

Air Insulated Factory Routine Test System for High Voltage Cable Accessories Upto 550 kV

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ABSTRACT

In this study, focus is given to the gases where they find wide application in power systems to provide insulation to various equipment and substations. Most commonly used two gas type (SF₆-air) investigated under several pressure levels and obtained results are compared.

According to obtained performance results a routine test system designed for high voltage cable accessories up to 550 kV. Due to difficulties of processing SF₆, cost expectations and environmental concerns, pressurized air selected as insulation fluid to perform routine tests.

After optimization of field control components, routine test system with air insulation successfully implemented up to 550 kV.

KEYWORDS

High voltage, cable accessories, accessory testing, routine test system, air, SF₆, insulation

INTRODUCTION

Prefabricated high voltage and extra high voltage cable accessories which are used at state of the art HV transmission lines requires stress control elements/systems to provide continues stress control to limit the electrical stress at the cut end of cables to a value to guarantee, by using available insulating materials, an expected life time of the cable system of at least 40 years.

Regardless of the type of cable, accessories quality requirements must be kept in a rigid level for long term reliable high voltage system. Since the failures in the production never can be avoided, routine tests are carried out in order to detect production failures or deviations before the product is delivered to the end customer.

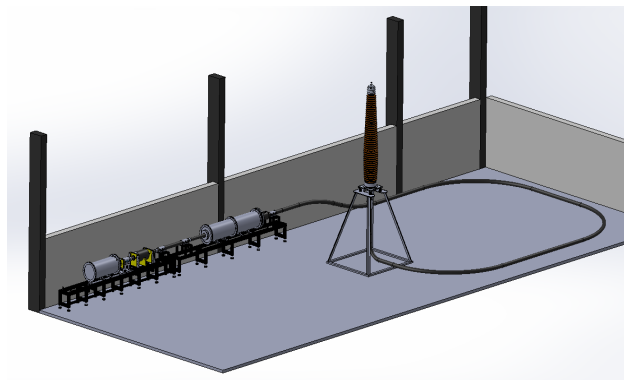


Fig. 1: High voltage cable accessories testing system

COMMERCIAL TEST SETUPS

Terminations and joints are the basic accessories of the power cables and they are required to make connections between lines or to an electrical apparatus.

The various aspects are considered while designing the cable terminations and joints because they must possess the same integrity as their associated cables while making the connection both all indoor and outdoor applications. [1]

General testing concept for above mentioned stress cones and joints are quite consuetudinary. Main approach is trying to imitate same electrical field stress conditions to test sample during factory routine testing applications.

Joint testing setups

Factory testing setups for joint bodies are quite conservative and mentioned setup includes two cable ends which has an interface connection for high voltage continuity. Two cable end dimensions prepared as being done in field applications and joint assemble is being performed accordingly.

Energy entrance



Fig. 2: Joint test setup concept

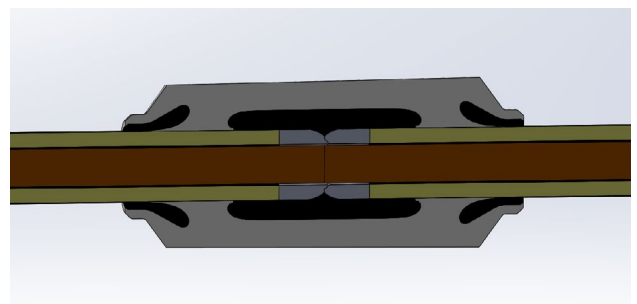


Fig. 3: Commercial joint test setup