

# **Development and Demonstration Situation of HTS Cable system in Korea**

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Superconducting cable system is an extremely cutting-edge power transmission system enabling to propose new paradigm in grid, and, by extension, enabling to change the existing grid more safely and simply due to its unique advantages such as high efficient bulk transmission with lower voltage, no external magnetic radiation, eco-materials and so forth.

For realizing better grid in future dreams, LS Cable & system has been carried out R&D by collaborating KEPCO, KEPRI, KERI and several universities to develop superconducting cable system for more than one and half decade based on our special experiences and technologies accumulated over half of the century in the field of conventional cable system industry.

With this endeavor, LS cable & system, nowadays, becomes the only provider to serve not only superconducting cable but also full package including cooling system from design to commissioning in the world, and even we are capable of providing various types of superconducting cable system in MV level as well as HV level.

For MV level, AC22.9kV 50MVA and 120MVA class system have been passed full scale of type test and long term reliability test successfully in the international certification center belonged to Korea Power Electric Corporation, and consecutively they have been demonstrated in actual grid located in I'Cheon substation near Seoul with 500m and 100m long each without any malfunction from 2009 to 2013.

In addition, for HV level, AC154kV 1GVA and DC80kV 500MW class system have been developed successfully, and AC154kV 600MVA class is under development in these days. Among them, DC80kV 500MW has been passed its type test in the end of 2012 in accordance with CIGRE test recommendation regarding HVDC cable system with XLPE or paper insulation, Electra 219 and 189, and it will be demonstrated in actual grid located in Jeju superconducting center with 500m circuit from end of this year. Furthermore, it will be the world first experience to develop and demonstrate DC superconducting cable system.

In addition, AC154kV 1GVA system has been developed in 2011, and is able to transmit power as much one nuclear plant power amount, and to be replaced one-to-one with existing AC345kV system.

Lastly, type test of AC154kV 600MVA class system is in progress and is expected to be completed within this year and will be put on demonstration bed in the middle of 2015.