

***Abstract: Tri-axial core design of a 22.9 kV/50 MVA class power cable***

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**Abstract**

HTS power cables appear to be the replacement and retrofitting of underground cables in urban areas. But existing HTS power cable still falls in the price competitiveness due to the high cost of the HTS wire. A tri-axial HTS cable has been proposed to reduce the price of the HTS cable because it has copper shield instead of HTS shield. However, there is an inherent imbalance problem due to an asymmetry configuration in the cable. The authors designed basic parameters of the tri-axial HTS cable. The inherent imbalance in the three-phase currents in the tri-axial cable has been resolved through the adjustment of pitches and radii of the cable core. An FEM analysis program was used to analyze the characteristics of the designed tri-axial HTS cable core. The design results of the tri-axial HTS cable were compared with design parameters of the same class the triad co-axial HTS cable to demonstrate the effectiveness of the tri-axial HTS cable.

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