ECA #Project 18

Preparing your business for the Wiring Regulations

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ECA #Project 18

Agenda

- ✓ History and implementation
- ✓ Part 2 – definitions
- ✓ Part 4 – protection for safety
- ✓ Part 5 – selection and erection
- ✓ Part 6 – inspection and testing
- ✓ Part 7 – Special locations
- ✓ Appendices
- ✓ Training and compliance
- ✓ Q&A

History and reasons for change

HISTORY AND IMPLEMENTATION

History and international requirements

- The Wiring Regulations first appeared in 1882. It was 4 pages and 21 Regulations
- The International Electrotechnical Commission (IEC) are the worldwide body
- CENELEC is the European body
- New and revised CENELEC and IEC 60364 Standards filter in to the UKs requirements

Why change?

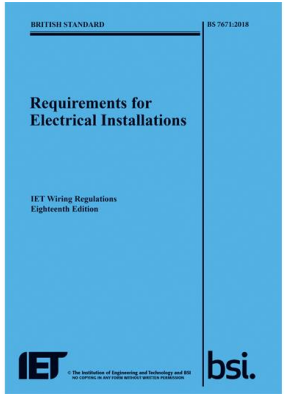
- To maintain technical alignment with CENELEC Harmonisation Documents (HDs), this is an on going process
- Opportunity to clarify existing Regulations
- Allows for new technology
- Once a HD is agreed at CENELEC, UK and other Countries are required to incorporate the technical intent into their national standard

Implementation

- BS 7671: 2018 was published 1st July 2018.
- It is now mandatory from 1st January 2019.
- You cannot cherry pick bits from either 17th Edition Adm.3 and the 18th Edition.

Outline

- The standard is divided into parts and chapters with appendices at the end as before
- There are 7 parts
- Definitions have been expanded and some modified
- Modifications and changes to some existing regulations
- New regulations introduced



New definitions

PART 2 - DEFINITIONS

Departure

- Deliberate decision to not comply fully with the requirements of this Standard, for which the designer must declare that the resultant degree of safety is not less than that achievable by full compliance

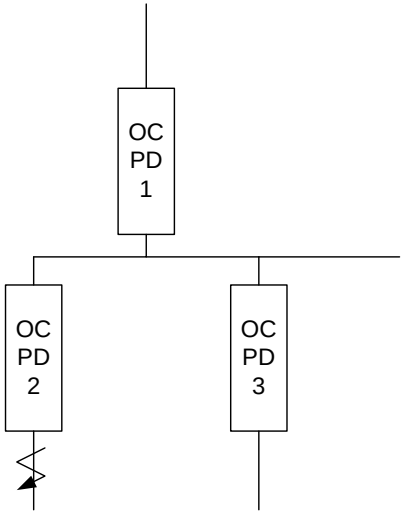
FOR DESIGN

I/We being the person(s) responsible for the design of the electrical installation (as indicated by my/our signatures below), particulars of which are described above, having exercised reasonable skill and care when carrying out the design and additionally where this certificate applies to an alteration or addition, the safety of the existing installation is not impaired, hereby CERTIFY that the design work of which I/we have been responsible is, to the best of my/our knowledge and belief, in accordance with BS 7671:2018 amended to _____ (date) except for departures, if any, detailed as follows:

Details of departures from BS 7671 (Regulation 120.3, 133.1.3, 133.5) _____

Selectivity

- Previously called discrimination, selectivity is an updated phrase
- Still means the same
- To ensure the correct device operates under a fault condition



New Regulations and updates

PART 4 – PROTECTION FOR SAFETY

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Chapter 41

- Metallic pipes entering the building having an insulating section at their point of entry need not be connected to the protective equipotential bonding
- Clarifying if and where bonding is needed on metallic pipe work

RCDs

RCDs for socket outlets

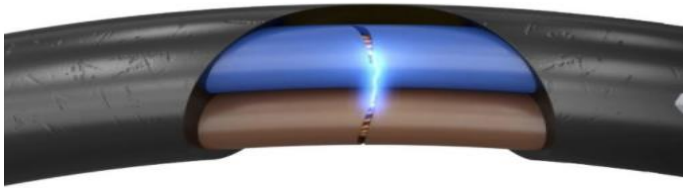
- Regulation 411.3.3 applies to socket-outlets with a rated current not exceeding 32 A
- There is an exception to omit RCD protection where, other than a dwelling, a documented risk assessment is completed

RCDs for luminaires

- A new Regulation 411.3.4 requires that, within domestic (household) premises, a 30 mA RCD shall be required for AC final circuits supplying luminaires

AFDDs

- A new Regulation 421.1.7 has been introduced recommending the installation of arc fault detection devices (AFDDs) in AC final circuits of a fixed installation
- NOTE – this is ONLY a recommendation, it is NOT mandatory



