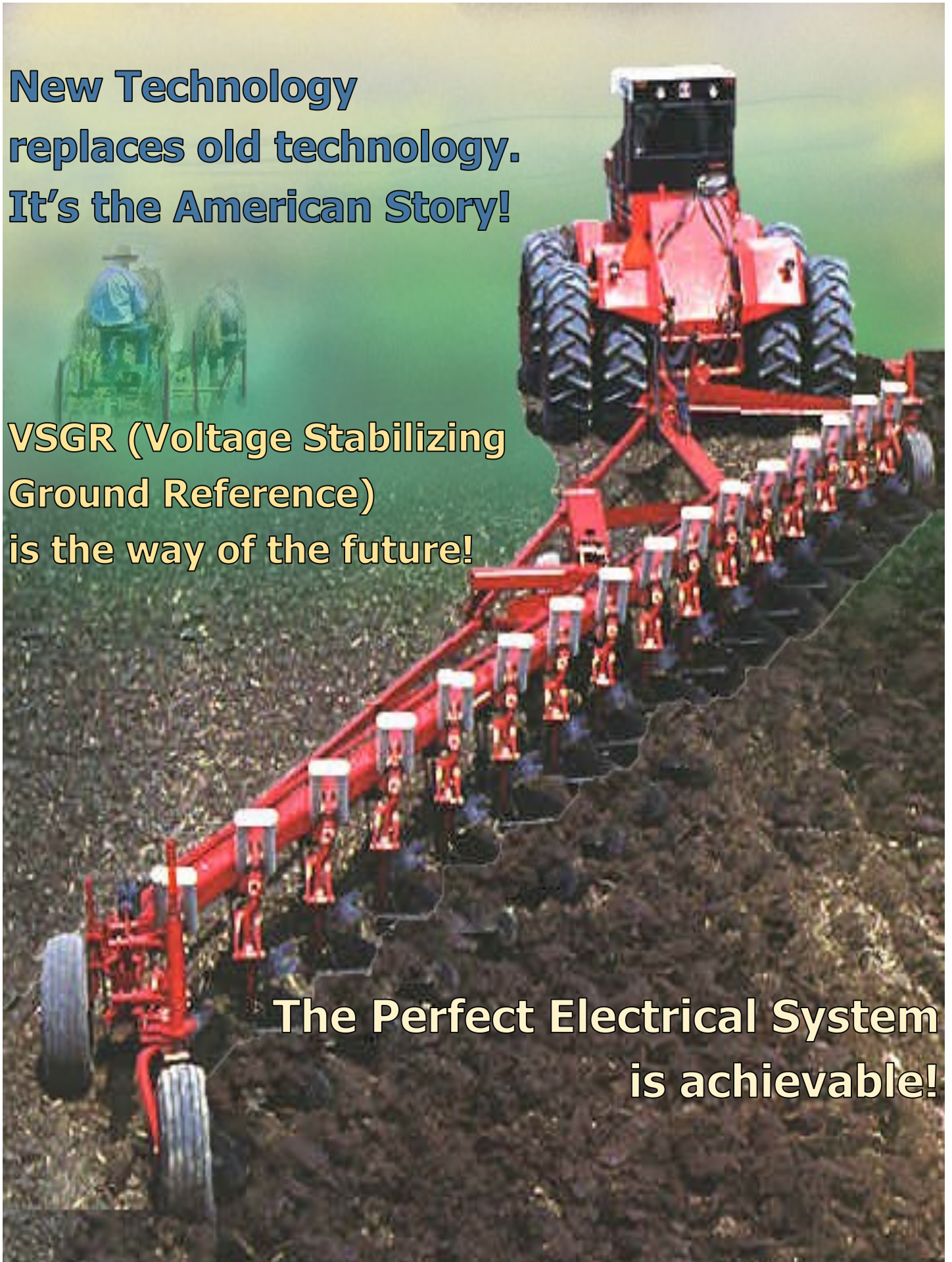


**New Technology
replaces old technology.
It's the American Story!**

**VSGR (Voltage Stabilizing
Ground Reference)
is the way of the future!**

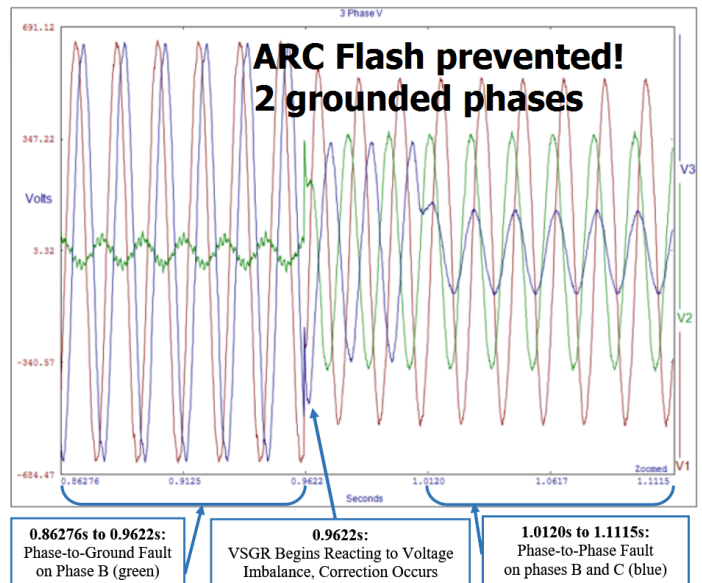
**The Perfect Electrical System
is achievable!**



