

Kill it! Once and for all

Lightning and other Voltage events are eliminated

Choose: Delta / Wye Transformer w NGR/HRG or AFPT

Harmonics Isolation	No	Yes
Arc-Flash / Fault prevention	No	Yes
<u>Voltage Spikes / High Voltage corrected</u>	No	Yes
Phase Voltage Imbalance corrected	No	Yes
Phase Loss from high impedance grnds fixed	No	Yes
Phase angle differential maintained	No	Yes
Phase voltage instability corrected	No	Yes
Phase voltage harmonics improved	No	Yes
Waveform distortion corrected	No	Yes
Noisy ground reference /frequency corrected	No	Yes
Arcing ground-faults corrected and alarmed	No	Yes
Operational efficiency reduce KW & grnd current	No	Yes

Let's focus on common Voltage related Power Quality events affecting Power Systems. Solutions

Lightning & Switching Surges 8 to 100 μ s SPDs or AFPT

1ph Sags - Cycles, seconds or minutes. **Volt Reg or AFPT**

Phase loss >100 μ s & related overvoltage. **Trip off or AFPT**

Noise and Harmonics, Frequency instability **Reactor Filter or AFPT**

Fundamentally improve your power system, continue to operate, rather than fault and replace damaged equipment or _____.

Replace your distribution transformers with **AFPT** and eliminate SPDs, Harmonic Filters, Voltage Regulators, NGR or HRG

SAVE MONEY & SAVE LIVES by PREVENTING ARC FLASH!

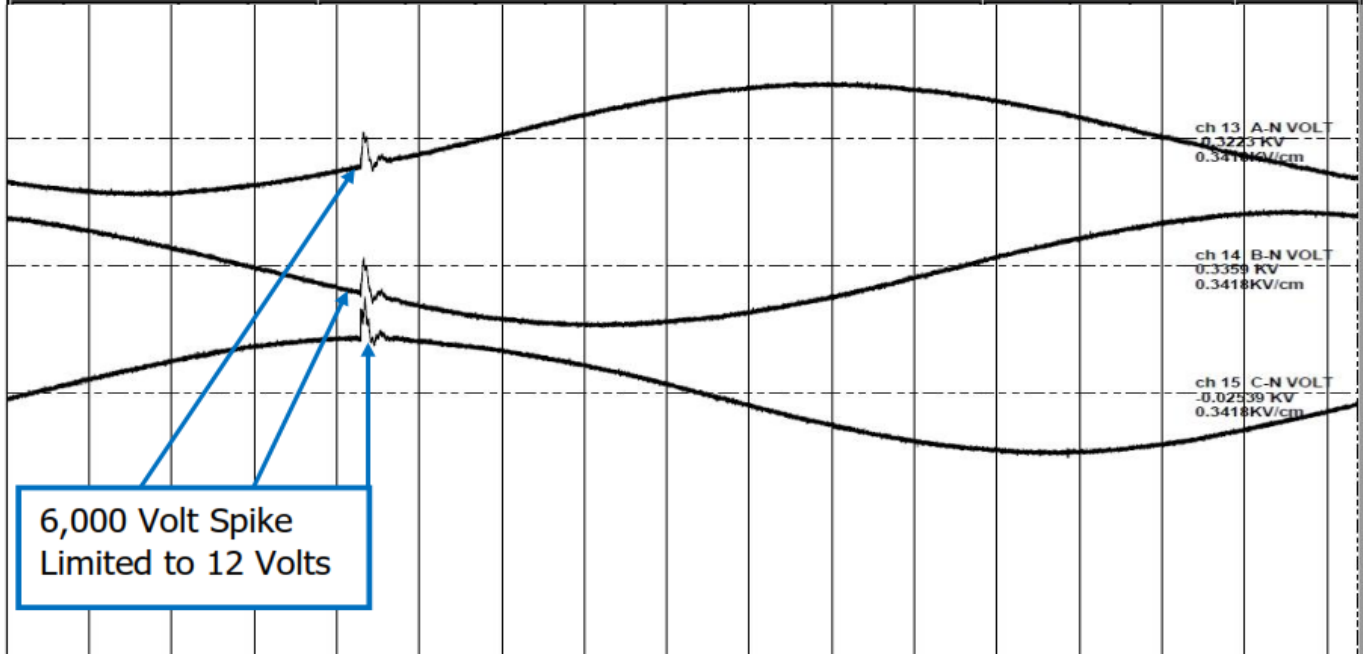
Test Voltages:
6,000 Volts

Current During
Test: 27.69A

Effective Phase
Voltage: 277
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TYPE OF TEST: Phase to ground overvoltage v DATE: January 13, 2017
TEST OBSERVERS: DNV GL KEMA lab personnel, William Stewart (Applied Energy) for 1/13/2017 TESTER: KS, BS

Trial	Sample	Test Duty	O.C.V. (V)	Phase	Total (A)	Sym (A)	Peak (A)	Total @ End (A)	Sym @ End (A)	TD Gnd I pk (A)	Curr. Dura. (ms)	Transient Duration (µs)	Phase	C.C. Volts (V)	Transient Peak (V)	Remarks
12	6.0kV charge	With	480.00	A	33.69	27.69	58.94	-	25.74	-	390	358	A-N	274	-	2.4
	TD connected			B	34.10	26.68	58.64	-	25.62	-	390	358	B-N	279	-	
				C	54.45	30.47	89.36	-	25.62	-	390	358	C-N	287	697	
				AVG	40.75	28.28	-	-	25.66	15.76	-	-	AVG L-L	485	-	



MOV devices, arresters, TVSS, SPDs Compared to **AFPT**

Ratings	SPD/MOV	AFPT
MCOV L-L	(1.) 550V TVSS	N/A
Let Thru Surge V	(1.) 1616V TVSS	12V
Current Used	(2.) 3000A	3A
Time of Test	(2.) 8/20µs typical	358µs This test

Ungrounded system, 480V with 6000V surge event. **AFPT** eliminates the need for MOV based SPDs, while improving overall system performance. Many SPDs will fail due to sustained high voltage, some will fail catastrophically and some of those will cause additional damage, depending on their location.

1. MOVs have a high clamping voltage, so it must wait to begin operation. 2. MOVs convert Voltage to Heat Energy, thus the Surge KA Rating, which determines the size. MOV's limitation is the amount of energy they can dissipate, as it takes time to cool. Station Class arresters dissipate more heat energy than Distribution Class arresters.