Overview

1. Background

- Develop a high current Solid State Circuit Breaker (Main Breaker in FID) to protect a 7.2 kV/200 A single phase lateral line in 12 kV distribution system;
- Perform the function of interrupting the large fault current, e.g., 200 A, during short circuit or overload and reclosing the hybrid dc circuit breaker during normal conditions.

2. Problem statement

- In order to have ultrafast protection of electric power system and capability to avoid arcing and to speed up the interruption process, solid state circuit breaker such as 15kV SiC ETO is used.
- Current available 15kV SiC ETO cannot provide large fault current (200 A) interruption, thus parallel operation is needed. But there might be issues with parallel operation of several devices.

Method

1. Experiment Design

![Hybrid dc circuit breaker diagram]

![Paralleled SiC ETO]

![ETO anode and ETO Cathode]

![GTO Device]

![15kV SiC GTO]

Results

1. Conclusions

![3-Parallel ETO Turn-off @4.5kV/200A]

![3-Parallel ETO DC Current Sharing (120kHz current sensor output)]

References