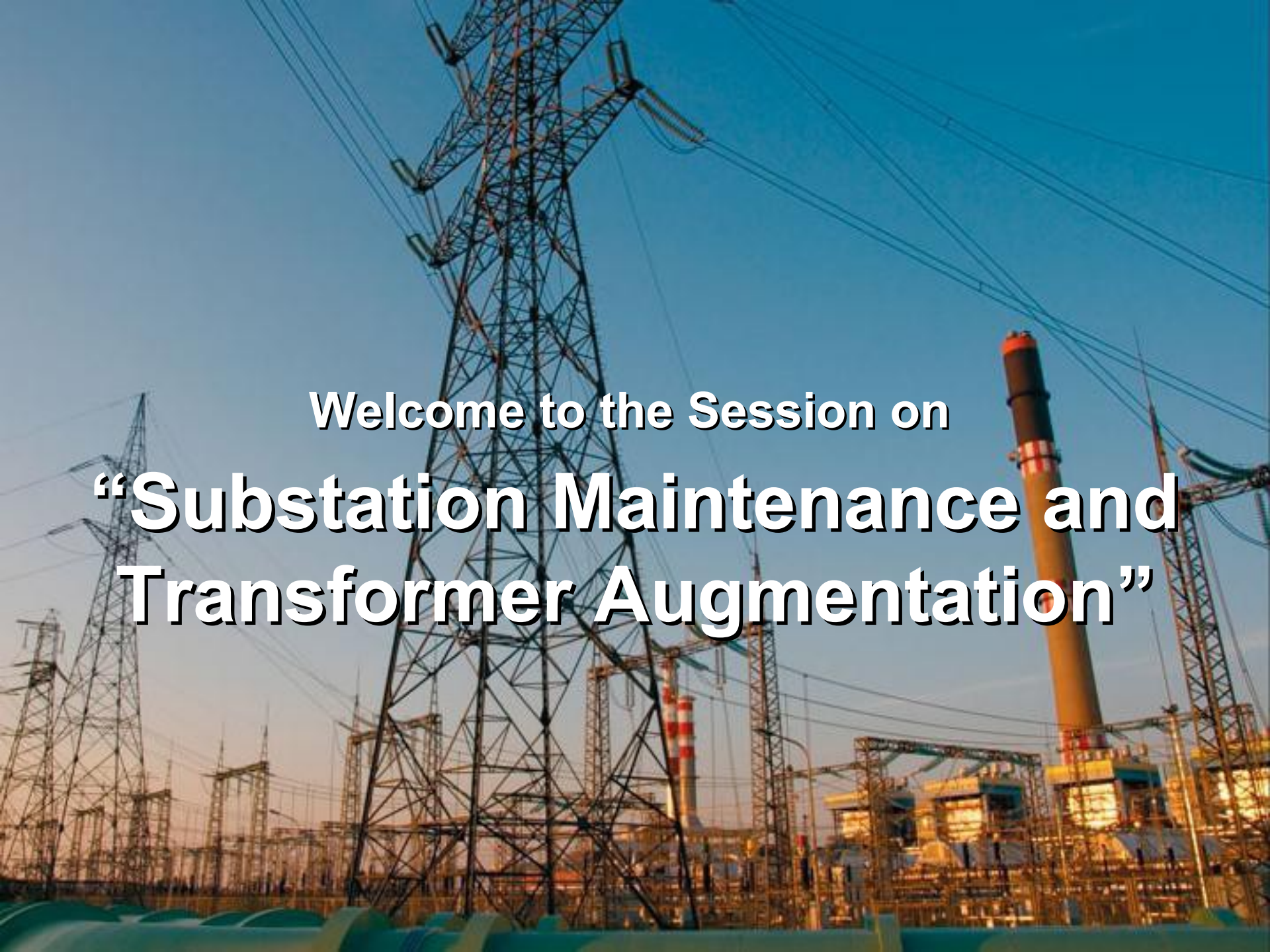
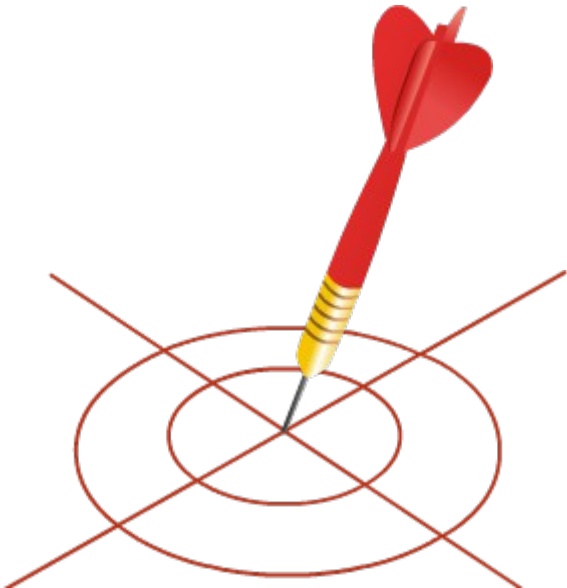

