

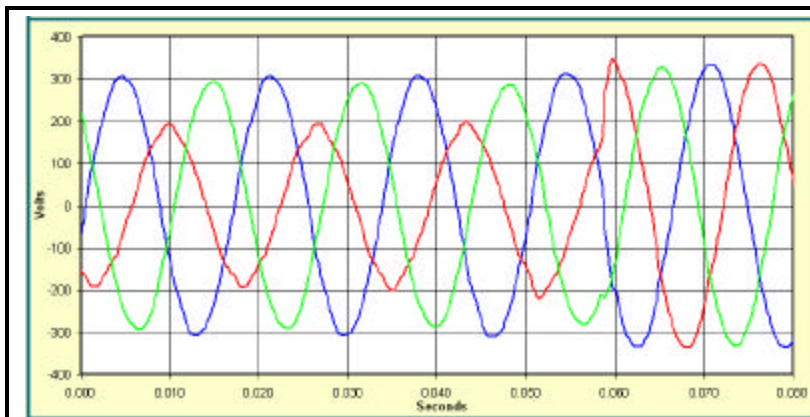
— Phase A
— Phase B
— Phase C

Waveform: Start of Event

Analysis

Voltage sags caused by utility faults are often fairly long (100 – 200 msec, 6 – 12 cycles at 60 Hz). In the case of a fault, the voltage will affect one phase or all phases. The sag severity depends on how far away the fault occurs.

Event	Date and Time	Type	Severity	Minimum	Maximum	Duration
8	10/27/05 10:17:04	Voltage Sag	Severe	131.5	234.2	0.117



— Phase A
— Phase B
— Phase C

Waveform: End of Event

Analysis

The TEALwatch® waveform snapshot has a fixed width (80 msec., or 4.5 cycles). For longer voltage events (such as this sag) two waveforms are recorded: capturing the start as well as the end of the disturbance.

The voltage returning quickly here points to

Event	Date and Time	Type	Severity	Minimum	Maximum	Duration
8	10/27/05 10:17:04	Voltage Sag	Severe	131.5	234.2	0.117

Technical Analysis

Electric utilities employ overcurrent protection to isolate faults and protect customers as well as the electrical distribution system. When a fault occurs - the electrical system sags until the breaker trips and the fault is isolated - typically a few cycles.

Manual breakers must be reset by utility workers - so a sag related to a manual breaker will occur just once - the sag occurs until the breaker trips, at which point, the sag ends.

In the event of automatic reclosers (such as the device shown at right), a trip is automatically reset after a few seconds. So if the fault has not cleared, multiple sags may be experienced, within a short time frame (1-2 minutes) before the fault has cleared or the recloser opens for good.

Voltage sags can occur for lots of reasons - faults, overloads, inrush currents, utility switching. But 100-200 msec sags are often related to faults on the utility. Small sags are caused by distant faults, and severe sags are caused by faults closer to the facility being monitored.

Faults within the facility or very close often cause voltage outages.

