



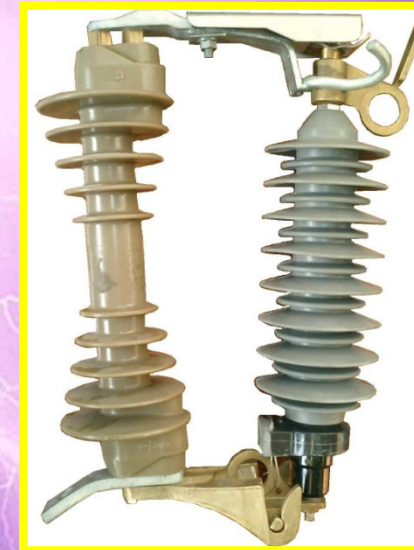
Live Line Technology

Distribution Line Lightning protection $3\text{kv} \leq 33\text{kv}$



Transformer Combi Unit

(Transformer Protection)



Live Line Arrestor

(Firewall)

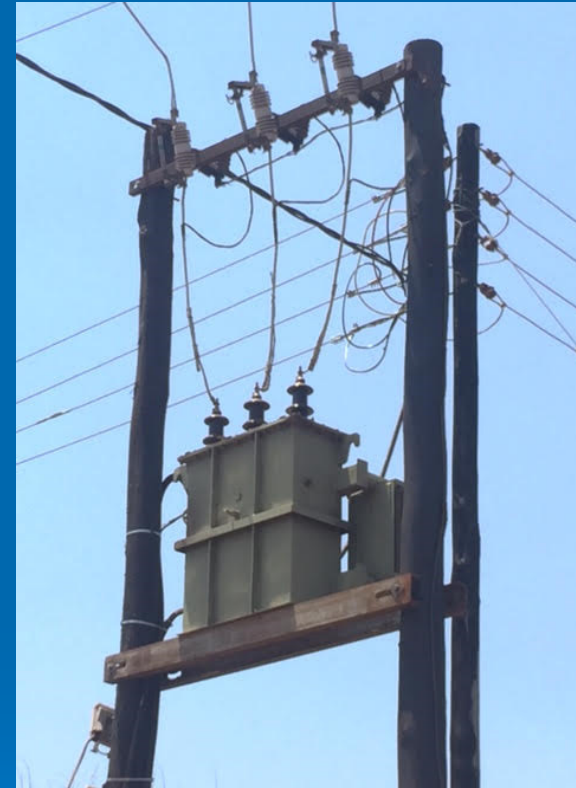
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LIVE LINE TECHNOLOGY

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ZESCO



Transformer point 4408 in Kafue

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Lusaka Kafue Transformer 4408

1x Transformer has been lost.

Issues :

Fuses in front of surge arrester and in lightning path.

Fuses will blow in lightning storms.

Surge arresters are behind fuses and cannot function during lightning.

Surges take too long to replace.

Surge arresters blow without staff knowing.

Transformers blow before 20 year Lifespan.

BEFORE

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Kafue – Transformer 4408

Issues :

Surge arresters expire and don't get replaced in time before the next Lightning strike.

Fuses in front of surge arrester and in lightning path. Nuisance fuse blows Frequently.



BEFORE

The surge arresters don't alert you when they are expired.

