An overview of the main proposals in BS 7671 17th Edition

Electrical Contractors’ Association
Why have Regulations

Behold the electrician standing there.
Soot, soil & verdigris defile his greasy hair.
Shall such a being perish in it’s youth?
Alas it is indeed the dreadful truth.
A moments lapse,a hands imprudent slip
A flash! A crash! A sound like Zip!
A smell of burning fills the startled air.
The electrician is no-longer there!!
History

- 1882 – first edition of the Wiring Regulations
- Remained as IEE domain until 1981 when they were aligned to some degree with IEC Wiring Regulations
- 1992 – Became a BS formalising harmonisation
- 2008 – BS 7671:2008

Requirements for Electrical Installations
IEE Wiring Regulations 17th Edition
What are the drivers for the proposed changes

• EU Harmonisation (CENELEC)

• Whole document has been revised to align with either CENELEC or IEC corresponding documents

• Very little national text remains
Parent Documents

- IEC 60364
- CENELEC 60384
- BS 7671
ECA Involved with development of BS7671:2008

• ECA Technical Committee involved
• ECA Technical staff member chairs a sub-panel of BS 7671 committee
• ECA member comments were submitted on the draft
• New ECA book due early 2008, written by Darrell Locke – Chairman of panel D of BS 7671
• Will provide a unique insight and solutions not available in other publications
• Available from January 2008
When is the proposed new standard expected to be introduced

- Published January 2008

- From January 2008 to July 2008 either 16th or 17th editions can be used

- All installations designed after 1 July 2008 to comply to BS 7671 17th edition
Outline

- BS 7671 17\textsuperscript{TH} Edition 2008 is laid out similar to BS 7671 16\textsuperscript{TH} Edition.
- The standard is divided into Parts and Chapters with appendices at the end as before.
- There are 7 parts as before
- Important changes to terminology and definitions
- Changes to Chapter 41 – Protection against electric shock
- Harmonisation of bathrooms – 701
- More stringent EMC requirements
- New section ‘Lighting & Luminaires’
- 7 new ‘Special Locations’ added
- 7 new Appendices

- Section 131: 4 new regulations for protection of persons & livestock against voltage disturbances and electromagnetic influences.
- 132.13 specific requirement for appropriate documentation. For a domestic or similar, a schedule could suffice.
- 134.1.1 ‘good workmanship by competent persons’ or persons under their supervision and proper materials.
- 134.2.1 Inspection & testing to be carried out by ‘competent person’.

- 134.2.2 Designer of installation responsible for specifying the interval to the first periodic inspection.

- 135.1 Now makes a positive recommendation that every electrical installation is subject to periodic and testing, in accordance with Chapter 62
Part 2: Definitions

• There are approximately 260 definitions, there were approximately 170 in the 16th edition.
• New ones include:
  • ‘Competent person’

  ‘A person who possesses sufficient technical knowledge and experience for the nature of the electrical work undertaken and is able at all times to prevent danger, and where appropriate, injury to themselves and others.’
Part 2: Definitions

- Verification
- Inspection
- Testing
- Reporting
- All of above terms, whilst generally well understood are now defined for the purpose of the 17th Edition

- Exposed conductive part, A conductive part of equipment which can be touched and which is not live but which can become live when basic insulation fails. Example: metal switch plates
Part 2: Definitions

- Extraneous – conductive part, and its associated definition, remain unchanged
- Line conductor (replaces phase conductor Line is the internationally used term) Do not confuse Line conductor with Live conductor which can be a Neutral conductor
Part 3: Assessment of General Characteristics

• Section 332 new regulations on EMC requirements (may be the subject of amendment no 1 to BS 7671:2008)

• Two new chapters: Chapter 35 Safety Services &

• Chapter 36 Continuity of Service
Chapter 41

- Direct contact protection now referred to as basic protection (that is protection under normal conditions)
- Indirect contact protection now referred to as fault protection (that is protection under fault conditions)
Chapter 41

