









**MAPNA**  
MAPNA STS CO.

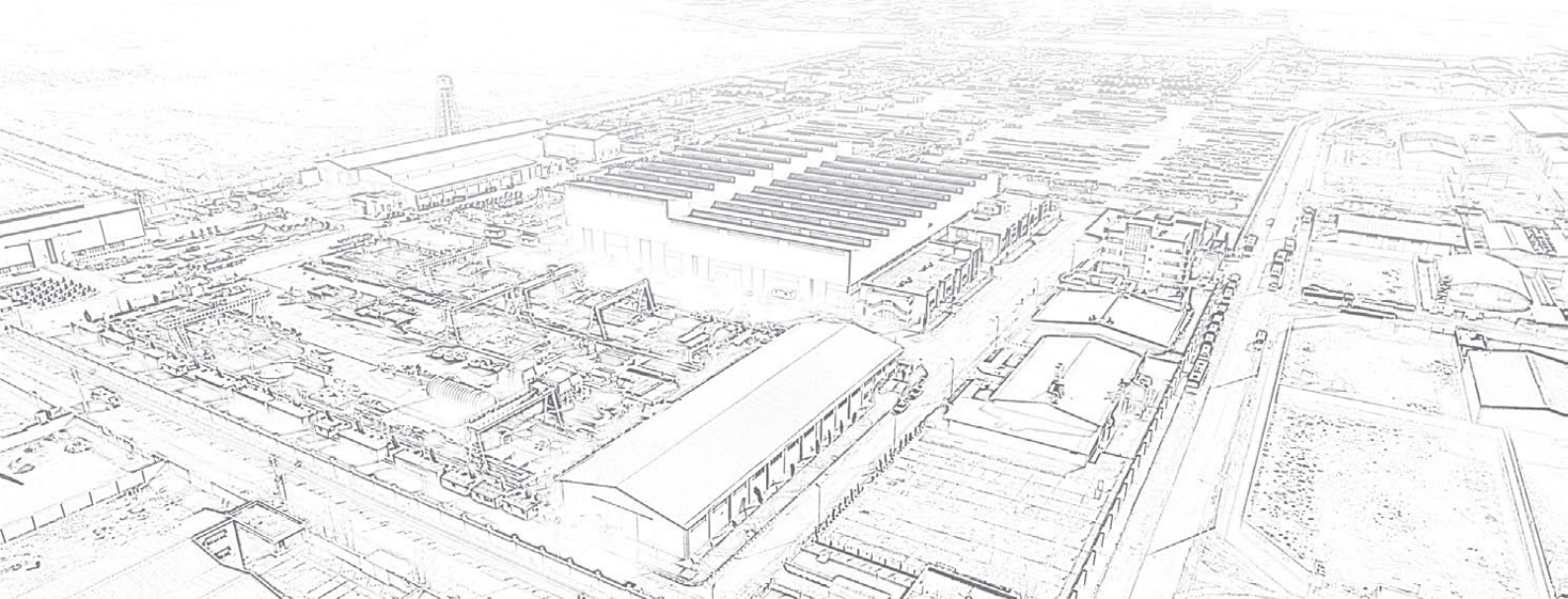
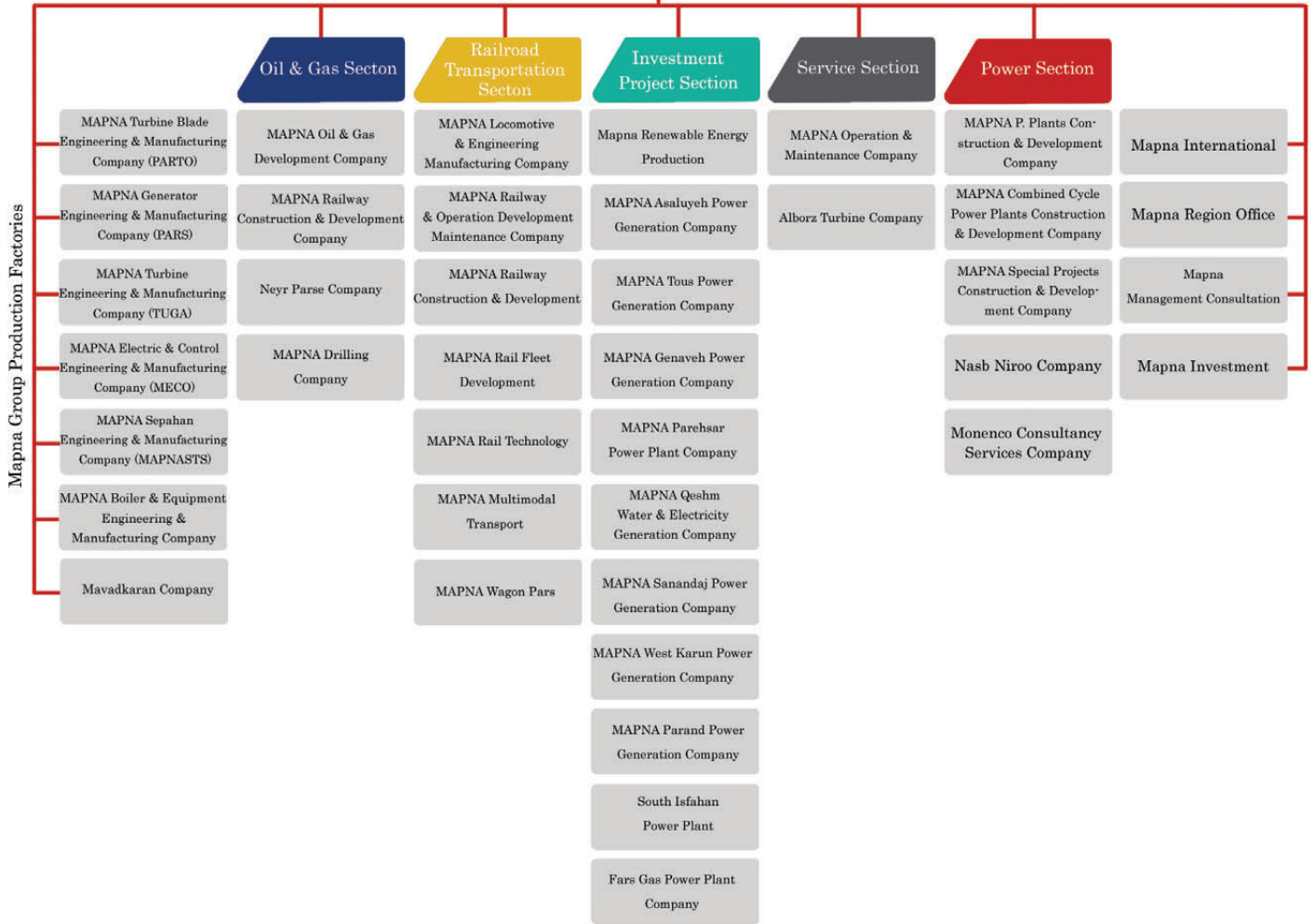


