

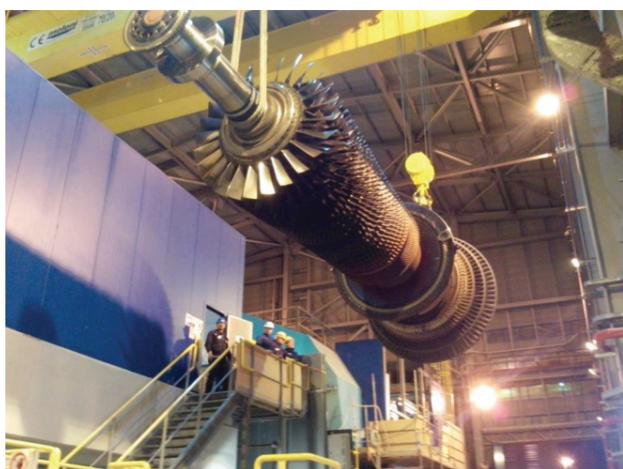
TMPnews

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Termomeccanica Service Sud General overhaul of the gas turbine of Gissi thermoelectric power plant

From 11 November to 13 December 2014, TM.P. Termomeccanica Service Sud Srl carried out the general overhaul of the gas turbine installed in the Gissi (CH) thermoelectric power plant owned by Abruzzo Energia - A2A.



Handling of gas turbine rotor after disassembly

The general overhaul of the gas turbine was performed using the LEAN method studied by Alstom Power; this new method provides for a reduction in maintenance time from 30 to 22 calendar days (commissioning excluded). It was the first maintenance carried out with this method in Italy and in Europe and the third in the world. The participation in this Alstom pilot project was therefore of particular importance for the Service Department of the Termomeccanica Pompe Group.

The machine, an Alstom Power GT26B2.2 with 280 MW rated power, is coupled on the same shaft (Single Shaft System (SSS)) to a moto/generator and a steam turbine (the latter through a Clutch of the SSS) in a common power train of nearly 400 MW.

The result of this coupling is a responsiveness that allows the machine to reach maximum load in just half an hour, with rise times that only very few other machines can obtain.

Moreover, the double-stage gas combustion allows this turbine to vary the load according to demand.

In detail, the activities provided for this overhaul included the following:

- Gas turbine: complete disassembly, replacement of worn parts, reassembly and (hot and cold) commissioning
- Steam turbine: overhaul of operating valves, clutch and pads
- Generator: overhaul of bearings, emptying and control of coolants

During the maintenance of the machines, the following faults were also found:

- Damage to the clutch of the steam turbine
- Considerable misalignment of the steam turbine clutch with the generator

It was therefore necessary to carry out further work such as the realignment of the alternator-rotor-stator

train, the dismantling and reassembly of the last blading stage for rotor fir tree anchoring inspection and the replacement of the steam turbine clutch.

To carry out this overhaul, a special yard within the Gissi site was set up, with containers (warehouse, office, and other facilities) and numerous material handling machines and means of transport.

A considerable amount of staff was involved in this work and a peak of 108 Termomeccanica mechanics working double shifts on the three machines was reached.

The work on the gas turbine was completed one day earlier than the detailed plan, allowing the French-Swiss manufacturer to add another piece to the implementation of its LEAN technique and allowing the end customer to reduce downtime, increase production and therefore the sale of energy on the free market.



Termomeccanica operators and Alstom supervisors involved in the extraction of the SSS clutch

At School in Termomeccanica Pompe

The Termomeccanica Group, and TM.P. S.p.A. Termomeccanica Pompe in particular, have been cooperating for years with various secondary education establishments with a technical/industrial orientation and with the main training centres in the province to offer a first experience of the world of work to young students that are finishing their training.

The company declared its availability for the school-work programme, a teaching method that allows students to perform part of their training, usually between two and three consecutive weeks, in a company. Because students come straight from school, the production environment is seen as a "learning place", with the objective of giving students a first and real, even if brief, practical experience.

At the moment, four students are in the company, attending a three-years course to become mechanical operators, organized by a training group in the province of La Spezia; moreover, a similar experience has just finished for two other students from a Technical Vocational School focused on maintenance and technical assistance.

The students work in the workshop in the assembly, testing and machine tool departments.

Apart from being an opportunity for the young students that can understand how work in the various departments is performed and what sectors they are most interested in, this training is an opportunity for the company that can get to "know" new young workers, some of whom might be selected at the end of their studies to follow longer training experiences.

PLM Windchill – Live!

In the first days of 2015 Windchill, the PLM system by PTC entered production in Termomeccanica Pompe.

PLM is the acronym for Product Lifecycle Management and stands for a system capable of controlling and managing the entire product life cycle, starting from design down to delivery to the customer and after-sales service, improving the information flow within the company and making co-operation between the resources involved in the processes easier.

For many months, the implementation of the system involved a team consisting of resources from different departments of the company and ended in December-January with the training phase.

All employees involved right from the start in using the system attended training; about 80 people were trained, from both the La Spezia and Bucharest plants; over 20 sessions dedicated to the various company departments were organized and were more or less specialized according to the users' levels and requirements.

Among the most important innovations connected to the introduction of the new system:

- **Product classification system:** a classification tree of the products and components used by Termomeccanica Pompe was developed, based on physical and technological attributes, that will make possible the streamlining and capitalization of the company's know-how as well as the quick and precise identification and recovery of product information
- **Computerization of product development processes:** all the main development and control processes of product documentation were mapped and computerized in order to guarantee the company's full control of the progress of projects and the planning of the continuous improvement of performances



Desalination - an already "mainstream" sustainable source of drinking water

Lack of water is a topical theme: the growth in population and the improvement in the standards of life have been the cause for centuries.

