the importance of making sure the component(s) orientation is correct before fitting and how to undertake this
K13 the relevant methods, techniques and procedures to replace components and ensure they are fit for purpose
K14 the implications of not following the methods and techniques for safe component handling
K15 the principles of operation of the equipment to be replaced
K16 how to protect operational equipment from the replacement activity

K17 your organisation's procedures for the use, care and control of tools and test equipment including calibration
K18 the procedures and precautions to be adopted to eliminate electrostatic discharge (ESD) hazards when working with and handling electronic devices
K19 how to select the correct tools for the activity, including how to confirm that they are calibrated and stored in accordance with your organisation's procedures after use
K20 how to identify the various types of connectors used and the correct tools and equipment to make the connections
K21 the different types of mounting, connecting and cable supporting systems used by the telecoms equipment
K22 the correct mode of operation of the equipment following replacement activities
K23 when independent testing is required
K24 how and when to carry out and the importance of integrity checks
K25 how to identify, analyse and deal with influencing factors during the maintenance activities including environmental factors
K26 your organisation's procedures for recording the replacement activity
K27 the relevant reporting lines and procedures that are approved by your organisation
K28 the limits of your own authority and responsibility and those of others involved

Scope/range related to performance criteria

1.
Types of health and safety legislation, regulations and safe working practices and procedures, include:
2.
Types of telecom site locations could include:
3.
Types of telecom equipment include:
4.
Types of approved/calibrated tools and equipment used, as applicable to the components being replaced, include:
5.
Types of connections made during the replacement of the components, as applicable to the type of equipment, include:
6.
Replacement activities may need to comply with the following:
7.
Types of replacement records that need to be completed and passed to the appropriate people could include:

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