**Health Technical Memorandum**

**06-01: Electrical services supply and distribution**

*Part A: Design considerations*

Appropriate Sources of supply voltages - healthcare facilities will have an electrical supply atone of the following voltages: 11 kV Large acute hospital, typical floor area greater than 8500 m2,

11 kV/400 V Medium-sized acute hospital, typical floor area 5500 m2 to 8500 m2

400 V TP & N General/community hospitals, health centres, large off-site clinics, off-site administrative buildings, stores and decontamination facilities

230 V SP & N GP and dental practices, small

off-site clinics

Resilience - Large healthcare premises should generally be supplied by a dual PES (ideally both at 100% fully rated) arranged with either an automatic or a manual change-over system.

Essential/non-essential supplies - When planning for new installations, the option

of segregated non-essential and essential electrical systems or a unified electrical system (that is,duplex or simplex) should be evaluated.

Primary sources of supply (see Chapter 7).

Secondary main sources of supply – generation (see Chapter 8).

Design of installations for growth and change - Changes in medical technology and healthcare practice have had an effect on the requirements for

electrical power in healthcare

Access for maintenance - In order to comply with the Construction, Design

and Management Regulations (CDM) 1994,

Commissioning procedures - Designers should consider how the installation

will be commissioned and how the required test measurements will be made

Patients in special medical locations - These areas will relate to the patient environment of group 1 under Chapter 10 in‘IEE Guidance Note 7’.

Risk of generator failures - Standby generators should be maintained in an operational readiness state in order to provide their principal function of standby supply

Generator control - A time delay of up to 15 seconds (following the initial confirmation time) is allowed between loss of normal supply and connection of the standby generator to the essential circuits. The essential circuits are defined as those which cannot accept an interruption of electrical energy greater than 15 seconds plus the detection time (that is, clinical risk Category 4 and above).

Fuel and fuel storage - The design process should evaluate the fire and pollution implications of storing diesel fuel

Earthing - The earthing arrangements for the full electrical system should comply with the requirements of BS 7430:1998 and BS 7671:2001.

Access for maintenance - Designers and stakeholders should consider the risks associated with the installed routes for preformed wiring and the need to provide suitable access for maintenance

Theatre operating lamps - All fixed theatre operating lamps, including the main unit and any satellite units, should be connected to a battery inverter unit providing 3-hour autonomy.

Emergency escape lighting - The emergency escape lighting circuits should be designed in accordance with BS 5266 and BS EN1838

Fire alarm, security circuits and critical alarms - Designers should provide an independent tertiary power source (battery inverter unit) for the fire alarm system.

Records to be kept - All tests and inspections records, As-installed drawings

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*Part B: Operational management*

Planned preventative maintenance - Set maintenance frequencies should be identified for each part of the electrical distribution and plant;

Permit-to-work and limitation-of-access - The fixed wiring and electrical plant within a healthcare premises must prevent the risk of injury and/or danger. The only acceptable way of achieving this high standard will be the adoption of a permit-to-work system.

Service/test/record documentation - Estate management staff should maintain countersigned records of all maintenance tasks and servicing activities on any part of the fixed wiring or plant.

Secondary power sources - Routine online testing to prove the essential electrical systems

Lightning protection The lightning protection system (LPS) should be visually inspected for any signs of damage without the need to expose any final earth electrodes.

Uninterruptible power supplies, inverters and batteries - Non-intrusive visual inspection of uninterruptible power supplies (UPSs), inverters and batteries should be considered as a frequent maintenance task at intervals not exceeding monthly

Final circuits Inspection & Testing - IEE Guidance Note No 3 in BS 7671 provides

guidance for the testing of the fixed wiring system

Portable appliance testing - Estates managers should compile a comprehensive asset register of all portable appliances within the healthcare facility

Energy management policy

Maintenance policy

Contract maintenance appointment that clearly defines the responsibilities of both parties and establishes a clear maintenance brief

Emergency action and contingency plans available in the event of a power failure,

Documentation of all assets (as-fitted drawings and their maintenance) and comprehensive operational manuals for all items of plant that include requirements for servicing, maintenance tasks and frequencies of inspection