

## R&D Project Title: Development of a New Technology for DC High Current Arc Interruption in SF<sub>6</sub>-free Gas Circuit Breakers

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### Summary :

The objective of this study is to study a novel technology for high current arc quenching processes, namely the "arc quenching method by nano/micro solid particle aerosol/mist dispersion system," with a view to developing SF<sub>6</sub> gas-free circuit breakers. The project aims to establish fundamental experimental systems for two aerosol dispersion systems without fluoride materials: (a) a nano/micro solid particle dispersion system and (b) a nano/micro-sized liquid-phase mist spraying system. Through experimental and numerical approaches, we will endeavor to comprehend the arc interruption capability and dielectric recovery properties. As a prospective contribution to carbon neutrality, it is postulated that by eschewing the use of SF<sub>6</sub>, the equivalent CO<sub>2</sub> emissions over the 40-year life cycle of gas circuit breaker will be reduced to one-quarter of its original level. The developed technology will liberate us from the PFAS problem from SF<sub>6</sub> alternatives of C-F-O or C-F-N system.

