

Development of HTS Transformer for Power Distribution

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Along with the improvement of an HTS wire, many researches on applications of the HTS wire to electric power appliances have been made so far. The HTS transformer is expected to be one of the superconducting power devices which will be installed in the power system at the first stage of commercialization. The HTS transformer attracts much attention because of its lighter weight, smaller volume, and higher efficiency compared to those of the conventional one. Moreover, the HTS transformer withstands overload without loss of lifetime and is environmental-friendly because there is no use of insulation oil. Thus several development programs of HTS transformers are in progress by major power companies and research institutes such as Asea Brown Boveri, Waukesha Electric Systems, and Fuji Electric Co.. The main superconducting parts of these transformers are HTS windings, which are mostly made of BSCCO wire. Each transformer has different HTS winding types and cooling systems according to their application and objects. Another development program of an HTS transformer for electric power distribution is in progress by CAST in Korea, and the second phase of the program has just started. In this paper, we described the features of HTS transformers which are in development in these days, and made a comparative study for merits and demerits of each transformer. We also described the present status and limits of the HTS transformer development and proposed future works in Korea.

keywords : HTS, transformer, BSCCO