Source: Eaton website

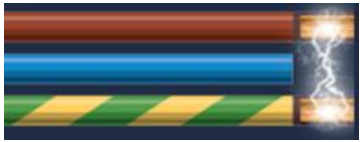
AFDDs

- Premises with sleeping accommodation (eg: multiple occupancy dwellings, student accommodation, hotels..)
- Buildings dependant on their particular characteristics (risk of fire) due to processed or stored material (eg: barns, woodworking shops, stores for combustible materials etc..)
- Buildings constructed of combustible material (eg: wood)
- Locations with irreplaceable objects (eg: museums, libraries, art galleries)

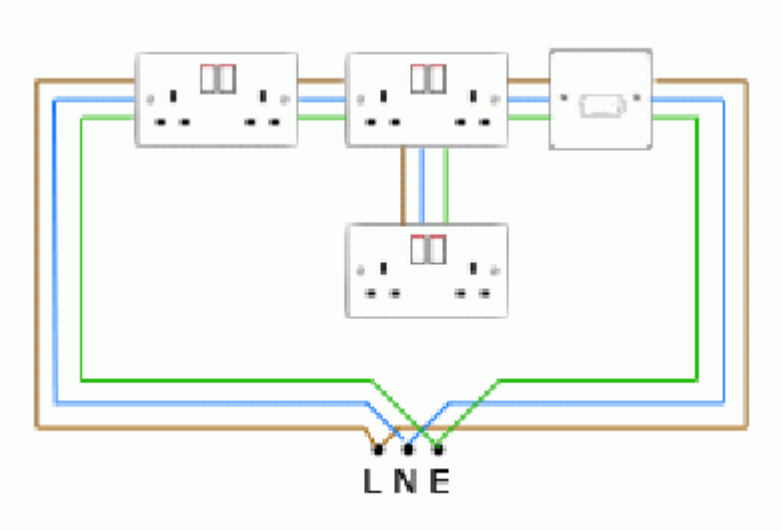
AFDDs

Series Arcs (90%)

Parallel Arcs (90%)



Live to CPC (RCD)



Protection against overvoltages

- Section 443 has been redrafted. The AQ criteria is no longer included in BS 7671
- Protection against overvoltages required where the consequences could
    - result in serious injury to, or loss of, human life, or
    - result in interruption of public services/or damage to and cultural heritage, or
    - result in interruption of commercial or industrial activity, or
    - affect a large number of co-located individuals.

Protection against overvoltages

- If protection is required, then an option would be fitting a surge protection device (SPD)
- For all other cases, a risk assessment has to be performed in order to determine if protection against transient overvoltage is required
- There is an exception not to provide protection for single dwelling units in certain situations

Calculated Risk Level (CRL)

- A calculation based several factors will help determine if SPDs are required
- Don’t worry! Examples are provided in the Standard
- ECA have created an ECA SPD calculator to help you with this and this is now available via ECA website

New Regulations and updates

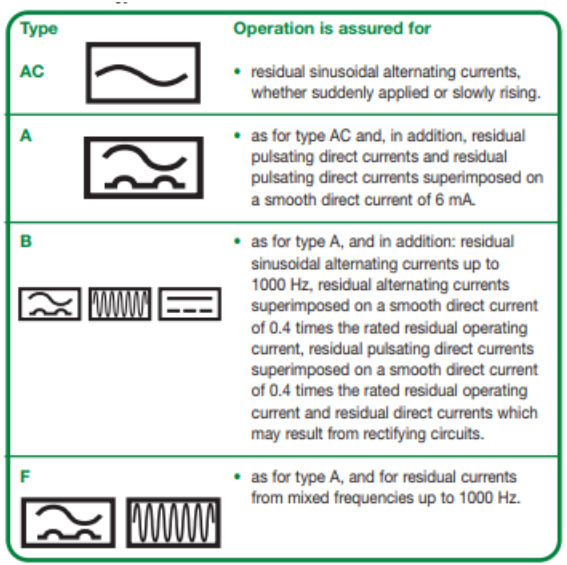
PART 5 – SELECTION AND ERECTION

Cable supports

- Regulation 521.11.201 which give requirements for the methods of support of wiring systems in escape routes, has been replaced
- Regulation 521.10.202 requires cables to be adequately supported against their premature collapse in the event of a fire
- This applies throughout the installation and **not just** in escape routes

RCD Types

- RCDs
- New types of RCDs now recognised depending on presence of DC components or higher frequencies
- Type AC
- Type A
- Type B
- Type F
- Note - These are not to be confused with B, C and D curve circuit breakers and RCBOs, they are specifically referring to the RCD element



Type	Operation is assured for
AC	• residual sinusoidal alternating currents, whether suddenly applied or slowly rising.
A	• as for type AC and, in addition, residual pulsating direct currents and residual pulsating direct currents superimposed on a smooth direct current of 6 mA.
B	• as for type A, and in addition: residual sinusoidal alternating currents up to 1000 Hz, residual alternating currents superimposed on a smooth direct current of 0.4 times the rated residual operating current, residual pulsating direct currents superimposed on a smooth direct current of 0.4 times the rated residual operating current and residual direct currents which may result from rectifying circuits.
F	• as for type A, and for residual currents from mixed frequencies up to 1000 Hz.

