

# Major Changes and Challenges in AS/NZS 3003(2011)

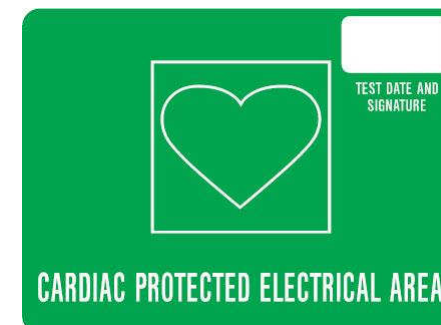
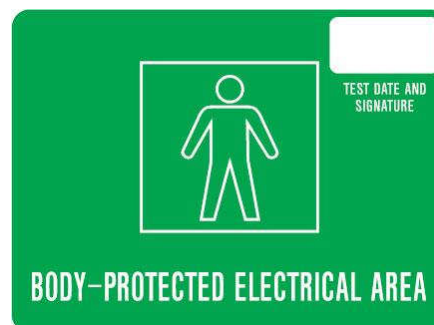
Presented by Matthew Jones

# Overview

- \* Major changes in AS/NZS 3003 (2011)
- \* Impact on new installations
- \* Impact on existing installations
- \* Interpretations
- \* Routine testing to AS/NZS3003
- \* Discussion

# Major changes in AS/NZS3003 (2011) *Electrical installations – Patient areas*

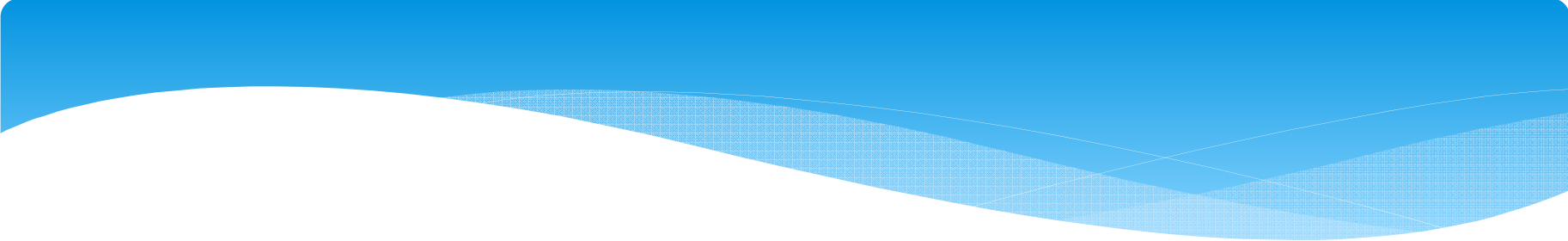
- \* All **patient areas** to be wired as Body or Cardiac Protected Electrical Areas (BPA/CPA) Clause 2.1
  - \* Patient Area “Locations where it is intended that low-voltage medical electrical equipment will be used on a patient. This does not include areas such as corridors and lifts where low-voltage medical equipment is only used in an emergency or for the transportation of patients”



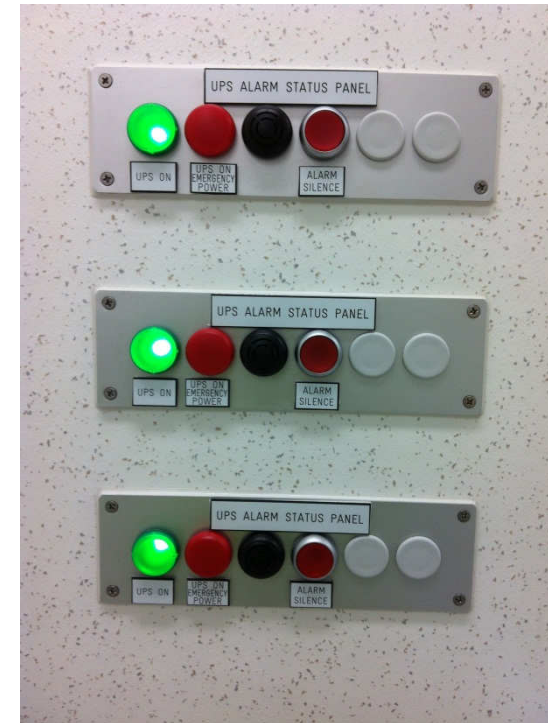
- \* Body and cardiac-protected electrical areas (BPA/CPAs)
  - \* Boundaries extend to walls, and if walls incomplete e.g. entryway without door, to the projection of such walls. Note: partitions, dividers, screens, benches, moveable walls, curtains are not walls/boundaries. Nurse stations, staff bases, beverage areas within the boundary are part of the BPA/CPA
- \* Locations required to be wired as CPA Clause 2.2.1
  - \* Cath Lab and control rooms (?)
  - \* ICU (Cardiac, Neonatal Level 3, Swann-Ganz Monitoring)
  - \* CCU
  - \* Operating Theatre (Cardiac/Thoracic Surgery)