- RCD’s are now recognised as giving additional protection (this term is now used instead of supplementary protection)
- RCD now required for all general use socket outlets rated up to 20A. Allows for 2 exceptions
  1. Socket outlet used under supervision of skilled or instructed persons.
  2. Socket outlet suitably identified for connection of particular item of equipment.
- To be recognised as giving additional protection
  The RCD must be rated at 30mA or less and operate within 40 ms when tested at 5 x rated operating current.
Chapter 41

Revised Disconnection times

- TN systems – 0.4 seconds (final circuits up to 32A)
- TT systems – 0.2 seconds (final circuits up to 32A – allows for 0.4s where all Protective bonding in place and disconnection is achieved by overcurrent device)
- Distribution circuits and circuits not covered by table 41.1, TN= 5 seconds & TT =1 second
- Supplementary bonding can be used were Disconnection times can not be met
Tables 41

- Maximum earth fault loop impedances tables 41B1 (fuses 0.4), 41B2 (Circuit Breakers) and 41D (fuses 5 secs) now replaced by tables 41.2, 41.3 and 41.4.
- The values between the old and new tables are now different, the new tables values being slightly lower base on a nominal $U_0$ voltage of 230 rather than previously $U_{oc}$ open circuit voltage at the distribution transformer.
- Example in the current table 41B2 the maximum $Z_s$ values for a 32A type B MCB was 1.5 ohms in the new table 41.3 the value is now 1.44 ohms.
- No longer a ref to table 41 C.
Chapter 52

Selection and erection of wiring systems

Additional requirements for cables concealed in partition/wall at a depth of less than 50mm.

- RCD protection (30mA or less) now required for these cables where installation (premises) is not intended to be under supervision of skilled or instructed person and traditional protection can not be provided (earthed metallic covering, earthed metallic conduit or equivalent protection from nails, screws, etc)
- PVC/PVC cables concealed in walls in domestic installation at depth less than 50mm will need to be in safe zone and have additional RCD protection
- Where wall has any metallic construction RCD required irrespective of depth of cable.
Chapter 52

Selection and erection of wiring systems

- Chapter 52 now includes reference to busbar trunking systems and powertrack systems

- Max value of Voltage drop in consumers’ installations has changed - Table in appendix 12
  Volts drop between origin and load terminals in LV system to be less than;
  Public Supply lighting 3% Other uses 5%
  Private Supply lighting 6% Other uses 8%
  These replace the current 4% requirement
Chapter 55. Luminaires & Lighting 559

- 36 new regulations
- Maximum circuit rating 16A for B15 B22 E14 or E40 lamp holders
- Through wiring only permitted where light is designed for this
Chapter 55. Luminaires & Lighting 559

- 559 applies to selection & erection of luminaires & lighting installations in fixed installations and highway power supplies & street furniture.
- Outdoor lighting includes:
  - roads., parks, car parks, gardens, sporting areas, monuments, floodlighting, telephone kiosks, bus shelters, advertising panels, road signs & road traffic signals.
  - Excludes, distributors equipment & temporary festoon lighting.
Chapter 56: Safety Services

- Chapter covers basic selection & erection aspects of supplies for safety services.
- Many overlaps with other standards & specifications ie: UPS and generators
- BS 5266: Emergency Lighting &
- BS 5839: Fire Alarms
- Requirements removed from BS 7671
Part 6 & 7

- Part 6 will be Inspection and testing Previously Part 7
- Part 7 will be Special Installations or Locations previously Part 6
Part 6

- New Part 6 Inspection and testing Table 71 A now known as table 61
- Minimum installation values changed to
  - 0.5 MΩ Selv or Pelv at 250 volts
  - 1.0 MΩ for systems up to and including 500 volts with a test voltage of 500 volts.
- For systems above 500 volts tested at 1000 volts the minimum is also 1.0 MΩ
Chapter 62: Periodic Inspection & Testing

- 621.5 Periodic Inspection & Testing shall be undertaken by a skilled person, competent in such work.

