



Live Line Technology

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

Sub-station Combi unit pilot project New Xade

Transformer Combi Unit
(Transformer Protection)

Live Line Arrestor
(Firewall)

Installation by : - Kevin Risi July 2014

LIVE LINE TECHNOLOGY

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BOTSWANA POWER CORPORATION

NEW XADE / 33 / 11KV/ SUBSTATION

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BEFORE -

New Xade

33kv/11kv Substation.

PROBLEMS

- New Xade 33kv/11kv Substation

1. 4x Transformer losses recorded from 2011 – 2013., a total loss of P 1000 000 to date 2014.
2. The substation site is +/- 120 km from Ghanzi, at New Xade.
3. Multiple nuisance fuse blows have been recorded.
4. Earths are present on the transformer, but no surge arresters are visible, and extra transformer earthing is not present.
5. Concern : The transformer is a refurb unit and is leaking through the insulator bushing. Continual leaking will drain the transformer of its oil and will create a burn out.

BEFORE

4x Transformers were lost here
in a Calendar year in 2011-2013.

Problems :

- 1) No 11kv arresters on transformer .
- 2) No 33kv arresters on transformer.
- 3) 33kv Fuses in front of transformer.
- 4) Transformer leaking.
- 5) Inadequate earth bonding to transformer tank.

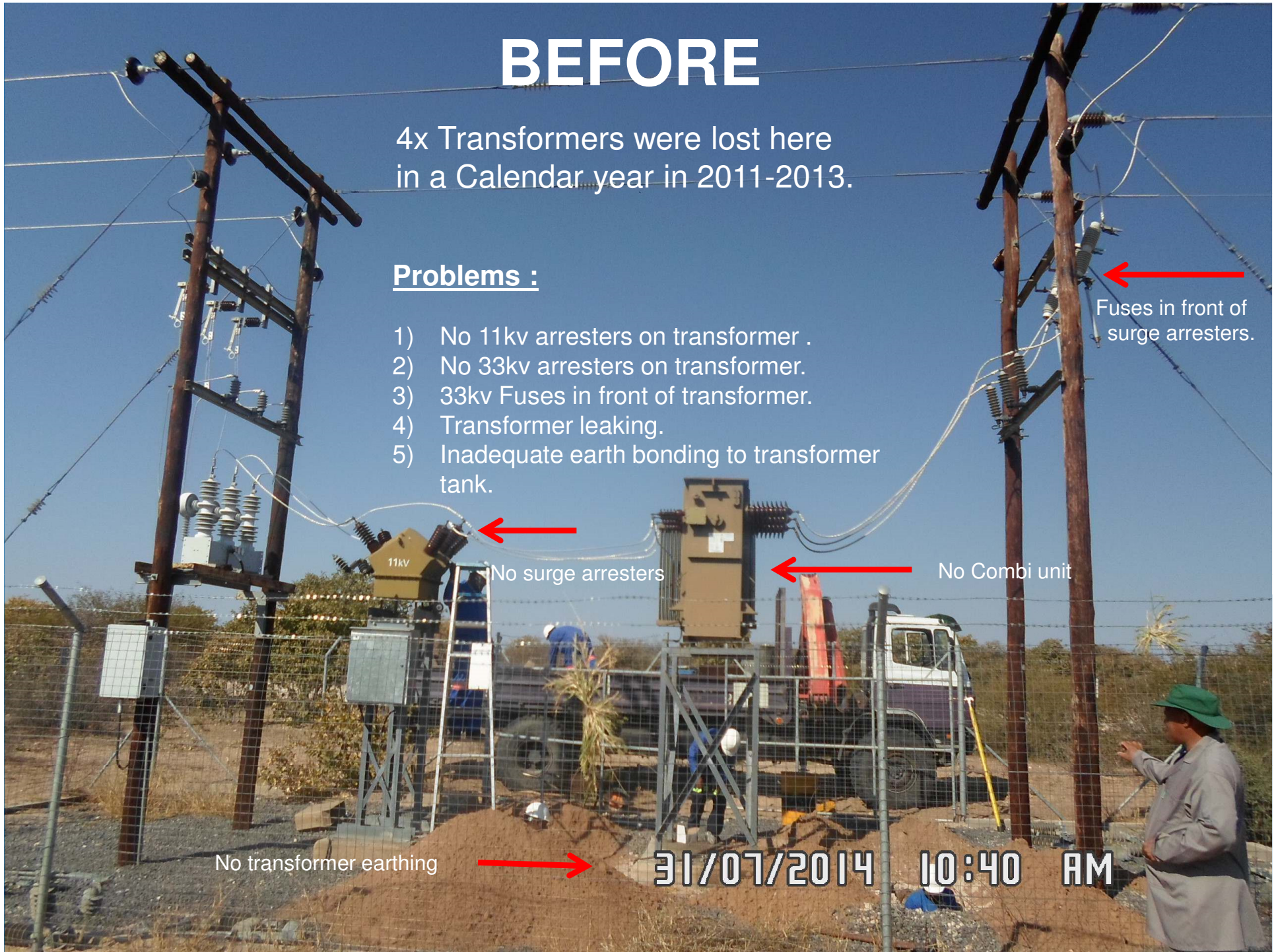
← Fuses in front of surge arresters.

