



NARVAN ARRA
Committed to Environmental Issues



TM.P. S.p.A Termomeccanica Pompe





ARPA
OIL & GAS

100 years of Italian technology
100
1912-2012
Termomeccanica

100 years of Italian technology
100
1912-2012
Termomeccanica

Introduction



TM.P. S.p.A - Termomeccanica Pompe, a pump designer by tradition whose history dates back as far as 1912, ranks today amongst the leading international manufacturers and service providers of engineered centrifugal pumps solutions. Fields of applications range from Desalination Power Generation, Water Handling to Oil & Gas and Heavy Industry.

The entire Company revolves around developing and providing solutions tailored to Customers & End Users' projects requirements, whether they are related to products or after-sales services.

During the course of its century-long history, the Company has achieved a key position in the various reference markets it operates in and, today, Termomeccanica's pumps are running in major plants all over the world at full end-user's satisfaction, as numerous certificates can prove.

TMP Key Figures

Industrial Areas:

- Total Area: 77.400 m²
- Covered Area: 30.000 m²

Patents:

- 8 Patents registered since 2003

QSE Certification

- ISO 9001
- ISO 14001
- OHSAS 18001





NARVAN ARRA
OIL & GAS

Narvan Arra

Established in 1997, Narvan Arra's prime objective and the vision of its Managing Director Kamran Kavian, was to inspire a quality culture within Iran's industry and infrastructure. We are committed to offering systems and solutions from the most reliable and reputable sources for a vast coverage of industry sectors such as Hydro Power and Water Transmission, Oil & Gas, Petrochemical, Automotive, Steel, and Marine & Offshore to assist our clients achieve quality and long-term profitability in their overall pursuits. Narvan Arra is representing T.M.P. products to Iran.



Our Services

- Marketing and Sales
- Contractual and Commercial
- Project Management and Coordination
- Technical Services
- Training and Transfer of Technology
- Systems Engineering
- Maintenance and After Sales Support

Our Subsidiaries

Kemva Enterprises: (United Arab Emirates)
Commercial & Banking Facilities

Pars Narvan Arra Kish: (Kish Island - Iran)
Import & Export Facilities

Pars Sirang Kish Industrial Services: (PSK)
Import & Export Facilities



TM.P. S.p.A Termomeccanica Pompe



—● Termomeccanica Pompe - Business

Products & Services

- Engineered Centrifugal Pumps
- Process Pumps (API 610)
- Global Service

Fields of Application

- Power Generation
- Desalination
- Water Transmission
- Oil & Gas
- Heavy Industry





VARVAN ARRA
OIL & GAS

● Power Generation

Termomeccanica Pompe (TM.P.) has been designing and supplying engineered pumps for the Power Generation market since the 1950s, establishing itself as a referenced leading manufacturer in Italy.

Over recent years, Termomeccanica Pompe has devoted most of its energy to product innovation and technological improvement. Today, the company designs and supplies UNI EN ISO 9001 pumps for all major services for any type of Power Plant, including Condenser Circulating, Boiler Feed Water, Booster Circulating Water, Condensate Extraction and Closed Circuit Service pumps.

The experience acquired worldwide and the necessity to compete in a more and more demanding market have led to the constant improvement of TM.P.'s products and, as a result, the centrifugal pumps designed and manufactured by Termomeccanica Pompe are presently running in several major plants, both in Italy and around the world, at full end-users' satisfaction.



Thermal Power Plant

- HP Boiler Feed
- LP Boiler Feed
- Condensate Extraction
- Circulating Cooling
- Closed Circuit Cooling



Combined Cycle Power Plant

- Boiler Feed Water
- Closed Circuit Cooling Water
- Circulating Cooling Water
- Condensate Extraction
- General Services



Geothermal Power Plant

- Condensate Extraction
- Closed Circuit Cooling



TM.P. S.p.A Termomeccanica Pompe

Transfer of Technology & Co-Manufacturing in Iran

Termomeccanica Pompe (TM.P.) has been a pioneer in the field of Technology Transfer to an Iranian pump manufacturer, for the local manufacturing of high-capacity, Horizontal Axially-Split Pumps and Recovery Hydro Turbines, for applications in the Power Generation Market.

