



**ZESCO**



Ndola – Dingaon Xfr 33kv

**Combi installation 22 July 2017**

## Ndola Dingaan 33kv Transformer Combi installation 22 July 2017

# Introduction

Mr. Simon Nyirongo was visited on the 19<sup>th</sup> Wednesday July 2017.

A troublesome site, called Dingaan 33kv transformer which is a 50kVa transformer has been lost 4x times in 12 months.

The total losses are estimated to be \$20 000 USD/annum or KZ 175 000 per annum. A 33kv combi unit was installed on the 22 July 2017.

The Combi unit will be tested, to see if it can eliminate transformer loss in the 2017 rainy season. (September 2017 – March 2018.) The budget price of a Combi unit is 10% of the losses ie. \$2200 USD.

Other pilot sites will also be installed in the region, such as Firewalls 11kv and also a Combi site in Chingola will be tested at the site : Chingola , Gymkana area (Bishop Chitumbo Hse)11kv Chitumbo pole mounted transformer.

Mr. Titus Ncube , LLT Director projects witnessed the installations.

**Ndola Dinga 33kv Transformer Combi installation 22 July 2017**

# **Live Line Technology**



**Transformer Combi Unit**  
(Transformer Protection)

LIVE LINE TECHNOLOGY

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# Ndola Dingaon 33kv Transformer Combi installation 22 July 2017



## Ndola 33kv Dingaon transformer 1010

### Problems with the site

4x Transformer has been lost.

High lightning intense region.

All surge arresters are blown.

Surges take too long to replace. Surge arresters blow without staff knowing.

Transformers blow b-annually and do not reach their 20 year. 4x Transformers have been lost at this site in 2016- 2017 ( in a 12 month period.)

Bonding us incorrect.