- \* Locations required to be wired as BPA Clause 2.2.3
  - \* Blood collection and plasmapheresis areas
  - \* Chiropractic/Physiotherapy rooms
  - \* Patient ensuite bathrooms, shower rooms, toilets, etc
  - \* Recovery areas
  - \* Resuscitation bays
  - \* Doctors consulting rooms
  - \* Nursing homes
- \* Following each clause, a new section in *italics* specifies how the clause is to be validated



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- \* Final sub-circuits permitted to supply only one room and an adjoining ensuite in BPAs and one patient location in CPAs, excluding CPO (Cleaning Purposes Only) Clause 2.4.1
  - \* Socket-outlets within 5m of the entrance to a protected area require LPD (Leakage Protection Device) protection (BPA/CPA) and connected to EP earthing system (CPA) – entrance with/without door!  
Clause 2.4.3.2.a.ii, Clause 4.4.2.4.1.a.ii

- \* UPS require status indicators for socket-outlets situated in areas of continuous patient observation, including Operating Theatres and Nurse Stations of Recovery, ICU, special care areas Clause 2.4.5.2



- \* RCD's (Residual Current Device), LIOM's (Line Isolation Overload Monitor) must be (excluding CPO):
  - \* Readily accessible *“Capable of being reached quickly and without climbing over or removing obstructions, mounting on a chair, or using a movable ladder, and in any case not more than 2m above the ground, floor or platform”*
  - \* Not mounted under benches, within cupboards or cabinets, or behind heavy equipment
  - \* If mounted near the entrance of a room, separated by 500mm of any light switch

Clause 2.6

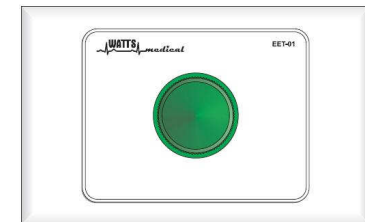




- \* Socket-outlets not readily accessible and not protected by dedicated LPDs require readily accessible isolation switch Clause 2.7.2
- \* CPO: Required within 15m of any point of a BPA and in every CPA Clause 2.7.3.1
- \* Commissioning and certification, including documentation and testing requirements of LPDs has been specified Clause 2.13, 2.14
  - \* Commissioning tests and Statement of Compliance to AS/NZS3000 by electrical contractor
  - \* Certificate of Compliance to AS/NZS3003, test report and test equipment calibration certificates

