

TECHNICAL SPECIFICATION

Low-voltage auxiliary power systems – Part 1-1: Terminology





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IEC TS 63346-1-1 has been prepared by IEC project committee 127: Low-voltage auxiliary power systems for electric power stations and substations. It is a Technical Specification.

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
127/63/DTS	127/68/RVDTS

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Technical Specification is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 63346 series, published under the general title *Low-voltage auxiliary power systems*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

INTRODUCTION

The purpose of IEC 63346-1-1 is to present terms and definitions for the publications related to auxiliary power systems (APSs) including system design, installation and commissioning, operation and maintenance, specialized devices and components and testing devices. An auxiliary power system is a system that provides electric power for the auxiliary equipment in power stations, substations, converter stations and telecommunications sites supporting the power network.

From the technical point of view, an APS consists of multiple components well standardized (e.g., station transformers, storage batteries, low-voltage switchgear, etc.). Several IEC product standards give definitions necessary for understanding terms used for these components.

IEC 63346-1-1 allows professionals to understand and identify APS-related concepts so as to avoid ambiguity and misunderstanding. Adopting clear and consistent terms will facilitate the development of programs, projects and future standards.

IEC 63346-1-1 may be subject to revision to avoid mismatch. Terms and definitions have been harmonized with the IEC Glossary and other IEC documents as far as possible. Definitions not included in this terminology documents may be found elsewhere in other IEC documents.

LOW-VOLTAGE AUXILIARY POWER SYSTEMS –

Part 1-1: Terminology

1 Scope

This part of IEC 63346 contains the terms used by low-voltage auxiliary power systems in power stations, substations, converter substations and associated telecommunications equipment.

Terms relating to low-voltage auxiliary power systems in nuclear power stations and railways substations are beyond the scope of this document.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1 Terms and definitions for APS

3.1.1

auxiliary power system

APS

system that supplies power to low-voltage equipment in power stations, substations, converter substations and associated telecommunications equipment

Note 1 to entry: Auxiliary power system is used to provide supply to the auxiliary equipment in the stations under normal conditions and provide emergency supplies to the auxiliary equipment under abnormal conditions to facilitate the isolation of faults and service restoration during an electrical network disruption.

3.1.2

overcurrent protective device

device intended to interrupt an electric circuit when the conductor current exceeds a predetermined value for a specified duration

[SOURCE: IEC 60050-826:2022, 826-14-14]

3.1.3

primary cell

cell which is not designed to be electrically recharged

[SOURCE: IEC 60050-482:2004, 482-01-02]

3.1.4

secondary cell

cell which is designed to be electrically recharged

[SOURCE: IEC 60050-482:2004, 482-01-03, modified – The note has been deleted.]

3.1.5

contingency event

system event involving failure or removal from operational service of critical elements of the installation that will affect the continuity of supply

3.1.6

supply point for maintenance

dedicated supply point which is used for the maintenance and testing equipment

3.2 Terms and definitions for APS design

3.2.1

power centre-motor control centre

PC-MCC

configuration of the low-voltage auxiliary power system consisting of a power centre and a motor control centre

Note 1 to entry: PC-MCC is adopted for power stations and synchronous condenser applications.

3.2.2

redundancy configuration

intentional increase in number of critical components or functions of the system with the goal of increasing reliability of the system

3.2.3

generator-transformer unit

unit consisting of a generator and a transformer directly connected through either an isolating switch or a circuit breaker, or both

3.2.4

enlarged generator-transformer unit

generator-transformer unit with two or more generators connected to one transformer

3.2.5

essential distribution bus

busbar to which critical loads are connected

3.2.6

radial system

system or part of a system consisting of single feeders supplied from a single source of supply

[SOURCE: IEC 60050-601:1985, 601-02-15]

3.2.6.1

one-level radial system

system consisting of distribution boards directly supplying the loads

3.2.6.2

two-level radial system

system consisting of sub-boards supplied from main distribution boards and supplying power to the loads

3.2.7

ring system

system or part of a system consisting of a closed loop where loads are supplied by two or more supplies at the same time

3.2.8**lead supply**
normal supply

power supply used under normal operation conditions

3.2.9**second supply**
standby supply

power supply in operation upon the loss of the lead supply

3.2.10**dual-supply configuration**

mode of operation where only one transformer supplies the load at one time on the low-voltage side

3.2.11**redundant configuration**

mode of operation where both transformers supply the loads at all time

3.2.12**external supply**

power supply for auxiliary loads sourced from a separate entity outside of the station boundaries

3.2.13**emergency supply**

power supply for auxiliary loads when both the lead supply and the second supply are lost

3.2.14**load classification**

definition of auxiliary loads in accordance with their importance for the operation of the system

3.2.15**essential load**
critical load

auxiliary load that requires permanent availability of supply (which can be continuous or intermittent)

EXAMPLE Example of an intermittent essential load is supply of circuit breaker operating mechanism; example of a continuous essential load is the supply of an IED (intelligent electronic device).