- Proof of competence may be required
Part 7

• Part 7 Special Installations or Locations
• This Part has now be greatly expanded to include 14 sections which include items on
  • Marinas and similar locations
  • Exhibitions/shows and stands
  • Solar photovoltaic (pv) power supply systems
  • Mobile or transportable units
  • Electrical Installations in caravans and Motor caravans
  • Temporary electrical installations for structures, amusement devices and booths at fairgrounds, amusement parks and circuses
  • Floor and Ceiling heating systems
Section 701: Bathrooms

- Section 7 Special Installations or Locations
- Section 701 Locations, containing a bath or shower
- Zone 3 has been removed
- Suitable equipment can be within 600mm of a bath
- Excluding 13 amp sockets to BS 1363, which must be 3M from edge of bath or shower.
- All circuits to be RCD protected
- Supplementary bonding is not required – provided any required Protective Equipotential bonding has been installed.
Part 7

- Numbering.
- The numbering system of BS 7671:2008 reflects the numbering of IEC and CENELEC documents generally, making it easier to find the source of a regulation.

- In Sections 7 the numbering reflects a change, addition or alteration to a previous regulation.
- Eg 701.415.2 modifies Regulation 415.2 (supplementary equipotential bonding) in relation to section 701 ie Locations containing a bath or Shower.
Section 702: Swimming Pools

- Zones A, B & C replaced with,
- Zones 0, 1 and 2
- Scope now includes basins of fountains
Section 703: Rooms & Cabins containing Sauna Heaters

- Zones, A,B,C & D replaced with:
- Zones 1,2 & 3
Section 704: Construction & Demolition Sites

Section 705: Agriculture & Horticulture

• In both sections the reduced disconnection times of 0.2s and 25v equation have been removed
Section 708: Caravan & Camping Parks.

• Socket outlets must be provided individually with overcurrent and RCD protection for each pitch outlet. Previously 1 RCD was allowed to protect not more than 3 pitch outlets.
Appendices

• Changes to Appendix 4.

• Cable installation methods have new reference designations eg method 1 now method A1.

• Grouping factors changed, including grouping for underground cables

• New diagrams and more installation methods included
Appendix 6

- Changes reflect changes of terminology throughout the regulations.
- Certificates in BS 7671 are model certificates.
New Appendices

- Appendix 8: Bus-bar current rating & volt drop
- Appendix 9: Definitions – Multiple source, D.C and other systems
- Appendix 10: Conductors in parallel against overcurrents
- Appendix 11: Harmonic currents on balanced 3ph systems
- Appendix 12: Volt drop in general
- Appendix 13: Insulation resistance of floors and walls
- Appendix 14: Loop impedance
EMC

- Requirement for installation to meet emissions and immunity levels
- Revised EMC Directive reinforces this
- Dedicated BS 7671 section was not ready but may appear in amendment No 1
- In meantime – follow best practice, earthing, separation distances etc
Training Courses

• ECA will be offering the following options

• For ECS Gold Card Holders an Assessment only option.

• A 1 day update course covering the changes from 16th to 17th Editions with m/c assessment for those who hold a qualification based on BS 7671 obtained since 2001.

• A 3 day course covering the whole of BS 7671 for people who are electrically qualified and require an in-depth overview of the new wiring regulations, or anyone who has not obtained a formal electrical qualification since 2001.
The chief danger of electricity is ignorance

- A gentleman called Hilaire Belloc made the following point during the life time of the first wiring regulations in 1882 which is as relevant today as it was then;

- Lord Finchley tried to mend the electric light. It struck him dead – and serve him right! For tis the duty of the wealthy man, to give employment to the artisan

    Fully competent to BS 7671:2008 of course!!