Boskalis
Dredging & Marine Experts

# PROJECT SHEET

**THE STRAIT OF MAGELLAN PIPELINE CROSSING, ARGENTINA**
FAST TRACK PIPELINE INSTALLATION UNDER CHALLENGING CONDITIONS

## BOSKALIS' ENERGY SOLUTIONS

Boskalis is a leading global dredging and marine expert. With safety as our core value we provide innovative, sustainable and all-round solutions for our clients in the energy market. Realizing projects in remote locations with a heightened environmental focus is one of our specialties. Under brands such as Boskalis Offshore, Dockwise, SMIT and Smit Lamnalco we offer a wide range of services, making us your next one-stop solution provider.
We support the development, construction, maintenance and decommissioning of oil and gas import and export facilities, fixed and floating exploration and drilling facilities, pipelines and cables and offshore wind farms.

## PROJECT DESCRIPTION

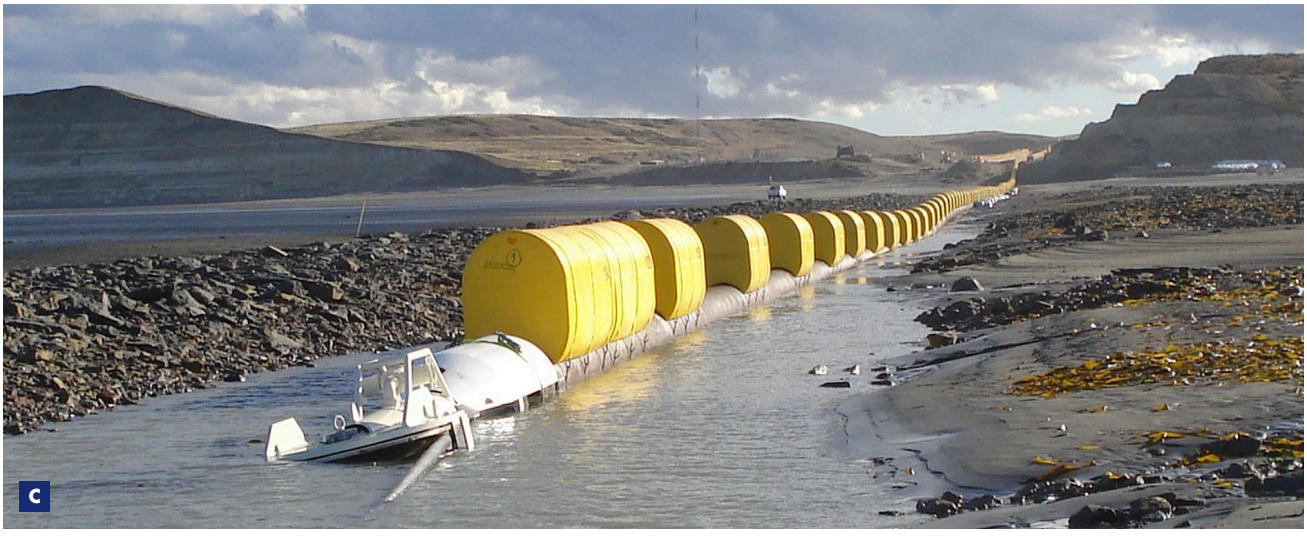
The project involved the construction of a new, strategically important, 24" natural gas pipeline across the Strait of Magellan, linking Cabo Espíritu Santo in Tierra del Fuego province with Cabo Vírgenes in Santa Cruz province. The new pipeline was built as an expansion of the existing San Martín pipeline in an effort by the government to increase gas supplies from Tierra del Fuego to the Argentinean mainland. The new submarine pipeline runs parallel 50 meters west of the existing pipeline that was built in 1978. The link was the final piece of a significant onshore project involving the construction of a pipeline stretching thousands of kilometers to carry the gas recovered from fields in the south to the distribution network in the north. The 'Gasoducto Transmagallánico', as the pipeline is called in Argentina, will transport 18 million cubic meters of gas a day. Boskalis Offshore's scope

