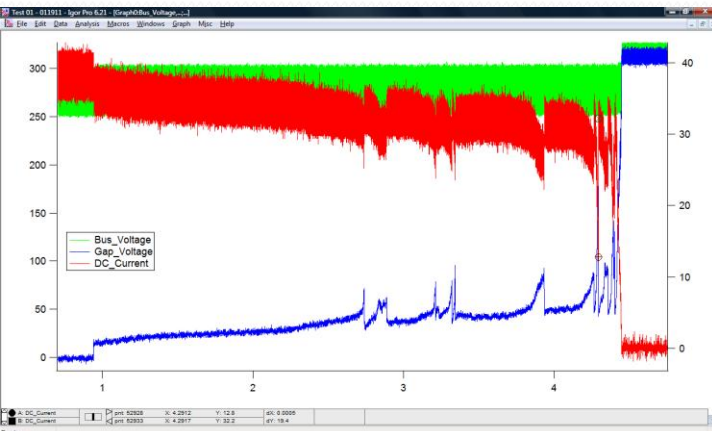


Fault Considerations for Distributed Generation μ Grid Architecture

Hunter Blake Estes

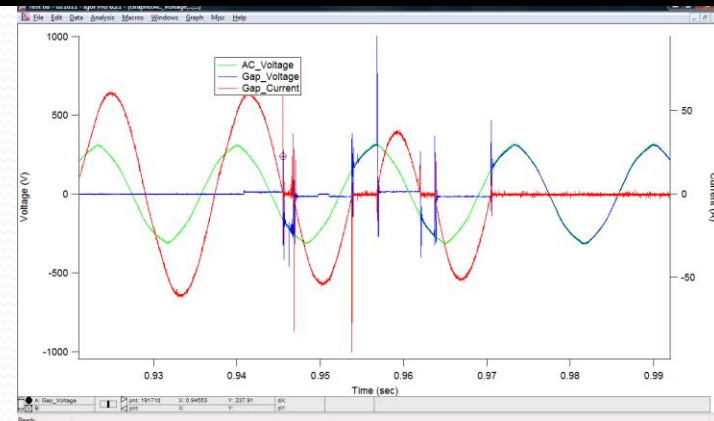
- With **localized** generation, without the need to transmit long distances, for large electronic loads (*i.e. data centers*) distributed generation from HVDC μ Grids is gaining promise.
- Control focus is power electronics & DC **safety**-DC converters
- However, one major concern is the stability of DC μ Grids, particularly during a **fault** condition
- Research topic is therefore on HVDC open series fault formations & effects on localized grid



DC open series fault transients



copper contacts /
simulated fault



AC open series fault transients

- Experimental approach by 1st building a μ Grid:
 - 3ϕ AC source panel \rightarrow variac or transformer \rightarrow passive 6 diode bridge rectifier (DBR) \rightarrow “open series fault” \rightarrow 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 μ s data capture rates, 12 bit resolution
- modeling, DC breaker designs, DC architecture fault clearing strategies, safety recommendations
- <http://www.youtube.com/user/utcem>