Today's estimate is that the demand for water for civil use is growing 3% a year on average; this means that in some particularly arid areas this growth touches 15% a year.

The solution adopted is often the desalination and treatment of water with high salt content, be it sea or underground water.

Some trends noticed in the desalination sector internationally are listed below.

In some regions desalination is a critical component for life and the economy. In the Gulf, for instance, desalination supplies today 90% of drinking water and is the only new sustainable source of drinking water.

Nowadays though, desalination is a solution to the problems connected with water that goes far beyond the traditional arid areas of the Middle East and North Africa. In fact, desalination has become an integral part of the mainstream management of water resources.

Consequently, growing attention is paid to themes such as energy consumption and environmental impact in this sector, driving their technological development.

Energy consumption reduction in current technologies (MSF - MED - SWRO)

The constant efforts to cut down on the energy-related footprint of desalination technologies have caused a market shift towards SWRO and MED technologies.

SWRO (Seawater Reverse Osmosis)

The current dominance of the SWRO technology in the sector is connected to its energy efficiency, traditionally better than thermal technologies.

Moreover, in the last 10 years, new technological developments in components have contributed to a continuous improvement in terms of reliability and energy consumption of the SWRO plants. Energy consumption has effectively fallen to levels approaching 4-5 kWh per cubic meter, thanks to the use of more sophisticated energy recovery devices and the development of membranes capable of operating with higher recovery rates and better flows.



Al Taweelah thermal desalination plant (UAE)

Thermal technologies (MED - MSF)

MSF (Multi-stage Flash) and MED (Multi-effect Distillation) technologies are traditionally less efficient at energy level than the SWRO technology, and between MSF and MED, the latter has higher energy efficiency. MED technology was excluded from large-scale projects for many years but this is changing thanks to the serious technological push of the market towards the increase in the performance ratio of distillation units. In fact, 10 years ago a distillation unit could produce 7kg of distilled water per kg of steam, while today the trend is towards 9-10kg. To be stressed is also the fact that, in some cogeneration configurations, MED technology can prove to be more efficient than SWRO technology not only with regards to O&M (Operations & Maintenance) costs but also to the whole energy impact.

Development of new renewable technologies

New very valid concepts are present on the market that might challenge the already established desalination technologies. They are called forward osmosis, membrane distillation, tri-hybrid applications and renewable desalination (also called solar desalination) that has recently seen a strong push in the Gulf region. The future of these new technologies will depend, however, on various factors among which the ability to create a platform of interest - involving researchers, investors and governments - and a legislation allowing their serious promotion.

Reduction in environmental impact

Planning a desalination project is a very delicate process, generally requiring between 3 and 8 years from the initial design stage to commissioning. This means that the possibility to increase the plant capacity must be taken into account right from the start. Moreover, the investment is amortized over 20 - 30 years (life span of the plant) therefore the decisions made today will affect the next generations.

First of all, quantifiable technical parameters such as energy costs, the costs of chemicals, steam and energy availability and level of O&M expenses must be taken into account, all parameters that, taking into consideration the speed in technological changes, can vary during the plant life span.

Non-quantifiable parameters of importance during the whole life of the plant, such as the level of environmental impact, must also be taken into account. The level of environmental impact shall be perceived differently during the long life of the plant and some solutions adopted today might be replaced by more advanced environmental solutions before the end of the plant life span.

The desalination industry is engaged in improving its environmental management and IDA, International Desalination Association, plays an important role in this sense. For instance, in 2009 IDA created a task force dedicated to environmental impact and at the end of 2010, the Association organized the first Environmental Symposium of the industry that contributed to defining a Blue Paper with a strategic roadmap to be followed for the environmental sustainability of desalination. To be noted the IDA Conference "New Horizons for Desalination" that will be held in Santa Margherita Ligure from 18 to 19 May. This event has the potential of playing a particular role for the Italian supply chain (EPC and component manufacturers), i.e. a support role in regaining the leadership position lost since the early 2000s in this sector that offers enormous potential. The charity aspect of the event must also be highlighted: its proceeds will be donated to finish two humanitarian projects connected with the need for water, the construction of wells in Madagascar and the purchase of water filtration systems for schools in Myanmar.

Santa Margherita
PORTOFINO, ITALY

ABOUT THE CONFERENCE

The International Desalination Association (IDA) invites you to participate in a two-day conference that is centered on the social responsibility we have towards future generations and the innovation to generate new environmentally friendly options to support water needs.

Topics will include:

- Advanced water treatment in new infrastructure markets (Mining, Energy, Oil and Gas)
- Development of desalination and water treatment technology that will enable implementation of renewable desalination and the pursuit of more sustainable options
- Improved responsiveness to water emergencies

In cooperation with Rotary Club La Spezia, part of the conference proceeds will be donated to a water-related humanitarian project.

For more information, visit www.idadesal.org
Email general inquiries to conferences@idadesal.org

The International Desalination Association (IDA) is the world's leading organization dedicated to the advancement of desalination technology and water reuse, and the foremost resource for news and information, education, and professional development for the global desalination industry.

New Horizons for Desalination

May 17, 2015
WELCOME RECEPTION

May 18 - 19, 2015
TWO DAY CONFERENCE

LOCATION:
Grand Hotel Miramare
Via Matte Ignoto 30,
16038 Santa Margherita, Portofino, Italy
+39 0185 287013
www.grandhotelmiramare.it/

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