Two important electrical companies in Colombia – Electricaribe S.A. E.S.P. and Electrificadora de Santander S.A. E.S.P (ESSA) – have chosen Siemens PTI for protection coordination studies development. PSS®SINCAL was used for network modeling and protection relays simulation. Beside these studies, Siemens Power Academy provided training to employees of these companies showing the potential that the software has in such studies.

ELECTRICARIBE S.A. E.S.P.

Customer description: A Colombian distribution company that provides electricity to customers located at the Colombian Caribbean Area (North of Colombia). It has a network of over 25,000 km with high- and medium-voltage levels. The company serves customers in seven departments of the Colombian Atlantic Coast.

The electrical system is comprised of transmission and distribution substations with voltage levels of 220kV, 110kV, 66kV, 34.5kV and 13.8kV.

Scope of study: Load flow and short circuit calculation for two operating scenarios:

- Year 2010
- Year 2011

Definition of basic and detailed settings for the following protection:

- Distance (21)
- Line differential (87L)
- Directional overcurrent (67/67N)
- Overcurrent (50/51 and 50N/51N)
- Reclosing (79)
- Over/under voltage (59/27)
- Synchronism (25)
- Circuit breaker failure (50BF)

Validation of the fuses installed in the distribution network at 13.8 kV.

- Settings of automatic circuit reclosers
- Validation of installed fuses

Project duration: One year
ELECTRIFICADORA DE SANTANDER S.A. E.S.P. (ESSA)

Customer description: ESSA provides generation, distribution and sale of electricity services. It serves 554,000 residential, commercial and industrial customers in 92 municipalities in the departments of Santander, Cesar and Bolivar (northeast of Colombia) in an area of more than 30 thousand square kilometers. Its coverage is 96.20% (99.85% in urban areas and 83.12% in rural areas).

The electrical system is comprised by transmission and distribution substations with voltage levels of 230kV, 115kV, 34.5kV, 13.8kV, 11.4kV and 6.3kV.

Scope of study: load flow and short circuit calculation for three operating scenarios:

- Maximum generation - Maximum demand
- Minimum generation - Maximum demand
- Minimum generation - Minimum demand.

Definition of basic and detailed settings for the following protections:

- Distance (21)
- Directional overcurrent (67/67N)
- Overcurrent (50/51 and 50N/51N)
- Transformer differential (87T)

Project duration: Two months

Due to the hiring of these two studies of protection coordination, Siemens PTI sold two licenses of PSS®SINCAL (Electricity Protection Module) Electricaribe and ESSA respectively. After that, the company Gas Natural Servicios Integrales SAS acquired one license of PSS®SINCAL (Utility Optimization Module). These were the first PSS®SINCAL software sales for Siemens PTI in the Austral-Andina region.

In addition, the Siemens Power Academy provided approximately 80 hours of training courses for the staff of Electricaribe and ESSA. The trainings were focused on the PSS®SINCAL load flow and short circuit basic modules and protection device coordination advanced module.