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## Testing of a sub-scale HTS coil for wind turbine generator

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Large power direct drive superconducting generators for off-shore wind turbines show promise for competitive cost of energy and would enable the deployment of wind turbine outputting 10 MW or more. As part of an ARPA-e project, a 10 MW generator was optimized based on YBCO excitation coils. The rotor is using an iron core in order to reduce the amount of HTS required and lead to an acceptable cost of energy. A subscale HTS coil was fabricated using off-the-shelf YBCO tapes as a demonstrator. This paper deals with the testing of the HTS coil between 77 K and 25 K. The coil is 0.65 meter long and 0.32 meter wide. It is composed of about 100 m of YBCO tape from Superpower. The coil is conduction cooled using an AL325 cryocooler; the experimental setup will be described in detailed as well as the electromagnetic and thermal analysis of the coil. The experimental results consist in  $I_c$  measurements at different temperature and voltage monitoring of the 4 sections of the coil to identify and potential conductor motion or mechanical structure degradation.

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