

Protection of Guatape - Rioclaro 110 kV Line Using Protecta*Lite™ Arresters

Foreword

Empresas Publicas de Medellin (EPM) might be one of the most organized and efficient public utilities in South America. With a serious policy of technological innovation, EPM has been the leader of the Colombian utilities during the last 20 years. Following is a brief description of their experience with the new Protecta*Lite arresters.

The Problem

The Guatape - Rioclaro line runs over 60 kilometers of rural area with a keraunic level of over 200 stormy days per year and feeds the "Cementos Rio Claro" large cement plant. This plant has state-of-the-art control equipment and machinery that demands a high quality power supply. Not only power parameters, but power continuity is also important. The responsibilities EPM has for operating this line are to provide maintenance and to keep detailed statistical records of power interruptions.

The line was originally designed using typical arrangements for 115 kV. Fig. 1 shows a very bad index of outages; 85/100 km/year, with 25/100 km/year due to atmospheric discharges (far from the conventional 3/100 km/year). This behavior of the line was severely influencing the production indexes of the cement plant. Transitory interruptions (like automatic reclosing operations) could cause process failures, due to the plant's sensitive equipment, with the inherent losses of materials and time.

Approach to the Solution

To solve the problem, EPM acquired the services of the consulting firm "Merjia Villegas S.A." to run several different computer simulations of the line. Upon completion, the firm recommended the installation of ZnO arresters in parallel with the insulator chains.

Implementation of the Solution

In 1991, EPM acquired 81 units of Ohio Brass Protecta*Lite arresters. They placed them strategically in line based on a complete study and simulation that gave the location of the most problematic spots.

The Results

To evaluate the effectiveness of the implemented solution, EPM monthly updates a register based on the readings of the discharge counters on each arrester, and both Rioclaro and EPM keep registers of the failure history of the line.

These readings show the reliability of the line has improved over 50 percent. Significant improvement has been made

from 85 to 41 outages/100 km/year (See figures 1 and 2) with only 81 units installed at strategic locations.

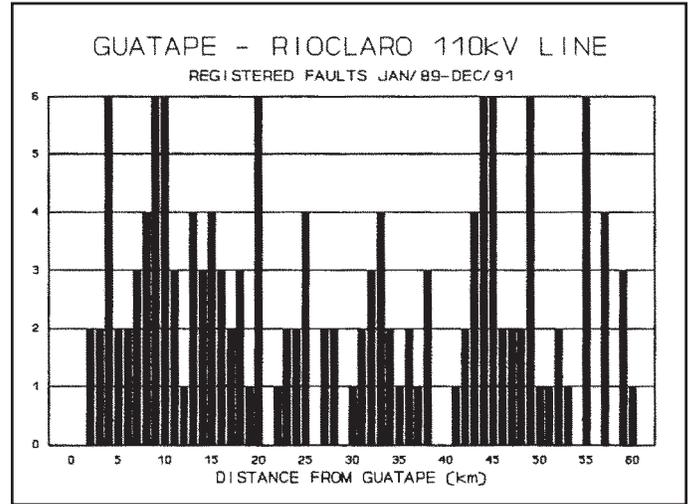


Fig. 1. Performance w/o Protecta*Lite is 85 out./100 km/yr.

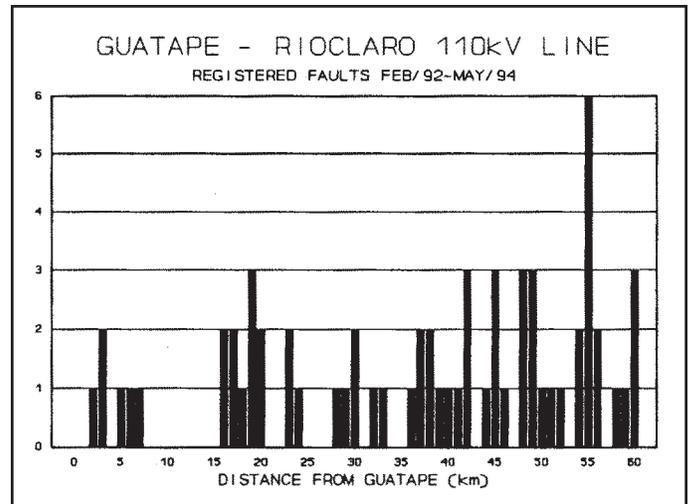


Fig. 2. Performance w/Protecta*Lite is 41 out./100 km/yr.

Even though there is no economical evaluation of the benefits achieved, they should include the increase in production and the reduction of wasted materials for Rioclaro, and the increase in income of energy sales for EPM.

These results have been so encouraging that EPM has acquired a new lot of 300 Protecta*Lite units to use in their Guatape - Calderas - Rioclaro 115 kV line.



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NOTE: Because Hubbell has a policy of continuous product improvement, we reserve the right to change design and specifications without notice.