Earthing and bonding

New Regulation 542.2.3

- Where foundation earthing earth electrodes are installed the materials and dimensions of the earth electrodes shall be selected to withstand corrosion and to have adequate mechanical strength

Note – for TT systems only

New Regulation 542.2.8

- Where an earth electrode consists of parts that must be connected together, connections shall be made by welding, pressure connectors, clamps or other suitable mechanical connectors

New Regulations and updates

PART 6 – INSPECTION AND TESTING

Inspection and testing

- Part 6 has been completely restructured, including the regulation numbering to align with the CENELEC standard
- Chapters 61, 62 and 63 have been deleted and the content of these chapters now form two new Chapters 64 and 65
- This is effectively just a number change

Addition or alteration

- **641.5** For an addition or alteration to an existing installation, it shall be verified that the addition or alteration complies with the Regulations and does not impair the safety of the existing installation

Polarity

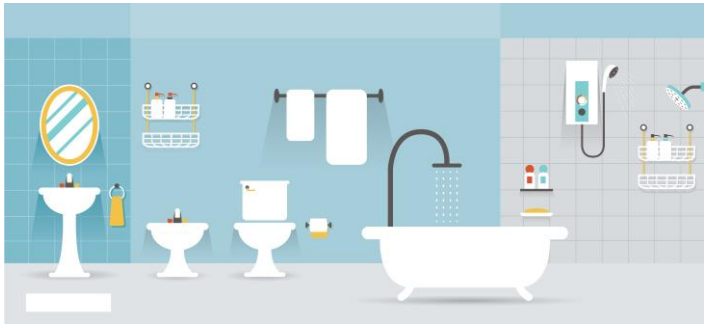
- **643.6** Where relevant, the polarity of the supply at the **origin** of the installation shall be verified before the installation is energized
- Where single-pole switching devices are not permitted in the neutral conductor, a test shall be made to verify that all such devices are connected in the line conductor(s) only

New Regulations and updates

PART 7 – SPECIAL INSTALLATIONS OR LOCATIONS

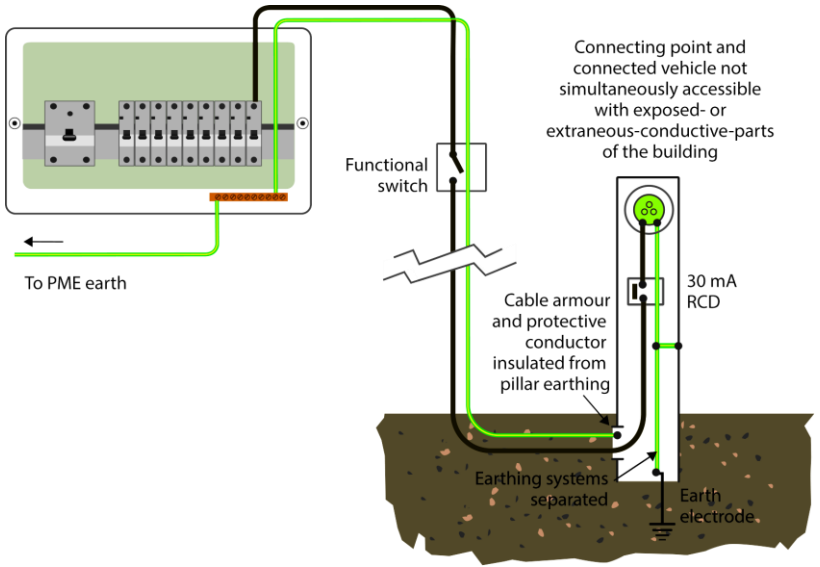
Section 701 Locations containing a bath or shower

- Much the same as per the previous edition
- The distance for a socket from the edge of zone 1 is still 3 m
- The zones have not changed



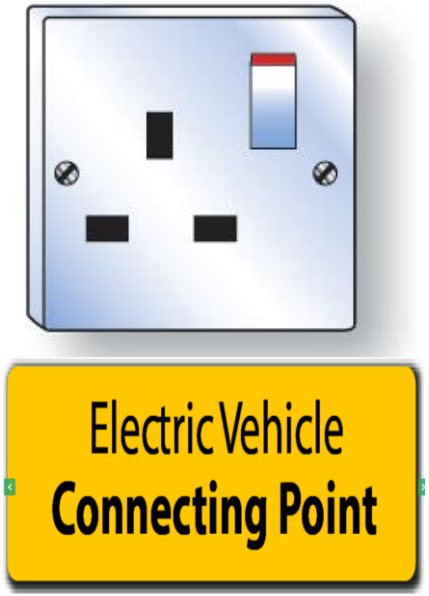
Section 722 Electric vehicle charging installations

- This section contains significant changes to Regulation 722.411.4.1 concerning the use of a PME supply to charge vehicles parked outside.



