

## **The Influence of Switching and Changing of Resistance Value of Incandescent Lamp on Watt-hour Energy Accounting**

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The expediency of repeated switching of regular incandescent lamp (IL) was checked by using calculation and experimental methods from the point of view of electric energy consumption. The induction and electronic single-phase meters of commercial accounting of active electrical power, intended for single-phase alternating current circuits were used to determine the amount of consumed electric energy.

The incandescent body (IB) of IL has coiled-coil shape. The reactive part of total resistance of IL is negligible and the changes of energy store in reactive elements of the circuit are almost difficult to identify. The amount of energy that accumulates in the magnetic field of tungsten spiral with inductance  $L$  tends to zero. Therefore, the energy consumption of IL during the transition process can be neglected.

When the first time turned on, according to Ohm's law, the starting current passes through IL, which is in times bigger than working. When current passes through a conductor, the electrodynamic forces arise causing the destructive mechanical stress, which destroys the spiral. Also the processes of evaporation and recrystallization of tungsten take place. Each next switching reduces operation time of IL, and energy consumption at the starting points is many times higher than at continuous operation of the lighting device.

It was found out that frequent "cold starts" of electric energy meters record the greater value of energy consumption at the certain interval of time of IL operation in comparison with the sustainable mode of the lighting device operation.

1. P.V. Pliaskin, V.V. Fedorov, Ju.A. Bukhanov, *The basics of electricity supply construction*. (Moscow: Energoatomizdat: 1983)p.
2. L.G. Ulmishek. *The manufacturing of electric incandescent lamps* (Moscow: Energiya: 1966).