Welcome to the Session on
“Substation Maintenance and Transformer Augmentation”

Learning Objective

By the end of this session, you will be able to:

- Explain the preventive maintenance of distribution transformer



Preventive Maintenance of Distribution Transformer

Preventive maintenance covers:

1. Transformer oil level check
2. Oil leakage from transformer tank or from its radiator
3. Check for transformer bushings for any damage or hairline crack
4. The condition of HT joints and LT terminations
5. Condition of silica gel in breather
6. Taking sample of transformer oil to check the bdv of oil

Clearing the Work Area

Double Pole (DP) structure is surrounded by tree branches

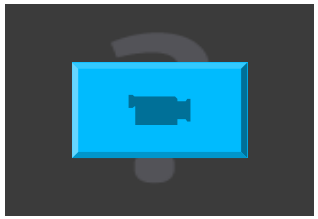
Trimming tree branches to clear the work area

Introduction – Breather Unit of Transformer

Absorbs the moisture from the air sucked in by the transformer.

Breather unit of transformer

Silica gel inside the breather has absorbed moisture. Its colour has thus turned pink



How to Change Breather Oil Cup?

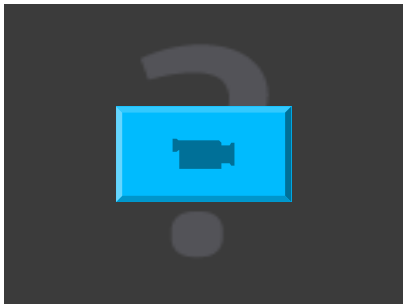
Fresh blue-coloured silica gel

Filling breather oil cup with fresh silica gel

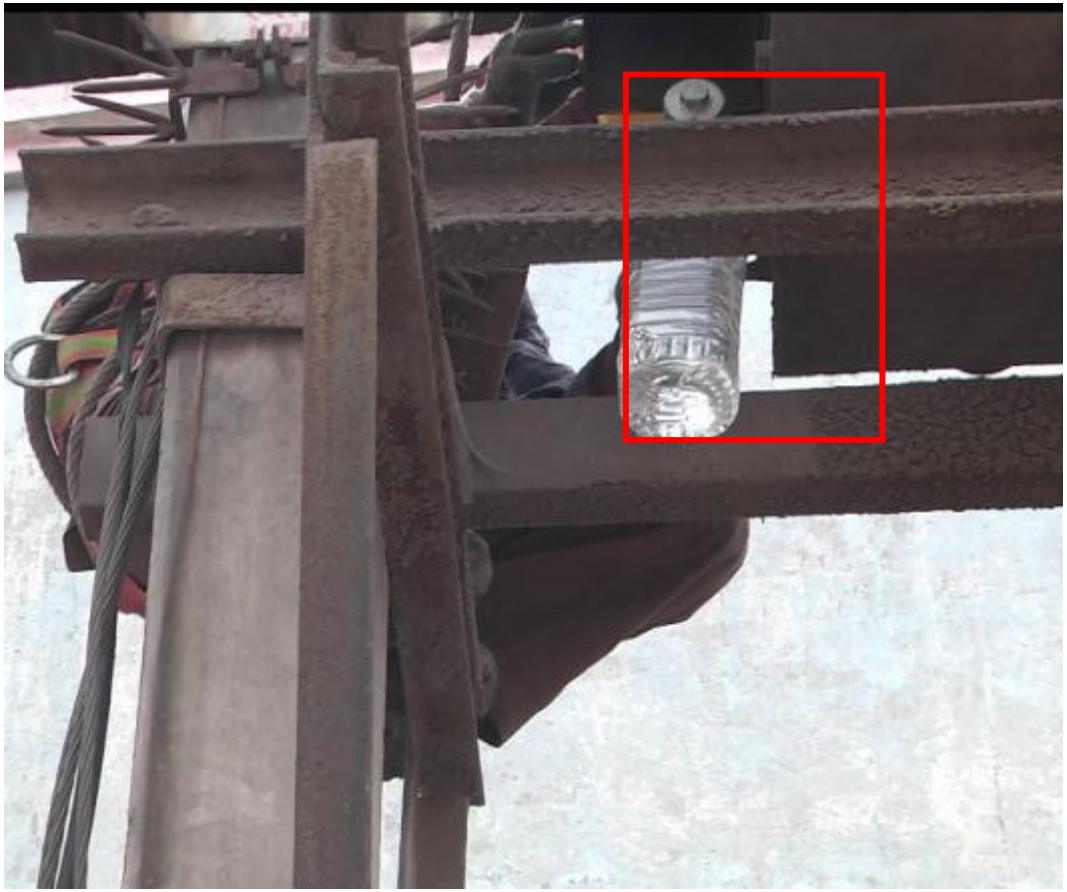
How to Change Breather Oil Cup?

