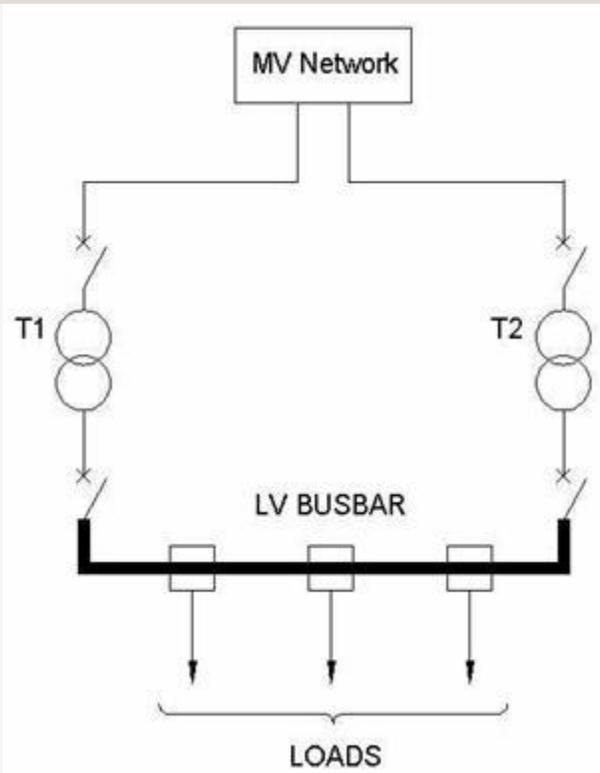


Parallel transformers benefits

I wish to present here the benefits of utilization and operation of MV/LV **parallel transformers** in **electrical distribution**. Having such experience, i will be interested to get feedbacks from other engineers.



2 MV/LV parallel transformers distribution network

For all my experience, I've never met a working electrical installation, where operation of parallel transformers was used. Once, we used this solution in the design of welding shop, mainly to reduce the **voltage drop** in the network and maintain a stable level of short-circuit current. But the project was stopped by the Employer, and the idea was gone. Below is the list of benefits of such solution, as it is seen. It would be great if interested engineers commented and shared experiences on this issue.

Generally, application of parallel transformers allows achieving the following benefits:

1) Reducing the total capacity of **electrical transformers** (as compared to separate their work). The decrease of total installed capacity is reached:

- by lowering the overall **demand load** to the diversity of loads connected to different transformers
- by using a higher load rate of parallel transformers
- less required backup in case of electrical transformer failure

2) Reduction of electricity **losses** in electrical transformers due to a possible disconnection of unloaded transformers

3) Improving the **power quality** due to the stable level of short circuit current throughout the network

4) Increasing the reliability of operation of protective devices in the case of phase-to-earth short circuits in the network.

5) Possibility of placing electrical transformers in operation phase-by-phase

Parallel transformers are allowed, provided that none of the windings will be loaded by current exceeding allowable current for that winding.

Of course, there are limitations for using electrical transformers connected in parallel. For instance, Russian Federation "*Rules for technical maintenance of electrical consumers*" allows operation of parallel transformers under the following conditions:

- windings connections of transformers have the same vector groups
- the ratio of transformers capacities of less than 1.3
- rates of transformation differ by no more than $\pm 0.5\%$
- short circuit voltages do not vary more than $\pm 10\%$
- transformers have same phase polarity

Source: <http://engineering.electrical-equipment.org/electrical-distribution/parallel-transformer-benefit.html>