In 2004, TM.P. signed an agreement with PETCO, the Iranian pump manufacturer for MAPNA Projects for the supply of 34 Circulating Water Pumps, Hydro Turbines and



Electric Motors for 17 Combined Cycle Power Plants in Iran. This cooperation which involved all managerial and production levels of the two companies has resulted in complete satisfaction and allowed the two companies to gain unparalleled experience in the field of Technology Transfer, which can be usefully applied to other types of pumps and services.

TM.P. Power Generation Work History				
Type of Plant	Services	Flow Rate (m ³ /h)	Head (mwc)	Biggest Power per Unit
Steam Power Plant	CCWP	54,000	43	660 MW
	BFP	2,350	3,850	
	CEP	900	350	
Combined Cycle Power Plant	CCWP	25,000	37	380 MW
	BFP	380	2,100	
	CEP	1,100	250	
Geothermal Power Plant	CCWP	10,000	25	60 MW
	CEP	11,000	35	

CCWP: Condenser Circulating Water Pump

BFW: Boiler Feed Water Pump

CEP: Condensate Extraction Pump

TM.P. Experience in Iran

In particular, with regards to the Iranian Power Generation market, TM.P. has been present since the early 80s, supplying through EPC Contractors important pumps in the Power Plants of Bandar Abbas, Esfahan and Dombey.

In the early 2000s, TM.P. decided to enter the market directly, firmly believing in the opportunity it offered and aware of being in a position to provide a product in line with the most qualified international competition.

Within the frame of this policy, Termomeccanica Pompe, collaborating with major Iranian Contractors like MAPNA and technology transfer to PETCO, has been providing dozens of huge-capacity pumps to several Power Generation Projects such as Yazd, Kazeroun, Damavand, Sanandaj, Yazd Solar and Jahrom.



TM.P. Visiting MAPNA's Facilities in Iran

TM.P.'s references include Circulation Water Pumps and Hydro Turbines supplied to MAPNA for Syrian Tisheerir and Jandar CCPP.

 MAPNA CONTRACTS			
Contract	Description	Plant	Note
22-0807-BA/TF- 21.04.2004	No. 34 Pumps, Hydro Turbine & Motors	Yazd Kazeroun, II & III Damavand I to VI Sanandaj I & II Shiravan I & II Jarom I, II & III	Consortium With PETCO Transfer of Technology
2204.391- 18.05.2008	No. 4 Pumps, Hydro Turbine & Motors	Yazd Solar Shirvan III	Consortium With PETCO
2204.5- 15.06.2008	No. 2 Pumps, Hydro Turbine & Motors	Tishreen (Syria)	
2200/1734- 16.08.2010	No. 2 Pumps, Hydro Turbine & Motors No. 2 Condensate Booster Pumps & Motors	Jandar (Syria)	
2200/1734- 16.08.2010	No. 8 Pumps, Hydro Turbine & Motors	Damavand or Sanandaj II Jahrom I Islam Abad Yazd Farab	

● Oil & Gas

TM.P.'s production of centrifugal pumps for the Petrochemical and Oil & Gas Industries has always represented an important share of Termomeccanica's Pompe business and, through the years, the company has built a remarkable reputation in such fields.

Important resources have recently been deployed to renew and enhance the production program of the company, including latest innovative studies carried out by the R&D Department that allow today Termomeccanica Pompe to supply a wide range of API 610 centrifugal pumps for the most demanding services including oil pipelines, liquified natural gas, on-shore and off-shore water injection.

In Iran, TM.P. has been involved in major oil & gas projects, having acquired prestigious references in water injection and process services.





