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ПЕРСПЕКТИВИ БУДІВНИЦТВА ПІДЗЕМНИХ ПІДСТАНЦІЙ І ВИКОРИСТАННЯ ЕЛЕГАЗОВИХ ТРАНСФОРМАТОРІВ

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PROSPECTS FOR THE CONSTRUCTION OF UNDERGROUND SUBSTATIONS AND APPLICATION OF SULFUR HEXAFLUPRIDE TRANSFORMERS

The construction of underground power generating units must be done by means of most up-to-date and advanced equipment, such as 220/20 kV sulfur hexafluoride transformer of 63 MVA capacity manufactured by *Toshiba* (Japan). These transformers are specifically designed for use at underground power facilities.

The performance characteristics of sulfur hexafluoride transformers make it possible to use them at underground substations in densely populated cities. If the equipment is provided with hexafluorated sulfur insulation, there is no need in fire-fighting equipment (fire extinguishers), oil pans etc. In the case of internal faults the pressure rise in the tank of a gas-insulated transformer will be extremely low, thus preventing the explosion.

The properties of the gas make it unnecessary to construction a transformer expansion tank and pressure relief assemblies, which reduces the height of the substation premises. In the case of 275 kV, 300 MVA gas-insulated transformers it is possible to reduce the height by 2-2.5 m.

This engineering solution is most suitable for large cities, where the land is expensive and there is little place to build a transformer substation. For example, sulfur hexaflupride transformers can be installed just underneath the residential buildings, business centers, etc. they do not occupy much space and are safe for people living and/or living around. It is especially convenient when there is no space available in the large city centers but there is a rising demand for electricity.

These transformers do not differ in principle from conventional transformers. The main feature they possess if the compact size, which saves a lot of room. Conventional transformers in their turn occupy three to four times more space. The second advantage of sulfur hexaflupride transformer is that they are not flammable. When using this equipment, you needn't be afraid of a fire danger, since sulfur hexafluoride (SF6) is used as an insulator instead of oil.

The cost of underground substations is significantly higher compared with the conventional ones, located above ground. Moreover, you need to build the substation underground before starting the construction of a building. Of course, this is quite expensive, which prevents this type of technology from being widely-spread in the world engineering practice. However, the number of such substations will gradually increase, and the demand for adequate transformers will be growing.

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