## FEATURES

| | |
|---|---|
| Client | Nación Fideicomisos S.a. |
| location | Strait of Magellan, southern Argentina |
| period | August 2009 – March 2010 |
| Contractor | Boskalis Offshore b.v |



**A** Location map
**B** Pull-in at northern landfall
**C** Pull-out at southern landfall



consisted of engineering, pre-trenching both shore approaches, pipeline pull-in and pull-out at the landfalls, submarine tie-in, hydrotesting and backfilling of the trenches. The multidisciplinary project has been completed in eight months after contract award, which is exceptionally fast considering the remote location, limited infrastructure, lack of local facilities and complexity of the project. Weather conditions in the Strait of Magellan can be notoriously severe. The harsh local conditions feature rapid weather changes, storms, strong currents and a tidal range of more than ten meters.

## PRE-TRENCHING

Before departure to Argentina the suction pipe of trailing suction hopper dredger (TSHD) Prins der Nederlanden was extended to enable dredging to the required 80 meters water depth. Three trench sections were dredged with a combined length of 17 km and seabed intervention was performed along the remaining 20 km to prevent spanning. At the tie-in location a 40 m x 45 m target box was dredged and leveled to allow full burial of the tie-in section.

## THE NORTHERN LANDFALL PULL-IN AT CABO VÍRGENES

To protect a breeding ground for penguins and to mitigate disturbance to the penguins Boskalis and the Guarda Fauna (the local environmental protection agency) erected a fence around the construction site and the Guarda Fauna moved some thousand penguins that were living there. At the northern landfall an 800 t linear winch system was installed to accommodate an 800 m pull-in of the pipeline from Allseas' pipe-laying vessel Solitaire. The winch was anchored by three Boskalis developed anchor moles with a 300 t holding capacity each. After the pull-in the Solitaire laid about 30 km pipeline towards Cabo Espíritu Santo, where the pipeline was laid down at the tie-in point.

## THE SOUTHERN LANDFALL PULL-OUT AT CABO ESPÍRITU SANTO

The pull-out design was partly governed by the large tidal range, which restricted the pulls to the higher levels of the tide. To extend the duration of the pull windows at high water, 40 pipe rollers were installed over a length of 1 km onshore and on the beach, which falls dry twice a day at low tides. To lower the required pull-out forces for the 6.5 km long pipeline section, some 300 buoyancy tanks were fitted along the pipeline providing 1,500 t buoyancy. The pipeline was welded on a stringing yard into 12 strings of approximately 550 m each. The strings were pulled-out by the Pontra Maris equipped with the same 800 t linear winch used for the northern shorepull-in and an anchoring system to provide sufficient hold and accurate positioning of the barge.

## THE SUBMARINE TIE-IN

After determination of the relative locations of the two pipeline ends at the tie-in location, the spool piece was adjusted onshore at Cabo Espíritu Santo and installed by divers from Smit Subsea Europe operating from the Pontra Maris. Subsequently, the pipeline was hydrotested, purged, cleaned and inspected. After a final survey the trenches and target box were backfilled by TSHD Seaway.

## FOCUS ON SAFETY

Thanks to the project safety system and Job Safety Analyses, Boskalis Offshore's stringent safety requirements were more than satisfied. It was deliberately decided to appoint a Spanish-speaking SHE-Q manager. Everyone involved in the project used the SHOC (safety hazard observation cards) system, including the 300+ employees of the Argentinian subcontractor Contreras. This has promoted the teamwork and enhanced safety, as the regular safety inspections have demonstrated.




**D** Spool piece for submarine tie-in
**E** Stringing yard at southern landfall
**F** Trench dredging by TSHD Prins der Nederlanden

Royal Boskalis Westminster N.V.
PO Box 43
3350 AA Papendrecht
The Netherlands

T +31 78 69 69 000
F +31 78 69 69 555

royal@boskalis.com
www.boskalis.com