

Qualification of a 150kV Transition joint for connecting external gas pressure three-core cable with extruded single-core cables

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The use of extruded cable systems for transmission and distribution circuits is ever increasing at the expense of LPOF and MI cables. Furthermore the number of manufacturers of these LPOF and MI cables is also decreasing and therefore the availability of such cables for repair works or re-routing is very limited in the future. Consequently it is becoming more and more common for a length of extruded cable to be introduced into a paper insulated cable circuit, requiring transition joints for the connection of the two cable types.

For the project: 'Zomerbed Verlaging Kampen' for the Dutch TSO TenneT, Prysmian was requested to deliver and joint new 150kV extruded cables to the existing external gas pressure (EGP) cable with aid of new type of transition joint for the replacement of part of the 110kV EGP connection: "Zwolle-Kampen Wit", between joint M9 and Tower 60.

For the design, development and prequalification of this new transition joint at 150kV level, CIGRE TB 415 'test procedures for HV transition joints' was followed.

The paper highlights:

- The basic design of the transition joint.
By using state of the art technology, the transition joint was based on pre-fabricated components as much as possible, allowing pre-testing of these components. Furthermore the use of auxiliary equipment for this joint was eliminated, resulting in a smaller joint bay, lower weight, smaller footprint and reduction of total required equipment on site.
- The electrical test loop set up.
The testing of a three core EGP cable and single core extruded cables require special attention for the heating of the conductor: In this case a back-to-back test loop was chosen
- The test of outer protection for the transition joint.
Because of the dimensions of the joint, a special water tank was constructed to test the outer protection of this transition joint
- The installation and commissioning test on site.

The joint was successfully tested, installed and commissioned and is now in service since august 2014.