

## RED ELECTRICA'S POWER CABLE MAINTENANCE PROGRAM.

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### ABSTRACT

Red Eléctrica de España (REE) is the Spanish TSO. The company was created in 1985 and the assets were 220kV, 400kV installations and every international interconnection. From 1985 until 2002 REE has had not underground lines between their assets. In the end of 2002, and according with the Spanish laws, the company bought an important number of installations to the utilities, including 200 km of underground lines. At the end of 2010 the last "big" purchase of assets were made, including 220kV, 66kV and inter-island connections in Balearic and Canary Islands. Nowadays the total length of the underground and submarine cables owned by REE is 920 Km.

After the first purchase, REE began to work in two main points: the developing of new internal regulations and a program to verify the real condition of the installations.

Moreover, during the period 2004-2009 the huge urban developing in Spain has had negative influence in the underground lines because the third party damages has been the main problem in the transmission underground lines. Due to this problem one of the main maintenance activities is the diary visual inspection. Other maintenance activities are the weekly visual inspection of terminations, the six-monthly inspection of every element of the cable system, the six monthly thermal infrared inspection, etc...

Summarizing, this paper includes a complete review of maintenance activity of REE on their power cable systems.

### KEYWORDS

TSO (Transmission System Operator); Visual inspection; Route inspections; Predictive program maintenance; Joint protection; Outer sheath test; Third party damages; Termination replacements.

### INTRODUCTION

Red Eléctrica de España, S.A. established in 1985, was the first company in the word exclusively dedicated to the transmission of electricity and the operation of electricity systems.

Regarding the transmission activity, Red Eléctrica is the manager of the transmission grid and, as such, acts as the sole transmission on an exclusive basis. In 2010, Red Eléctrica has carried out, in compliance with Law 17/2007, the acquisition of the extra-peninsular assets (Balearic and Canary Islands), as well as those transmission assets on the peninsula that were property of the electric utility companies. Passing this Law has been the final step in the process of acquiring assets that began in November 2002 and which has allowed Red

Eléctrica to increase its assets base. This acquisition is of the utmost strategic importance for Red Eléctrica: this supposes the definitive consolidation of its position as sole transmission and electricity system operator (Spanish TSO -Transmission System Operator).

Red Eléctrica's peninsular transmission grid is composed of more than 38,000 kilometres of high voltage electrical lines and more than 4,500 substations positions, and has more than 72,000 MVA of transformation capacity. These assets make up a safe and reliable meshed grid that offers the highest service quality rates to the electrical system.

As the manager of the transmission grid, Red Eléctrica is responsible for developing and enlarging the grid, for maintaining it on a uniform and consistent basis to provide the required availability and reliability, for managing the transmission of electricity between external systems and the peninsula and for guaranteeing third party access to the transmission grid under equal conditions.

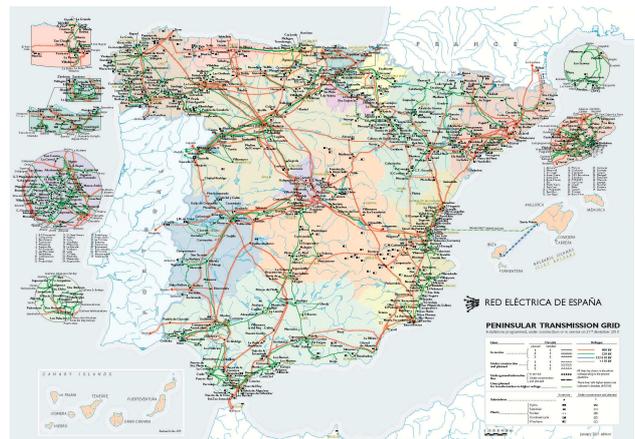


Fig.1: Map of the Spain peninsular transmission grid.



Fig.2: Map of the Balearic transmission grid.