



China Project : Implementation of damped AC voltages for testing of 110kV XLPE cables

Henning Oetjen, HDW, USA
Frank Petzold, sebakmt, Germany
Rogier Jongen, Seitz Instruments, Switzerland
Piotr Cichecki, Delft University of Technology

In co-operation with:

- Electric Power Research Institute of China State Grid
- Wuhan Power



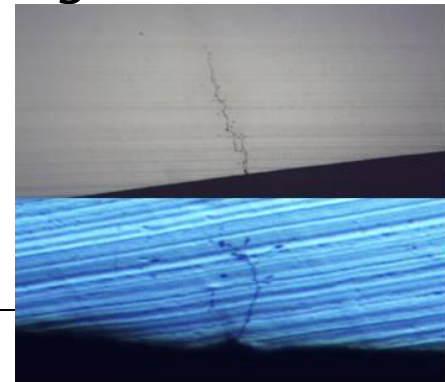
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Background



1. AC voltage withstand testing only is not always sufficient to identify all manufacturing and installation problems.
2. It has been observed that after successful voltage withstand tests, during initial operation or some weeks later failures may occur.
3. It have been found that insulation defects in the cable insulation and cable accessories are responsible for these failures.
4. Therefore more sensitive testing and diagnostic methods have to be found to detect during after-installation testing those weak spots in the cable insulation and cable accessories.



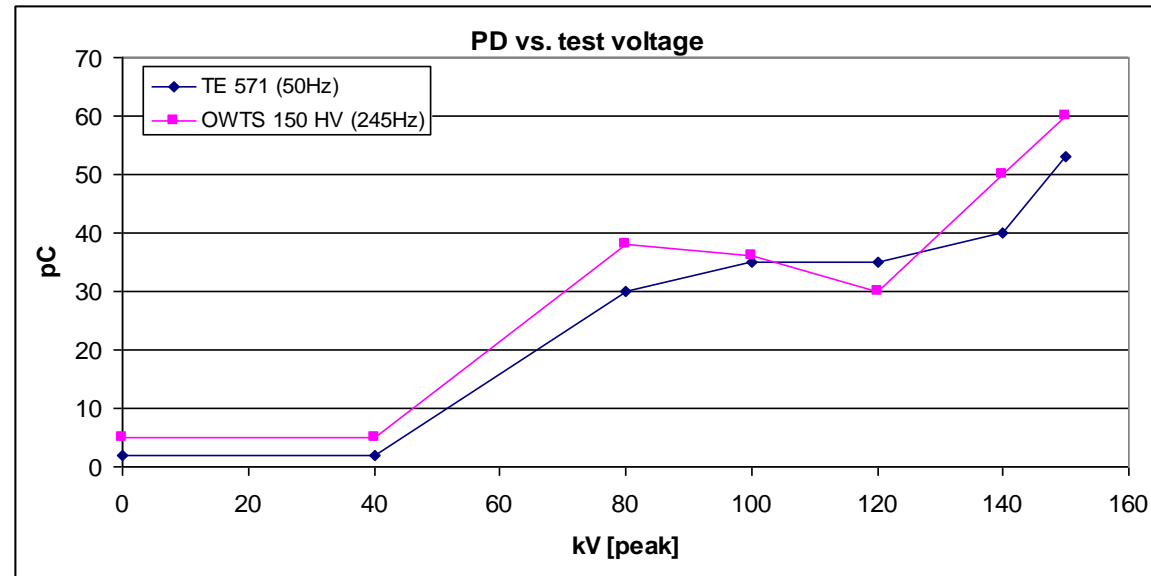
Comparison of 50Hz continuous AC with 245 Hz damped AC:



50Hz continuous AC energizing test set-up



245 Hz damped AC test set -up



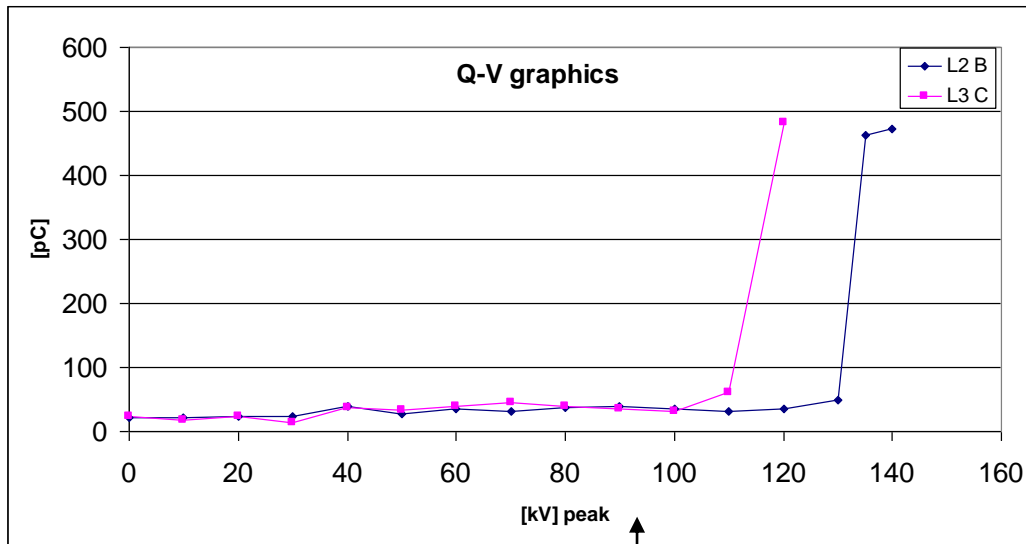
Tests performed on sample with artificial fault in termination
PDIV and pd level are similar between continuous AC and DAC !

70 Hz damped AC test up to 1.7U_o
cable circuit: 110kV XLPE (2.89km)
Wuhan



Complicate connection of the HV test lead
Test with 50 DAC excitations was passed without breakdown or pd events

48 Hz damped AC test +PD cable circuit: 110kV XLPE (5.77km) Wuhan



48 Hz damped AC test set -up
Cable circuit: 110kV XLPE (5.77km)

Phase: A B C



90kV (U_0)

DAC voltages withstand test of 50
excitations (18 minutes) at $1.1U_0$
Cable remain pd free