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# MAPNA Group

## Top Chart







# MAPNA SEPAHAN

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## COMPANY INTRODUCTION

SEPAHAN MAPNA Engineering Equipment and Manufacturing Company is one of the largest companies in the country, which started its activity in 1996 in Isfahan province by manufacturing various industrial in equipment and metal structure in the cement and steel industries.

Sepahan Mapana engineering and equipment manufacturing company entered the field of power plant equipment manufacturing in 2001 using the technology of international such as ANSALDO and SIEMENS.

The presence of this company in the center and cradle of industry (Isfahan) and the use of specialized and personnel, has led to successful implementation of large projects of power plants, oil and gas, renewable energy, etc...

Sepahan Mapna Company currently operates on a land with an area of 350,000 square meters and employs more than 700 well-qualified and professional labor in the form of operational and support departments in the stages of studies, recruitment, and planning and commitment management.

Establishment of Research and Development Department of Sepahan Mapna Company in Isfahan Science and Technology Park, in addition to strengthening the knowledge-based infrastructure, has provided a suitable platform for the development of industry-university relations. In this regard, Sepahan Mapna Company was awarded the rank of knowledge-based in 2017.

### Range of products and services:

- Design, supply and repair of various power plant equipment
- Supply and construction of outdoor and hot shells for gas and steam turbines
- Supply and repair of hot air equipment for various types of gas turbines
- Design, supply constellation and cooling system for combined cycle power plants
- Design, supply and repair of various types of thermal sweeteners
- Design, supply and construction of wind turbine tower in different capacities
- Supply and manufacture of equipment for steel and mining industries such as lime production furnaces
- Design and supply of pressure vessels with different capacities
- Design and supply of fire tube auxiliary boilers
- Design and supply of firefighting packages and fire alarm and extinguishing system
- Design, supply and installation of ZLD system in the field of water and wastewater treatment
- Providing a variety of services in the technical and engineering support of the providing engineering solutions
- Providing services for supply materials and spare parts in the field of power plant ancillary equipment
- Providing heat treatment and annealing services equipment



