

1.2. THE STRUCTURE OF POWER SYSTEM

An electricity consumer is supplied from a power system, which consists of all electrical installations of production, transmission and distribution of electricity. They are interconnected and have a continuous and joint production and consumption of electricity. The National Power System is the result of regional interconnections.

Structurally a power system is composed of:

- Nodes, consisting of plants and substations
- Typical air-insulated lines (LEA) of transmission (higher power on considerable distances) and of distribution (low power on short distances for a small number of consumers)
- Injection stations, which step down the voltage of the transmission lines to the distribution line,
- Receiving station which, depending on the nature of the consumer, may be transformer stations (ST), substations (PT) or general panels (TG).

* A distribution board - *TD* - (also known as electric panel board or breaker panel) is a component of an electricity supply system which divides an electrical power feed into subsidiary circuits, while providing a protective fuse or circuit breaker for each circuit, in a common enclosure. Normally, a main switch, and in recent boards, one or more residual-current devices (RCD) or residual current breakers with overcurrent protection (RCBO), are also incorporated.

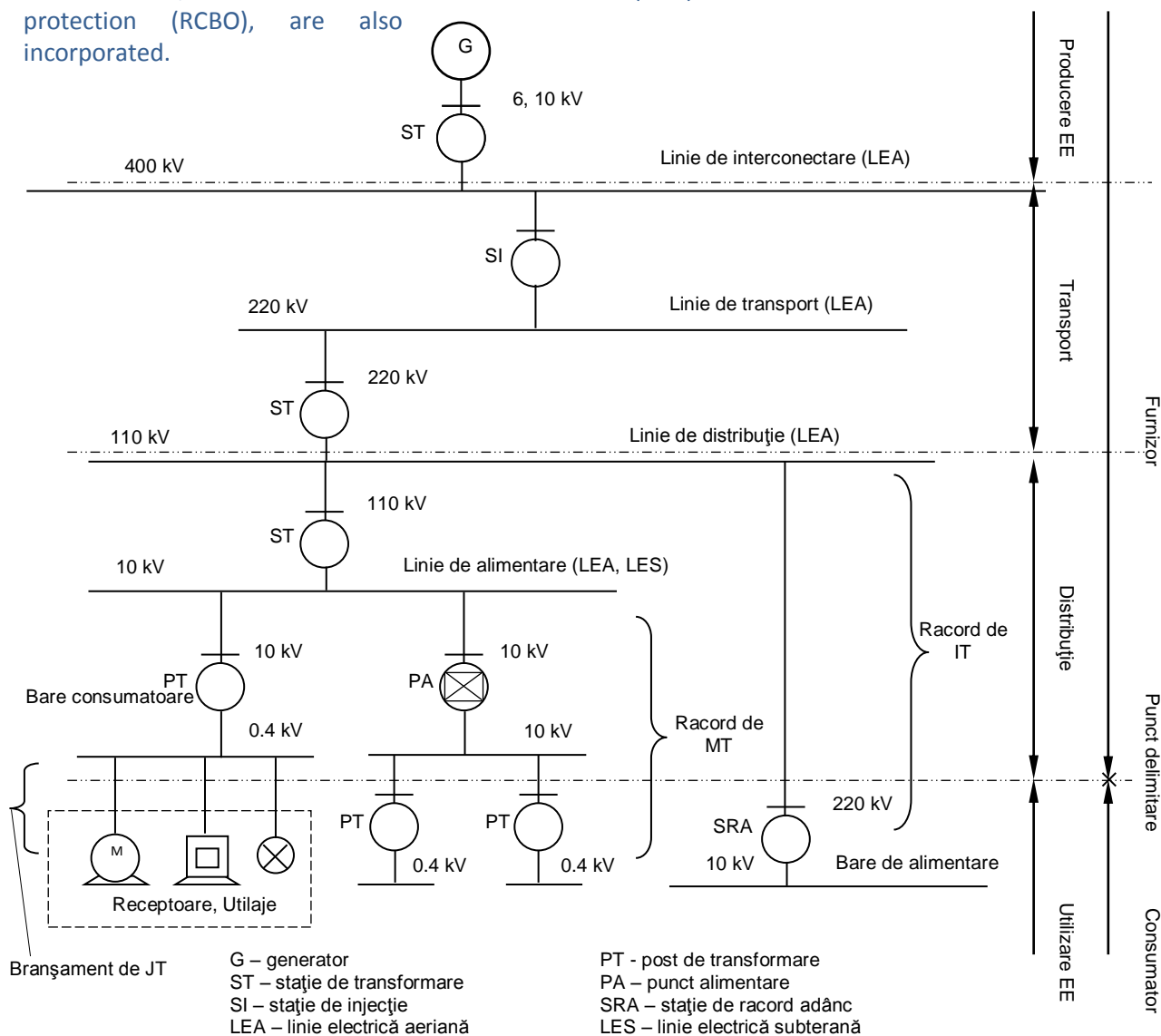


Fig.1.1 Structura unui sistem electroenergetic

Electrical installations are connected to the provider by one or more **boundary points** or **receiving points** (where the facility is delimited as property). Boundary point can be located upstream, downstream or within the receiving station and it consists of a physical element that enables effective separation of installations belonging to the provider and to the consumer (eg, clamps, terminals, bushings, boxes terminals, etc.). So receiving station with all equipment and related constructions can belong to provider, consumer or both.

Supply system (IA) consists of electrical installations which connects the provider's network and customer's facility (in boundary points). It is called branching (bransament) at low voltage, respectively junction (racord) at medium or high voltage, being connected with SEN nodes called source nodes. Junction system connects the nodes or transmission lines with customer facility. It consists of 1-2 power lines or 1-2 transformer stations.

The most-common **LV networks** are within the range 120 V single phase to 240/415 V 3-phase 4-wires. Loads up to 250 kVA can be supplied at LV, but power-supply organizations generally propose a MV service at load levels for which their LV networks are marginally adequate. An international voltage standard for 3-phase 4-wire LV systems is recommended by the IEC 60038 to be 230/400 V.