Experience of development tests on connectors for large conductors according to the CIGRE TB 758 test sequence.

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ABSTRACT

The experts of TB 758 (WG B1.46) have designed a separate development test sequence for HV/EHV connector / conductor combinations that is recommended for cross sections above 1200mm². It is recommended to be followed by type/PQ tests on the cable system / accessory to be fully qualified.

In the conclusions, they state that "Involved parties are invited to collect and share experience with the here proposed development tests of new connector / conductor combinations to verify practical use of proposed procedure and assessment before a further standardization of type testing of HV and EHV cable connectors is considered."

The purpose of this paper is to share experience about the implementation of the development test sequence..

KEYWORDS

Paper format; Instructions; Paragraph Styles, Character Styles, etc.: list a few keywords relevant for the article if you think that it will help readers.

INTRODUCTION

The new development test sequence as proposed by WG B1.46 (TB 758) [1] could not be tested before the disbanding of the CIGRE WG.

A method cannot be validated before it has been experienced. The authors report here their experience on two cases. These cases regard 2500mm² conductors; one is enamelled copper the other aluminium. The two developments tests were performed independently, in France and in Germany, using different local laboratories.

The purpose of this paper is no to give details on the conductor and connectors that were used, but to detail how the new development procedure was performed.

DEVELOPMENT TEST PROCEDURE AS PER CIGRE TB 758

The development test procedure takes over the IEC 61238-1-3 procedure for cross sections higher than 1200mm². It consists in different sequences:

Table 1: sequences of the proposed development test

Test sequences	Success criteria
S1 - Pre-stress **a) Tensile load test** **b) Short circuit test**	• no visual slippage • no obvious signs of overheating
S2 - Constant high-current temperature stability test	• each connector in each measurement campaign should not exceed that of the reference conductor by more than 5 K. • The mean value calculated from all (four) connector temperatures in all (eight) measurement campaigns should not exceed the highest temperature value of the reference conductor.
S3 - Heat cycle temperature stability test	• same as constant high temperature sequence
S4 - Tensile strength test on (3) new connectors	• not more than 3 mm slippage during last minute of the test (i.e. at the full test load)

The organisation of the succession of the different sequences. CIGRE brochure proposes a lay out and some comments:

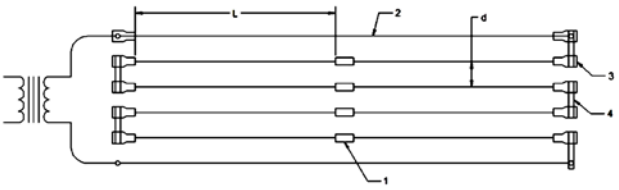

Figure 1: Example of the test loop as per CIGRE TB 758

1 – test connector; 2 – bare reference conductor; 3 – terminal lug; 4 – link bar

d - minimum lateral distance between test connectors and between conductors = 250 mm

L - minimum length of bare conductor on either side of the test connector = 40√A where A is the nominal cross-sectional area of the conductor.