

HTS DC Cable line for St. Petersburg Project

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Abstract - Utilization of DC and AC HTS cable lines in electrical grids enables enhancement of the transmission capacity, reduced power losses, lowering of allotment areas, improvement of environmental conditions and improvement of fire and explosion safety of these power transmission lines. An HTS DC cable offers new additional advantages including the opportunity to introduce into the power system a new electric link without increasing fault current levels. It allows to connect input stations in the city on low voltage sites and, as a result, improves the reliability of the energy supply to customers. Based on previous experiences in Russia, the Federal Grid Company of Unified Energy System (FGC UES) started with the development and construction of a HTS DC cable link, which includes the cable, cryogenics, AC/DC converters, terminations and cable coupling joints. Nowadays are developed all the elements of the line and all technologies required for cable manufacturing. Two HTS cable samples, each 30 m in length, have been made. This presentation describes the basic elements of the system, its design and the results of cable tests together with current leads and coupling boxes.

Keywords - Electric power transmission, electric power grid, St. Petersburg power grid, transmission cable, DC cable, HTS cable