



ENERGY

No. 1 in research of new methods of operation and maintenance of offshore wind yards

Ingeteam Service was granted a subsidy of 60,000 euros (the maximum amount granted in the call for proposals) by the European Fund for Regional Development (EFRD) and the Regional Government of Castilla-La Mancha (from the Spanish JCCM - Junta de Comunidades de Castilla la Mancha) to carry out a research project on new operation and maintenance methodologies for offshore wind plants on floating structures.

The aim of the project is to cover the emerging needs of the wind sector. Until now, the wind plants installed onshore have been the basis for the development of wind energy. However, in recent years, the lack of space, the saturation of optimal locations and the need to attain higher production levels through the use of improved wind systems has encouraged offshore developments.

The 2005-2010 Spanish Renewable Energy Plan (REP) sets the target to be attained in offshore wind plants at 1,000 MW, at least during the construction and commissioning phases. For installations with these depths new types of structures and foundation shapes need to be employed, namely floating structures. This, along with the fact that locations are remote and inaccessible, makes operations and maintenance substantially more complex. Larger plants, which involve displacement of heavy loads at great heights, will particularly face more difficulties. Moreover, maintenance tasks must be

carried out on anchors and chains under more extreme and less accessible weather conditions.

Tools

In this Project, Ingeteam Service has planned to carry out research and develop three possible technological advances. Firstly, an automated technological surveillance software tool that will allow for onshore monitoring of the proper operation of the turbines at all times.

Secondly, a tool to optimize the efficiency of operation and maintenance simulations carried out at each of the Spanish maritime zones, so that the specific specifications of each one of these zones may be taken into account.

Lastly, this research should focus on a new corrective, predictive and proactive maintenance methodology for offshore plants on floating platforms, with a specific safety plan and measures to be taken, general considerations, materials to be used, tools, etc.





INDUSTRY

Ingeteam delivers the new electric units for Arcelor Mittal's rolling mill

The most outstanding development is the implementation of the regulation system of the gap between the rollers of the stands, using a new HGC/AGC system developed by Ingeteam.

The Industry Division has successfully completed the design of all the electrical machinery required to equip Arcelor Mittal's new rolling mill at its Olaberria factory. The new machine, which incorporates new elements like a cooling bed and a profile stacking unit, will increase factory productivity by 10% and consequently improve the quality of its products.

About 70 Ingeteam staff members worked on this project, which involved the supply of turnkey electrical machinery, engineering, assembly, automation and commissioning of a hot profile

rolling mill.

This production line rolls medium-sized "U" and double "T" type profiles, with an average annual production of 1 million tonnes. This increase in production is possible due to the fact that downtime is avoided since the stands already come prepared from the workshop.

After the commissioning of the production line, the mechanical portion of which was developed by Lagun Artea, Ingeteam carried out follow-up tasks to ensure that the production line was operating correctly.

MARINE

Launching of the "Simon Stevin" vessel at the Sestao Shipyard

Many representatives from Ingeteam were present at the launching of Jan de Nul's Simon Stevin vessel, last March 13th.



This is a fall pipe or mining vessel used to cover submarine pipelines with stones, and extract minerals from the bottom of the sea.

It is no coincidence that so many representatives from different companies and divisions were present at the launch, since Ingeteam carried out several projects for this vessel, together with Indar and Pine.

On the one hand, the complete electrical plant was supplied, including five main generators, 5,625 kVA at 6,600 Vac, Medium Voltage cabinets (6,6 kVac), distribution transformers, converters, transformers and motors for the four main propellers (3,500 kW each), the transformers, converters and motors for the four auxiliary manoeuvring propellers (2,200 kW each) and the power management system. Moreover, an integrated monitoring and alarm system, communication and navigation equipment were also installed, and all engineering, programming, commissioning and testing of this equipment was also carried at sea.

The "Simon Stevin" vessel, with a length of 191 meters and a dynamic position vertical discharge pipe, is capable of dumping rocks with high precision at depths of 1,700 meters. This vessel will be used by the offshore industry, which installs gas and oil pipelines at great depths.

Jan de Nul is a Belgian business group that carries out civil works and marine construction. The company is a world leader in dredging works. It has a significant international presence with more than 3,500 workers worldwide.



TRACTION

Ingeteam delivers the first diesel-electric cargo locomotive to Euskotren

Last February 4th, the Traction Division delivered the first of the twelve diesel-electric cargo locomotives ordered by Euskotren.

