Contribution ID: **729** Type: **Poster**

2P61 - STUDY ON SHEATH INDUCED VOLTAGE AND SPATIAL TEMPERATURE FIELD OF LONG-DISTANCE 330/110KV CABLE SHARED THE SAME PIPE JACKING

Tuesday 25 June 2019 13:00 (1h 30m)

Cable is the main component of the network of power system. It is usually laid in the underground corridor and its function is to transmit and distribute electrical energy. As with further development of urban construction, cable usage is inevitablty getting higher and higher in hub substation with 110kV or higher voltage levels. Meanwhile, high voltage single-core XLPE insulated power cables will be widely used. In engineering, high voltage level and low voltage level cables share a tunnel or pipe jacking is very common, which can significantly increase the current carrying capacity of the cable. However, the induced voltage of the metal sheath of the single-core cable and the spatial temperature field will be significantly changed.

In this paper, long-distance 330/110kV cable shared the same pipe jacking is taken as example to compare the two types of cross-interconnected methods. First, the appropriate segment length is determined based on the value of sheath induced voltage under steady state. Then, the sheath induced voltage of transient fault is analyzed, including many single-phase ground faults which occur in different places of the cable. Finally, the influence of cable length growth under steady state and transient conditions is discussed.

It is found that the steady-state induced voltage of the sheath increases linearly with the increase of the length of the cross-interconnected small segment. No matter where the fault occurs, the transient induced voltage at the cross-interconnected point closest to the fault point is the highest. If the distance from the fault point increases, the induced voltage will gradually decrease. When fault occurs in the 330kV cables, the sheath induced voltage of the 110kV cables will have a great impact.

Authors: Mr LIU, Shuhan (School of Electrical Engineering, Xi'an Jiaotong University); Mr SUN, Yi (School of Electrical Engineering, Xi'an Jiaotong University); Mr LI, Chenjie (School of Electrical Engineering, Xi'an Jiaotong University); Mr WANG, Yifeng (School of Electrical Engineering, Xi'an Jiaotong University); Ms FENG , Xin (School of Electrical Engineering, Xi'an Jiaotong University); Mr LIU, Yuhao (School of Electrical Engineering, Xi'an Jiaotong University); Prof. LI, Jiangtao (School of Electrical Engineering, Xi'an Jiaotong University)

Presenter: Mr LIU, Shuhan (School of Electrical Engineering, Xi'an Jiaotong University)

Session Classification: Poster - Microwave Generation and Plasma Interactions and Pulsed Power Switches and Components

Track Classification: 5.4 Transmission Line & Transformers