

COMPARATIVE ANALYSIS OF TYPICAL STRUCTURAL SYSTEMS OF POWER SUPPLY

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For today there are considerable backlogs of economy of power resources in the electric systems of Ukraine. From statistical data, losses in electric networks reach from 14 to 17%, and from unofficial sources it is known that they reach 20 %. Mostly it is conditioned by absence of the modern systems of account, that allows to use her almost without limitations, out-of-date equipment of the electric systems and imperfection of the structural system of power supply in the lines of electricity transmissions of 0,38/0,22 kV, that does not allow to bring down additional losses in lines.

In the USA the typical system of power supply of electrical installations of buildings is the TN - C - S system. Step-down monophase transformers are used with nominal power of 10 - 50 kVA and voltage 120/240 V from a secondary winding with the earthed middle outlet, that allows to have standard voltage on a secondary network - 120/240 V. Due to this, the size of powerfailure stipulates the length of secondary network for domestic consumers and does not exceed 80 meters.

In the projects of the USA the power supply lines of secondary network are used as basic branches of the system. Three-phase voltage is used for the power supply of commercial enterprises. The repeatedly earthed neutral of primary distributive network gives many advantages from the point of view of safety.

The countries of Europe widely use as a distributive system of power supply three-phase four leading system by voltage 400/230 V with the deafly earthed neutral. 3-phase transformers that get a feed from high-voltage lines voltage 10 or 20 kV with the insulated neutral are usually used. It is done with the aim of limitation of current of earth-fault to a few the ampere in case of single damage of isolation. Nominal power of each transformer is approximately 100 - 1000 kVA. Usually one transformer feeds a few independent consumers. Separate apartments can feed on one phase, at the same time private houses, farms and analogical building, get a three-phase feed. The level of secondary tension in Europe reaches 220 V level, 230 V or 240 V. Lines of secondary network is rarely used as basic, but here a secondary network is laid on length more than a 1.5 kilometer.

The comparative analysis of the typical structural systems of power supply of Europe and USA showed, that the American system of power supply is more flexible, and the losses of electric power considerably below, than in the European system, here accidents in the American system lead to the interruptions of power supply more rare.