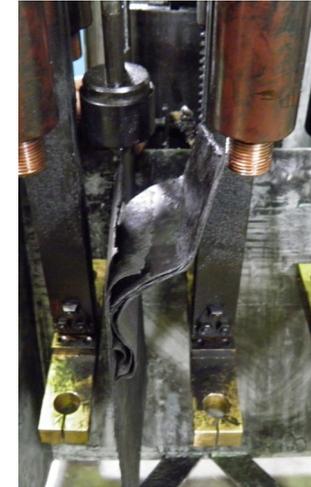
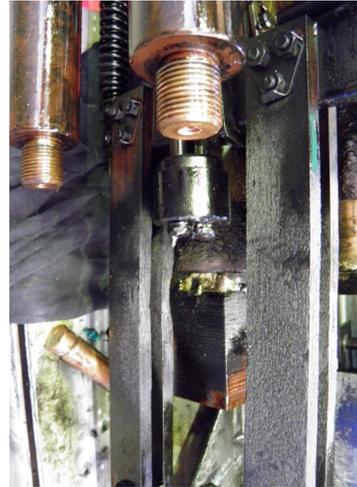


## Event Notice - Equipment Failure

11kV Oil Circuit Breaker failure during fault

September 2013 ID 13015



### Issue/Impact

On the 10th September 2013, during a windstorm, a Brush R8/2 MK4 bulk oil circuit breaker was required to open under fault conditions.

The oil circuit breaker failed catastrophically, causing extensive heat damage to the surrounding area and causing the safety glass to blow out of the substation.

The result of this failure was loss of supply and equipment damage with no injuries to staff or members of the public.

### Investigation Findings

An internal three phase fault occurred within the circuit breaker during or shortly following the clearing of a fault. The barrier board between phases was found to be damaged which led to this internal arc being created. Because of the nature of the damage, it is possible that there are other Brush CB units that exhibit similar problems. To date the Brush circuit breakers have had no recorded failures of this nature within Orion's network.

It is believed that the insulating barrier board was damaged when the circuit breaker was reassembled after maintenance.

### Lessons Learnt

The design of this make of switchgear and others of this age, rely on the integrity of the barrier board for insulation between phases.

Following any internal work being carried out it is important that the barrier board is correctly replaced in the tank and that it is not damaged when reassembling the circuit breaker tank.

When maintenance or inspections are carried out, any failures of equipment shall be noted and reported immediately to the Contract or Asset Manager.

### Required Actions

Signage has been installed at Bishopdale, Montreal and Spreydon Zone Substation whilst further investigations and actions are undertaken. The signage indicates the precautions to be taken when working in these substations including an increased level of PPE required.

Operating procedures have been altered to delay the reclosing of these circuit breakers immediately after operation.

Staff and contractors will be asked to vacate the switchroom when any switching is carried out, which will be completed remotely where possible.

A review of maintenance carried out at Bishopdale will be completed and remedial actions required will be completed