

COMPUTER AIDED DESIGN OF ELECTRICAL INSTALLATIONS

COURSE 3

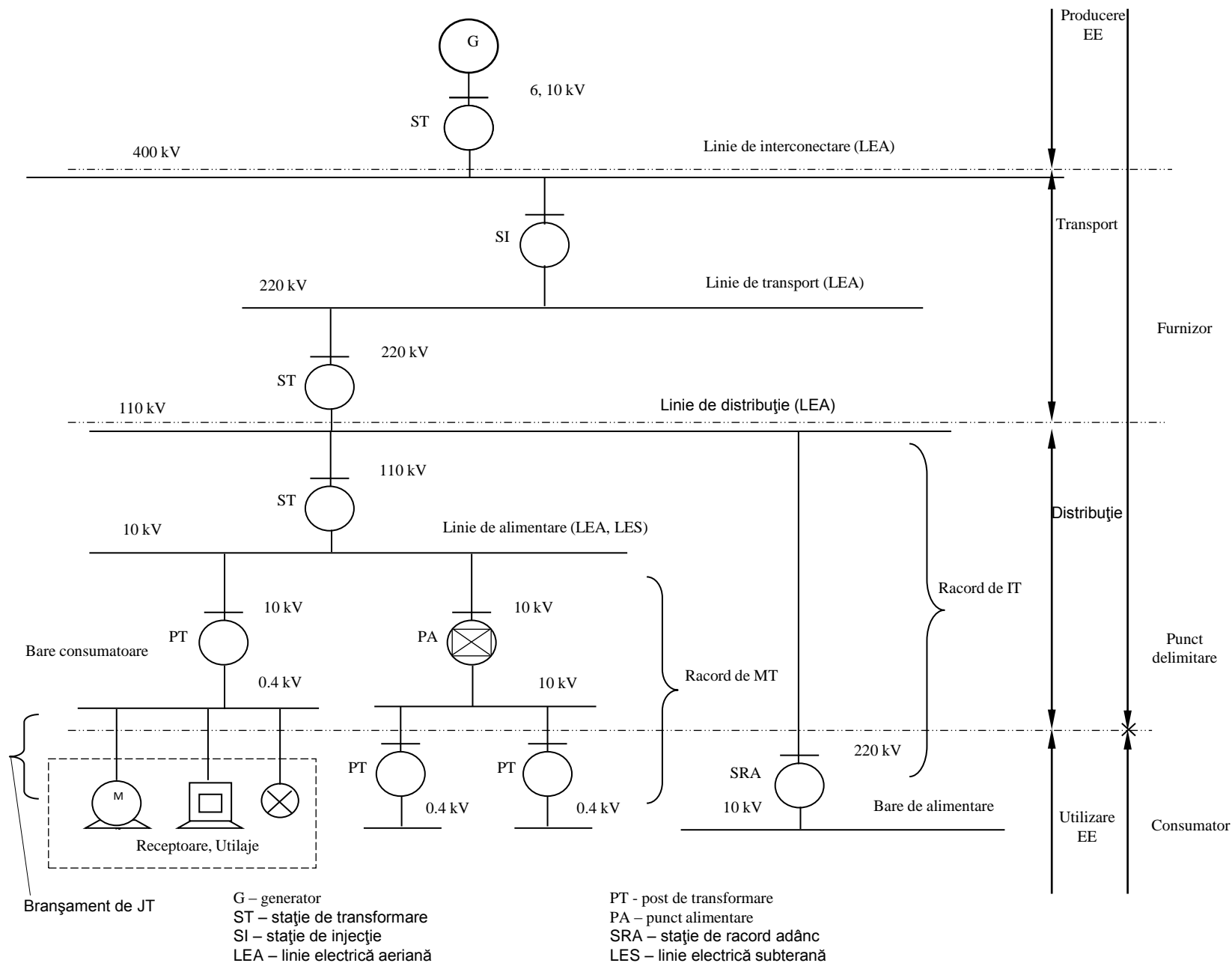


Quiz 1

1. Define, as you perceived, the smart grids. (2p)
2. Identify at least 5 common elements of smart grids and traditional electricity networks. (2p)
3. What is the difference between a microgrid and a smartgrid? (2p)
4. Mention three features of microgrids. (2p)
5. What kind of electricity tariff you benefit as a LV consumer, according to the supply contract with EON? (2p)

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.
- 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 steps 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) or 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.*



- Electrical installations are connected to the provider by one or more **boundary points** or **receiving points** (where the facility is delimited as property) –
 - physical elements that enables effective separation of installations belonging to the provider and to the consumer (e.g., clamps, terminals, bushings, boxes terminals, etc.)
- **Supply system** (IA) consists of electrical installations which connects the provider's network and customer's facility (in boundary points). It is called branching at low voltage, respectively junction at medium or high voltage, being connected with SEN nodes called source nodes.
 - Junction = 1-2 power lines or 1-2 transformer stations

The voltage of the local LV network may be 120/208 V or 240/415 V, i.e. the lower or upper extremes of the most common 3-phase levels in general use, or at some intermediate level. An international voltage standard for 3-phase 4-wire LV systems is recommended by the IEC 60038 to be 230/400 V.

In Europe, the transition period on the voltage tolerance to “230V/400V + 10% / - 10%” has been extended for another 5 years up to the year 2008.

Low-voltage consumers are, by definition, those consumers whose loads can be satisfactorily supplied from the low-voltage system in their locality.