

Environmentally Friendly Power Cable

made from advanced HTS BSCCO wire fabricated by the CT-OP process

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Abstract

Since 1988, when BSCCO HTS material was discovered in Japan, SEI has been developing the BSCCO wire for real applicable HTS wire. The recently developed CT-OP (controlled over pressure) process made it possible that the wire has extreme characteristics for practical use. The Sumitomo CT-OP wire has greatly improved critical currents (I_c), mechanical properties, anti-ballooning properties and yield of Bi-based wires simultaneously.

Sumitomo BSCCO wire has been utilized for not only SEI's HTS cable but also world largest HTS magnet for silicon single crystal growth, HTS magnet for magnetic separation, HTS transformer and so on.

The innovation of the Bi-based wire is the turning point for the HTS application to the real application for its user-friendly characteristics.

Three HTS cable demonstrations in Yokosuka (Japan) by TEPCO and SEI, Copenhagen (Denmark) and Carrollton (US) were successfully implemented. After these successful milestones, the HTS cable development has been entered into the 2nd stage. Three Bi-based cable projects, which are in the real network, have started in US under international collaborations. Also, Asian HTS cable projects are on-going in Korea and China. Sumitomo Electric Industries, Ltd. (SEI) is now engaging in the US Albany Project adopting Sumitomo's 3-core in one cryostat type HTS cable for distribution network.

SEI along with SuperPower Inc., Niagara Mohawk, the BOC Group, is conducting an HTS cable project in Albany, NY, funded by Dept. of Energy and New York State Energy Research and Development Authority (NYSERDA). The 34.5kV-800Arms-350m underground cable will be installed between two substations in the Niagara Mohawk utility grid. In this Project, SEI will develop and produce a Bi-based HTS cable, terminations and a cable joint which demonstrates the utilization of the real power cable longer than several hundred meters and a 30m part of 350m length cable will be replaced with the HTS cable made from the second generation coated conductor.

HTS Cables with Large Transmission Capacity and Low Loss are environmentally friendly, hence indispensable for 21st Century's Power Grid and the innovated Bi-based wire is leading the HTS cable!