Breather oil cup is filled with fresh oil

Fixing the oil cup to breather



BDV Testing



Collecting the transformer oil from outlet valve for testing the BDV

BDV Testing

The oil sample has to be taken to the lab

It has to be tested for its BDV

The BDV should be 40 KV

If the BDV is less, then replace the entire oil of the transformer

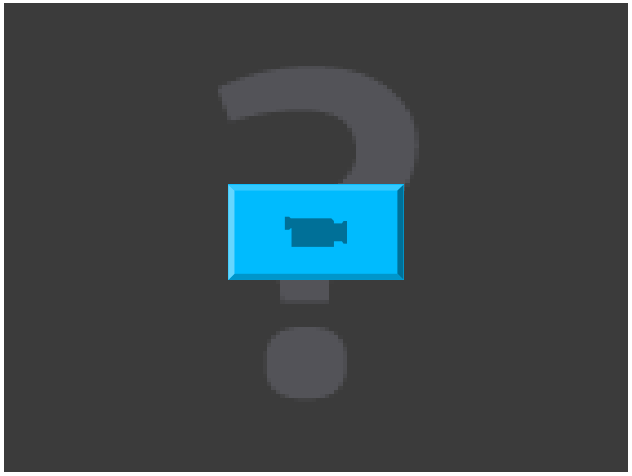
Instead of replacement, the oil can also be dehydrated using the oil filtering machine

Cleaning of Transformer Surface

Cleaning all parts and units

Cleaning HT and LT bushing of transformer

LT ACB Augmentation – Introduction



Augmentation of power systems is carried out to enhance the current carrying capacity of power lines as well as the rating of transformers. This is to meet the increased demand by consumers.

