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LICENSING OPPORTUNITIES

South Dakota School of Mines Office of Economic Development is actively seeking exclusive and/or nonexclusive licensing opportunities. Joint development opportunities are also available.

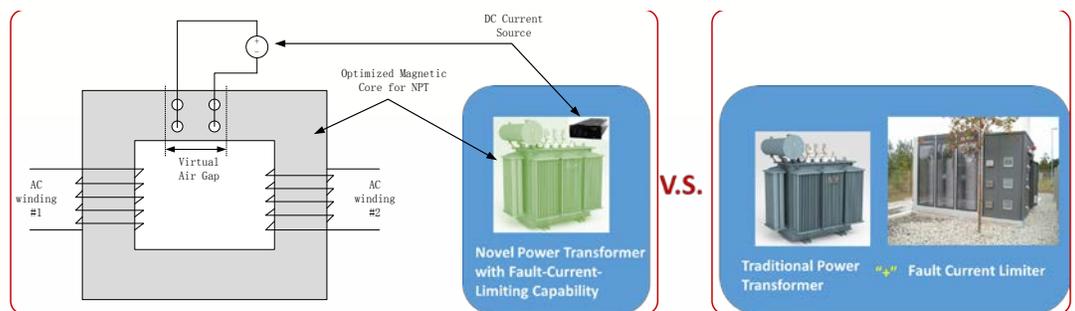
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Overview

Power transformers are the most commonly applied and widely installed power device in transmission and distribution networks throughout modern power systems. In this invention, **the fault-current-limiting capability is enabled in power transformers** by adopting the theory of virtual-air-gap (VAG) in electromagnetics. The concept of VAG is to saturate a certain portion of the magnetic core to change the reluctance of magnetic loops. VAG is not an actual air gap but a saturated portion of the magnetic core, which restricts the magnetic flux to follow through it. In power transformers, electric power is transferred between electric windings through the magnetic core interface. By changing the dc current, the redistribution of magnetic flux and isolation between the electric windings can be achieved. The power rating of the power electronics drive in VAG can be much smaller than the power rating of power transformers, which would greatly reduce the cost of device.



Impact and Benefits

Compared with the state-of-art solutions of fault current limitation, this invention is a very cost-effective and space-saving approach to satisfy the protection requirement both in current power systems and the scoped future smart grid.

Notable benefits:

- 1) No need to install additional fault current limiters;
- 2) Grand benefits in power system mobility and transportation in some particular environments;
- 3) Improved power system stability and power quality; extended life-time of electric components.