

Amendment Number 3 to BS7671:2008

Geoff Cronshaw, chief electrical engineer at Institution of engineering and technology, provides us with a look ahead at the proposals of Amendment 3 to BS 7671:2008 Requirements for Electrical Installations – and the resulting changes on the design, erection and verification of electrical installations.

Introduction

The National Wiring Regulations Committee, JPEL 64, will confirm changes to BS 7671:2008 by 1 November 2014. The Draft for Public Comment (DPC), which sets out the proposed changes, was made available for comment 14 December 2013 and 7 March 2014.

I outline the draft proposals below. It's important to note although I refer to the changes in the affirmative, they remain proposals (despite the comment period being closed) and not all of the proposals may be included in the final version of Amendment Number 3 - inclusion of proposals is at the discretion of JPEL 64.

Part 2 Definitions

Definitions will be expanded and modified. For example, the definition for 'skilled and instructed persons' will be changed. It was also decided that the definition for a 'competent person' should be removed, to avoid confusion, as it was considered that some overlap existed between the definition of 'skilled person' and 'competent person'.

It was proposed to modify the definition of 'skilled person' to align this definition with that of the IECV (International Electrotechnical Vocabulary). The Committee also proposed to modify the definition of 'instructed person' for the same purpose.

These changes will be reflected throughout the wiring regulations. For example, Regulation 134.1.1 has been changed from:

"Good workmanship by competent persons or persons under their supervision and proper materials shall be used in the erection of the electrical installation. Electrical equipment shall be installed in accordance with the instructions provided by the manufacturer of the equipment."

to:

"Good workmanship by skilled (electrically) or instructed (electrically) persons and proper materials shall be used in the erection of the electrical installation. The installation of electrical equipment shall take account of manufacturers' instructions."

Some new symbols have been included in the definitions.

Chapter 52 Selection and Erection of Wiring Cables

Cables concealed in a wall or partition

The Regulations for the selection and erection of wiring systems (impact) will be redrafted, with the removal of all references to "under the supervision of skilled and instructed persons".

It will be a requirement that cables that are concealed in a wall or partition (at a depth of less than 50 mm) are protected by a 30 mA RCD for all installations if other methods of protection, including the use of cables with either an earthed metallic covering or mechanical protection, are not employed. This will apply to a cable, irrespective of the depth of that cable, in a partition where the construction of the partition includes metallic parts other than fixings.

The exception for cables that form part of a SELV or PELV circuit will be retained.

Section 557 Auxiliary Circuits

A new section, Section 557, covering auxiliary circuits for low voltage electrical installations will be included. Auxiliary circuits are defined as circuits for the transmission of signals intended for the detection, supervision or control of the functional status of a main circuit, such as circuits for control, signalling and measurement. Auxiliary circuits for fire and intruder alarms, traffic lights, etc (where specific standards exist) are excluded. This is a completely new section. The current requirements for auxiliary circuits in BS 7671 are given in Regulation 537.5.3 (extract below):

"537.5.3 A circuit shall be designed, arranged and protected to limit dangers resulting from a fault between the control circuit and other conductive parts liable to cause malfunction (eg inadvertent operation) of the controlled equipment."

Section 557 will cover issues such as:

A.c. or d.c. auxiliary circuits;

power supplies for auxiliary circuits, depending on the main circuit;

auxiliary circuits supplied by an independent source;

protection against overcurrent; types and sizes of cables for auxiliary circuits;

special requirements for auxiliary circuits that are used for measurement; and

functional safety and EMC;

the connection of the devices and protection against overcurrent where the auxiliary circuit is supplied from the main circuit via a transformer or rectifier;

circuits used for measurement, such as connection requirements for voltage and current transformers etc.

Section 717 Mobile and Transportable Units

In 2008 Section 717 was introduced, which provided requirements that were applicable to mobile or transportable units. These units may be self-propelled, towed or transportable containers or cabins, for example, technical and facilities vehicles for the entertainment industry, medical services, advertising, firefighting, workshops, offices, and transportable catering units.

There are many risks associated with such units, arising from:

a loss of connection to earth because of temporary cable connections;

the connection to different national and local electricity distribution networks;

the impracticality of establishing an equipotential zone external to the unit;

open-circuit faults of the PEN conductor of PME supplies, raising the potential of all metalwork (including that of the unit) to dangerous levels;

shock from high functional currents flowing in protective conductors; and

vibration while the vehicle or trailer is in motion, or while a transportable unit is being moved – causing faults within the unit installation.

Some of the current Requirements that aim to reduce these risks included:

Regulation 717.411.1: automatic disconnection shall be by RCD.

Regulation 717.411.3.1.2: accessible conductive parts of the unit to be connected through the main equipotential bonding to the main earth terminal within the unit.

Regulation 717.514 (identification): type of supply, voltage rating of the unit, number of phases, on board earthing, and maximum power required by the unit.

Changes introduced by Amendment 3

Regulation 717.413 will be introduced, and is based on the latest CENELEC HD. The Regulation will require an insulation monitoring device to be installed so that automatic disconnection of the supply is provided in the case of a first fault or an RCD, and an earth electrode to be installed so that automatic disconnection is provided in the case of failure of the transformer to provide electrical separation.