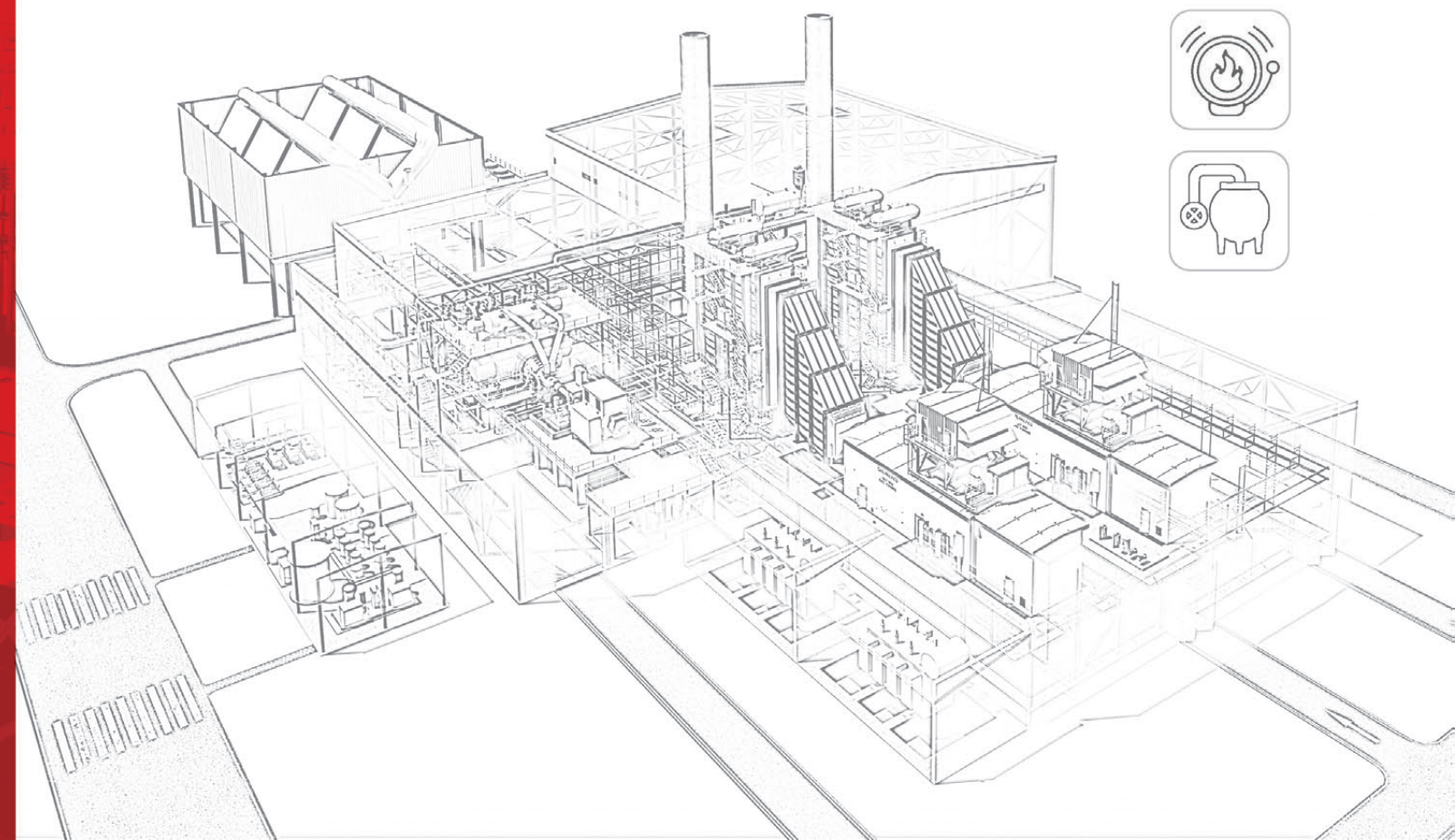


• A country's overall economic development and its level of industrialization and progress can well be gauged by the growth and progress of core sectors including power industry.

# THERMAL POWER PLANTS

• **Reliable, eco-friendly energy systems**

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**THERMAL POWER PLANTS**

The electricity industry is of special importance as the main platform for sustainable development. Self-sufficiency in this field is considered as one of the growth factors of countries. Mapna Group is considered as one of the major companies in Iran and neighboring region as one of the centers for the development of the electricity and energy industry.

Design, construction and operation of thermal power plants are among the main missions of Mapna Group. Mapna Group's dominance on value chain of thermal power plants in most holding companies is one of the significant competitive advantages in providing power plant services.

As a reliable and superior supplier, Sepahan Mapna is responsible for supplying various types of equipment for gas, steam and combined cycle thermal power plants in this chain. Ability, expertise and sophisticated technology in engineering, supply and manufacturing of these parts, has put Sepahan Mapna among few companies supplying ancillary equipment in the region.

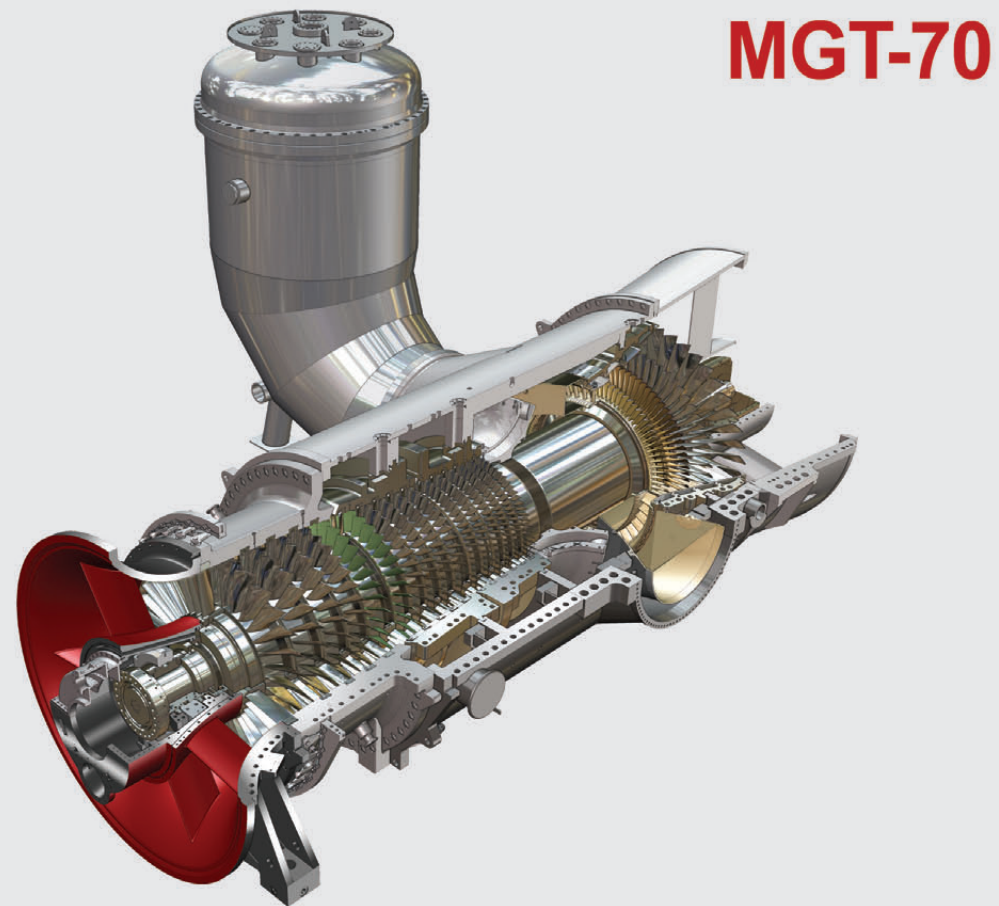
**GAS POWER PLANT**

Gas turbines consist of three main components : compressor, combustion chamber and turbine. The fuels used in this turbine are liquid fuels or natural gas.

