

Russian Development Program on HTS Power Cables

Victor Sytnikov¹, Vitaly Vysotsky², *Member IEEE*

¹R&D Center for Power Engineering, 115201, Moscow, Russia

²Russian Scientific R&D Cable Institute (VNIKP),
5, Shosse Entuziastov, 111024, Moscow, Russia
e-mail: vysotsky@ieee.org

Abstract - Russian R&D Program for superconducting power devices is underway, supported by both government and electric power company funding. Within this program, the development of HTS power cables is considered to be most advanced and close to commercialization. The scientific background was established and several, heavily instrumented, 5 m long cables have been tested. As the second step, the 30 m long, 3-phase experimental power cable with rated parameters 1500/2000A and 20 kV has been developed, fabricated and successfully tested. The following step has been the development of a 3-phase 200 m power cable with same rating: 1.5/2kA at 20 kV. The cable is at first installed at the experimental test facility to undergo extensive tests; subsequently, it will be reinstalled into the Moscow utility grid. In the framework of the Program, a special test facility has been developed permitting to test different HTS electrical power devices at voltages up to 110 kV and currents up to 3000 A (rms) under full load. In this paper, we overview the whole program and present some details of the cable development and tests.

Keywords - High temperature superconductivity, Power cables, Experimental test facility

Submitted July 1, 2010, accepted July 25, 2010. Reference No. CR18, Categories 5, 6.
This paper is based on the invited talk on the subject, which was presented at the ASC 2010.

Authors' listing replaced on April 8, 2015 per request of co-author V. Vysotsky.