Installation of twenty-four (24) lines of 150kV XLPE power cables at 2.5 m depth below ground level in the tropical urban city Jakarta

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Jakarta as the capital of Indonesia, since 2010 has issued new rules about Network Utilities Placement Procedure, one of its contents about sets out guidelines for the installation of high-voltage cables. Under this law stated that the high voltage cables should be buried at a depth of 2.5 m from the ground level to the top surface of the cable.

In order to connect the substation (150kV Tanah Tinggi Substation), required incomer transmission with double-phi configuration (4 circuit) with the number of cables per phase is two (2), so that the total number is twenty-four (24) cables. On first and second circuits, used cables with XLPE insulation and copper conductor 1000 sqmm. On third and four circuits, used cables XLPE insulation and copper conductor 800 sqmm.

Installation of this incomer transmission in general use two ducts system, there are box-cluvert and boring systems. For box-cluvert system, cable construction made by eight (8) rack support which each rack containing 3 cables. As for boring system, cable construction made of six (6) cables in horizontal in four (4) stacking.

Numerical analysis for cable temperature and ampacitiy that depend on the power load and trench type. At the box-cluvert system, temperature distribution simulated by air circulation, while the boring system based on the thermal resistivity of the protective layer and backfilling material.

In general, this paper covers the installation details and results of the analysis for the thermal characteristic and electrical characteristic.

Key words

XLPE cables; Power cable installation; Cable ampacity; Ducts; Trench