

TMP news

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Iraqi water injection pump project demonstrates Termomeccanica Pompe's ability to design and manufacture complex Oil & Gas solutions



Main injection pump with electric motor, gearbox and suction & discharge piping

A marketing event focused on highlighting TMP's potential to customers, suppliers and partners took place on Oct. 10th at the company's La Spezia facilities. The event was organized around the string test of the Zubair oil field water injection project pumping system, more specifically a test of the complete pumping system (with all its auxiliary components) in the final on-site configuration. Termomeccanica is actually one of the only companies in the world with the know-how and facilities to support such a complex test set-up.

Many have responded to the invitation, both from Italy and abroad, and have been able to share this special occasion, personally witnessing the results obtained by Termomeccanica Pompe.

In 2013, Termomeccanica Pompe (TMP) acquired an important contract for the supply of 12 pumping systems for one of the major oil-extraction pumping plants in the Middle East, namely Zubair situated near the city Basrah in Iraq. This supply is worth about 50 million euros, with an additional 5 million for a "Long-Term Maintenance Service Agreement" for the system over a period of 5 years. TMP's customer is Eni Iraq bv, member of the consortium that will build the plant. TMP will also develop the contract under the strict supervision of South Oil Company (part of the Iraqi Ministry of Oil) who is the end user's consultant. The machinery will be installed at three different sites, Hammar, Mishrif and Rafidya, almost inaccessible areas where the severe environmental conditions entail the application of stringent design regulations ensuring that the pumping systems are suitably reliable over time. The plant should produce 1.2 million barrels of crude oil per day up to the year 2035.

Each pumping unit supplied is composed of a main injection pump (MIP), API 610 BB5-type, with a total capacity of 1,100 m³/h and a head of 2000 m at a speed of 5600 rpm. The MIP is actuated by an electric motor with a capacity of 8,700 kW, a voltage of 3300V and a speed of 1495 rpm. A gearbox is positioned between the pump and motor in order to increase the speed from 1495 rpm (motor shaft) to 5625 rpm (pump shaft). The MIP is connected to a booster pump, API 610 BB-type, with the same capacity of 1100 m³/h and a head of 106m at a speed of 1485 rpm, which, in its turn, is driven by a motor with a capacity of 500kW, a voltage of 6000V at a speed of 1485 rpm. The pumping unit composed of MIP, gearbox and electric motor is lubricated by a lube oil system with a capacity of 5000 liters and a flow of 300 l/min. The motors that drive the main injection pumps are equipped with a variable frequency drive in order to optimize production and related consumption depending on the various requirements of the plant over time. Each single pumping unit is equipped with a frequency converter which transforms the voltage of the plant's power line from 32kV to 4x1.8 kV, each with a power of 10 MW, and which goes to a variable frequency drive (VFD) connected to the motor. Considering the importance of the equipment and of the uninterrupted operation of the plant, each pumping unit is also equipped with a LER (Local Electric Room) ensuring the control of the most relevant parameters namely temperatures, pressures and vibration levels. All these parameters allow to assess the correct operation of the pumping systems, even by remote control, minimizing any chance of faults thus extending maintenance intervals.

The electric powers in question are high: taking into consideration MIP, booster and auxiliaries, the 10MW level is reached thus generating a heat level that requires the use of important cooling systems. For this reason, each pumping system is equipped with an oil heat exchanger for the cooling of lube oil system as well as with a water chiller for the cooling of the VFD. The development of a system with such characteristics has also been made possible thanks to the strong partnership established between TMP and some of the most important industrial components companies present on the market. Indeed, such companies have not only supplied but also participated in the definition of the components that were critical to the optimal operation of the system. Given the particular complexity of the supply, functional tests had to be included so as to guarantee the perfect operation of the system. The tests, which include the main injection and booster pumps with their relative electric motors as well as all the above-mentioned auxiliaries, are called "string test" and are to be performed at Termomeccanica Pompe's test center located at the La Spezia facilities. Termomeccanica Pompe tests each pump it manufactures to validate their hydraulic and mechanical properties; so, the singularity of this string test does not come from the test itself but from the logistic complexity related to the testing of all the auxiliaries. In fact,

