A.6.2.

Anti-explosion protection for HV porcelain & composite terminations.

F. Gahungu[1] – J. Cardinaels[2] - P. Streit & D. Rollier[3]
1. Nexans France Calais
2. Nexans Benelux Euromold
3. Nexans Switzerland Cossonay

Presently used fluid filled porcelain and composite terminations for High Voltage synthetic cable systems have been designed and installed without any protection against explosion resulting from the effects of an internal arcing fault.

Up to now, Research and Development work has mainly concerned the technical performances and not the safety aspect. The extension of residential and industrial areas, accessible to the public, tends to reduce considerably the safety distances with regard to electric installations.

With short circuit currents of 31.5 kA and 63 kA during 0.5 seconds, depending of the constraints of the network, the preliminary tests to evaluate the effects of internal arcing, demonstrated the fragility of unprotected fluid filled outdoor terminations. Indeed without protecting devices, metal components of the terminations and fragments of the insulator are propelled in all directions. These parts could cause severe damages to persons and to the installation itself in a perimeter of several hundred meters.

In order to reduce this risk, we developed and integrated anti-explosion devices into our porcelain and composite terminations. The selected principle is to include one or more fusible systems in the fixation of the insulator or in the tubing structure located around the stress cone. At an internal pressure below the insulator's mechanical resistance, the anti-explosion protection opens the termination, allowing the filling fluid to escape and preventing so the destruction of the insulator.

With anti-explosion protections integrated into outdoor porcelain and composite terminations, the internal arcing tests gave positive test results and confirmed progress realized in this domain.