VARVANARRA
OIL & GAS

● Desalination & Water Transmission

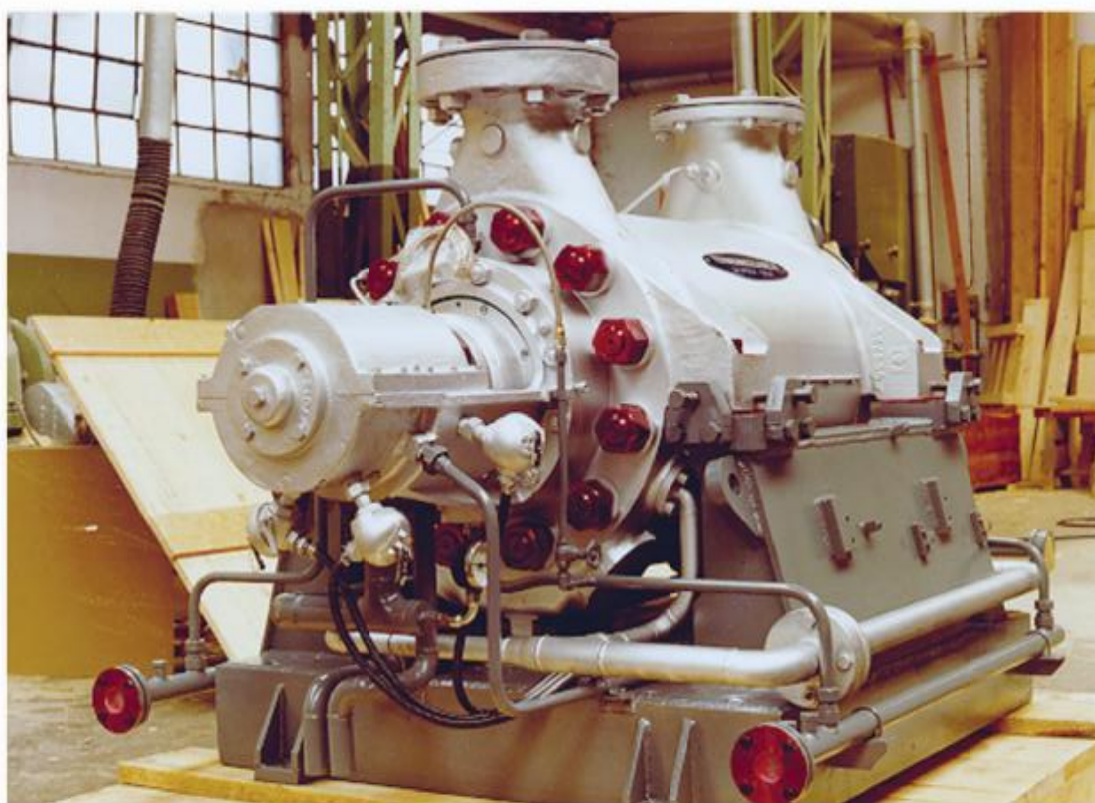
In the early '70s, Termomeccanica entered into the desalination market, designing and manufacturing pumps for both Sea Water and Process services. Having installed pumps in major plants in the Middle East and Gulf Area, TM.P. has acquired a leading position in this field.

Today, TM.P. is amongst the leading manufacturers of desalination pumps in the world – in a position to offer products and services, meeting the toughest technical requirements and exceeding customer satisfaction. TM.P. is proud to have completed engineering design, manufacturing and installation for the Konarak (1987) and Parsi Desalination (2009) plants in Iran.



● Heavy Industry

The Company started building a strong presence in the industrial market in the 1960s, supplying pumps designed to meet the most demanding performance and environmental requirements. TM.P. has supplied thousands of pumps for many types of plants, in Steel Industries, Paper Mills, Sugar Factories, etc.



