

Tele-Fonika Kable chooses Borealis HV material for Quintero Bay LNG project in Chile

The case

Lack of self-sufficiency in gas resources has meant that Chile has been reliant on its neighbour Argentina for vital supplies to feed its industrial sector. Over the years disruption to those supplies has adversely impacted electricity generators and consequently industry as a whole. To address this issue the national oil and gas company Empresa Nacional di Petrolio (ENAP) was asked to initiate and lead a liquefied natural gas (LNG) project that would give Chile energy independence.

The project involved the construction of a terminal and infrastructure for the importation of LNG by sea and its collection, re-gasification and distribution. Quintero Bay on Chile's pacific coast, approximately 155 km northwest of the country's capital Santiago,



was chosen for siting the terminal and where construction began in May 2006.

The challenge

To manage the project and operate the completed terminal a joint company was formed, GNL Quintero S.A. This brought together a partnership between ENAP, the Spanish power company Endesa, gas distributor Metrogas and BG Group, a world leader in the field of LNG.

The facility, which includes a 1,600 m quay equipped with unloading arms, two large storage tanks each with a capacity of 160,000 m³, two smaller 10,000 m³ tanks and a vaporisation station, is designed to handle 2,5 million tonnes of LNG per year and satisfy around 40% of Chile's gas demand.

To deliver the energy needed to operate the re-gasification complex, GNL Quintero commissioned Tele-Fonika Kable, one of the world's largest cable and wire suppliers, to manufacture the 110 kV cable and Distributed Temperature Sensing system (DTS) to connect with the power plant of Chilean energy company AES Gener. The connection over a distance of 5.2 km involved four cable lines laid at a depth of 1.5 m, predominantly in sandy soil and within 20 m of the Pacific coastline.

Because of the volatility of LNG in both its liquid and gaseous states, the possibility to monitor cable temperature was of key importance to prevent fire hazard and was therefore central to cable construction. This challenge was met through the inclusion of multi-mode optical fibres within the cable and the installation of a DTS system. The system utilised the property of optical fibre which registers change in fibre temperature. In addition to safety, temperature control over the whole length of the cable gives the possibility to optimise energy transfer and extend cable working life.

"Borealis' Superclean insulation and Supersmooth semiconductive compounds provided the ideal cable foundation for the Quintero Bay project. Assured long-term performance is always a priority objective and its importance is emphasised when the installation is particularly risk-sensitive. For this project Borealis' materials delivered both performance and confidence."

Tele-Fonika Kable

The solution

The 110 kV power cable solution for the Quintero Bay LNG project was produced by Tele-Fonika Kable using Supersmooth LE0592S semicon shielding and Superclean LE4244S insulation compound. These Borealis materials are manufactured to the highest standards of cleanliness to ensure reliable, long-term performance.

To provide the necessary protection against environmental factors such as abrasive subsoil and seawater, the cable was jacketed with Borealis' Borstar HE6062 high density polyethylene.



The power link-up of the Quintero Bay terminal was completed in February and received its first delivery of LNG in July 2009.

Project summary

Customer	GNL Quintero, Chile
Application	Cable materials for HV power supply. Voltage: 110 kV Cable length: 20 km Cable diameter: 73 mm Cable weight: 6900 kg/km Conductor size: 300 mm ² Classification: 2XS(FL)2Y
PE materials used	Borealis Superclean™ LE4244S, crosslinkable (XLPE), low-density polyethylene (LDPE) insulation compound. Borealis Supersmooth™ LE0592S crosslinkable, semiconductive shielding compound. Borstar® HE6062 high density polyethylene (HDPE) external protective sheathing.
Functional requirements	Consistent High Voltage performance with Distributed Temperature Sensing system and extended-term reliability.
Benefits	Borealis Superclean compound excludes contaminants >100 microns and controls those <70 microns. This gives assured high levels of cleanliness and therefore a reliable high performance working life. Borealis Supersmooth compound provides a very smooth interface between shielding and insulation to minimise electrical stresses and ensure consistent, stable power flow. Borstar HDPE delivers good long-term abrasion and stress crack resistance, together with good barrier properties.

Borealis and Borouge are leading providers of innovative, value creating plastics solutions. With more than 40 years of experience in polyolefins and using our unique Borstar® technology, we focus on the infrastructure, automotive and advanced packaging markets across Europe, the Middle East and Asia. Our production facilities, innovation centres and service centres work with customers in more than 170 countries to provide materials that make an essential contribution to society and sustainable development. We are committed to the principles of Responsible Care® and to leading the way in 'Shaping the Future with Plastics'™.

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