

Category 1 Standard

S1126 Batteries and Chargers for Fixed Power Supply Installations in Non-Substation Locations

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1 Purpose

- 1.1 The purpose of this Standard is to define the requirements for the design, manufacture, supply and installation of batteries and chargers used for supplying fixed power supply installations in non-substation locations including Depots and Sidings.

2 Scope

- 2.1 This Standard applies to all batteries and chargers used for fixed power supply installations in non-substation locations.

Note: A typical application example is for Depot DC switchgear.

- 2.2 This standard does not apply to assets in locations including DC Traction Substations, 11kV / 22kV Substations, transmission Substations or Transformer Rooms.
The LU Technical Authority should be consulted if there is doubt as to the applicability of this standard.

Note: Refer to Standard SP80701 to cover the above locations.

- 2.2 This Standard does not cover the requirements for UPS, OLBI, emergency lighting or for supplying non-power asset installations, such as IT and telecommunication systems.

3 Requirements

3.1 General

- 3.1.1 Batteries and chargers shall be suitable for duty in its operational environment taking cognisance of the requirements detailed in Section 3.2 of this Standard.
- 3.1.2 Where reasonably practicable, the design of LV switchgear shall eliminate the need for associated batteries and chargers.

Note: Circuit Breakers with AC supplied motor charged springs are preferable to those that require batteries.

It is always preferable to avoid the use of batteries and chargers (as per this standard) if the technology is available to achieve the desired functions within the switchboards and schemes to be operated. This can sometimes be safely achieved by use of self powered protection relays etc., or via AC control schemes but it is accepted that this is not always possible.

3.2 Design and Performance

- 3.2.1 The battery and charger shall provide a safe and reliable DC supply for control, tripping, and any associated functions.
- 3.2.2 The battery and charger shall be designed to supply short duration, heavy current pulses for the operation of switchgear or a continuous standing current drain or both, as appropriate for the application.



- 3.2.3 The battery and its charger shall be compatible.
- 3.2.4 Chargers shall have a mean time between failures of no less than 25,000 hours and shall have a minimum life of 20 years when correctly maintained.
- 3.2.5 Batteries selected shall have a minimum design life of 10 years at 25 centigrade ambient in a float charge application.

Note: Designers to note that batteries may be operated at elevated temperatures. For sites with elevated temperatures an evaluation of battery technology offering improved life versus replacement costs is recommended.

- 3.2.6 At any time whilst in service, any battery which fails to deliver 80% of its rated capacity shall be replaced.
- 3.2.7 All battery and charger systems shall not require maintenance more frequent than 12 months, depending on its environment and location.

Note: Refer to LU work instruction F2852, titled "Annual inspection and test of depot Lightning circuit breaker back-up installations".

- 3.2.8 The battery and charger system designer shall develop the worst case credible duty cycle defined within the operational requirements, as the basis for determining battery capacity, which shall be submitted for approval to the LU Technical Authority.
- 3.2.9 The equipment shall be sized for use within the operational environment considering temperature, humidity and solar gain. The battery location maximum / minimum / ambient temperature values and humidity envisaged, shall be confirmed by the designer and submitted for approval to the LU Technical Authority.

Note: The battery location temperature should ideally be in the range of +10 degrees Celsius and +30 degrees Celsius with an optimal nominal temperature of +20 degrees Celsius. Temperature has a great influence on the rating, performance and longevity of batteries.

- 3.2.10 LU Category 1 Standard S1109 Clause 3.2.3 provides details of the envisaged brake dust exposure and vibration expected.
- 3.2.11 Battery and charger systems shall have a nominal voltage of 110V DC. Applications requiring a lower nominal voltage may be considered on the merits of the application and in these cases the designer shall submit proposals to the LU Technical Authority for approval.

Note: The normal practice for DC switchgear applications is to use a nominal voltage of 110V DC.

3.3 Batteries

- 3.3.1 Batteries shall be fit for purpose and shall comply with relevant BS, EN and International standards. Approved battery types are NiCad and lead acid with liquid or gel type electrolytes. Lead acid batteries shall preferably be valve regulated type. The minimum Ah rating shall be determined by the designer.
- 3.3.2 A proposal to use other types of battery technology may be considered and a proposal submitted to the LU Technical Authority for approval detailing any proven track record and reliability data.