G&W CLIP® INFORMATION SHEET

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WHY WOULD I WANT TO USE A ***TRIGGERED CURRENT LIMITER***?

(OR WHAT DOES IT DO FOR ME?)

BACKGROUND

Let's first look at what a triggered current limiter (TCL) is. G&W Electric Company produces 2 types of triggered current limiters. These are the CLiP® Current Limiting Protector and the PAF®Power Assisted Fuse.

The CLiP concept began as an EPRI project in the late 1970's. The idea was to develop a current limiting device that has a much higher continuous current capability than traditional current limiting fuses. **At 15kV, traditional current limiting fuses were rated less than 300 Amperes.** To make the conducting elements larger was not the answer, as they would simply not melt early enough to limit the fault currents to acceptable levels. In addition to PAF devices rated to 600A and CLiP units of 1200 and 3000 A ratings, G&W is introducing a **15.5kV, 5000A CLiP**. Interrupt ratings up to 120kA are available.

Triggered current limiters conduct their primary current through an alternate, heavy busbar path instead of a current limiting fuse element. A small current limiting fuse sits in parallel with this bus, but conducts only a small fraction of the continuous current due to its higher resistivity. The current through the triggered current limiter is sensed electronically. When an overcurrent condition occurs, the electronics sends a pulse to a light pyrotechnic charge that cuts the busbar path. This is simply a high speed switching technique. **During a fault, the full current is transferred to the small current limiting fuse, which interrupts the circuit.**

TYPICAL USES

What we now have is a heavy busbar path that is electronically sensed and switched in a current limiting fashion. **The path has such low impedance that, unlike fuses, which actually have a substantial resistivity, this is essentially a busbar path.** Since we have current limiting capability combined with very high continuous current capability, we can use these characteristics to:

- **Save money** - upgrade the system source by adding transformers or cogenerators (resulting in higher available fault currents) without the changeout of downstream breakers,
- **Bypass current limiting reactors** to eliminate their real operating costs (**save $10s of thousands per year**) and eliminate voltage regulation difficulties,
- **Close tie position breakers** to improve voltage regulation or avoid further system upgrades while still being fully protected,
- Protect historically **underrated equipment**, (the ones that have been neglected over the years) and satisfy the insurance companies,
- **Reduce fault energy** to limit damage or prevent transformer tank rupture (let-thru I^2t is commonly 0.5% of that from a 5-cycle breaker),
- Clear the **generator with high asymmetries** in 1/4 cycle where the breaker may not reach an effective current-zero for many (20-30) cycles,
- **Limit cogenerator fault contribution to the utility** within utility mandated limits,
- **Protect cogenerators** - its a multimillion dollar investment that a breaker alone cannot fully protect,
- **Escape the cost of full rated breakers** (especially generator breakers) and have a more effective protection package,
- Protect from fault **backfeed of large rotating loads,**
- Protect **capacitor bank switches** by limiting fault currents superimposed on inrush from adjacent banks,
- Protect **harmonic filter** systems without responding to the higher frequencies,
- **Bypass neutral reactors** to maintain system balance until a major fault occurs,
- Limit damage from **ferroresonance** by causing 3-phase clearing,
- Limit fault damage to **variable speed drives**,
- Improve **power quality** by limiting the fault contribution to adjacent faulted buses that would cause unacceptable voltage sag on the system.

For additional information contact G&W Electric Company at 708/388-5010 or for an application literature visit our web site at www.gwelec.com.