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DC power generation at power stations



Overview

What voltage does a DC generating station use?

The DC systems employed in generating stations for providing power and for control purposes have voltages of 110 or 220 V, while the increasing use of electronics has also led to self-contained rectifier-battery systems of 24 or 48 V.

What is a direct current (DC) station?

Direct current (DC) station services Direct current (DC) systems are used for control and monitoring purposes, but also for supplying power to DC drives and, as part of an emergency (UPS) system, via inverters to alternating-current drives. The required energy is stored in batteries, with conversion by means of rectifiers and inverters.

How is direct current generated in a power plant?

However, direct current is generated by photovoltaic cells and batteries. Direct current generators are rare in major power plants due to the prevalent use of alternating current over direct current in transmission lines. Direct current generation is therefore limited mainly to small-scale generators.

What are electrical station services in a power plant?

In a power plant, the electrical station services (abbreviated to SS in the following) consist of all the DC facilities from 24 to 220 V and AC facilities up to about 20 kV for controlling and supplying power to the equipment needed to keep the plant running.

How is the active power flowing through AC and DC substations determined?

The active power flowing via AC and DC substations in the HVDC system is determined using Eqs. (14) and (15) correspondingly. The HVDC system, seen in Fig. 1, consists of an AC substation at the start of the DC transmission line and a DC substation at the conclusion of the line.

Why is DC power important?

DC power has significant and inherent advantages in realizing both decarbonization and resilient grids, due to DC's higher "potential" for electrical power diversification, decentralization and naturally improved transmission efficiency. MVDC is essential for delivering renewable energy to the consumer.

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