TMP news

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Project Developed in-house
Authorisation from the tribunal of La Spezia
N. 5/08 dtd. 02/12/2008

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December 2011, issue 04

End of Year Message from the Managing Director

2011 has been a year of stagnation during which, the international and, above all, the national crisis reached their peaks.
Our companies have been able to face and react promptly to the situation thanks to the initiatives formulated during the previous years, which included corrective measures related to both market and supply chain repositioning.
The Company's financial results can be considered satisfactory given the crisis context as well as the sectors average results.
In short, the company's farsightedness and commitment to investments of the past few years have been recompensed.
Signals of economic recovery have started to show over the last months of the year, in our key foreign markets as well as in the emerging markets where we have been operating for a while in order to strengthen our presence.
I see **2012** as a demanding year, revolving around giving our companies involved in the Mechanical business a more suitable set up so as to face the global market challenges in sight.
This will mean intense work, which will involve the entire system, from our internal resources to the Supply Chain network, including the sharing of our plans and results with Customers, which is our foremost objective.
This is a significant challenge, of epoch-making value I would say, which will see all of us protagonists of our own future.
In my opinion, it should be faced with tenacity and optimism, each one of us being aware of our own potential.
I would like to seize the opportunity of this issue to wish to all readers and their families a Merry Christmas and a new year full of success!

Edoardo Garibotti

Widening of the Range of Termomeccanica Pompe's OH2- & VS4- Type API 610 Centrifugal Pumps

The strategic plan re-launching our company on the Petrochemical and Oil & Gas markets, also with small-size standard products, has been harvesting success for a few years already, both at home and abroad, notwithstanding the international crisis which has been slowing down investments in the large industrial plants sector.
The market analysis deriving from the commercial activity developed up to now has highlighted the necessity to widen the number of models of Termomeccanica Pompe's AP and CPPL families (equivalent to API610's OH2 & VS4 type pumps) with low flow rates (< 30 m^3/h) and high heads.
This market demand has entailed the development of new hydraulics characterized by a very low specific speed (Ns).
For this purpose, a prototype was built (40 AP 32 – **fig. 1**) and underwent experimental testing in our Test Center so as to validate the hydraulics performances estimated by calculation.
The fluidodynamics study of the entire pump was developed by the R&D Department, which used ANSYS-CFX code for the computational calculations.
The CFD analysis of the volute, which was designed using traditional correlative methods, confirmed minimal losses and, consequently, the development of alternative solutions was not necessary. **Figure 2 shows** the flow field developing within the volute.
Various impellers geometries were analyzed and the most performing solution chosen, leading to the building and testing of the corresponding impeller prototype.
Figures 3 and 4 provide the geometry of the optimized impeller and the results of the post processing CFD calculations.
Figure 5 illustrates through adimensional diagrams the comparison between the numerical and experimental performances.
All the main hydraulic parameters, which the Sales & Marketing Department had set as objectives (efficiency, stability of the Q-H curve, shut-off and BEP head ratio and suction specific speed), were entirely fulfilled. In conclusion, the new hydraulics developed made it possible to add the following models to our product portfolio:

