

Overview of HTS Power Cable and SMES in Korea

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The study conducted by the Korea Electrotechnology Research Institute (KERI) on effects of using superconducting power equipment in the power system focused on HTS power cable, Superconducting Magnetic Energy Storage (SMES).

HTS power cable is expected to have a wide range of effects such as compactness, high-capacity power transmission, and even advantages in environmental protection. We have already developed a 22.9kV, 50MVA, 30m HTS cable and now we are going to carry on the long run test of this cable in the LS cable plant.

In SMES, electric energy is stored by circulating a current in a superconducting coil. Because no conversion of energy to other forms is involved (e.g., mechanical or chemical), round-trip efficiency can be very high. SMES can respond very rapidly to dump or absorb power from the grid, limited only by the switching time of the solid-state components doing the DC/AC conversion and connecting the coil to the grid. We developed a 3 MJ class SMES system that successfully compensated the sensitivity load against instantaneous voltage drops and momentary power interruption by the test. And we started a new HTS SMES project last year.

keywords : HTS Power Cable, SMES