HVDC Open Series Fault considerations for Distributed Generation μGrid architecture

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With localized generation, without the need to transmit long distances, for large electronic loads (i.e. data centers) distributed generation from HVDC µGrids is gaining promise.

Control focus is power electronics & DC-DC converters
However, one major concern is the safety of DC µGrids, particularly during a fault condition

Research topic is therefore on HVDC open series fault formations & effects on localized grid

Experimental approach by 1st building a µGrid:
- 3φ AC source panel → variac or transformer → passive 6 diode bridge rectifier (DBR) → "open series fault" → R-L load
- DC (280 – 635V) vs. AC systems of “quasi-equivalent” parameters
- monitor AC & DC currents, voltages, arc fault transients, power dissipated, bus disturbances, duration, re-strikes, loading effects
- 50 to 5 µs data capture rates, 12 bit resolution
- modeling, DC breaker designs, DC architecture fault clearing strategies, safety recommendations

http://www.youtube.com/user/utcem