In Mapna Group, various types of turbine classes with the names of MGT-30, MGT-40, MGT-70, MGT-75, MGT-80 have been designed, produced, installed and operated.

Class E gas turbines from the family called V94.2 are manufactured by Mapna Company under the brand name MGT-70 in versions 1 to 3 are being used in many gas power plants. Upgrading this model of turbine by Mapna Group has resulted in the production of 185 MW in MGT-70(3) model.

At present, Sepahan Mapna is the manufacturer of equipment for various types of gas power plants of Mapna Group.



**MGT-70**



**AIR INTAKE SYSTEM :**

This equipment weighing 23 tons is responsible for supplying the air required for the combustion chamber of the turbine. After passing through this system, the ambient air is directed to the compressor after filtration, so that after compression and reaching a certain temperature, it is ready for consumption in the turbine combustion chamber. Due to the importance of this section in the performance and efficiency of the turbine, the design and construction of this complex is highly sensitive.



**EXHAUST SYSTEM**

Turbine exhaust gases are emitted through this system. This metal structure weighs approximately 210 tons and consists of several major parts. The whole structure consists of two outer and inner layers and fire-proof insulation between them. The outer layer is made of low carbon steel and the inner surface liner sheets are made of stainless steel. Exhaust system consists of various components that have a relatively complex technology in the field of construction and dimensional control.





**Gas turbine casing**



**CENTER CASING**

This is the main shell of turbine, which covers the compressor and turbine itself. The weight of this low carbon steel equipment is about 42 tons. Due to the special technology, Mapna STS is the only manufacture of this product in the region.

**EXHAUST CASING**

This part weighs about 30 tons and is located at the end of the steam turbine. The steam coming out of the turbine is smoothed through this part and moves towards the condenser. Due to the complex dimensions and geometry of this equipment, a complex manufacturing, welding and machining process is performed on it.



**Hot gas path of gas turbine equipment**



**HOT GAS INNER CASING**

The hot gas from the combustion is directed to the turbine through this complex. The operating temperature of this part is close to 1200 degrees Celsius. Due to the high temperature of this part, it is made of a kind of super alloy. The total weight of the complex is 3.5 tons and due to its special and complex geometric shape, its construction and production requires high technology, for which we are one of the few reputable manufacturers in the world.

**GAS DIFFUSER**

The exhaust gas reaches the exhaust through gas diffuser, in which, the static pressure increases and the speed decreases. The weight of this equipment is 7 tons and its material is stainless steel.



**COMBUSTION CHAMBER**

This 15 ton equipment is to direct compressed air to the burner and mix it with gas or diesel fuel and perform combustion operations in this chamber. The operating temperature of this chamber is 1200 degrees Celsius. In order to withstand the temperature of the part, a kind of super alloy is used in its construction.





### ▲ FIN FAN COOLER

The turbine and generator heat up during operation and need to be cooled, so the air conditioner system, with the help of circulating water fluid, reduces the temperature of the cooling fluid, which is used as an accessory of the main equipment of the gas power plant. The weight of this system without tube bundles is 23 tons.

### ▲ ENCLOSURE & NOISE PROTECTION

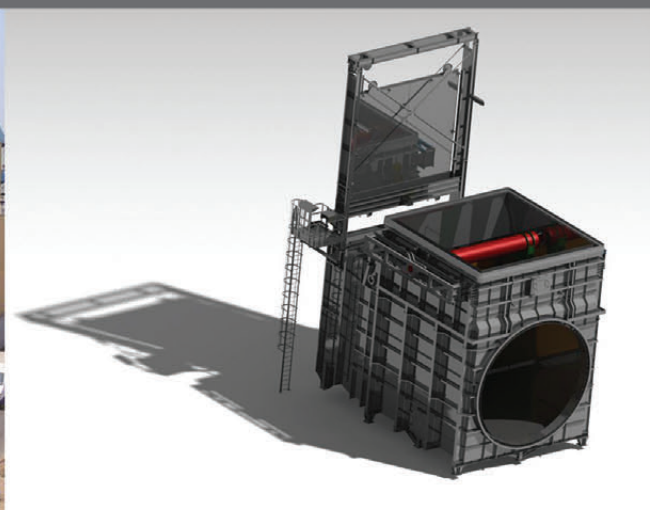
Due to the noise generated by the operation of the turbine and generator in the turbine hall, this system is used in order to reduce the volume to the threshold of human hearing. The structure consists of three main parts, the container is double-walled and a special insulation is used between the two walls to resist sound. The outer wall type is low carbon steel and the material of the ducts is stainless steel. The total weight of the set is 32 tons

### ▼ DIVERTER DAMPER

Improving the efficiency of the country's power plants by converting gas units into a combined cycle is one of the main strategies of the country in the energy sector. In combined cycle power plants, due to the possibility of reusing the heat output from the gas turbine using a heat recovery boiler (HRSG) and a steam power plant unit, the fuel efficiency of the power plant increases. The equipment of the rotary damper system in combined cycle power plants is of great importance as the common chapter of gas and steam units. The rotary damper equipment is composed of various and complex components that all these sensitive and high-tech parts are provided by Sepahan Mapna Company.

#### Equipment performance :

- Transferring of turbine exhaust smoke to boiler or exhaust (outdoor)
- Directing the exhaust gas flow to the boiler or bypass stack
- Adjusting the exhaust gas flow to the boiler during start up and run back of the boiler
- Preventing hot gas from leaking into the HRSG space or towards the bypass chimney



### STEAM POWER PLANT:

In steam power plants, which generally have a high power generation capacity, thermal fuels are used to produce steam by the boiler.