High pressure multistage barrel type discalling pump at Mobarakeh Steel Company
Capacity: 429 m³/h
Head: 2367m

TM.P. has developed a strong presence in the Iranian Steel Industry since 1979, having supplied more than 300 pumps to the major steel plants such as Mobarakeh Steel Company, including high pressure multistage barrel type discalling pumps.

Reliability & Support

Manufacturing reliable products has always been at the core of TM.P.'s practice. TM.P. believes in the success of its customers through quality products it provides to them. All TM.P. products go under stringent scrutiny at all stages of purchasing, designing, manufacturing, production, and testing to assure high quality standards and ensure customers' requirements are fully met.

Quality

TM.P. has a specialized AP production line for manufacturing heavy-duty overhung centrifugal pumps that fully complies with the requirements of the ANSI/API Standard 610 10th edition (ISO 13709). In addition, TM.P. already Certified ISO 9001: 2008 and ISO 14001: 2004, has recently implemented a Safety Management System (SMS) integrated with the Environment Management System (EMS). Thus, obtaining in July 2011 the OHSAS 18001: 2007 certification. All three certificates have been obtained from Lloyd's Register Quality Assurance.



TM.P. Research & Development and Test Center

TM.P. allocates significant resources to continuously enhance its production program. Through the latest innovative studies carried out by its R&D Department, and the implementation of effective quality procedures and advanced process technologies, TM.P. is able to meet the most stringent market requirements.

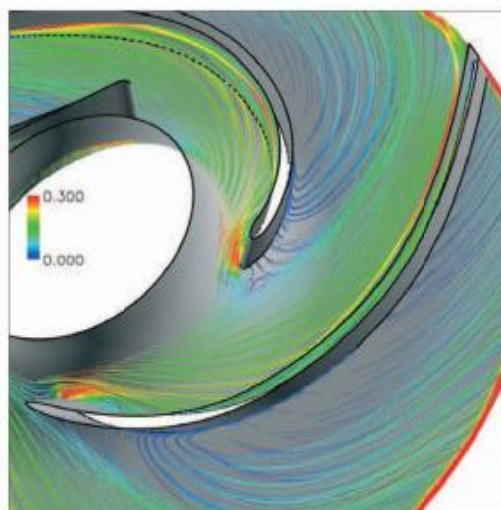
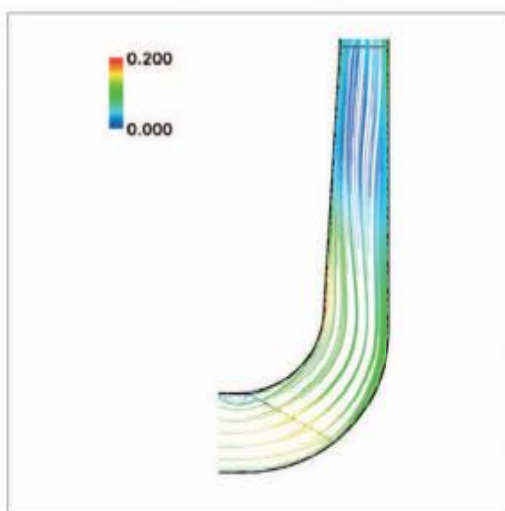
TM.P. uses extensive 3D modelling, FEM analysis, and CFD calculations on its production in order to reach the highest efficiency over a wide range of capacities and to keep the suction specific speed within proper limits against flow recirculation and cavitation, and to avoid vane passing-frequency vibration.

TM.P. Test center covers an area of more than 4000 m². This center is equipped with 6 test loops and is capable of testing pumps with capacities of up to 65,000 m³/hr, powers of up to 12 MW, and temperatures of up to 350°C.