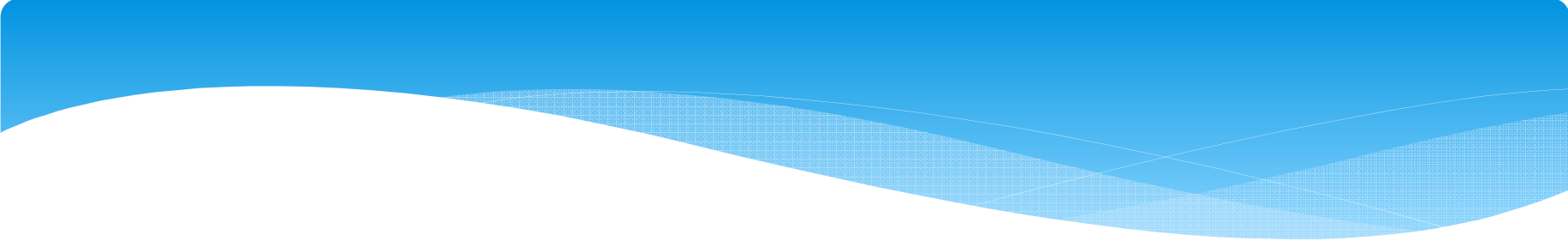


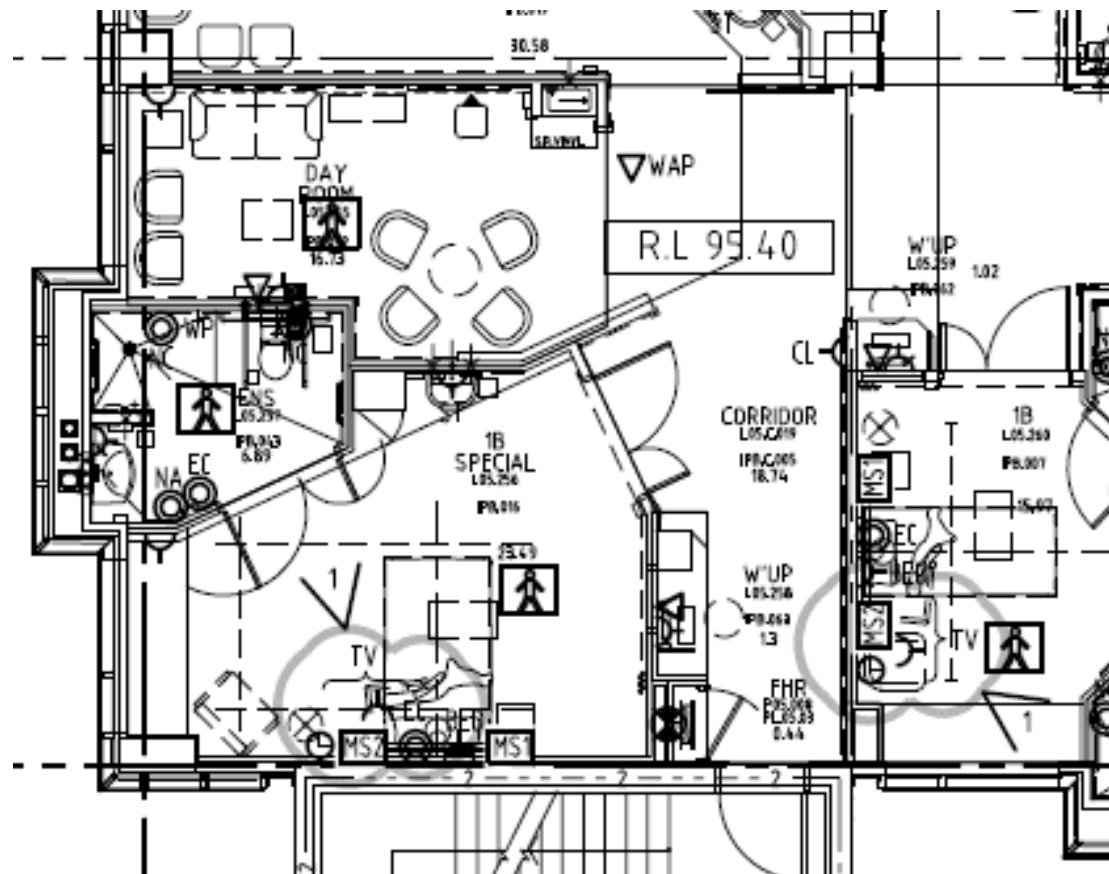
- \* Requirement for EP (Equipotential) Terminals has been removed Preface p2
- \* Minimum size EP conductor  $4mm^2$  Clause 4.4.1
- \* Use of “nodes” optional e.g. large CPAs Clause 4.4.2.3
- \* New Sections
  5. Special Patient Areas
    - \* Home Care Installations and Self Harm Areas
  6. Alterations, Additions, Repairs of Existing Areas
  7. Magnetic Fields
  8. Marking
  9. Routine Inspection