This steam is used to move the turbine blades and the generator rotor. In these power plants, dry and wet cooling system is used to cool the water resulting from the condensation of steam output from the steam turbine.

In Mapna Group, various types of steam turbine classes with the brand names MST-10C, MST-70, MST-50C have been designed and produced.

Sepahan Mapna supplies most of the fixed equipment and metal structures of the steam power plant. The transfer of technical knowledge and technology of manufacturing these parts under the supervision of the German company Siemens, along with the knowledge, experience and specialized workforce of this company, has made us one of the few manufacturers of steam turbine parts.

### EXHAUST CASING

This part weighs about 30 tons and is located at the end of the steam turbine. The steam coming out of the turbine is smoothed through this part and moves towards the condenser. Due to the complex dimensions and geometry of this equipment, a complex manufacturing, welding and machining process is performed on it.



### ◀ TRANSITION PIECE OF STEAM TURBINE (T-Piece)

This part is used to direct the output steam from the steam turbine to the condenser. The weight of this set is 95 tons and its material is low carbon steel.

### Part of power plant projects:

- |   |                                      |                                   |
|---|--------------------------------------|-----------------------------------|
| - PARAND Combined cycle power plant                 | - SHIRVAN Combined cycle power plant | - ASALUYEH Gas power plant        |
| - YAZD Combined cycle power plant                   | - PARESAR Combined cycle power plant | - SOUTH ISFAHAN Power Plant (BOT) |
| - Centralized South Pars Combined Cycle Power Plant | - KERMAN Combined cycle power plant  | - YAZD Solar Thermal Power Plant  |
| - KAHNOUJ Combined cycle power plant                | - ARDABIL Gas power plant            | - HEIDARIEH (Najaf) Power Plant   |
| - ARDESTAN Combined cycle power plant               | - UROMIA Gas power plant             | - KERMANSHAH ZAGROS power plant   |
| - JAHROM Combined cycle power plant                 | - AL SADR (IRAQ) Gas power plant     | - SOUTH ISFAHAN Gas power plant   |
| - DAMAVAND Combined cycle power plant               | - TOUS Gas power plant               | - KAZEROUN Gas power plant        |
| - SOLTANIYEH Gas power plant                        | - KHORRAMSHAHR Gas power plant       | - KASHAN Gas power plant          |
| - SEMNAN Gas power plant                            | - SANANDAJ Gas power plant           | - CHABAHAR Gas power plant        |
| - FERDOWSI Gas power plant                          | - SHAHROUD Gas power plant           |                                   |
| - GHAYEN Gas power plant                            | - FARS Gas power plant               |                                   |





# TURBO COMPRESSOR

GAS TRANSMISSION PROJECT

Turbo-Compressors are used in gas pressure boosting stations and consist of two main parts, turbine and compressor. The main task of the turbo-compressor is to move the compressor to compress a substance with a gaseous state. Air Intake system, gas exhaust system, gas volute exhaust equipment, gas fuel system and firefighting system are among turbo-compressor equipment that are supplied and manufactured by Sepahan Mapna.

## - Air intake system

This equipment weighing 23 tons is responsible for supplying the air required for the combustion chamber of the turbine. After passing through this system, the ambient air is directed to the compressor after filtration, so that after compression and reaching a certain temperature, it is ready for consumption in the turbine combustion chamber. Due to the importance of this section in the performance and efficiency of the turbine, the design and construction of this complex is highly sensitive.

## - Exhaust system

The main task of this equipment is to transfer the turbine exhaust gases to a height higher than the turbo-compressor and release it into the atmosphere. The turbine exhaust gases have a temperature of at least 400° C, which decreases along this path and finally enters the atmosphere at a temperature of about 150 ° C. The weight of the exhaust set is about 35 tons.

The intensity of the current passing in this path causes a strident sound. Therefore, in the middle of the path, exhaust gases pass through a set of sound absorbers and the intensity of the sound frequency is reduced. The set of sound absorbers is called the silencer.

