

Zanzibar Interconnector 132kV submarine cable in Tanzania

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Zanzibar Island is located off Tanzania in East Africa and in the Indian Ocean. This island recently experienced chronic electricity shortage because of aging of existing equipment. A new 132kV XLPE insulated submarine power cable interconnector was installed to improve power supply reliability and to deal with higher electricity demand in the future. The transmission capacity of this new line is 110 MW.

The cable design is three-core with copper conductors and XLPE insulation. The latest manufacturing technology and the excellent quality control system enable lower insulation thickness. The submarine cable has incorporated 24 optical fibers.

The choke points of transmission capacity are the shore landing areas for submarine cable, as the thermal resistivity of the landing area is higher than the sea bed and it reduces permissible current carrying capacity of the cable conductor. There are two different conductor sizes in one continuous cable to meet the required transmission capacity. Both ends of the submarine cable lengths contain larger size conductors than the center of the cable. Transition joints and factory joints were made in the factory and the completed cable was delivered with one continuous length.

A type test according to CIGRE recommendation was performed to confirm the mechanical and electrical properties of the cable design. The submarine cable was manufactured in VISCAS Ichihara Factory in Japan. After successful factory acceptance test, it was shipped to Africa. In Kenya, the cable was transferred from the cargo vessel to the cable laying barge. The cable laying work from Zanzibar Island to the mainland consisted of 37 km length and maximum 60 m water depth. There are outdoor terminations at shore and the submarine power cable is connected to an overhead transmission line. The construction work was completed in March 2013.

This paper will give the outline of the project and design, manufacturing, testing and installation of the submarine cable.