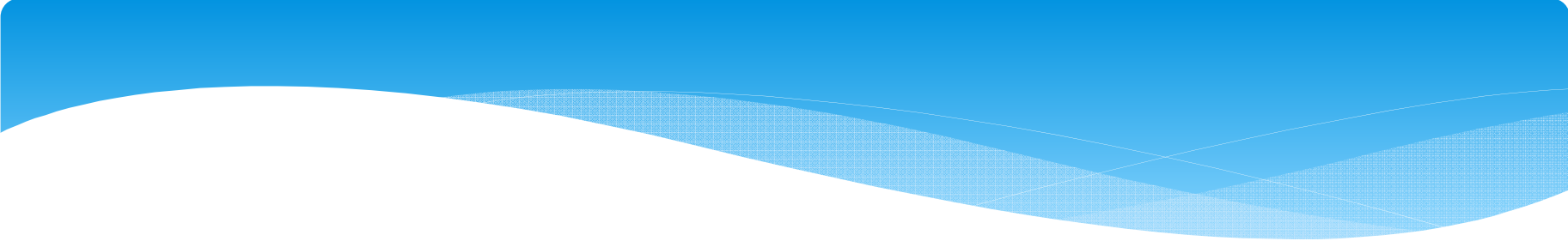


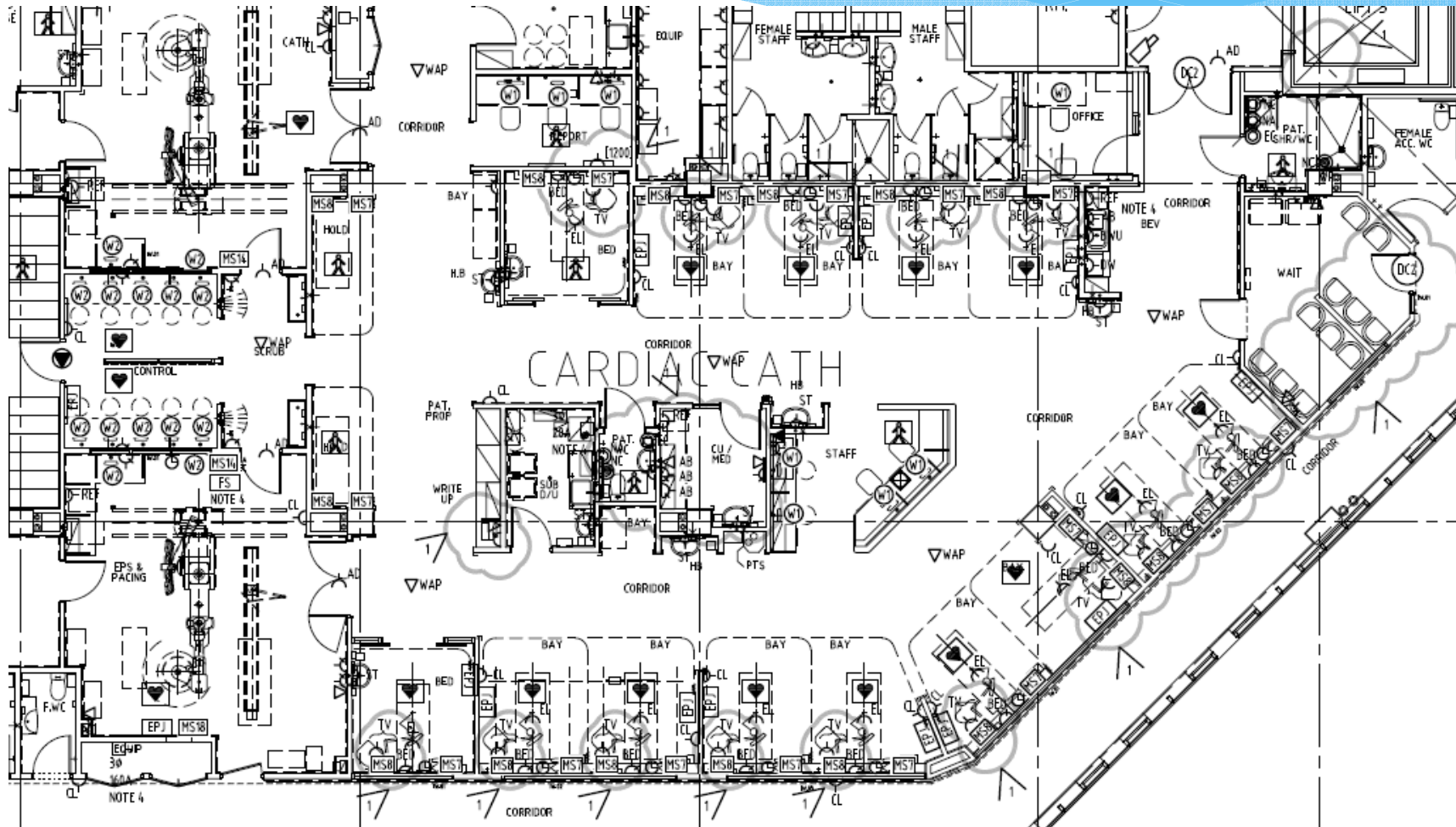
# Impact on New Installations

- \* In Victoria, the Electrical Safety (Installation) Regulations 2009 apply
  - \* Part 2 “Electrical Installation Work”, Regulation 238, Clause 2 “For the purposes of section 45 of the Act, prescribed electrical installation work means work on all or part of any fixed electrical equipment operated at any voltage installed in a patient area”
  - \* Legal requirement to comply with AS/NZS3003 and lodge prescribed COES, which includes having new installations inspected by “M” class inspector

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- \* Individual sub-circuits: affecting distribution board size, amount of cable and associated wiring systems
  - \* 5m rule: increased quantity of 10mA RCDs used and consequently, increased importance on mechanical protection of cable from DB (over-current circuit breaker) to RCD
    - \* Note: RCDs cannot protect outlets in different rooms, or outlets in a patient area and outlets not a patient area  
Clause 2.8.4



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- \* 5m rule: increased the boundary of EP earthing system outside a CPA, led to conflict with adjoining areas
  - \* UPS status indicators: 1 commercially available product
  - \* CPA: now specific led to reduced overall quantity, however, EP earthing systems increased in size due to boundary requirements
    - \* Nodes: Introduced to facilitate design and meeting specified requirements