AP (OH2) Pumps:
20AP25 20AP29 25AP32 40AP36 50AP50
CPPL (VS4) Pumps :
20CPPL25 20CPPL29 25CPPL32 40CPPL36

Figure 1.
experimental prototype used for testing

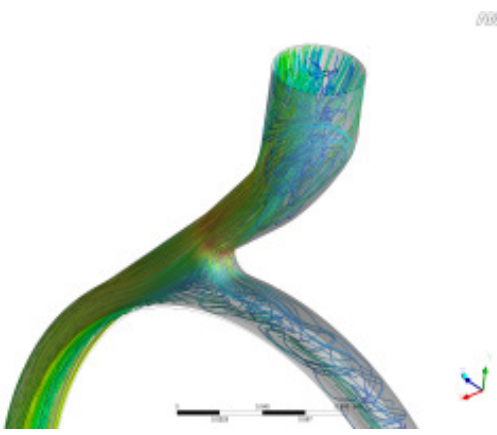

Figure 2.
Pathlines on the volute

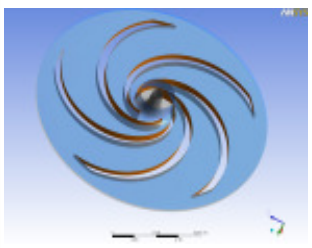

Figure 3.
model of the optimised impeller

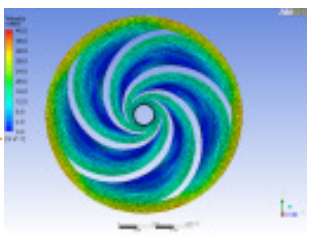

Figure 4.
Velocity distribution at mid-span of the impeller

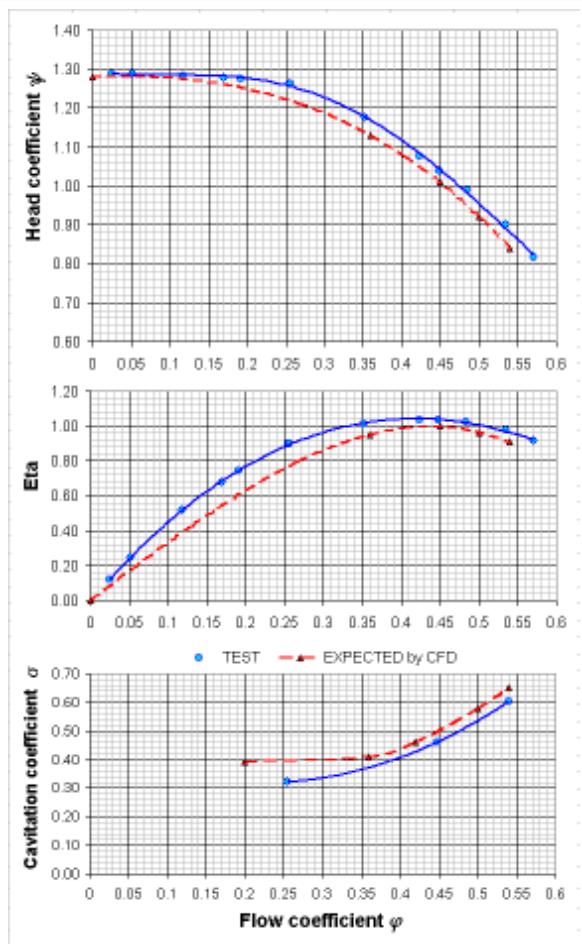

Figure 5.
Comparison between test and expected values by CFD

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TM.P. DOUBLES THE LIFESPAN AND HALVES THE CONSUMPTION OF THE PUMPS OF DUBAL (DUBAI ALUMINIUM) DESALINATION PLANT

The necessity to reduce carbon dioxide emissions and, at the same time, to optimize energy consumption has created an increasing demand of eco-sustainable and high efficiency products.
In this regard, a large number of industrial projects, related to plants or machines themselves, which combine high performances with low emissions have been developed.
Nonetheless, this trend tends to exclude the “existing” installed base, that is to say the products, machines or plants which, having been designed and built quite a while ago, result either inefficient or polluting.
In such cases, the solution seems easy at first sight, i.e. changing the machine (by stimulating its purchase through public funding for example). However, in reality, the situation is much more complex.
First of all, large plants cannot simply be “scrapped” without, in their turn, causing a great environmental impact nor generating very high costs which are unsustainable whether by their owners or the governments themselves (which have to face tighter and tighter annual budgets).
Furthermore, machines such as pumps, compressors, etc. often represent a plant’s “beating heart”. As such, their substitution, as made-to-measure parts of the structure hosting them, if not the other way around (i.e. a structure built around the machine), results in most cases very costly, if not dangerous for the operations of the plant itself.
In order to facilitate the modification of existing plants, international bodies have established through the Kyoto protocol specific mechanisms allowing to grant loans or subsidies to projects that positively benefit the environment in terms of reduction of green-house effect emissions such as CDMs (Clean Development Mechanism) or JIs (Joint Implementation).
CDM is based on the “baseline and credit” system which estimates the reduction of emissions through the calculation of the difference between the baseline emissions (scenario which does not include the development of the project) and the emissions in case of implementation of the project.
The Dubai Aluminium (DUBAL) production plant, the largest in the world, finds itself in this situation. Indeed, the desalination plant located inside its premises, consisting of 6 Multi Stage Flash distillers which produce distilled water from sea water, was built in the 1970s.
It is equipped with pumps from Weir, a company who has shifted its business to other types of machinery and who, therefore, cannot give support to the Customer for its CDM project.
The almost 30-year old vertical pumps supporting the main services, i.e. the pumping of the sea water and the recycling of the brine (i.e. the sea water which has gone through a cycle of desalination) into the circuit, have reached the limit of their operating life with regards to both quality of materials and energy consumption.
Their substitution with new machines would entail excessive changes and, in all cases, would not result feasible for DUBAL from a financial point of view.
Hence the idea to search the market for another pump manufacturer able to substitute the key components of the machines (such as the impeller and pump casing), leaving the others unchanged (for example shaft, sleeves, discharge column).
This way, it is indeed possible to give a “new life” to the pumps (yet respecting the existing physical and functional interfaces) and to reduce their operating costs as well as maximize the energy saving / investment ratio.
In conclusion, such project allows to reach two objectives: energy saving through the increase of the efficiency of the modified pumps and credit generation through the CDM mechanisim.
DUBAL performed a preliminary study which allowed to indentify the characteristics the new pumps should have in order to obtain an 8 to 10% energy consumption reduction.
This rather high target restricted the participants to the final assignment of the bid to a few specialized international companies, amongst which Termomeccanica Pompe (TM.P).
TM.P. , using its own R & D resources, performed a extensive engineering study and proposed two high-tech solutions for the sea water pump and the brine recycle pump. All the latest technical developments were used to optimize the hydraulics of the pumps, maintaining the existing interfaces as well as the existing materials as per DUBAL’s request.
Thanks to these specific characteristics, the expected energy savings for the TMP machines offered resulted higher than the ones requested.
All this combined with the subsequent credit generated by the carbon dioxide emissions reduction will result for DUBAL in more than 5 million USD of savings over the next 6 years, equivalent to almost 3 times its initial investment.
This is why the Termomeccanica Pompe project won over the competition.
TM.P. is in charge of the design, manufacturing, installation and on-site testing of the modified pumps.
In order to carry out such tasks, the company will employ for the next two years resources from both its Italian head office and its Sharjah branch office.
The project was launched last November, starting with the on-site survey of the existing machines and interfaces.