← No surge arresters

← No Combi unit

← No transformer earthing

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AFTER -

New Xade

33kv/11kv Substation.

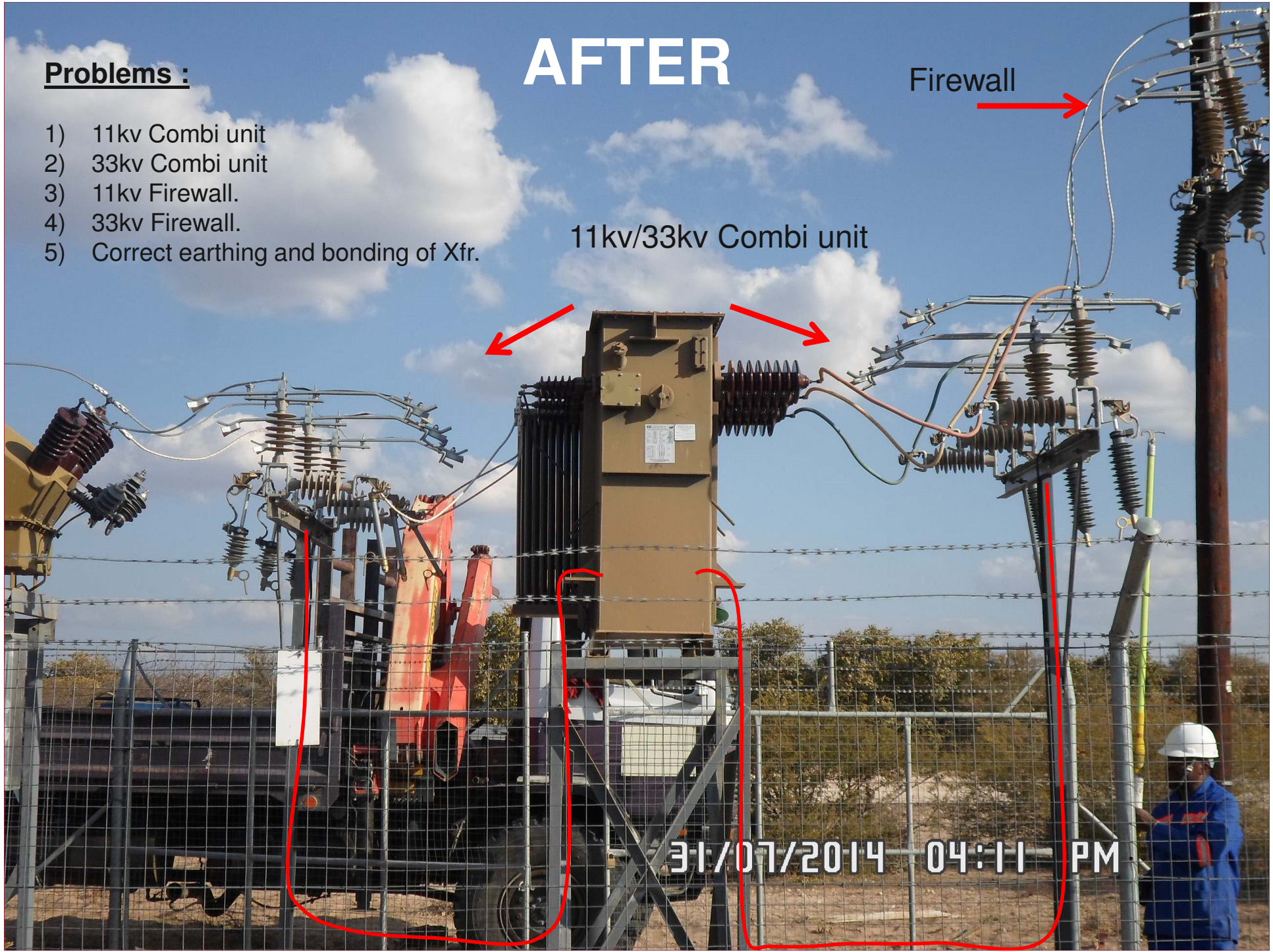
Problems :

- 1) 11kv Combi unit
- 2) 33kv Combi unit
- 3) 11kv Firewall.
- 4) 33kv Firewall.
- 5) Correct earthing and bonding of Xfr.

