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Mon-Af-Po1.23-05 [114]: Performance Evaluation of Conductor on Round Core Cables Used in Superconducting Fault Current Limiting Transformer

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Conductor on Round Core (CORC®) cables with scalability, flexibility, strong mechanical strength and high current density are of large potential for different power applications. In this paper, CORC® Cables are proposed to be the secondary winding for superconducting fault current limiting transformer (SFCLT). In order to evaluate the working performance of CORC® cable in SFCLT, firstly, a 60cm-long CORC® short sample is fabricated, fundamental parameters including self-field critical current and room temperature resistance are measured by experiments. Then, so as to represent the real working condition, both rated current tests and overcurrent tests are carried out to the CORC cable, respectively. In rated current test, AC loss and current uniformity are used as key parameters to evaluate the performance, discussions are investigated by both experimental and numerical method. Meanwhile, in overcurrent tests, the recovery-under-load (RUL) capability is used as an important evaluation parameter. Because the RUL capability shows the uninterruptible power ability of the power system with SFCLT. Conclusions obtained in this paper can verify the feasibility of this technique and also provide useful information for future SFCLT applications.

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