the string test of the pumping systems in question has required 1000m² of the total 2500 m² of the overall testing facilities. Furthermore, even though it was not included in the contract terms, TMP purchased and installed in its test center a frequency converter transforming 6kV with four 1.8kV outputs and a 10MW power, similar to the one to be installed on site in order to replicate as well as possible the plant's operating conditions. Once the tests are run, the transformer will remain at TMP's disposal for possible future contracts. The complete site replication also required to feed the main injection pump with its booster pump, fed in its turn by a vertical auxiliary pump of the test center. Such auxiliary pump sucks water from the test center tanks (with a depth of up to 10m and a total volume of 3000m³). Various valves and electromagnetic flow meters as well as pressure transmitters are positioned in the piping connecting the pumps (test center auxiliary pump, booster pump and MIP). Through the regulation of the above-mentioned valves (opening or closing), flow is modified and it is possible to observe the operation of the system under various conditions which are defined by a specific procedure. Once the system is stabilized at each specific flow, all parameters are measured and recorded: flows, heads, powers, temperatures and vibrations. The Zubair water injection pump project clearly illustrates how Termomeccanica Pompe has become a key supply partner designing and providing customized solutions for the most challenging environments and the most demanding customer. The following diagram and pump pictures summarize the test center string test configuration.

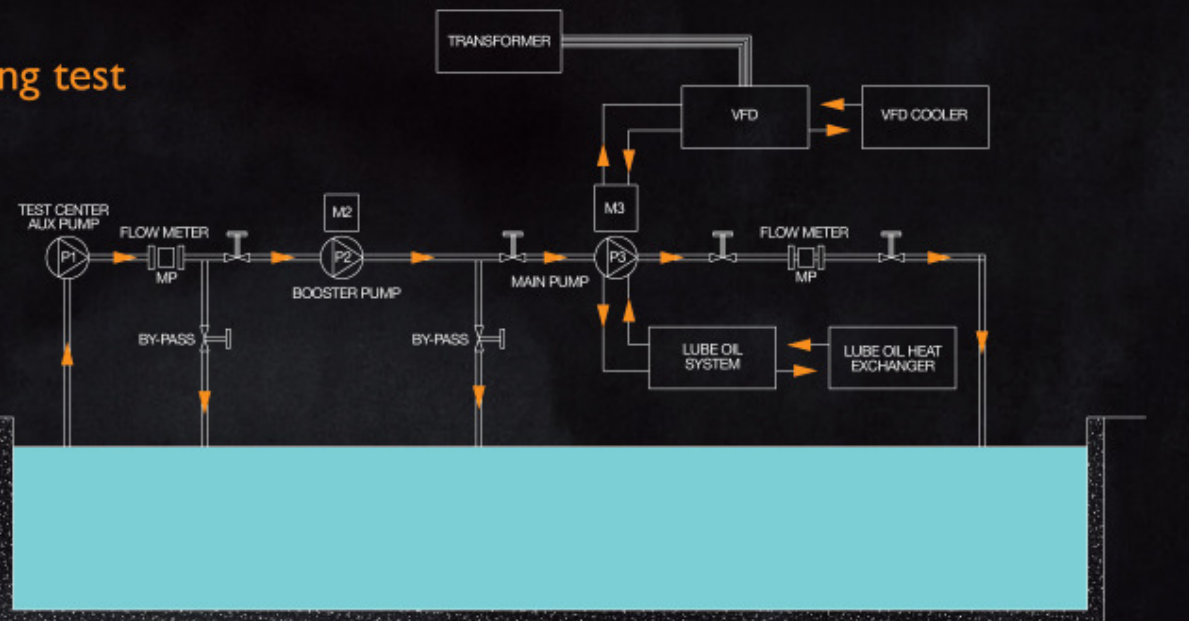


Test center auxiliary pump (left) and booster pump (center) with electric motor (right)



Service Division GM (left) & Gulf Area M. ger (right) together with Danway's CEO (center), UAE partner

The string test



Pumps Division Key Account Manager for Italy with a delegation from Saipem Milan

Serious Changes in TMP Purchasing Department



To face the challenges of increasingly more difficult and competitive markets, in the last few years Termomeccanica Pompe has started a reorganization and renewal process.

One of the sectors undergoing this change has been without doubt the purchasing department, divided into two teams: purchasing and suppliers/materials' management.

The whole of the purchasing staff has been involved in a specialization training program aimed at developing highly professional figures with an adequate technical, economic and managerial background.

Such training was structured into various phases and included in-company training sessions as well as further external courses, including sessions with loyal suppliers.

