Reliability Verification of Superconducting Flywheel Energy Storage Systems and its Application to Railway System

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The flywheel energy storage systems (FESS) can stabilize the fluctuation of the output of the solar photovoltaic power generation system. FESS has been developed as a joint project of five enterprises subsidized by the New Energy and Industrial Technology Development Organization. Key technology of FESS is the high temperature superconducting magnetic bearing (SMB). It consists of high temperature superconducting coils for its stator and high temperature superconducting bulks for its rotor. The FESS demonstration machine was installed in the power plant, and the examination of the charge/discharge of solar photovoltaic power by the FESS demonstration machine was executed. SMB's test for the levitation time of 3000 hours, 120 times of current application and 24 times of heat cycles could verify the reliability of the SMB.