## - Gas Turbine Enclosure & Base Frame

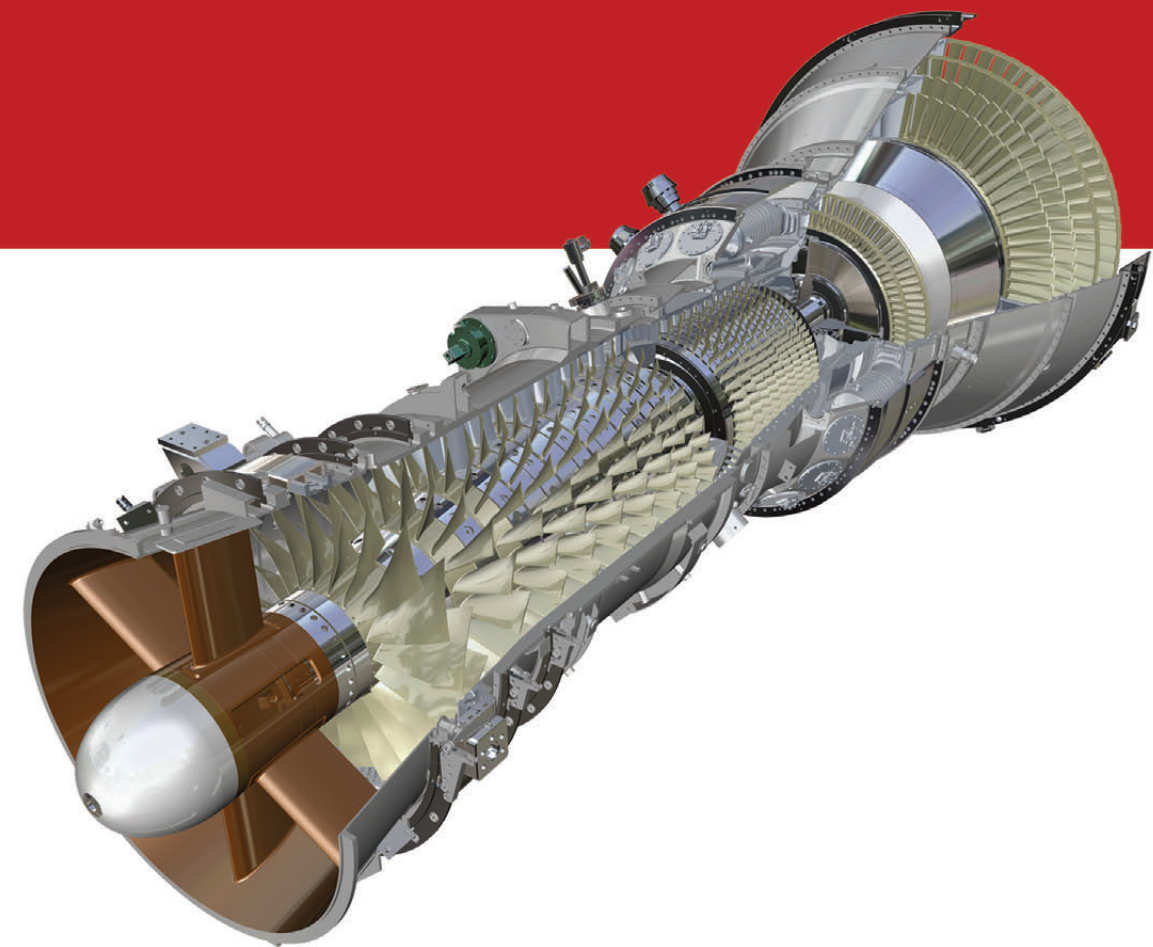
This equipment is used to protect and maintain the turbine and internal accessories. The total weight of the set is 32 tons and consists of three main parts, the container of which is double-walled. The outer wall is made of low carbon steel and the ducts are made of stainless steel.

## - Gas Volute Exhaust Transmission System

This unit, weighing about 1 ton, directs the exhaust air from the turbine to the exhaust. Due to the complex manufacturing technology, this piece is made in the form of cut pieces in special fixtures

## Projects carried out:

- Supply of equipment for 32 refinery turbo-compressors for phases 13,14,19, 22 and 24 of Assaluyeh
- Supply of equipment for 70 turbo-compressors out of 100 turbo-compressors to boost the pressure of gas transmission stations



MGT-30





# MGT-40 BASED THERMAL POWER PLANT

MGT-40 gas turbine is used in power generation and mechanical drilling generation and mechanical drilling applications. In the field of electricity generation, it can be used in simple and combined cycles and simultaneous production of electricity and heat.

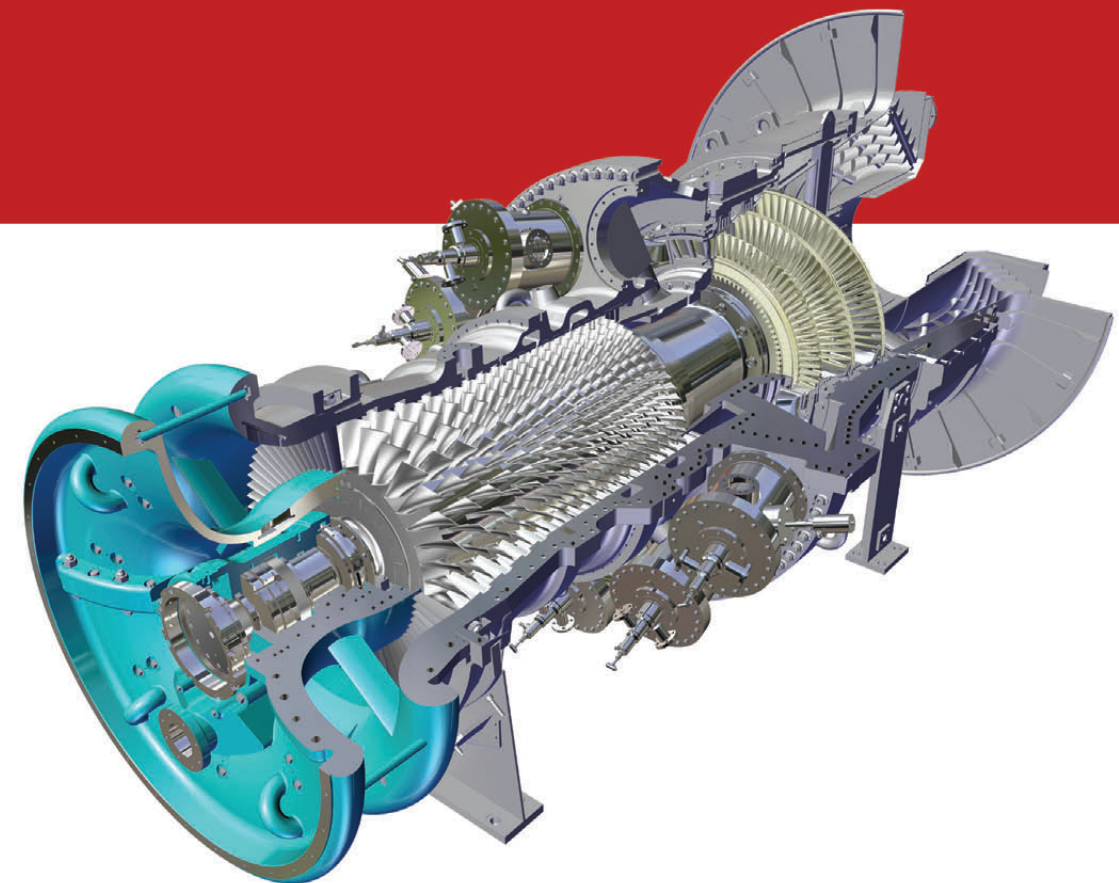
The main feature of this turbine is high availability and reliability and as a reliable machine in harsh yet flexible conditions, it is a suitable option for sensitive industries such as petrochemicals and refineries.

