



# ELIA BELGIUM INCREASES LINE CAPACITY BY 100%

ACCC® conductor

“*The replacement of ACSR298 by ACCC® Lisbon increases network capacity by almost 100% while maintaining the existing infrastructure.*”

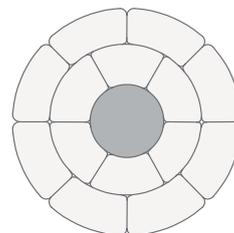
## SITUATION

Due to a new production unit of 400MVA, load flow studies indicated that the 20-km-long double-circuit 150-kV network, between Mol and Beringen, strung with ACSR 298mm<sup>2</sup> (Aluminium Conductor Steel-Reinforced) would be overloaded under certain conditions. Both ACSR conductors each with a diameter of 22.4 mm operated at a maximum load transfer capability of 162 MVA each with a maximum operating temperature of 75 °C as specified by Belgian legislation.

The challenge Elia faced was to increase the load capacity of each circuit from 162 MVA to 360 MVA without costly reinforcement of the tower-foundation system and with minimal environmental impact. Each circuit had to be upgraded while the other stayed in operation.

## SUMMARY

- > Project Goal: increase capacity while keeping existing infrastructure
- > Type of Conductor: ACCC® Lisbon
- > Conductor Length: 130km between Mol - Beringen
- > Voltage: 150 kV
- > Energized: 2009





## POSSIBLE ALTERNATIVES

Given the fact that existing towers and structures should remain, reconductoring the existing circuits was the best solution for Elia. An important prerequisite for the new conductor was that the sag at its maximum operating temperature could not exceed the sag of the existing ACSR 298 at 75°C. In addition, the outer diameter of the new conductor and the forces on the existing towers had to be less or equal to the ACSR 298, while the load transfer capacity had to be around 22% higher.

As potential solutions, ACSS (Aluminum Conductor Steel-Supported), GZTACSR (Gap Super Thermal-resistant Aluminium Conductor Steel-Reinforced), ACCR (Aluminium Conductor Composite-Reinforced) and ACCC® (Aluminium Conductor Composite-Core) conductors were considered for this project.

## THE SOLUTION - LAMIFIL ACCC® LISBON 325

After analysing the cost-benefits, Lamifil proposed the ACCC® Lisbon 325 conductor because of its advantages:

- > Capacity increased from 662A to 1380A for a same diameter conductor
- > No significant changes to the existing towers
- > Max operating temperature increased to 180°C compared to 75°C previously
- > Lower SAG helps reducing the magnetic field level at the annual mean current
- > Lowest line losses and line construction costs

Replacing the existing ACSR 298mm<sup>2</sup> with the ACCC® Lisbon 325mm<sup>2</sup> doubled not only the ampacity, but also results in a saving of line losses of an estimated 64 500 MWh over a 30 year period; meaning that 600kW less capacity per year needs to be generated, also resulting in a reduction of 40,000 metric tons of CO<sub>2</sub> for the 30 year period.

To make the conductor offering complete, Lamifil also supplied line hardware, special tools and installation training and supervision.

## CONCLUSION

The first installation of some 125km of ACCC® Lisbon in Belgium ran smoothly and was completed ahead of schedule.

The results were so impressive, it led Elia to install ACCC® conductor for other projects. As it is ACCC® conductor offers twice the capacity of conventional all-aluminum or steel-reinforced conductor with far less thermal sag. ACCC® runs cooler and more efficiently than any other HTLS conductor type of the same diameter and weight. Line losses are decreased under any operating condition, freeing up generation capacity, while reducing emissions.

*“ Contact us to define how we can increase your line capacity. ”*