SEMOLEC306

Install overhead line equipment main steelwork

Overview

This standard identifies the competencies you need to install, enhance or carry out the renewal of overhead line equipment (OLE) earthing and bonding cables, such as continuity, cross, impedance, rail, red, return, return screen conductor, structure, transposition, and yellow bonds.

The definition of OLE is an arrangement of wires, suspended over the railway line, for supplying electricity to electric trains, together with associated fittings, insulators and other attachments including feeders, autotransformer feeders, overhead line switches, jumpers and return conductors. This equipment together with its structures, foundations, lineside switching stations is described collectively as Overhead Line Equipment.

To prove competence in this standard you shall need to demonstrate your ability to complete the earth and bonding installation, enhancement, renewal, or modification activities in accordance with current working instructions. You will be required to determine, from the drawings and specifications, what has to be done and how best it can be achieved safely, within the time frames allowed and appropriate to the environment and site conditions.

Your underpinning knowledge will provide a good understanding of your work, and provide an informed approach to applying cable selection, termination and connection procedures. You will understand the principles and processes associated with the installation of the earthing and bonding cables and their application. You will know about the ways of handling, terminating, positioning and connecting cables, as well as the care and use of the tools and equipment in adequate depth to provide a sound basis for carrying out the activities, correcting faults and ensuring the finished earthing and bonding is produced to the required specification. You will understand the safety precautions required when working at height and with cable components and their 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.

Your responsibilities will require you to comply with organisational policy and procedures for the safe installation of the earthing, bonding and the associated terminating and connection activities to be undertaken and to report any problems with the component parts, equipment or installation activities that you cannot personally

resolve, or are outside your permitted authority, to the relevant people. You will be expected to work with minimum supervision, taking personal responsibility for your own actions and the quality and accuracy of the work that you carry out.

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 follow all relevant drawings and specifications for the installation being carried out
P3 use the correct tools, plant and equipment for the installation and check that they are in a safe and usable condition and are fit for purpose
P4 install, position and secure the earthing and bonding components in accordance with the drawings and specification
P5 check and confirm that all necessary connections, fittings and components are secure and complete
P6 address problems within your control and report unresolved issues
P7 check installation is complete and that all earthing and bonding components are free from damage
P8 check that completed installation conforms to the drawings and specification

Knowledge and understanding

You need to know and understand:

K1 the relevant health and safety regulations, directives, guidelines, and safe working practices and procedures as defined by your organisation
K2 the requirements for a safe system of work and the limits applicable, including reference to the signalling standards where required
K3 how the activity may affect the safe operation of the railway
K4 what procedures need to be followed, to confirm operational and personal safety, is maintained during the work
K5 the general electrical hazards associated with working on and around overhead line equipment
K6 how to prevent personal injury and injury to others during the work
K7 the hazards associated with earthing and bonding activities (such as working at height, drilling holes, cutting and terminating cables) and how the risks can be minimised
K8 the personal protective equipment (PPE) that you need to use for the activities that you are undertaking
K9 the correct methods of moving, lifting, handling, shaping and supporting cables and associated components
K10 the documentation and certification that supports the installation activities (such as overhead line specifications, work/task instructions and inspection/test plan)
K11 the purpose of the different types of design drawings used in OLE wiring installation (such as layouts, cross section diagrams, bonding layouts, OLE system design range (such as OLEMI))
K12 how to carry out currency/issue checks of the specifications you are working with
K13 the construction methodology for the earthing and bonding installation being undertaken
K14 how the OLE is designed to function under normal operating conditions
K15 what each of the earthing and bonding component parts contribute to the overall operation of the OLE and how it interfaces with the signalling system
K16 the function of the different types earthing and bonding cables used in OLE
K17 how to identify the correct type and size of earthing and bonding cables required
K18 the principles of the electrical checks to be carried out on the earthing and bonding cables
K19 how to use electrical test equipment to carry out checks on the cables

K20 what terminology and methods are used to identify OLE earthing and bonding and to describe the operational status of the cables
K21 the types of bonding systems used (such as Miles Royston (Glenair), Cembre)
K22 how to use the tools, plant and equipment needed for the earthing and bonding installation process and how to check that maintenance checks are in date and any calibration certificates are available
K23 the torque loading requirements of the components or connectors and what to do if these loadings are exceeded or not achieved
K24 the methods of securing the installed earthing and bonding components and connections following safe working practices
K25 the types of tools and equipment used to shape, position, adjust, terminate and secure the installed components (such as drills, presses, pullers, torque wrenches)
K26 what the limits of your responsibility and authority are
K27 who is responsible for taking equipment out of operational service and handing the equipment back to operational service
K28 the installation activity reporting documentation
K29 reporting lines and escalation procedures
K30 the industry protocols relating to communication of important safety information
K31 how to complete records and confirm that they are retained and preserved

Scope/range related to performance criteria

1.
Activities carried out during the installation will include the following:
2.
Types of personal protection equipment could include:
3.
Types of design drawings and specifications, used to interpret earthing and bonding requirements, include:
4.
Types of earthing and bonding activities to be carried out includes:
5.
Types of bonding systems to be installed or renewed could include:
6.
Checks on the earthing and bonding being installed or renewed will include the following:
7.
Recording and reporting procedures could include the following:

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