The MGT-40 gas turbine has 17 rows of compressor blades, 10 can annular combustion chambers and 3 rows of turbine blades.

For the first time in the country, Mapna group, using the capabilities and engineering knowledge obtained from research and development in designing and manufacturing all the equipment of the 42 MW gas power plant and by installing operating this power plant in Sistan and Baluchistan province, added another efficient product in the basket .

The mission of Sepahan Mapana Engineering and Equipment Manufacturing Company is to supply and manufacture the following parts:

- Air Intake System
- Exhaust System
- Turbine Casing(cold)
- Hot Gas inner Casing
- Fin Fan Cooler System
- Skids
- Enclosure & Noise Protection
- Fire Fighting System







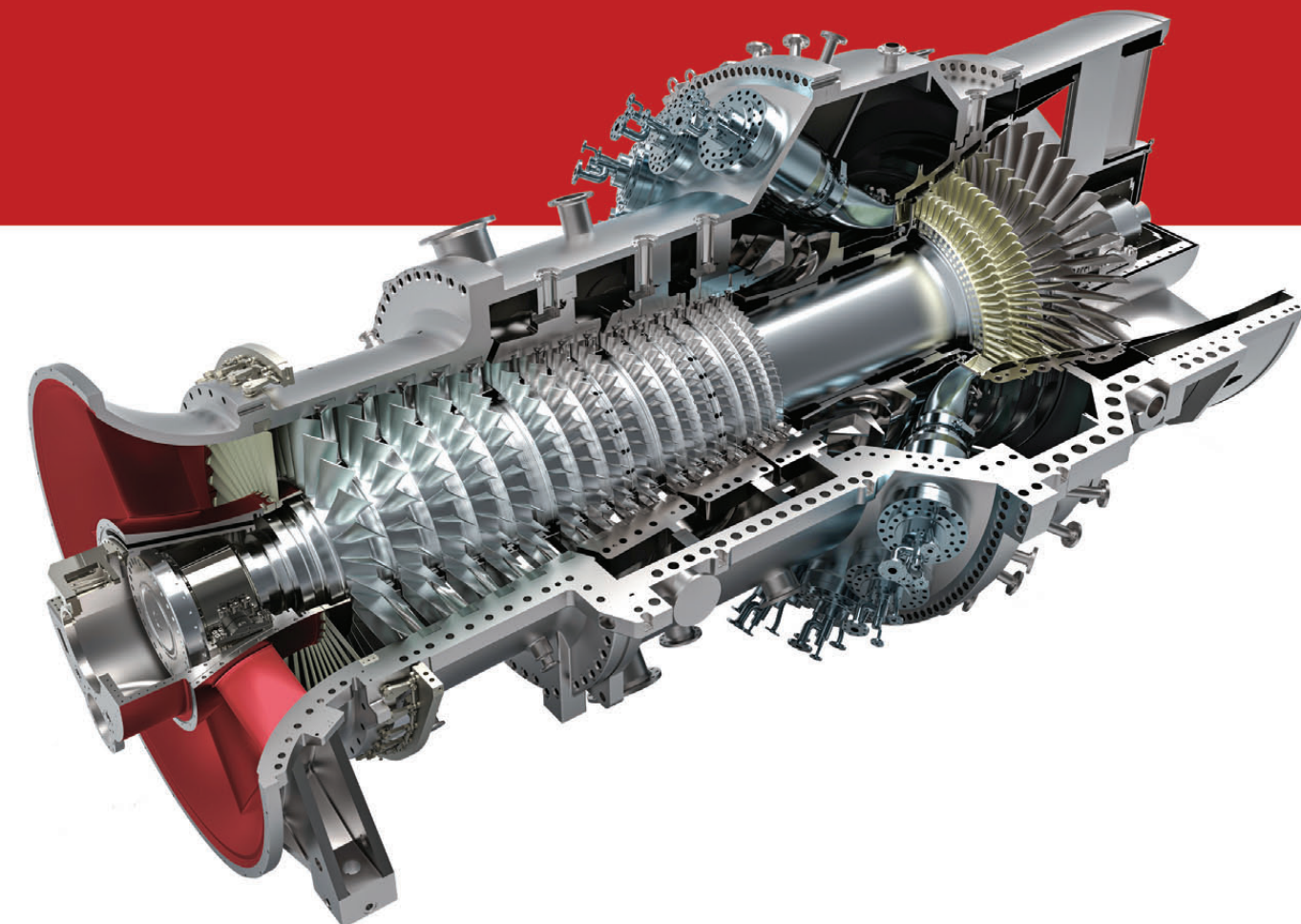
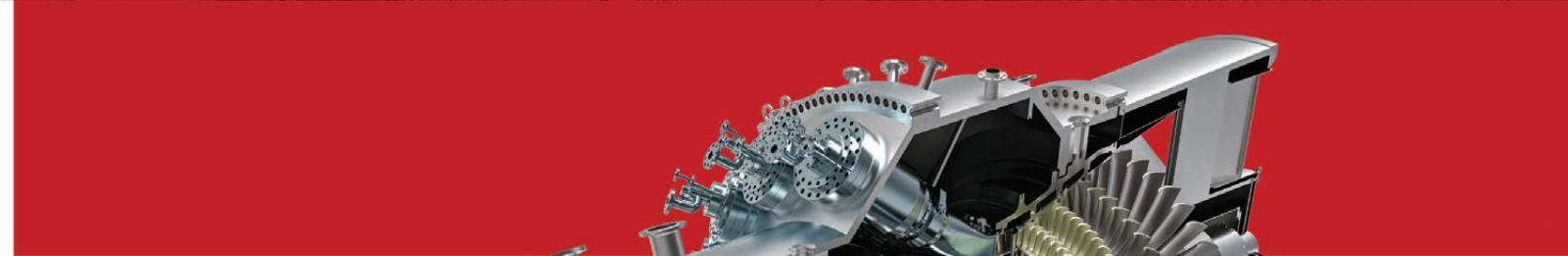
## MGT-75 BASED THERMAL POWER PLANT

