

PQ TEST AND FIRST 230 KV CABLE SYSTEM PROJECT IN MEXICO

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ABSTRACT

This paper describes the PQ test procedure to qualification of 230 kV cable system by IEC 62067-2006 and ICEA S-108-720-2004 / AEIC CS-9-06 standards using the same test loop into the Viakable facilities under the witnessing of the LAPEM and NEETRAC. This is the first cable system qualification made by a Mexican manufacturer using a power cable with smooth welded aluminum sheath.

Likewise describes the first 230 kV cable system project in Mexico named "Ayotla-Chalco" installed near to Mexico City in a place subject to earthquake with characteristics of unstable soil.

The system comprises 29.7 km of single circuit of 1200 mm² copper conductor, XLPE insulation, smooth welded aluminum sheath, polyethylene jacket and semiconducting over layer.

The tests after installation includes Partial Discharge (first time requested in 230 kV cable systems by CFE) and Voltage test. The PD test uses an effective technique to separate the external noise and the PD detection and permit the separation between internal PD detection, corona discharges or surface discharges.

KEYWORDS

Type test, Prequalification test, XLPE cables, aluminum welded sheath, 230 kV cable systems

INTRODUCTION

Actually the use of HV and EHV underground cable systems increases in America and the options to choose International Standards (IEC) or American Standards (ICEA/AEIC) depends of the utilities technology requirements and the legislation in each country.

Neetrac provided a complete analysis and procedure to qualify a cable system to both IEC 62067 and ICEA S-108-720 requirements and during the last Jicable'11 was presented a technical paper about this project.

Viakable, Wire and Cable division of the Mexican Xignux group and Conductores Monterrey SA de CV (VIKON), Mexican wire and cable manufacturer followed Neetrac's procedure and into their facilities was installed a complete 230 kV system loop for qualification by International and American standards.

The 230 kV cable was supplied by Viakon, the joints and terminations by ABB Kabeldon.

The success obtained by the qualification program was reflected in the CFE (Comision Federal de Electricidad) 230 kV project named "Ayotla Chalco" being the first 230 kV project with cable made in Mexico and finished in February 2015.

The tests after installation were AC by IEC standard and PD according CFE specification requirements.

CABLE SYSTEM PREQUALIFICATION TEST

Layout of 230 kV PQ test

The test sequence for to satisfy IEC and ICEA/AEIC standards were according Neetrac recommendation using a combined test program shown in Figure 1



Fig 1: Test program (Neetrac Jicable'11).

The test loop for PQ test includes different installation sections as direct buried, tray and ducts.

The power cable system was tested in Viakable facilities consisted of power cable, porcelain and compound outdoor terminations, prefabricated composite straight joint (continuous shield and break shield), and GIS terminations.

Details of test loop is showed in Figure 2.