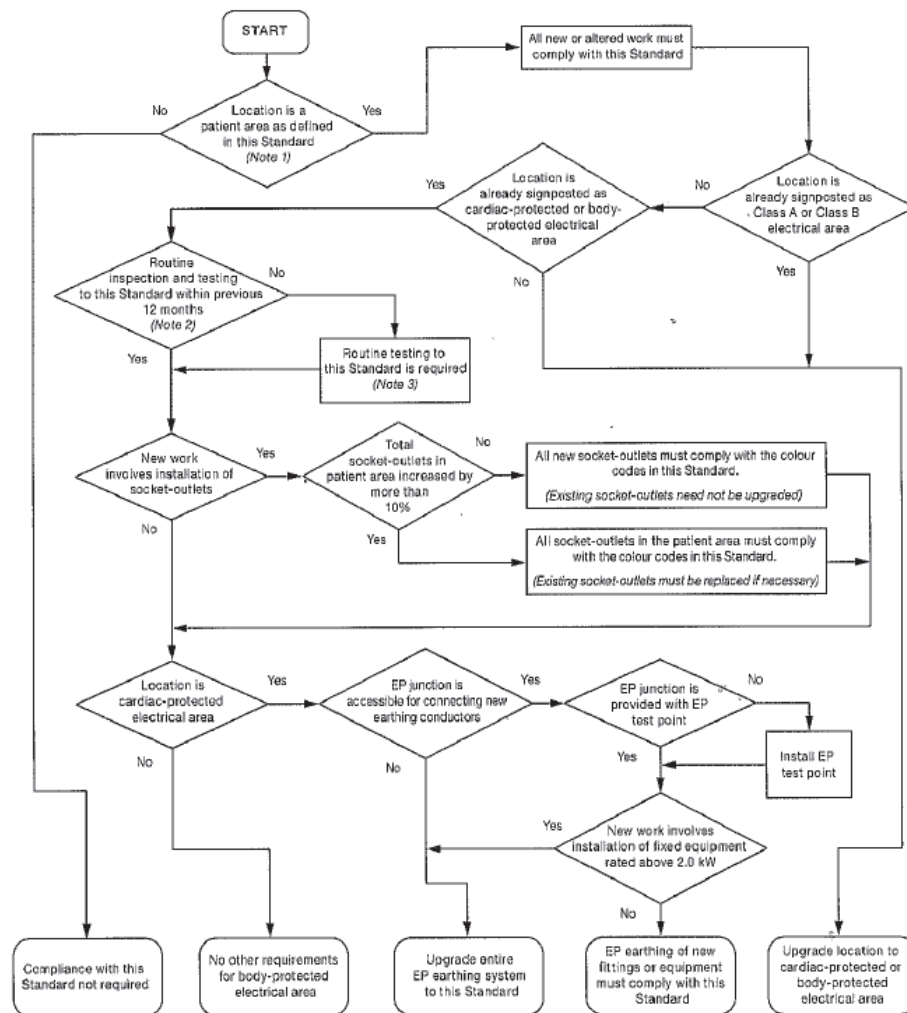


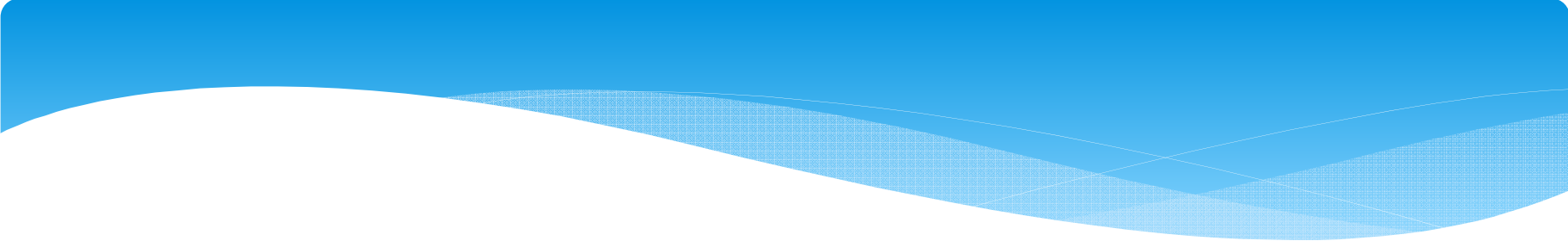
# Impact on Existing Installations

- \* *AS/NZS3003 Section 6 Alterations, additions and repairs to electrical installations in patient areas (new)*
  - \* “Every alteration of, or addition to, an existing electrical installation shall be deemed to be a new electrical installation, and all relevant provisions of this Standard shall apply to every such alteration or addition” Clause 6.2.1
  - \* Legal requirement to comply with AS/NZS3003 and lodge prescribed COES, which includes having alteration and addition installation work inspected by “M” class inspector



Fig 12, p51



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- \* Individual sub-circuits: affect installation of additional socket-outlets e.g. new circuit may be required
  - \* 5m rule: Affect additions outside an area and also affects adjacent non-protected patient areas
  - \* **Repairs** to existing installations e.g.
    - \* To accessories or replacement of like-for-like fittings
    - \* Replacement of component parts of fixed equipment with like-for-like componentssatisfy fundamental principles of Part 1 AS/NZS3000
  - \* Replacement of a complete fixed electrical equipment constitutes an alteration, and in Victoria is deemed prescribed electrical work

# Interpretations

- \* Bill te Wierik, Senior Compliance Officer, ESV