The same approach was then extended to the suppliers'/materials' management team, whose main task is to obtain components of the required quality and within the required time frame, making available to suppliers, when needed, the help and support of expert production technologists.

At the same time, a series of initiatives for the development of software management platforms has led to greater efficiency and control of the material and service supply process. To this end, it is worth mentioning the most important ones:

- Evolution of SAP reports and order management
- Development of a platform integrated with the company's Intranet to enter, query and consult the suppliers' expediting, control and appraisal reports. This platform can also be accessed and used by branches and controlled companies that interface with and monitor local suppliers
- Development of a Suppliers' Portal.

These tools have also allowed to improve monitoring the company's internal processes and therefore expressing the performance levels of the sector and of the controlled companies through suitable indicators (KPI - Key Performance Indicators).

Similarly, a system to calculate suppliers' performance (Vendor Rating) has been introduced that, in a very simple way, calculates annually three indexes for each supplier, two based on quality and one on lead time.

Thanks to the Vendor Rating system, a supplier's performance is examined statistically and quantitatively, highlighting the various critical cases requiring support and, in extreme cases, suspension.

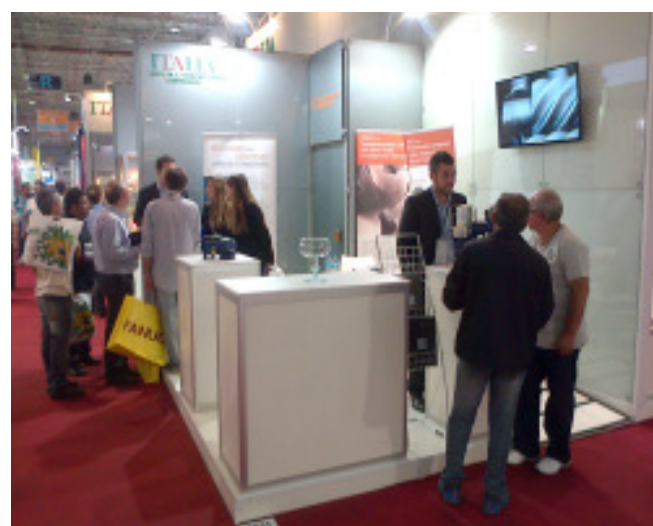
This way the supply process consists of a self-correcting closed circuit whose main purpose is not only to get the best purchase prices but also to establish long-term relationships with reliable suppliers, in other words creating mutually beneficial partnerships.

Termomeccanica takes part in MECANIC 2014 São Paulo- Brazil

More than 10.000 visitors attended the 2014 edition of MECANICA, the largest international mechanics showcase of South America. The event, which took place at the Anhembi exhibition center of São Paulo (Brazil) lasted for 5 days (May 20 -24).

Termomeccanica Pompe, through its bare-shaft compressor division, participated in the event for the first time in its history, thus having the opportunity to present its new compression products dedicated to air and gas applications.

The high level of attendance to the event has allowed the division to consolidate existing commercial relationships and to establish new contacts but has also confirmed the trend of the market towards South America's development, a trend which Termomeccanica Pompe has decided to follow by investing more and more in the area.



Flash News

New acquisitions in the U.A.E. Oil & Gas sector for TMP

In addition to the 4M\$ contract for 48 API 610 VS4-type process pumps for the Satah Al Razboot Field Development Project – EPC Package 4, TM.P. has acquired another two contracts for two off-shore plants owned by Abu Dhabi Marine Operating Company (ADMA OPCO).

The first supply is for the Umm Lulu Phase 2 offshore oil platform. TMP has acquired an order from NTC (a Joint Venture between Technip Abu Dhabi and NPCC) for four water injection pumps for a total of approximately 6.5M\$. The pumps are in superduplex with a power of 3MW and are installed on a 3-point base plate. Delivery is planned for end of June 2015.

As for the second supply, also acquired from NTC, it regards four sea water lift pumps in superduplex destined to the Umm Shaif Super Complex. Their most relevant characteristic is their length: two pumps will be 25-meter long while the other two will be 21.5. The value of the supply is approximately 4.3M\$ and delivery is planned for mid-April 2015.



Umm Lulu offshore platform

The editors of this issue are:

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Our mission

To contribute to the success of our customers through our experience and know-how. We pursue this goal giving the utmost consideration to the hard work and commitment of both employees and suppliers, respecting the environment and complying with the expectations of our shareholders.

We think outside the box for you



Chose a unique partner for your unique needs

