

## Chapter 5

### ELECTRICAL POWER SUPPLIES

#### 5.1 INSTALLATION

- 5.1.1 The installation, control and distribution of wiring of electrical equipment in buildings shall be in accordance with SS CP 5 Code of Practice for Wiring of Electrical Equipment of Buildings and SS CP 16 Code of Practice for Earthing.

#### 5.2 PRIMARY AND SECONDARY SUPPLIES

- 5.2.1 Where any of the following installations is required by this Code or other Codes/Regulations, its primary and secondary source of power supplies shall comply with the corresponding Code of Practice stated therein:

Apart from the supply from normal mains, a secondary source of power supply shall be provided to serve all essential services in the building when there is a power failure from normal mains. Secondary source of power supply would come from standby generator set, which would automatically start, when there is power failure in the building.

- (a) Where electrical passenger or goods lift is required, its electrical installations, inclusive of battery and other form of secondary power supply, shall comply with SS CP 2 Code of Practice for Installation, Operation and Maintenance of Electric Passenger and Goods Lifts. Where the provision of fire lift is required by this Code, installation of the primary and secondary supplies shall also comply with the above mentioned Code of Practice.

(No illustration)

*Atrium smoke control system is required if any building under Purpose Group IV, V and VII is designed to incorporate an atrium under cl.7.5 of Chapter 7. Large basement occupancy other than car park usage shall be provided with engineered smoke control system, if the gross floor area exceeds 1900 sq m under cl.7.4 of Chapter 7. All smoke control systems shall be connected to secondary power supply.*

*Lifts that are commonly found in buildings under purpose IV, V and VII are electrical passenger lifts, fire lifts and goods lifts.*

*Although the current SS CP 2 does not specifically require the installation of generator set to provide secondary power supply to the above lifts, however in the case of multi-storey office, shops and places of public resorts under Cl. 6.6.2(b) and (c), generator set is required to be provided to operate the lifts during emergency.*

*Where emergency generator is provided, the lifts would be designed to home to the designated floor under generator power upon loss of normal power supply.*

- (b) Where electrical fire alarm system is required, its primary power supply as well as type and capacity of battery shall comply with SS CP 10 Code of Practice for the Installation and Servicing of Electrical Fire Alarm Systems.

(No illustration)

*Electrical fire alarm system(manual or automatic fire alarm system) is required in most buildings under purpose group IV, V and VII. The electrical fire alarm system shall be provided with emergency battery supply to the requirement of SS CP 10.*

- (c) Where exit or emergency lighting system is required, its electrical wiring, type and capacity of battery or other form of secondary power supply shall comply with SS CP 19 Code of Practice for the Installation and Maintenance of Emergency Evacuation Lighting and Power Supply Systems in Buildings.

(No illustration)

*Emergency lighting in exit staircases, escape routes and other common area leading to the exit are to be provided with either self-contained battery or connected to secondary power supply.*

- (d) Where an emergency voice communication system is required, its electrical wiring shall be fire rated or otherwise fire protected in accordance with SS CP 25 Code of Practice for Emergency Voice Communication System in Buildings. Appropriate type and capacity of secondary source of supply shall also be provided accordingly.

(No illustration)

*The current Fire Code 2002 requires emergency voice communication system to be provided in buildings under Cl. 8.2.1(a)(i) Purpose group IV, V and VII.*

*The type and extent of the emergency voice communication shall be in accordance with cl.8.2 of the Fire Code 2002. Technical requirements such as fire rated cables, routing and emergency power supply shall comply with SS CP 25.*

- (e) Where a wet rising main system is required, the relevant electrical supply shall be installed in accordance with SS CP 29 Code of Practice for Fire Hydrant Systems and Hose Reels. A secondary source of power supply with capacity stipulated in SS CP 29 shall be provided for the wet rising main pumps.

(No illustration)

*Where a building under purpose group IV, V and VII exceeds 60m in habitable height, wet rising main system shall be provided. The wet riser pump including any transfer pumps shall be connected to secondary power supply. If electrical generator is available, the electrical pumps shall be connected to this source of supply. In the absence of electrical generator set, the duplicate wet riser pump or transfer pump shall be diesel engine-driven and shall start automatically when there is demand on the riser main system to supply water. This is to ensure that the wet riser main system would remain operational during failure of normal power supply.*

- (f) Installation of electrical supply for sprinkler system shall comply with SS CP 52 Code of Practice for Automatic Fire Sprinkler System. Capacity of secondary source of supply, where required, shall satisfy the operation requirements under the respective hazard category.

(No illustration)

*Buildings under purpose group IV, V and VII exceeding 24m in habitable height, larger than the permitted compartmentation size and containing the respective hazard category (high risk) shall be provided with automatic fire sprinkler system complying with SS CP 52.*

*The sprinkler pump including any transfer pumps shall be connected to secondary power supply. If electrical generator set is available, the electrical pumps shall be connected to this source of supply. In the absence of electrical generator set, the duplicate sprinkler pump or transfer pump shall be diesel engine-driven and shall start automatically when there is demand on the sprinkler system to supply water. This is to ensure that the sprinkler system would remain operational during failure of normal power supply.*

- (g) Mechanical ventilation where required for the following rooms or spaces shall be provided with secondary source of supply in accordance with SS CP 13 Code of Practice for Mechanical Ventilation and Air-conditioning in Buildings:

- (i) exit staircases and exit passageways;
- (ii) smoke-stop and fire fighting lobbies;

- (iii) areas of refuge within the same building;
- (iv) basement car parks;
- (v) fire command centres;
- (vi) flammable liquid/gas storage rooms.

(No illustration)

*Standby source of power supply may be in the form of emergency generator or uninterruptable power supply. This is to ensure that the mechanical ventilation system provided to these rooms or spaces would not be affected during power failure.*

- (h) Where mechanical ventilation is installed to provide air for the operation of the following equipment, secondary source of supply shall be provided:
  - (i) emergency generator;
  - (ii) engine driven fire pump.

(No illustration)

*If the emergency generator or engine driven fire pump rooms are provided with mechanical ventilation, the mechanical ventilation system should continue to function under secondary source of power supply.*

5.2.2 The following systems shall be provided with secondary source of supply:

- (a) Atrium smoke control system, including associated AHU's forming part of the system.
- (b) All smoke control systems where required by this Code.

(No illustration)

5.2.3 Where emergency generators are provided as a secondary source of supply, they shall comply with SS CP 31 Code of Practice for Installation, Operation, Maintenance, Performance and Constructional Requirements of Mains Failure Standby Generating Systems.

(No illustration)

*Emergency generator shall start automatically upon simulation of power failure and shall be sufficiently sized to supply power to fire safety systems such as essential fans, fire pumps & lift system.*