LT ACB Augmentation

Two transformers

Replacing New Transformer

New 400 kVA transformer in place of 315 kVA transformer

LT ACB Augmentation

Prepared a safety zone around the DP

LT ACB Augmentation

Single core 95 sq mm cable leads are connected on HT side

LT ACB Augmentation

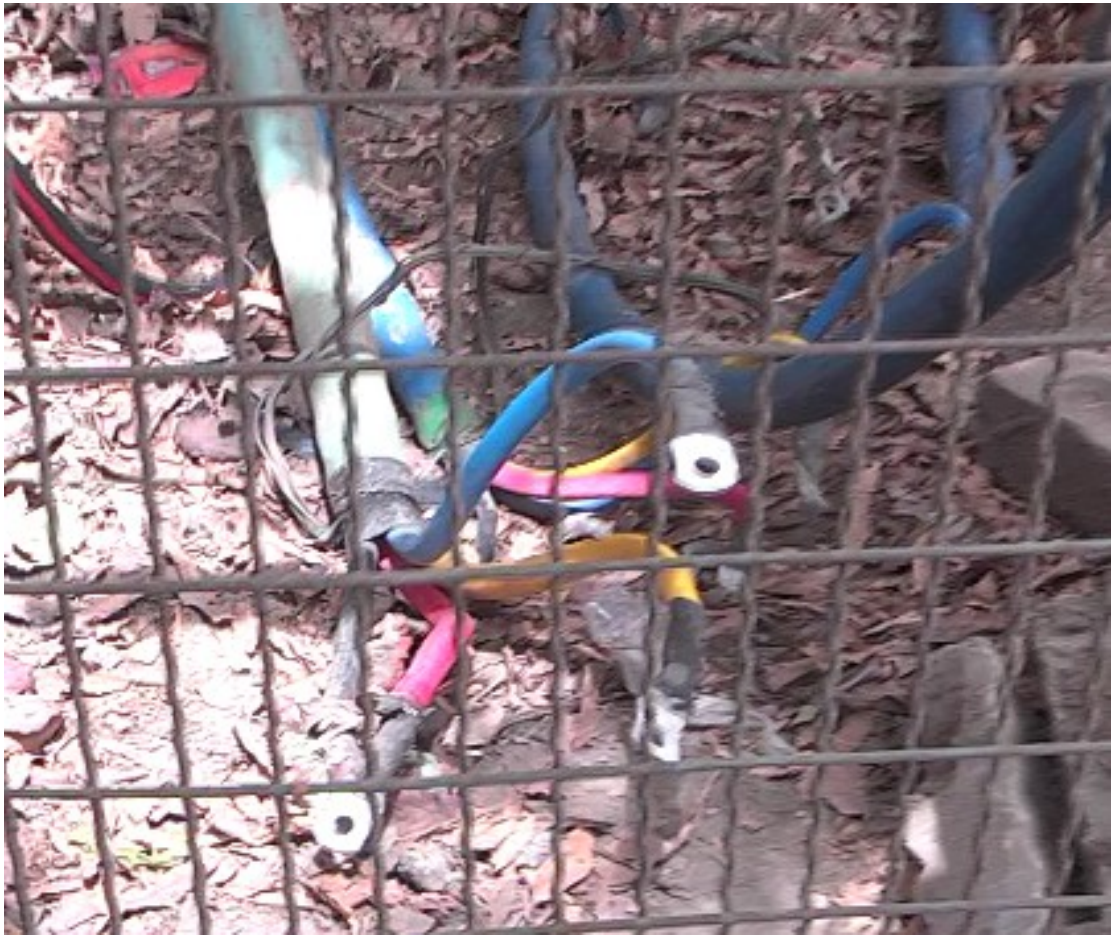
Two LT ACBs of 400 amperes

LT ACB Augmentation

4X300 sq mm cable is coming out from the LT bushing of transformer

Lineman is crimping the cable

LT ACB Augmentation



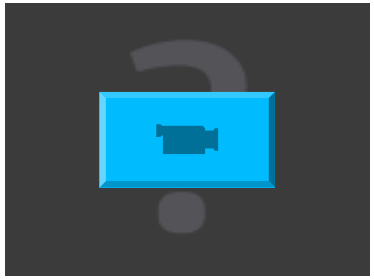
4 service line connections

LT ACB Augmentation

Connecting service cables from ACB to consumer end

LT ACB Augmentation

LT cable



One end of this cable is fixed to transformer LT bushing using the crimping tool

LT ACB Augmentation

The other end of the LT wire is connected to terminals at the back of the LT ACB

LT ACB Augmentation

Wooden cleat

Wooden cleat is fixed to the fencing or MS frame

LT ACB Augmentation

Name of the substation

Details about the capacity and the make of transformer are mentioned

Key Learning Outcomes

- Breather is a unit of the transformer. It is filled with silica gel to absorb the moisture in the air, which is sucked in by the transformer during the breathing process
- The steps to be followed in maintenance of a pole-mounted sub-station include:
  - Trimming the branches of trees around the work area
  - Checking for loose connection points and insulating them
  - Checking and replacing any burnt jumpers
  - Replacing silica gel in breather with new gel
  - Filling the breather cup with fresh oil
  - Collecting transformer oil from the outlet valve for testing the BDV of the oil
  - Cleaning the HT bushing of the transformer

Key Learning Outcomes

- The steps involved in augmentation of a power system include:
  - Preparing a safety zone around the DP structure
  - Connecting single core 95 square millimetre cable leads to HT side up to the new transformer
  - Connecting service connections to service cables from the ACB to the consumer end
  - Attaching a wooden cleat for supporting the LT cable, so that any extra stress of its weight is not exerted on the transformer LT bushing
  - Painting the name for identifying to which substation the transformer belongs