Section 722 Electric vehicle charging installations

- Specific types of RCDs are mentioned i.e. Type B devices
- Socket outlets should be suitable for use and if 13A BS 1363 marked with ‘EV’ on their rear



Section 722 Electric vehicle charging installations

- Still the option for isolating transformer is present
- This option removes the reference of line to earth, therefore making the system almost shock proof

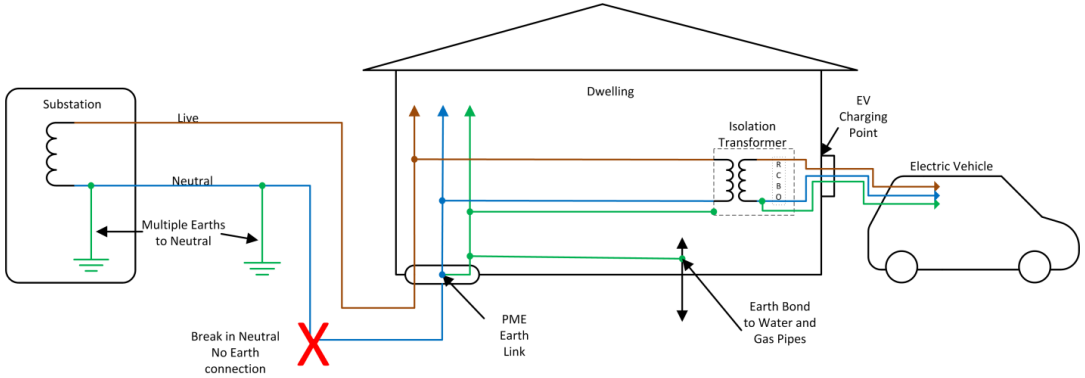


Image courtesy of Ludo McGurk

Section 730 Onshore units of electrical shore connections for inland navigation vessels

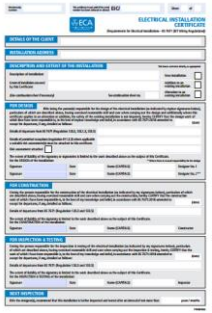
- This is an entirely new section
- Most, if not all, of the measures used to reduce the risks in marinas apply equally to electrical shore connections for inland navigation vessels
- One of the major differences between supplies to vessels in a typical marina and this is the size of the supply needed

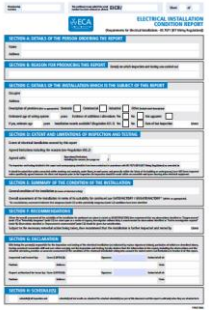
New appendices and updates

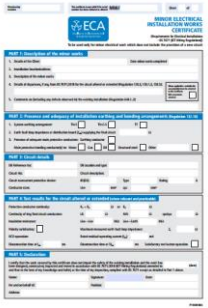
APPENDICES

Appendix 6 Model forms for certification and reporting

- Some minor alteration have taken place to the test certificates
- ECA will be providing free to use test certificates for Members online







Appendix 14 Determination of prospective fault current

- Some of the appendices have been renumbered / rearranged
- Appendix 14 gives guidance on determining Prospective Fault Current, particularly safe working practice

Appendix 17 Energy efficiency

- Originally proposed as Part 8
- This is a new **appendix** that provides recommendations for the design and erection of electrical installations including installations having local production and storage of energy for optimizing the overall efficient use of electricity
- Will likely be developed into a future Part 8

Appendix 17 Energy efficiency

- The recommendations within the scope of this appendix apply for new electrical installations and modification of existing electrical installations. Much of this appendix will not apply to domestic and similar installations
- It is intended that this appendix will be developed into Part 8 of BS 7671 in a future amendment

What training do I need?

TRAINING AND COMPLIANCE

Qualifications

- There is currently **no** requirement to complete a training course in the 18th Edition for existing QS's - all that is needed is an adequate knowledge of the requirements - However this may change....
- ECS Registered Electricians need to obtain this qualification by 1st July 2019
- New QS's will need a formal qualification
- However, it is recommended that anyone involved in the design or installation of electrical systems is adequately trained
- Information about qualifications is on the #Project18 www.eca.co.uk

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Any Questions?

www.eca.co.uk