  - \* Questions & Answers Document (draft)

# Routine Testing

- \* Intervals not exceeding 12 months, with report
- \* Body-Protected Electrical Area
  - \* General: labelling, colour coding, power available, max no. of outlets on RCD circuit, all outlets trip RCD/LIOM Clause 9.2.1
  - \* Earthing:  $< 1.0\Omega$  to medical gas outlet Clause 9.2.2
  - \* RCDs: sensitivity, 2 trip times at rated current Clause 9.2.3
  - \* LIOMs: PHC system/alarm, overload within 3-5sec Clause 9.2.4, Clause 9.2.5



- \* Cardiac Protected Electrical Area

- \* General: labelling, colour coding, power available, max no. of outlets on RCD circuit, disposition of RCDs between patient locations, all outlets trip RCD/LIOM Clause 9.3.1
- \* Earthing:  $< 0.1\Omega$  to EPJ Clause 9.3.2
- \* Potential Difference:  $< 50\text{mV}$  between at least 2 socket-outlets, reticulated plumbing, permanently wired equipment to EPJ Clause 9.3.3
- \* RCDs: sensitivity, 2 trip times at rated current Clause 9.3.4
- \* LIOMs: PHC system/alarm, overload within 3-5sec Clause 9.3.5, Clause 9.3.6

# Discussion

- \* My message
  - \* Understand the patient areas in your facility (protected and not protected)
  - \* Ensure program in place for routine testing and rectification of identified defects
  - \* Ensure electrical contractors are aware and familiar with AS/NZS3003 and they engage a licensed electrical inspector at the beginning of any works