GENERAL INFORMATION ABOUT ELECTRICAL NETWORKS

Introduction. Basic concepts of electrical networks and the requirements for them.

The collection of plants, power lines, substations and heat networks linked into one common mode and continuous process of production and distribution of electric and heat energy is called the energy system.

Electric networks

Electric networks called part of the electric power system consisting of substations and power lines AC and DC voltages different. The electrical network is used for transmission and distribution of electricity from the place of production to places of consumption.

Classification of electrical networks

- Assignment
  - general service circuit
  - networks autonomous power supply
  - networks of technological objects
  - overhead line
- Size of the network
  - backbone networks
  - regional networks
  - regional networks, distribution networks
  - internal networks
  - wiring
- Type of current
  - three-phase electric power
  - single-phase alternating current
  - direct current

Power plant - plant for the production of electricity and heat by converting other forms of energy.

Classification

- Nuclear power plant (Атомная ЭС)
- Thermal power station (Теплоэлектростанция)
- Hydroelectric power station (Гидроэлектростанция)
- Wind power stations (Ветроэлектростанция)
- Geothermal power station (Геотермальная электростанция)
- Solar electric plant (Солнечная электростанция)

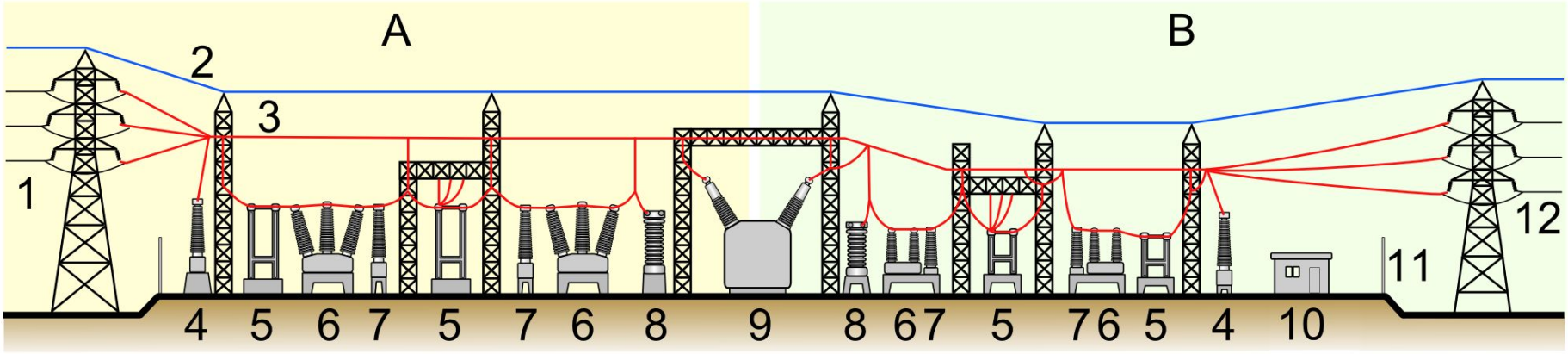
Electrical substation

Electric substation - electrical installation designed for the reception, conversion and distribution of electric energy, consisting of transformers or other electrical power converters, controls, switchgear and auxiliary equipment.

Types

- Transmission substation
- Distribution substation
- Collector substation
- Converter substations
- Switching substation
- Classification by insulation
- Classification by structure

Electrical substation model

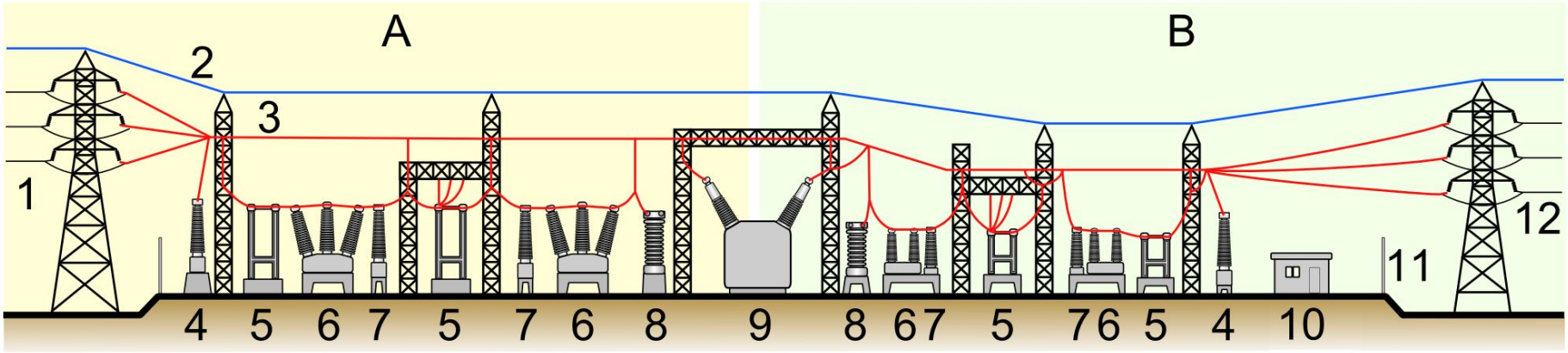


A: Primary power lines' side

B:Secondary power lines' side

1.Primary power lines
2.Ground wire
3.Overhead lines
4.Lightning arrester
5.Disconnect switch
6.Circuit breaker
7.Current transformer
8.Transformer for measurement of electric voltage
9.Main transformer
10.Control building
11.Security fence
12.Secondary power lines

Модель электрической подстанции



A:Сторона основной ЛЭП

B:Сторона вторичной ЛЭП

1. Основная ЛЭП
2.Заземляющий провод
3. Воздушние линии электропередач
4. Молниезащита (громоотвод)
5. Разъединитель
6. Высоковольтный выключатель
7. Трансформатор тока
8. Трансформатор для замера напряжения
9. Основной трансформатор
10.Здание с аппаратурой управления
11. Ограждение
12. Вторичная несущая ЛЭП