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INSTALLATION

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INSTALLATION

Thompson – 1Tee

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INSTALLATION

Innocent

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Before – Nothing



After Combi – 2x Earths system



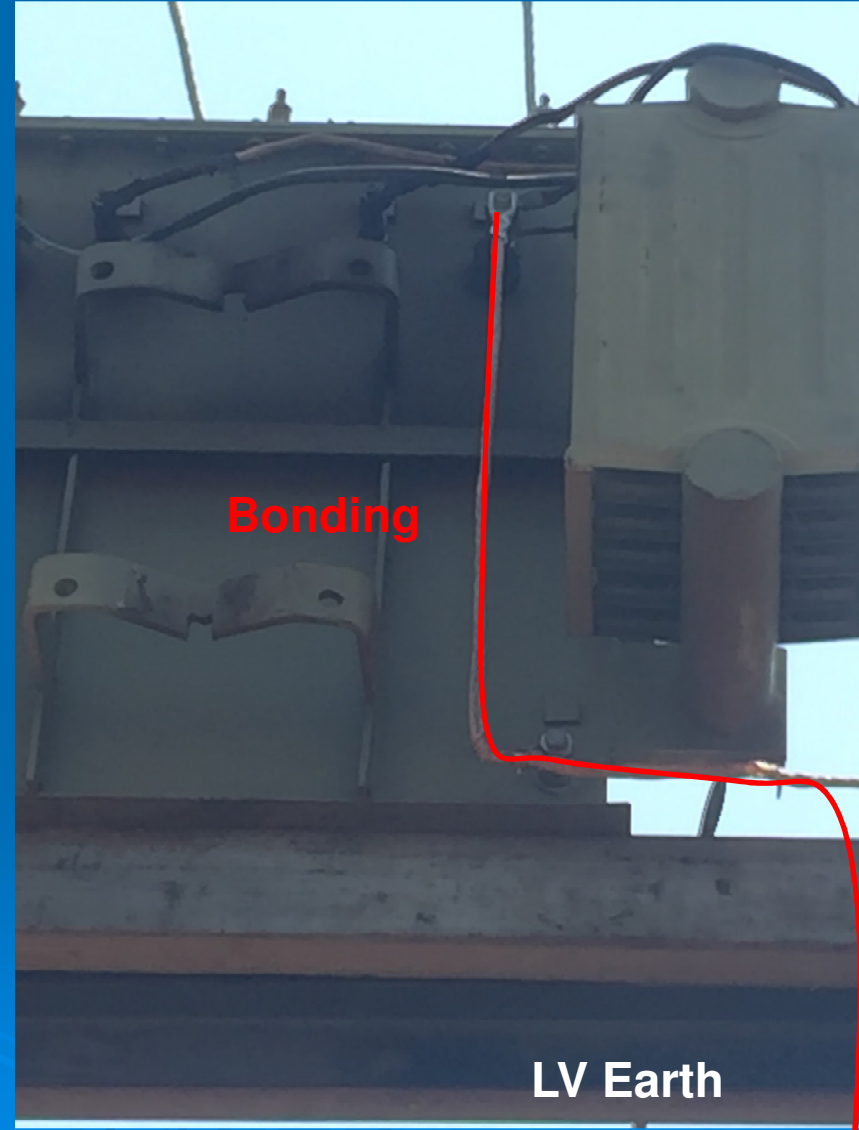
INSTALLATION

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Before – No bonding



After Combi – 2x Earth system



INSTALLATION

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Better maintenance system

- Transformer survives for 20 years.
- The surge arrester is only replaced when needed.
- Surge arrester alerts you when it is spent.
- Surge arrester replacement is a 30 seconds operation rather than 3 hours.
- Safer.
- Quick & Fast.
- Easier.

AFTER

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AFTER

improvements :

1. Transformer only has lesser chance of getting damaged.
2. Improved earthing & bonding system. The Combi unit system has a two earth system.
3. Surge arrester replacement is easier, quicker, and enforced.
4. Replace the surge arrester from ground and easily identified.
5. Safer to replace the surge arrester from ground.

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Advantages:

1. Safer
2. Easy maintenance. No outage required.
3. Transformer isolated on arrester expiry.
4. Extend the life of transformer to 20 years.
5. Replace the surge arrester with link stick.

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Advantages:

1. Arrester replaced with link stick
2. 30 second operation.
3. No outage for replacement.
4. Safer from ground.
5. 100% replacement probability

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Conclusion :

Pole mounted transformers should have a 20 year life span.

They should not blow before they reach this age.

Fuses should not blow when the rainy weather comes.

Surge arresters should be replaced as soon as possible to ensure , the protection of the transformer.

Zesco can reduce transformer losses, nuisance fuse blows and improve surge arrester replacement by deploying Combi units in troublesome areas / hotspots.