AFTER

Firewall

11kv/33kv Combi unit



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AFTER

Firewall

Combi unit



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AFTER

500kva Transformer protection with Combi & Firewall

33kv Firewall

33kv Combi unit

11kv Firewall

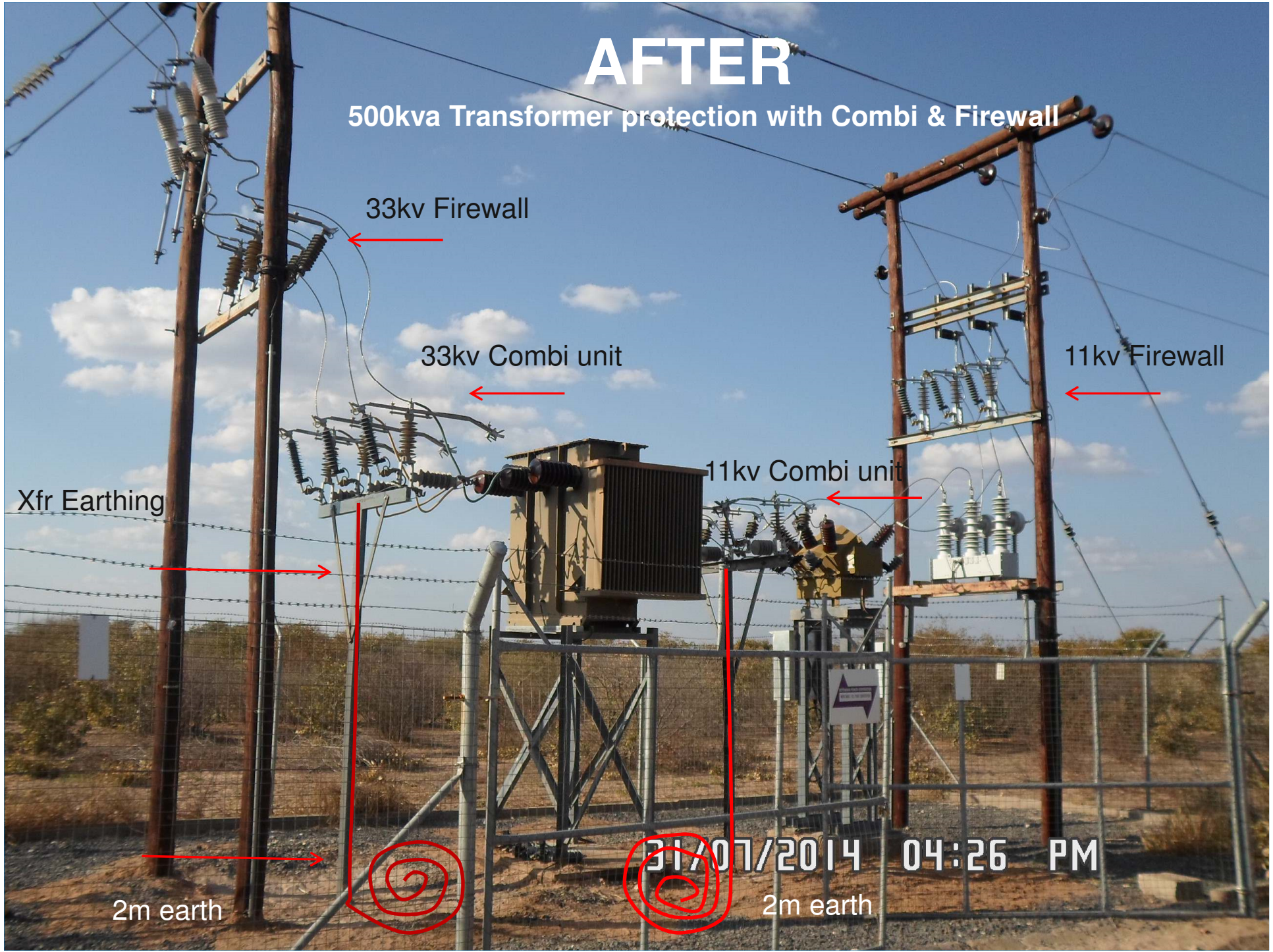
11kv Combi unit

Xfr Earthing

2m earth

2m earth

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AFTER

Installation complete

11kV

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AFTER



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AFTER

This installation is..... miraculous



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The End.