

# Future Power Transmission System

Michael Bank

*Professor, College of Technology  
Saint Petersburg - Jerusalem*

The development of means of transporting people, goods, water resources, energy, and information seems to have general trends. Some of them can be noted.

If something is transmitted along the same route, it is more profitable to use one large and powerful tool than several small ones. For example, the carrying capacity of ships, trucks and airplanes is growing all the time.

Transport lines, such as for cars, are combined into one high-speed, more direct line. To transfer a large volume of water, canals are being built. At the same time, to supply a large volume of water, one channel is built and not several parallel channels.

A similar trend exists in the transmission of information. One optical cable transmits a gigantic volume, up to hundreds of gigabytes.

Summarizing what has been said above, the noted trends can be formulated as follows. If the conditions allow to advantageously reducing the number of channels, and then their number is reduced. In addition, it is often better in terms of impact on nature.

Indeed, can dream of building three or four parallel narrow water channels instead of one wider and deeper one?

All this is true, but this logic does not always work. It does not work when transmitting electricity. For over one hundred and twenty years, large flows of electricity have been transmitted using a three-phase system. Today, such a three-phase line can include four wires. In many cases, one hundred percent redundancy is used. Then the number of wires can be up to eight. For such a line, high supports are needed. So, the power transmission system is very expensive.

But it may not be otherwise. But it can be.

It is shown [1 - 10] that a three-phase system can be replaced with a single-wire one. A single-wire system operates at 50 or 60 Hz and uses the same wire as a three-phase system of the same total capacity. It allows the construction of underground and submarine lines and does not use land to transmit electricity. In [10] are showed diagrams and all the necessary converters to change the number of wires. The single-wire method makes it easy to combine various sources of electrical energy, including renewable sources.

The proposed system can be built without using additional wires for redundancy. In this case, the system is built on the principle of a road network with the possibility of detours.

A single-wire system can include relatively simple DC-1 converters to inject renewable energy into the backbone without the use of synchronizers.

One wire method allows building charging system for long roads and streets. After 5 - 20 km on the left and right of road may be exists small stations for fast charging electrical any capacity cars.

The system for transmitting large electricity power using one wire can be comfortable combined with optical line for transmitting control signals and additional information.

Returning to the beginning of the letter, one can be sure that in the field of electricity, the future belongs to single-channel transmission. The references contain descriptions, simulations results and circuits necessary to build single-wire devices.

#### REFERENCES

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