



### The scope

Silicon rubber vermin guards were added to seal the top part of the bushing assembly against vermin ingress.

These vermin guards could, however, add to discharge activity in the following ways:

- Proper adhesion between the silicon vermin guard resin breaker bushing is not achievable. As there are air gaps between the vermin guards and bushings, this will lead to increased PD activity.
- Dirt (surface contamination) is trapped between the poorly adhered vermin seal and them breaker bushing. This leads to increased PD activity in the area of the vermin seal.
- Adverse modification of the electric field in a region of potentially high stress.



The silicon rubber vermin was trapped inside the female insulator (Sprout) in the blue phase indicated with the yellow arrow in the photograph.

The red arrows are indicating the vermin covers in the correct place on the switchgear.



The trapped silicon rubber vermin cover will reduce the space inside the female insulator (sprout). Once the switchgear breaker is racked into position with an extra silicon rubber cover, mechanical stress will add to the switchgear breaker components. The insulation could crack due to the mechanical stress by the extra silicon rubber cover. Refer to the photograph with the crack insulation.



### Partial discharge defects



**References (AMEU) - Medium Voltage Switchgear Partial Discharge Investigation by A Rogerson of EA Technology Services**