Case Study

República de Panamá Empresa de Transmisión Eléctrica, S.A. (ETESA)

Company Details

ETESA is a public limited company providing transmission of high voltage electric power and maintenance of substations in Panama. ETESA employs over 400 people, and manages transmission lines with a voltage equal to or greater than 115 kilovolts to service the population of Panama. For more information about ETESA, visit **etesa.com.pa**.

MHI Service

Transmission Line Engineering and Analysis

Use Case

• Thermal rating
• Clearance reports
• Vegetation reports
• Structural analysis
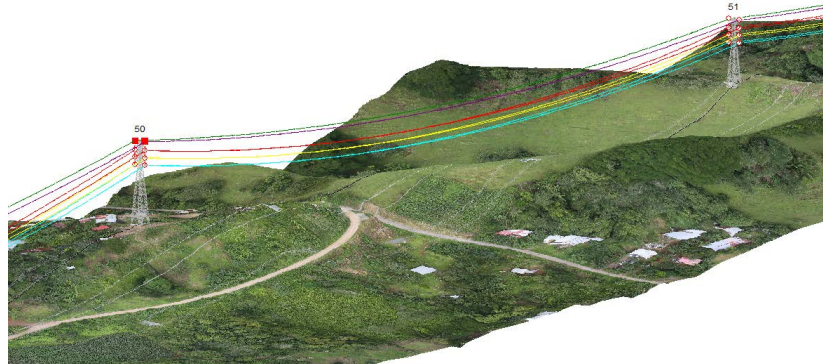• PLS-CADD
• PLS-TOWER
• Training

Benefits

• As-Built Transmission Lines (PLS-CADD) and Steel Tower (PLS-TOWER) models that can be used to simulate various loading conditions.

• Identify and mitigate violations (ground, aerial, vegetation growth)

• Greater reliability and safety

• Develops in-house expertise on software used to analyse the transmission system

ETESA Transmission Line Modelling and Analysis

Executive Summary

Following a LiDAR collection survey completed in July 2018, Manitoba Hydro International Ltd. (MHI) was tasked with modelling ETESA's 115kV and 230kV transmission line network. The first task was to create new, or update pre-existing, as-built PLS-CADD models of ETESA's 115kV and 230kV transmission system. For new as-built models, MHI reported on thermal rating, clearance, and vegetation violations to highlight the maximum safe operating temperatures of transmission line conductors and potential electrical clearance violations. The second task was to create PLS-TOWER models from structural drawings provided by the client. By integrating PLS-TOWER models with the as-built PLS-CADD models, MHI determined the maximum structural usage of each tower in the transmission line under extreme weather events.

As-built transmission line in PLS-CADD

Solutions

MHI's local presence and Spanish speaking staff was an asset in this partnership to overcome geographical and language challenges commonly seen in international jobs.

The foundation for the success of this project, where large amounts of data were transferred, was the communication and flexibility demonstrated between multiple departments. This was essential to completing the project as changes arose.

How MHI Helped

MHI provides multidisciplinary line solutions with the goal of increasing public and employee safety, increasing efficiency, and supporting reliable energy service. ETESA also wants to provide dependable service and improve efficiency.

The MHI solution for ETESA includes:

• Training on PLS-CADD and PLS-TOWER software for ETESA staff;

• Structural analysis to guide asset management and future building requirements;

• Vegetation studies to prevent line damage caused by growth violations;

• Digital 3D modelling for future line modelling and analysis.
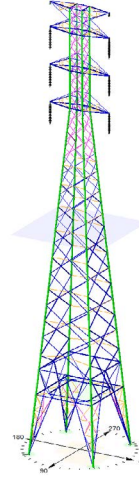
Structure constructed in PLS-TOWER
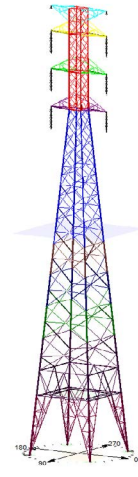
Structure with sections displayed in PLS-TOWER
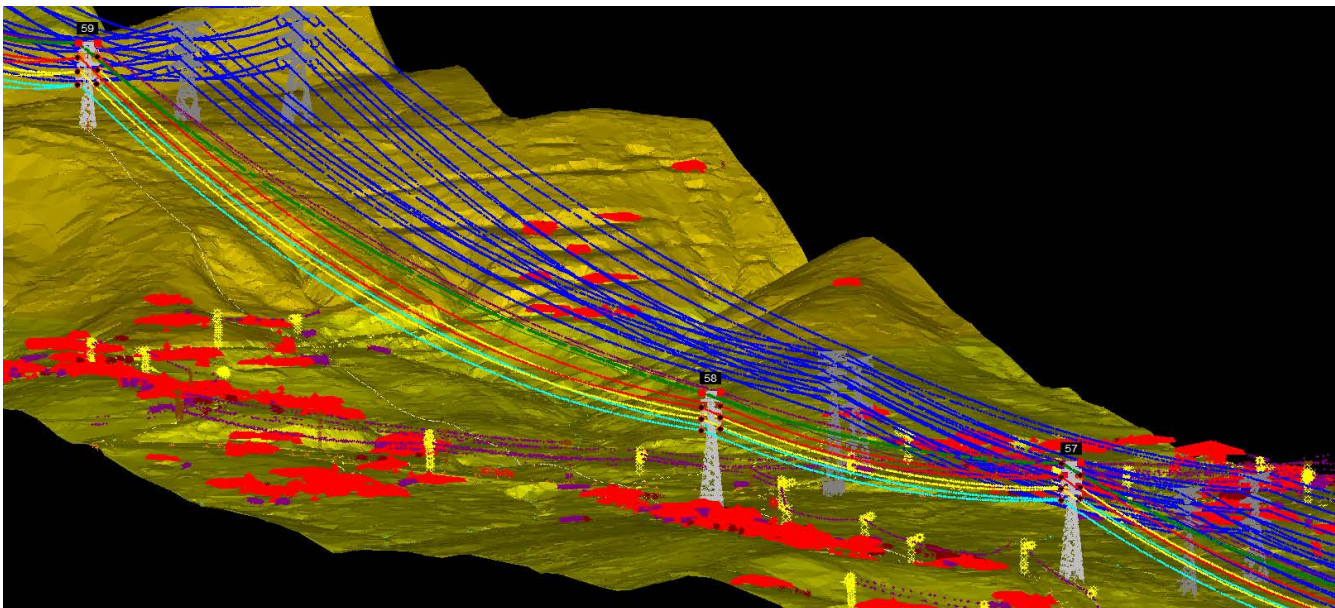
As-built transmission line in PLS-CADD with LiDAR data

Results and Future Plans

The MHI solution has proven to be an effective resource in predicting and avoiding costly line outages, damages, and dangerous line fires. ETESA plans to apply these solutions to enhance asset management and line development analysis moving forward.

For more information about this project, contact **klaing@mhi.ca**

mhi.ca

Available in accessible formats upon request.

Manitoba
HYDRO INTERNATIONAL