# Ndola Dingaon 33kv Transformer Combi installation 22 July 2017

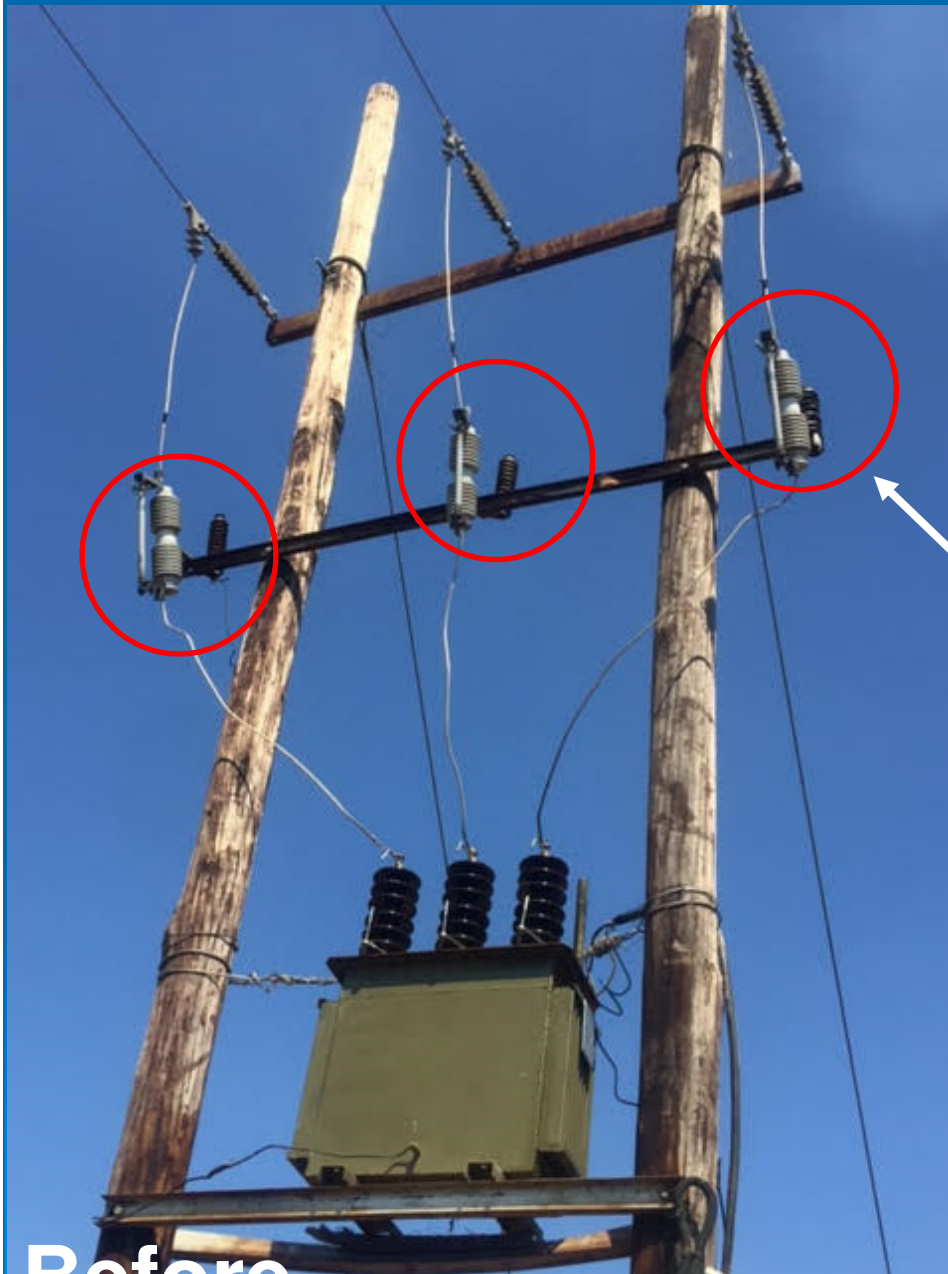
## Ndola 33kv Dingaon transformer 1010

### Problems with site

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



Conventional surge arresters don't alert you when they are expired & are never replaced.



**Before**

# Ndola Dingaon 33kv Transformer Combi installation 22 July 2017



## Improvements :

When a surge arrester is spent it alerts ZESCO. Transformers will no longer be lost due to lightning.

- Faster to maintain.
- Easier to maintain.
- Safer to maintain

## Installation

# Ndola Dingaon 33kv Transformer Combi installation 22 July 2017

Before – Surge protection (bonding)

After Combi – 2x Earth bonded system



After

# Ndola Dingaon 33kv Transformer Combi installation 22 July 2017



## Combi – 2x Earth bonded system

### MV Bonding

Copper cable 35mm must be connected between the Combi pole clamp and the transformer body.

Bonding is vital for the transformer Protection. This is connected into the crowfoot.

The voltage inside and outside of the transformer must be at the same potential during a lightning strike.

If the voltage potential = 0.

### LV Bonding

Copper cable 35mm must be connected from the neutral bushing and the transformer tank.

This is connected into the crowfoot.

# Ndola Dingaon 33kv Transformer Combi installation 22 July 2017



**AFTER**

## Improvements :

Surge arrester has 100% chance of replacement.

Replace surge arrester with link stick & safely from ground.

Transformer surge protection is improved significantly. Transformer survives for 20 years.

- Surge arrester alerts you when it is spent.
- Surge arrester replacement
  - Is a 30 seconds operation
  - rather than 3 hours.
- Safer, Quick & Fast, Easier to replace.

# Ndola Dingaon 33kv Transformer Combi installation 22 July 2017

## Advantages:

1. Safer to operate.
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.

After

# Ndola Dinga 33kv Transformer Combi installation 22 July 2017

## Advantages:

1. Link stick replacement of surge arrester.
2. 30 second operation.
3. No outage for replacement.
4. Safer from ground.
5. 100% replacement probability

After

## Conclusion :

1. The Combi unit improves transformer protection.
2. Transformers should have a 20 year life span.  
Transformers should not blow before they reach this age.
3. Fuses should not blow when the rainy weather comes.
4. Surge arresters should be replaced as soon as possible to ensure , the protection of the transformer.
5. Zesco can reduce transformer losses, nuisance fuse blows and improve surge arrester replacement by deploying Combi units in troublesome areas / hotspots.

Ndola Dingaan 33kv Transformer Combi installation 22 July 2017

The End – thank -you