



ElectroNet
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Preventing Distribution Transformer Bushings Gasket Erosion

Bushing Gasket Erosion

- Westpower's transformers were blowing up!
 - No apparent external cause
 - Water was found in tanks
 - Gaskets were eroded
 - Only affected new style transformers (older T&J transformers were not affected)

Transformer Comparison

Bushing with problem



Bushing without problem



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Eroded Gaskets

- Near new gasket shown on bottom left
- Various stages of erosion were found on the in-service gaskets



Partial Discharge?

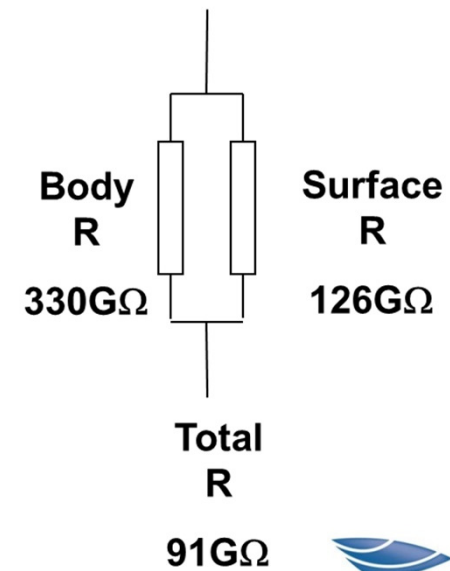
- One possibility was that partial discharge was occurring across the air gap between the insulator and the tank.
- This was assessed using the following test and carried out by Dr Yafei Zhou of IRL.



Bushing Model



At dry condition



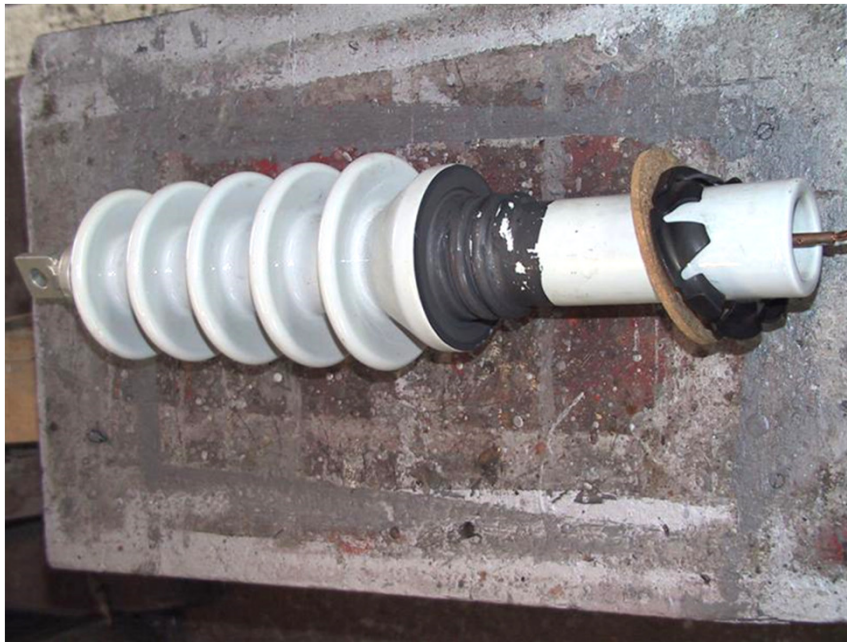
Leakage Current Measured Values

Voltage (kV)	3	6	9
AC total (μ A) dry	10.3	18.6	26.2
AC surface (μ A) dry	2.6	4.7	7.1
AC surface (μ A) wet	14.2	25.4	38.4

Potential Solutions

1. Replace the existing gasket with a conducting gasket.
2. Apply conducting paint
3. Apply metal foil or braid.
4. On-site repairs.
5. Use metal coating on insulator interface.

Chosen solution



- Use conductive coated insulator bases
- Available as standard on 22 kV bushings
- Problem went away following retrofitting campaign