Reaching for Excellence (A.R.D.E.) Project - Year 2011

The customary plenary meeting of the company was held last December 2nd.
On this occasion, the Competence Teams, the groups “guarding” the five company competences, were once again the leading protagonists.
Indeed, the A.R.D.E. project’s Leading Committee established a “**Competence Team Award**”, based on the activities performed as well as the results obtained by the various Competence Teams.
This year, the **Foreseeing & Solving Problems and Initiative** Competence Teams jointly won the award.
Both Teams received a commemorative plaque and a voucher for a group dinner in a local restaurant.
The end of the year 2011 marks the end of the start-up phase of the Competence Teams as well as the beginning of the consolidation phase of their work.

In January 2012, a calendar of all the events, activities and initiatives to be organized by the Teams during the course of the year (and open to all employees for participation) will be prepared.
In addition to these now well-established activities, each Competence Team will focus on one or two new projects

The World Smallest Compressor is Termomeccanica’s

Termomeccanica Compressori officially presented to the public **its new SCA 14 GAS compressor, in compliance with the API619 standard,** during the fairs dedicated to the renewable energies applications, namely **Ecomondo & KeyEnergy** which were held in Rimini last November (9th to 12th).
The SCA14 GAS is the smallest compressor in the world in compliance with the strict standard mentioned above.
The API619 standard’s objective is to delineate a guideline for the design, manufacturing and testing of machines that must be able to operate in environments in which safety and reliability are non-negotiable values, such as refineries, process plants with explosive atmospheres, offshore platforms, extraction wells and mines with residual gases.
The SCA14 GAS compressor is equipped with a device for the variation of the compression ratio as well as with last generation mechanical seals, developed in collaboration with local La Spezia companies.
The compression ratio variation device works in such a way so as to optimize the SCA14 GAS performances according to the various suction and discharge pressures.
The Vi variation is discrete type and is achieved through 4 piston valves which can be open or closed manually from the exterior, on the side of the discharge pressure cover (i.e. without dismantling the machine).
The compressor is also available in standard versions, with only the compression ratio variation device and non-compliant with the API standards, for generic applications and uses differing from the ones above mentioned.
Likewise, the type of mechanical seal can be selected from a wide range of widespread standard market solutions.

Here are a few of the distinctive characteristics of the SCA14 GAS:
- Maximum Power: 110 kW (147 HP)
- Maximum Flow rate: 36 Nm³/min (1935 MSCFD)
- Minimum Suction Pressure (no load): -0,7 barg (20"Hg)
- Maximum Suction Pressure: 3,5 barg (50 psig)
- Minimum Discharge Pressure: 1 barg (15 psig)
- Maximum Discharge Pressure: 24 barg (350 psig)
- Conducting Rotor Minimum Speed : 2000 rpm
- Conducting Rotor Maximum Speed : 6500 rpm

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