

PERFORMANCE OF IN-SERVICE SHUNT CAPACITOR SWITCHING DEVICES

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ABSTRACT

The capacitive current switching duty demand is increasing in medium voltage networks, as the decentralized power generation by renewables requires additional reactive power compensation to ensure adequate power quality. IEC 62271-100 stipulates test procedure to verify the capability of the switching device to prove this [1]. Capacitive current switching is carried out to disconnect cables, overhead lines with currents of about 50A or with almost daily frequent switching of capacitor banks at interruption currents up to 1000A. This switching has been always challenging for vacuum interrupter (VI) technology because of the micro-welding of contacts during the making operation, due to the inrush current, and there is a risk of re-strike based on breaking of this micro-weld at contacts during opening [2]. This produces micro-tips during each opening operation creating roughness on the contact surface which leads to locally enhanced field strength between both the contacts. In the new innovative “K-type” technology a way of minimizing the roughness of contact surface and to reduce the extent of the molten volume during the pre-arcing while closing has been figured out [3]. This new VI has been tested up to 1000 switching operations instead of 104 operations stipulated in the standard to qualify the VI's as class C2 for capacitive current switching [4]. This new multipurpose VI “K-type” family has been developed and successfully introduced into the market.

References

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