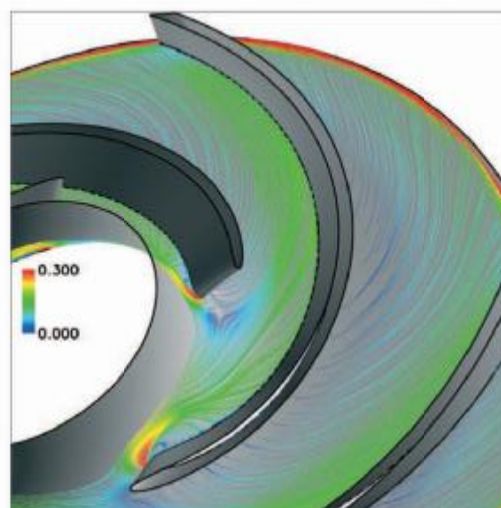
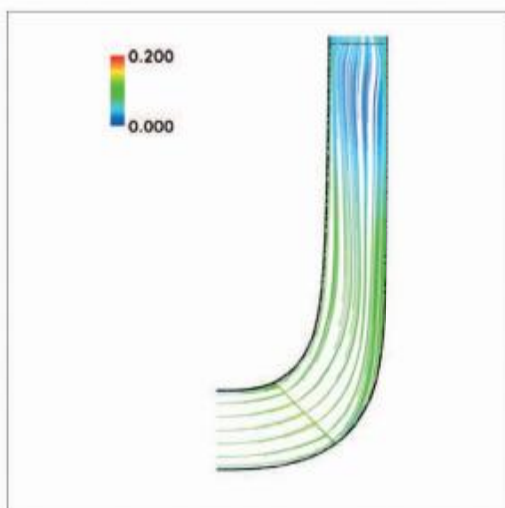
Meridional Channel

Blade-To-Blade

Original



Optimized



CFD Calculation of impeller

Service Division

Mission

The mission of Termomeccanica Pompe's Service Division is to offer a complete portfolio of services to its worldwide Customers & End-Users, covering any need that may arise during a plant's entire life cycle.

TM.P.'s Service Activities & Service Companies

Service Activities Portfolio

- Supply of rotating machines
- Supply of spare parts
- Maintenance, overhaul & repairs
- Rehabilitation (upgrading & refitting)
- Plant Shutdown global service
- Reverse engineering
- Technical assistance & other field services
- Installation, start up and commissioning
- Local and remote monitoring & diagnostics
- Personnel training & plant management

Network of Service Companies

Termomeccanica Pompe has been following for over 10 years a policy of local presence aimed at optimising its customers relationship management, and more specifically, at improving the responsiveness of the services offered.

Termomeccanica Pompe's Service Organization has therefore been establishing a local network of Service Companies in key geographical areas with high density of installed products and/or job opportunities, namely:

- TM.P. Termomeccanica Service Sud S.r.l. (Taranto – Italy)
- S.C. TM.P. Termomeccanica Romania S.r.l. (Bucharest – Romania)
- Termomeccanica Saudia Ltd. (Riyadh – Al Jubail - Saudi Arabia)
- TM.P. S.p.A Termomeccanica Pompe – U.A.E Branch (Sharjah – U.A.E.)





TM.P. S.p.A Termomeccanica Pompe



NARVAN ARRA

Narvan Arra

6th Floor, Sayeh Tower, Vally Asr Ave.
Tehran, Iran, Postal Code 1967713679
Tel: + 98 21 22043410
Fax: + 98 21 22058473
Email: info@narvanarra.com



NARVAN ARRA
Committed to Environmental Issues

TM.P. S.p.A Termomeccanica Pompe

Via del Molo, 3
19126 La Spezia
Tel: +39 0187 552.1
Fax: +39 0187 552.506
e-mail: pumps@termomeccanica.com



Narvan Arra

9th Floor, Sayeh Tower
Vally Asr Ave., Tehran, Iran
Post Code: 1967713679
Head Office: +98 (0) 21-2204 3410
Oil & Gas: +98 (0) 21-2201 9809
Fax: +98 (0) 21-2201 9810



NARVAN ARRA
Committed to Environmental Issues