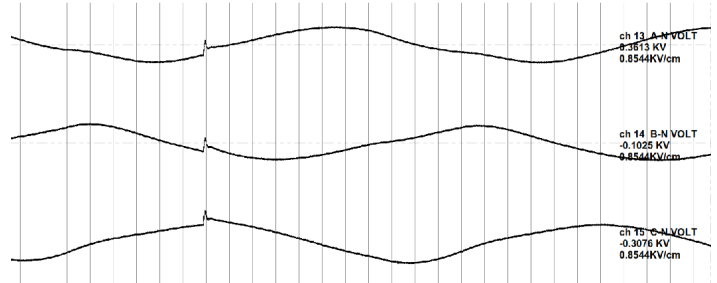
What does the perfect Electrical System look like?

Simple, Efficient, Safe, & Reliable!

- Safe**—Prevents 85% of Arc Flash Events. Reduce Fault Current to 1A.
- Efficient**—Use less energy.
- Reliable**—Maximum uptime with Balanced Voltages Phase/Ground, no 1ph Sags.
- Equipment & Loads achieve maximum life** – with Lowest operating Temperatures and noise free V.
- No Fault**— First ground fault, Alarm and correct the event, system operates. The 2nd ground fault, Alarm and Correct the event.
- All Transients are eliminated.**
- Save Money, eliminating energy consuming and expensive “Band-Aide” equipment, such as 12+ Pulse Drives, Reactors, Filters, SPDs, Isolation Transformers, Snubbers, NGR, HRG, etc.** Don’t worry about Voltage Harmonics or Frequency issues as they are corrected.
- Make more money—With the perfect Electrical System.**



6,000V Surge on Phase C doesn't happen - reduced to 12V.



Call me for a quote or a demonstration.

Thanks,

Cy Cates

Table 1: Methods of different Grounding Systems & Characteristics
(Grounding options as applicable for specific installation requirements)

Considerations and System Characteristics	Wye Secondary systems					Delta Secondary	
	1 Solidly	Low Res.(NGR)	2 High Res.(HRG)	Reactance	3 Wye w/VSGR	Ungr. Delta	3 Delta w/VSGR
Continuity of Service on Grnd Fault	No	No	Yes	Yes	Yes	Yes	Yes
Likely to propagate multiphase fault	High	Medium	Lower	High	Lowest	Low	Lowest
Equipment Damage Potential	High	Low	Very Low	High	Lowest	Very Low	Lowest
Ground fault current	Highest	400A	<10A, 5.0A	High	1.0A	1–3A	1.0A
Transient over-voltage level	2.5X	2.5X	2.5X	2.5X	1X	≥6X	1X
Cable Insulation level	1.0X	1.0X	1.73X	1.0X	1.0X	1.73X	1.0X
Arc Flash Risk Level	High	Medium	Low	High	Lowest	Low	Lowest
Energy drained to ground \$ Continuously	5–10A	5–10A	5–10A	5–10A	0.01 - 0.02A	5–10A	0.01 - 0.02A

Ground Faults are the primary cause of Arc Flash and Fault events. **The most serious question may be:**

A. Can one conductor, with insulation failing, cause a fault or ARC FLASH event? 1 Yes. 2 No. 3 No.

B. Can two conductors with insulation failing cause a fault or ARC FLASH event? 1 Yes 2 Yes. 3 No

1 & 2. The first grounded phase will cause increased temperature, ionizing the air, higher current and will likely cause the other phases to fault, and increase potential for ARC FLASH.

3. Because of Voltage Stabilizing, with VSGR there will be no appreciable increase in current or temperature, avoiding the cascading effect, so there cannot be an ARC FLASH event. See [Kema Arc Flash Test](#) and Blog post on [Correcting the path of least resistance](#).

Leakage current costs energy continuously, caused by capacitive charge, 5 Amps to 10 Amps or more, being drained to ground. In one Michigan 1mil sq ft plant, 9A continuously was being drained to ground. **Phaseback VSGR** uses this continuous charging current to balance the phase to ground voltages, thus saving lots of money annually, and preventing Arc Flash. The reduction in current being drained to ground is a big cost savings.

\$ Charging current will depend on the size of the electrical system. Savings reported from 150,000sq ft manufacturing facility, to be \$50,000/yr on energy cost.