

INSULATING AGAINST POLLUTION CHALLENGES ON DISTRIBUTION NETWORKS

With prevailing mists or damp conditions contamination can combine to provide a conductive path for leakage current flow across otherwise non-conductive materials, resulting in tracking, erosion and accelerated ageing of equipment.

There are many conditions in Australia and New Zealand that expose in-service distribution insulators to high pollution or contamination. This may be the result of industry, mining, farming practices, elements of nature such as salt laden sea air and mists or the result of natural disasters, for example ash from wildfires. Many areas experience prolonged periods with little rainfall enabling pollution contaminants to build up and compound on the surface of insulators, cross arms and associated distribution equipment.

LEAKAGE CURRENTS

With prevailing mists or damp conditions this contamination can combine to provide a conductive path for leakage current flow across otherwise non-conductive materials, resulting in tracking, erosion and accelerated ageing of equipment. Should the pollution resistance of insulation be exceeded, excessive leakage currents can lead to conditions prevalent to pole top fires in wooden poles at the cross arm interface.

Contaminants that are non-conductive in their dry state have little effect on the insulator performance under dry conditions. Fog, mist or light rain wet out contaminants which can result in a conductive surface layer. For example salt contaminants dissolve to form a conductive electrolytic surface film.



This fibreglass composite cross arm is evident of tracking from leakage currents after service in a coastal application

In the case of fogs, mists and light rain often there is insufficient moisture present to initiate the self cleaning process of the insulators, thus, the now conductive contaminants promote leakage current flow along the surface of the insulator. If insulating materials have poor long term surface resistivity in wet conditions tracking and erosion may eventually take affect within and across their surface.

The EMC Pacific Pty Ltd patented integrated cross arm insulator and PH-CEP (patent applied) hydrophobic polymeric resin insulator range offer exceptional durability of surface material resistivity properties in damp or wet conditions, which combined with their high pollution rated designs provide for the very best long term defence against network pollution and ageing related challenges. These are Australian manufactured products providing solutions to global power network issues.

INSULATOR MATERIAL SCIENCE

Very fine treated silica particles are a key component of cycloaliphatic epoxy (polymeric) resin and their hydrophobic augmentation enhances insulator performance. HSIL becomes a permanent part of the PH-CEP material matrix and provides a non-oil based enduring

barrier to moisture and contaminant absorption. This presents perpetual material resistivity giving everlasting defence to tracking and erosion associated with voltage stress in the most demanding conditions, together with improved natural cleaning ability and contaminant shedding.

Independent outdoor insulator pollution test station (salt-fog) assessment, long term QUV-A testing and dip wheel tracking and erosion test methods have all been undertaken to substantiate and prove the material properties.

Now being implemented by Australasian and North American electrical utilities, EMC Pacific's PH-CEP 600, 900 and 1100 series line insulators have undergone renewed independent design and type testing to AS/NZS, IEC, CSA and ANSI performance standards.



Integrated cross arm insulator and universal mounting with North American Raptor nest above.

INTEGRATED CROSS ARM INSULATOR

The profile of the integrated cross arm insulator is designed to be devoid of pollution retaining surfaces. The combination of the profile and the entire cross arm being a solid insulator manufactured from PH-CEP eliminates the issue of cross arm burnout, which has resulted from contamination retention and tracking with some composite arm applications in high pollution environments.

Labelled the 'IXI' integrated cross arm insulator and suitable for 11kV to 66kV applications, evaluation units are now available for purchase during the implementation of volume production methods at EMC Pacific's Dandenong Victoria plant.

A universal mounting assembly has been developed to enable mounting of the IXI to a variety of pole materials and tapers and compliments the one piece construction by simplifying mounting, reduced inventory and reduced pole dressing time.

To learn more or express your interest please contact EMC Pacific email: sales@emcpacific.com.au or telephone +61(3) 9706 6643.