The need for a single transformer for different transmission systems

Polytransformer, a multivoltage transformer approach, is a comprehensive product, which may be used as an universal network-link transformer. This means: compact dimensions to be shipped to any substation within the scope and different voltage ratings to connect alternative transmission systems. All in one single product.

Change of electric power industry to a fully competitive and deregulated market has highlighted the importance of asset management. Large power transformers represent a significant asset within the utility delivery system. These are the most important and costly components and the critical nodes in electricity networks.

The Polytransformer is designed with multiple voltage ratings, on the high-voltage (HV), the low-voltage (LV) and tertiary side, that allow it to work in substations at different voltages. Impedances and mega-volt ampere (MVA) ratings are chosen to cover most of the applications. Single phase and three phases units are available. Its compactness and flexibility of use make the Polytransformer the ideal universal transformer for any transmission system.

Polytransformers - Quick facts
- Compact, ready for shipment and installation in any substation
- Multiple voltage ratings
- Useful and convenient, you never know when you may need it

Universal multi-voltage transformer
Main features of the universal network-link transformer are:
- Minimum installation dimensions to optimize substation space requirements. Minimizing total dimensions allows replacement of a wide range of existing transformers or installation in substations with limited space.
- Short circuit impedance of the Polytransformer is designed taking into consideration the impedances of existing transformers. Parallel connectivity with other units is achieved by setting the appropriate tap in the on-load tap changer.
- Customized design: your Polytransformer will be designed to be electrically and dimensionally compatible with the different transformers in your transmission system. The design will meet your specifications and applicable standards.
- Standardized external components to reduce the number of spare parts and to facilitate their availability
- Multiple voltage ratings on the high voltage and low voltage side. The polytransformer is designed with internal taps providing different voltage combinations to allow connection of different systems (i.e. from 345 kV to 230 kV, 345 kV to 138 kV, 345 kV to 115 kV, 230 kV to 138 kV and 230 kV to 115 kV, combined with 33, 26, 4 and 24 kV in the tertiary). Depending on the connection, power rating of the transformer varies. An on-load tap changer regulation is also provided. The different voltage rating alternatives can be selected by changing connections internally when the unit is being prepared for shipment to a different station. The Polytransformer may be specified either for three phases or single phase execution.
- Multiple voltage ratings of tertiary winding. The tertiary has internal taps to provide several voltage levels to match different substation needs.
- Maximum power rating limited only by transportation restrictions.
- Compact design. Shell form design helps to accomplish compact shipping dimensions providing in addition mechanical robustness to withstand transportation and hauling loads. This way, the polytransformer can be easily shipped to many different substations.
Advantages and applications of the Polytransformer

Based upon the described features, several applications are possible for the Polytransformers

**Spare Transformer**
The Polytransformer may replace a number of different transformers (multi-voltage, impedance compatibility, parallel connectivity), located in different substations, in a limited time (high transportability), without major adjustments (standard adapted to your needs)

**New substations**
When you need to expand your system, the Polytransformer will fit it. It will be designed to match the requirements of your network. It can be installed permanently on-site or used as temporary replacement of other units. Your new system will be commissioned and running on time. And you will know it is always available.

**Valuable asset**
You can also cover most of other utilities’ or industries’ requirements. The Polytransformer can be rented, leased or lent to others in case of emergency or temporary need.

**Peaks of Load**
The polytransformer can also be used to provide additional power in the network during seasonal or emergency consumption peak periods. This reduces the risk of black outs, and will prevent other installed units from being overloaded.

**Reduce your inventory and maintenance cost**
As the Polytransformer can take the place of different transformers, your total fleet of transformers will be reduced, with the subsequent reduction of inventory, investments and maintenance costs.

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