3.2.16**non-essential load**
non-critical load

auxiliary load other than the essential load

Note 1 to entry: A non-essential load can be continuous or intermittent.

3.2.17**continuous load**

auxiliary load that requires to operate continuously for a long period of time

3.2.18**intermittent load**

auxiliary load that requires to operate on an intermittent basis

3.2.19**emergency load**

critical load that needs to remain operating for safety purposes

EXAMPLE Emergency lighting.

3.2.20

demand factor

ratio, expressed as a numerical value or as a percentage, of the maximum demand of an installation or a group of installations within a specified period, to the corresponding total installed load of the installation(s)

[SOURCE: IEC 60050-691:1973, 691-10-05, modified – The note has been deleted.]

3.2.21

maximum demand

highest load possible on site that determines the size of the source of AC supply or the size of the DC chargers and DC battery systems

3.2.22

standby duration

duration which is necessary to allow loads to stay supplied when the charging circuits are not available and is used to calculate the capacity of batteries

3.3 Terms and definitions for APS equipment

3.3.1

battery charger

electrical item used to convert AC into DC to charge batteries and to supply power to DC loads during normal operation

[SOURCE: IEC 61225:2019, 3.2, modified – The note to entry has been deleted.]

3.3.2

on-line monitoring system for batteries

system that continuously monitors and records the voltage, current and other operating parameters (e.g. temperature and internal resistance) of batteries

3.3.3

uninterruptible power system

UPS

combination of convertors, switches and energy storage devices (such as batteries), constituting a power system for maintaining continuity of load power in case of input power failure

[SOURCE: IEC 62040-1:2017, 3.101, modified – The note to entry has been deleted.]

3.3.4

distribution board

assembly containing different types of switchgear and controlgear associated with one or more outgoing electric circuits fed from one or more incoming electric circuits, together with terminals for the line, neutral, mid-point and protective conductors

[SOURCE: IEC 60050-826:2022, 826-16-08]

3.3.5

change-over board

enclosure comprising manual or automatic change over scheme between the sources of supply

3.3.6

DC assembly

assembly of batteries, chargers, transfer switch, distribution boards and indications housed in one enclosure or separate enclosures

3.3.7**AC assembly**

assembly of change-over switch, distribution boards, and indications housed in one enclosure or separate enclosures

3.3.8**battery cubicle**

enclosure for housing stationary batteries

3.3.9**charger cubicle****rectifier cubicle**

enclosure for housing chargers or rectifier

3.3.10**auxiliary transformer****station transformer**

transformer intended to supply auxiliary loads of a power station, substation or converter substation

3.3.11**insulation monitoring device for DC APS**

device which permanently monitors the insulation resistance to earth of unearthed DC APS

3.3.12**earth detector**

instrument or equipment used for indicating the presence of an earth on an unearthed system

3.4 Terms and definitions for APS operation and maintenance**3.4.1****equalization charge**

extended charge to ensure an equal state of charge of all cells in a battery

[SOURCE: IEC 60050-482:2004, 482-05-40]

3.4.2**boost charge**

accelerated charge applied at greater than normal values of electric currents or of voltages (for a particular design) during a short time interval

[SOURCE: IEC 60050-482:2004, 482-05-37]

3.4.3**float charge**

constant voltage charging stage in which the battery is maintained at a voltage below the gassing point to complete the charging cycle and compensate for battery self discharge

[SOURCE: IEC 62509:2010, 3.9]

3.4.4**overcurrent selectivity**

coordination of the operating characteristics of two or more overcurrent protective devices such that, on the incidence of overcurrents within stated limits, the device intended to operate within these limits does so, while the other(s) does (do) not

[SOURCE: IEC 60947-1:2020, 3.7.23.1, modified – The note to entry has been deleted.]

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CIGRE TB 777, *Reliability analysis and design guidelines for LV DC auxiliary systems*

CIGRE TB 834, *Reliability analysis and design guidelines for LV AC auxiliary systems*

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