Regulation 717.551.6 will be added, and will prohibit the interconnection of units with different power supply systems. It also prohibits the interconnection of different earthing systems unless special precautions have been taken, as set out by Regulation 542.1.3.3. This reinforces the general rules in Parts 1 to 6 of BS 7671.

Regulation 717.551.7.2 will be added, which will give additional requirements for installations where the generating set may operate in parallel with other sources. This also reinforces the general rules in Parts 1 to 6 of BS 7671.

Changes will be made to the figures that show examples of connections associated with the mobile or transportable units.

Sections 559, 714 and 715: luminaires and lighting installations

In 2008 additional requirements for general lighting were included for:

protection against fire;

connection of luminaires to the fixed wiring;

fixing of the luminaires;

through-wiring in a luminaire;

control gear, for example, ballasts;

compensation capacitors; and

the need to give consideration to stroboscopic effects.

Amendment 3 will introduce a number of notable changes to align the BS 7671 requirements with the both latest IEC and CENELEC standards. Examples of these intended changes include:

moving the requirements for outdoor lighting and extra-low voltage lighting installations from Section 559 to two new sections, Section 714 and Section 715;

requirements for the type of devices that are to be used for the connection of luminaires to the supply and the protection of cables against heat and UV radiation effects within luminaires; and

introduction of the requirements for protection against electric shock for display stand for luminaires.

Section 715 Extra-low Voltage Lighting

The particular requirements apply to installations that are supplied from sources with a maximum rated voltage of 50 V a.c. rms or 120 V d.c. BS 7671 already includes requirements for:

- protection against electric shock (SELV);
- protection against the risk of fire due to short circuit;
- types of wiring systems, including special requirements where bare conductors are used;
- the types of transformers and converters; and
- suspended systems.

Amendment 3 will make a number of notable changes to align the latest IEC requirements with CENELEC requirements, including:

- the types of wiring systems permitted;
- voltage drop in consumer's installations; and
- requirements for isolation, switching and control.

Section 714 Outdoor Lighting Installations

In 2008 some major changes to the requirements for outdoor lighting installations were introduced, covering requirements for:

- car parks;
- gardens;
- parks;
- places open to the public;
- illumination of monuments; and
- floodlighting.

These will be retained in Amendment 3, along with the recommendations for additional protection by a 30 mA RCD for telephone kiosks, bus shelters, advertising panels and town plans.

Amendment 3 will make only minor changes to outdoor lighting installations. One important change will be that individual circuits will be required to be isolated.

Chapter 41 Protection Against Electric Shock

References to 'ordinary persons' in Regulation 411.3.3 have now been removed.

This Regulation will require, in accordance with Regulation 415.1, RCD protection for socket outlets up to 20 A (and for mobile equipment up to 32 A for use outdoors) for all installations.

There is, however, an exception for RCD protection (for socket outlets up to 20 A) for a specific labelled socket outlet or where a documented risk assessment determines that RCD protection is not necessary.

This means that socket outlets up to 20 A in all types of installations, including commercial, domestic and industrial, will need to be protected by a 30 mA RCD unless a risk assessment can determine that it's not necessary.

'Cmin' factor

Maximum earth fault loop impedances given in Tables 41.2, 41.3, 41.4 and 41.6 will be revised to take into account the Cmin factor given in CLC/TR50480:2011.

Cmin is the minimum voltage factor to take account of variations in voltage, depending on time and place, changing of transformer taps and other considerations. The notes to the Tables will be changed to reflect maximum permitted operating temperature. In addition, Regulations 411.5.4 and 41.6.4 will include a Cmin factor.

Chapter 42 Protection Against Thermal Effects

Regulation 421.1.200 has been introduced and will require switchgear assemblies, including consumer units, to have their enclosure manufactured from non-combustible, or not readily combustible, material, or to be enclosed in a cabinet or enclosure that is constructed of non-combustible, or not readily combustible, material.

This new Regulation is being introduced to help to protect against fire that can result from the overheating of connections within consumer units. Overheating can arise from loose connections and connections that have not been made correctly, for example, the connection of a cable over the insulation.

Appendix 6 Model Forms for Certification and Reporting

Appendix 6 contains the electrical installation certificate, the minor works certificate and the electrical installation condition report (used for reporting on the condition of an existing electrical installation) as required by Part 6 of BS 7671.

Condition report

The condition report has a series of inspection schedules. The inspection schedules provide a detailed breakdown of the inspection that is required on each aspect of an installation so that the work is carried out in an organised and efficient manner. For example, the schedule for domestic and similar premises will include over 60 check points. Each item that is listed on the schedule as requiring checking will be accompanied with the relevant regulation number of BS 7671 for ease of reference. In addition, the form provides a facility to indicate the outcome of the inspection of each item with either a tick (acceptable condition), a code C1 or C2 (unacceptable condition), NV (not verified), Lim (limitation) or NA (not applicable).

Amendment 3 will make a small number of changes to the electrical installation condition report and associated notes, including a requirement to carry out an inspection within an accessible roof space where electrical equipment is present in that roof space.

Amendment 3 will make a significant change to the certification of new work: the schedule of inspections (for new work only) has been replaced by examples of items that require inspection during initial verifications (which must be appended to the electrical installation certificate).