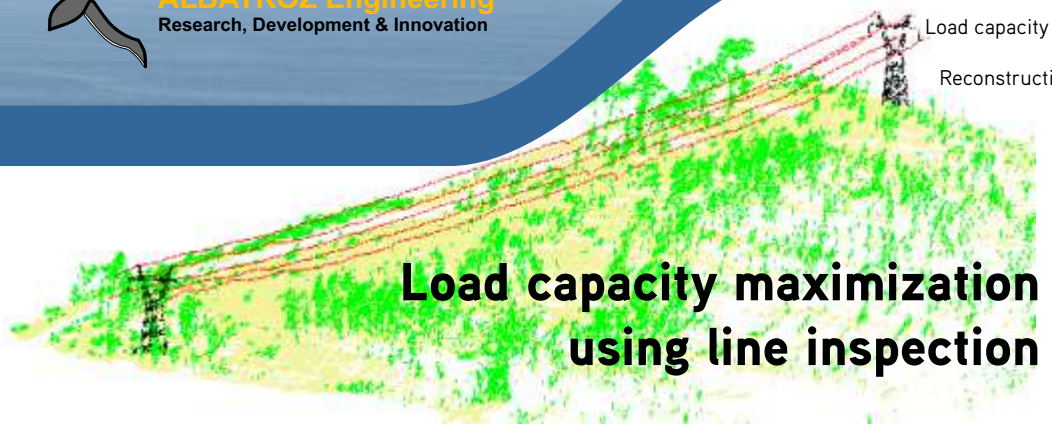
Load capacity maximization using inspection data ⇨ p.1
Reconstruction at Machado de Castro museum ⇨ p. 2
Albatroz at CIGRÉ 2008 ⇨ p. 2



Load capacity maximization using line inspection

Power demand is increasing every year at significant rates all over the world. This increase in demand, however, cannot be supported by simply constructing new transmission and distribution lines since compliance with ever more stringent environmental and social conditions is increasingly more difficult and less economically sustainable.

Therefore, it is imperative that all companies in the energy sector review their exploration guidelines and search for innovative methods to increase transmission and distribution efficiency while maintaining or improving safety. One immediate and economically sound measure is to operate the line nearer its nominal value.

Nominal load values are defined during the project phase considering parameters that guarantee the operation conditions through the line life cycle. The parameters include structural constraints of line components, average line sag, clearance to ground and clearance to objects in the vicinity of the conductors under all loading conditions. Generally, the boundaries of these parameters are evaluated under worst case scenarios with significant factors of safety. Therefore, an optimization strategy based on the worst case values for each parameter results in a suboptimal operating conditions.

Power line inspections can provide valuable information used to increase the current loadings nearer to the exploration limits. Up-to-date line positions can be used to more accurately calculate the loading capacity of the line and provide spatial data surrounding the line critical in uprating projects. This type of data can be used to create models that represent actual field conditions for each span rather than relying on model parameters that consider the entire line a single entity.

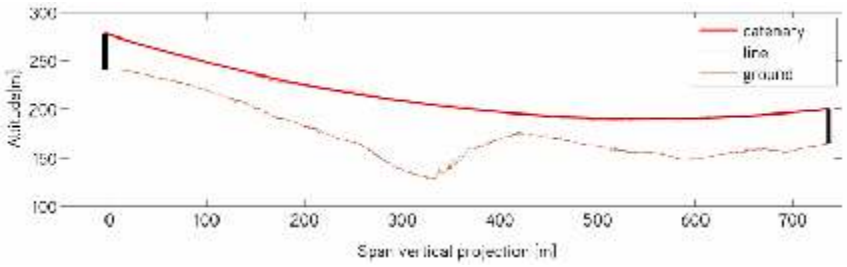
Track clearance data collected during inspection using LiDAR sensors in conjunction with current load information, conductor characteristics, and wind speed permits the evaluation of several line parameters: sag value for each span for different loading conditions, mechanical tension estimation for each tower, critical span identification, etc. Figure 1 and Table 1 represent a model for a specific span and corresponding span parameters such as span length, sag and catenary equation automatically calculated from the inspection data.

The data collected and the models generated, provide sufficient information to simulate the behaviour of the line under different current loading and meteorological conditions so that the amount of energy delivered is optimized and thereby maximizing return while respecting operational security standards.

Tabela 1 - Span parameters

Length	738,2m
Sag (rigth tower)	9,4m
Miinimum ground clearance	19,5m
Line angle to left tower	-20,9°
Line angle to rigth tower	-0,5°

Figure 1 - Span model based on LiDAR inpection data



Reconstruction at the Machado de Castro Museum

Figura 2- Colour detail of the cryptoportico

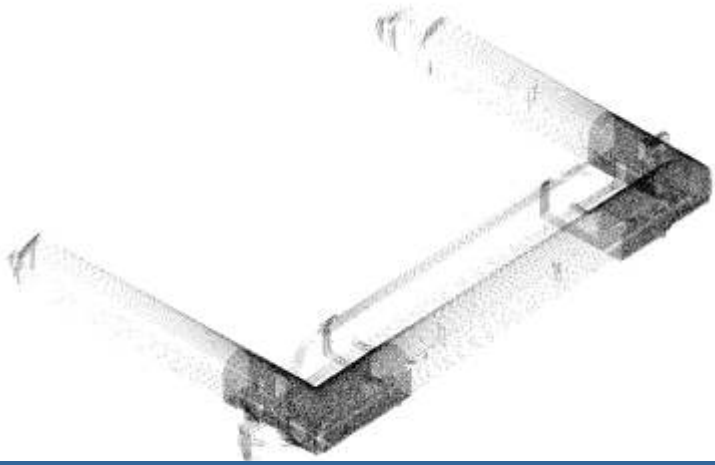
Figura 3- 3D detail of the cryptoportico

During the month of May, Albatroz Engineering performed the digital reconstruction of yet another Portuguese heritage landmark the National Museum Machado de Castro, located in Coimbra-Portugal. The museum was established in a Bishop's Palace constructed on top of a cryptportico that supported part of the forum in the Roman city of Aeminium

The museum integrates several architectural spaces, namely the ruins and cloister of the 12th century church of S. João de Almedina and the 1st century Roman cryptoportico. The objective was to obtain a three-dimensional detailed model of the cryptoportico. The reconstruction was done using the solutions developed by Albatroz Engineering: the GIM solution for three-dimensional reconstructions and the LMT solution for floor plans and projection measurements.

The figures show the partial reconstruction of the Roman cryptoportico

Figure 4 - Tridimensional model of the roman cryptoportico with laser data.



Albatroz Engineering at CIGRÉ 2008

The 42nd worldwide CIGRE meeting will take place in Paris, France, on the 25th - 29th of August, 2008. (www.cigre2008.com).

The Conference and Technical Exhibition will bring together some 4000 delegates and visitors from all sectors of activity related to electricity. This will provide an opportunity to see the latest achievements by manufacturers and service suppliers.

Following its successful participation on the 2006 event, Albatroz Engineering will be present at the Technical Exhibition (stand 62) and will also present a paper on the session B2 - Overhead Lines (Tuesday 26, 08:45) about "Geographical information tools for overhead lines preventive maintenance".

At the stand, Albatroz Engineering will present its complete line inspection solution PLMI, starting with simultaneous data acquisition (laser, thermography and video), followed by the data analysis and report generation, and ending with the geographical information system update. The visitor will have the opportunity to experience and test all the equipment and software, with real data from transmission and distribution overhead lines.

If you would like to visit the exhibition, please contact us and we will provide you a invitation.