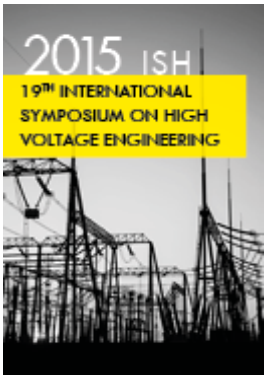
Reference: **ISH2015_416**



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Title:

DIRECT CURRENT INTERRUPTION BY A CURRENT ZERO IMPULSE OF CONSTANT STEEPNESS

Abstracts

Due to the current and future development of electrical transmission and distribution technologies, the importance of direct current circuit breakers is increasing. Requirements on direct current breakers differ significantly from those on alternating current breakers. The lack of a natural current zero, the absorption of the energy stored in the system during every switching event, and a fast interrupting performance are unique key requirements for direct current breakers. Different approaches to interrupt direct currents by using mechanical gas or vacuum breakers, semiconductors or combinations of both are possible and have different benefits and drawbacks. Purely mechanical direct current breakers are often built up with parallel resonant circuits to create an artificial current zero in the opening breaker contacts. A counter current generated by an RLC circuit has typically a sinusoidal waveform. In a setup of a direct current breaker with active injection of a counter current impulse, the varying steepness of the impulse through the mechanical breaker is generally not optimal to interrupt both low and high direct currents. This contribution presents a mechanical direct current circuit breaker device with a conventional vacuum interrupter as a mechanical breaker in the main path. The necessary artificial current zero is created by a counter current impulse installed in a parallel path. Instead of a sinusoidal waveform the counter current impulse has a saw tooth-shaped waveform generated by an RLC lattice network. The impulse waveform has nearly a constant steepness at the time instant of current zero and allows arc interruption for different magnitudes of direct currents by using the same counter current impulse.

More Informations :

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