The TD 2000 BB is a great step forward for Euskotren, considering the locomotives it had been using until now. The fact that it is capable of operating in two different traction modes will, to a great extent, contribute to reducing the environmental impact.

The dual diesel-electric option allows the locomotives to operate in two different traction modes: using the energy via a pantograph connected to the overhead catenary type line and also the power produced by the locomotive's motor diesel set itself. In both cases, the rated power supply is at 1,500 Vdc.

Each TD 2000 BB locomotive has a maximum weight of 62 tonnes in operation and is ready to be ballasted at 80 tonnes. It can operate in basic composition formed by the wagons and one or several locomotives in multiple traction through one single control command.

Moreover, the locomotive is equipped with GSM/GPRS digital network radiophone communications systems, the double-safety Deadman protection system, a tachograph and parameter recording device, an ATP (Euroloop) and ASFA unit, one detection and identification with GPS positioning system, an odometer and

GRPS telephone system, an anti-skid unit and a driving and maintenance aid system.

Other companies also participated in this project, like Indar, who supplied 36 asynchronous motors of 600 kW each, and 12 synchronous generators of 1,500 kW each. Pine also carried out the electrical installation of the units.

Benefits of the locomotive

- **Reduction of costs.** A cargo transport fleet that incorporates the latest technological advances, with low maintenance costs and high levels of reliability which, therefore, leads to a reduction in operating costs.
- **Reduction of environmental impact,** since it reduces the need to transport goods by road and due to its dual diesel-electric mode.
- **Increased dragging capacity** during the successive phases; the axle is able to admit greater weights, due to increased power and higher adhering weight.
- **Versatility to circulate in electrified and non-electrified lines** and ability to access terminals and ports, with less impact on the environment.





BASIC TECHNOLOGIES

New order for Enel in Angola

Ingeteam T&D has just signed a new contract with Isolux to supply the electrical equipment for an Enel power station in Angola.

The contract includes the supply of five complete substations and protection relays for four substations in different provinces of Angola.

By securing this order, Ingeteam T&D will be well positioned to obtain the second phase of the project, which includes the expansion of several substations of the awarded project and the supply of another three new

substations for the final client of the state-owned electric company.

It is also noteworthy that this is the second contract the company has carried out in the African continent, after the Kuraymat project in Egypt, another important step in the company's internationalization.

BASIC TECHNOLOGIES

INDAR delivers six new generators to EPSA (Unión Fenosa)

Indar Electric has signed a contract with the Empresa de Energía del Pacífico power company, a Unión Fenosa company.

This contract involves the design and manufacture of six synchronous generators for the Amaime, Tulúa Alto and Tulúa Bajo hydroelectric stations in Colombia.

More precisely, the project includes the design, manufacture, supply and commissioning of four generators of 13,080 kVA each, at 720 rpm, and a voltage of 13,800 V (Tulua Alto and Tulua Bajo), and the Amaime project includes two units of 11,513 kVA, at 720 rpm and voltage of 13,800 V. The six units will be coupled to Francis turbines.

These projects form part of INDAR Hydro's business strategy, aimed at collaborating with different electric companies in Central and South America. INDAR is currently negotiating important projects with other countries in the same geographic area.

SERVICES

Pine Equipos Eléctricos strengthens its position in IT project management

The offices of Pine Equipos Eléctricos in the south of Spain have secured orders to carry out fifteen new projects for the Puerto Real shipyard (Cadiz) with its in-house software Ethyria.

This is an in-house program developed for marine construction that can be used to manage different tasks, such as the control of the technical receiving of material, comprehensive cable management or fault management, among others.

The advantages of the Ethyria software to marine clients is its total compatibility with other design applications used in the sector, such as Foran or Necora, when it comes to importing/exporting data and transferring information.



FAIRS

EUROPEAN FUTURE ENERGY FORUM	9-11 Jun	Ingeteam Corporación, S.A.	Solar and Solar Thermal
NORSHIPPING Oslo	9-12 Jun	Ingeteam Marine, S.A.	Marine
EXPO ANEAS Mexico	Jul	Ingeteam Maquinas Hidráulicas, S.L.	Basic Technologies
WIND POWER ASIA Pekin	8-10 Jul	Ingeteam Energy, S.A.	Wind
24TH EUPVSEC Hamburgo	21-24 Sep	Ingeteam Energy, S.A.	Solar
Wind Power Zaragoza	22-24 Sep	Ingeteam Energy, S.A.	Wind