

The Rebirth of Tower 473N

Tower 473N rises majestically above the Campucana district in Putumayo. Throughout the works, we never cut the electricity service.

The inhabitants of Putumayo were on the verge of a blackout following a landslide that affected an electric power transmission tower. A GEB team, in the midst of difficult conditions and in record time, built a new tower, code-named 473N.

TIn the highlands area of the Campucana district (Putumayo), a downpour released tens of cubic meters of mud and plant material from a mountain, which hit tower 472 with full force, a structure that was 34 meters tall and had been operating for 11 years within the Tesalia-Jamondino line (Teja).

Two of the tower's legs buckled under, but it did not fall and continued to operate. So it did not generate an alert in GEB's monitoring room. If it had fallen, we would not have been able to guarantee the sustainability of the electric energy system in southern Colombia or the interconnection with Ecuador.

But our Maintenance Management employees who were inspecting the line noticed the fact and reported it. The next day, a team set out from Pitalito (Huila) to the site to assess the situation. The journey took three hours by car and four more on foot along a muddy and uneven path to tower 472.

On their return to Mocoa, the team delivered the diagnosis: the tower had two broken legs and was at risk of falling. We could not intervene on the site because a new landslide was imminent, so the recommendation was,



After a lot of hard work, the tower was raised, which enables the transportation of electric energy to southern Colombia

avoid a blackout, to leave the tower alone and implement a temporary bypass using the structures of a nearby line, the Mocoa-Jamondino (Moja) line, which had been out of service since 2017. Then, we suggested disabling the section between towers 470 and 507 of the Teja line in order to be able to work in the affected area without interrupting electric power transmission.

"We began engineering studies to determine how and where to connect the temporary bypass. Then, we proceeded with the property, legal and social requirements, and the construction of the temporary 1.2 km bypass", explains Javier Aponte, an engineer at GEB's Maintenance Management.

At the same time, we carried out the technical and engineering studies for the final solution on the Teja line and for the controlled dismantling of tower 472. It was to be implemented by March 10, 2019 at the latest. The best option was to remove tower 472 from the line and instead build a new 70-meter structure, called tower 473N.

By mule and helicopter

To win the battle against time, we used the existing head of tower 473 and built the rest. In mid-February we disassembled towers 472 and 473. It was a very complex operation because our employees had to be ready at the meeting place in Mocoa at four o'clock in the morning to undertake a four-hour walk to the work site. "We refurbished six kilometers of that difficult dirt trail and used mules and motorcycles with small platforms to transport some materials. The vehicle could only go so far, and from that point on, we had to walk", Aponte recalls.

Dubán Suárez, line maintenance inspector, remembers that the work hours in those 1,643 meters above sea level were from seven o'clock in the morning to two o'clock in the afternoon because it was raining a lot. "The guys had lunch up at heights. Although the area's climate is hot and humid, up there the rain felt like pins stabbing through the your skin," says Leonardo Galeano, line maintenance inspector.

The 30 tons of tower 473N, which arrived in Mocoa from Bogota at the end of January, were transported to the Campucana site in 258 helicop-



Construction work of tower 309, second section of the Tesalia - Alférez project in Pradera, Valle del Cauca

ter trips. "It took us 40 days to mount it. On March 10, 2019, exactly on the deadline for delivering the final solution, the section that had been out of service was powered up and normalized," concludes Aponte with satisfaction.

"We all worked hard to fulfill our promise to GEB and Colombia, meeting the established deadline and respecting all the safety and engineering protocols. This is a clear example of our Superior Performance".

Javier Aponte, GEB Maintenance Management engineer.