MGT-75 gas turbine with simple and combined cycle efficiency of 39.1% and 59%, respectively is an advanced product in Class F with brand and full intellectual property of Mapna Group, which is in the line latest technology and achievement in the field of power plant gas turbine. It is the new and future needs of customers.

Due to the high efficiency, low pollution, performance flexibility, wide operating range, excellence capabilities in the field of maintenance and online monitoring service, this equipment, in the addition to the medium-term need of the electricity and energy market, is a suitable compliment to combine with renewable energy. This turbine with unique fuel variety provides customers with the possibility of producing clean electricity with the least amount of greenhouse gas emissions according to the latest trends that can be achieved worldwide.

The mission of Sepahan Mapana Engineering and Equipment Manufacturing Company is to supply and manufacture the following parts:

- Air Intake System
- Exhaust System
- Turbine Casing(cold)
- Hot Gas inner Casing
- Fin Fan Cooler System
- Skids
- Enclosure & Noise Protection
- Fire Fighting System







# MGT-80 BASED THERMAL POWER PLANT

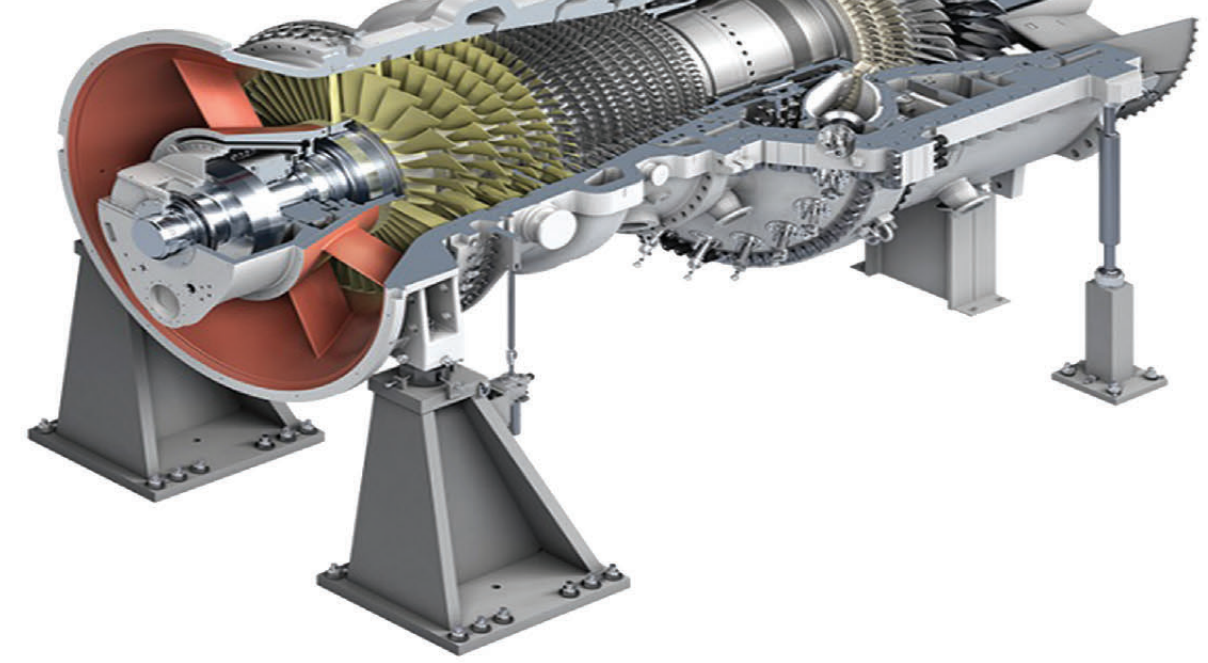
MGT-80 high power turbine is an advanced turbine according to the latest technology in the world, with unique performance characteristics and the possibility of achieving high and unparalleled amounts of efficiency and power in response to the growing needs of the power and energy sectors. The related power and efficiency of this turbine are 308 MW and 40.1% in the simple cycle. Respectively and it has an efficiency of 59% in the combined cycle. Other prominent features of this turbine are very low pollution and the lowest emission of pollutant gases such as carbon monoxide and nitrogen oxides. Sepahan Mapna Company is the manufacturer of MGT-80 turbine peripheral equipment in Dokuheh Andimeshk power plant.

The mission of Sepahan Mapna is to supply and manufacture the following parts:

- Air Intake System
- Exhaust System
- Turbine Casing (cold)
- Hot Gas inner Casing
- Skids
- Enclosure & Noise Protection
- Fire Fighting System



Exhaust System



## MGT-80



## COOLING TOWERS

Cooling systems are generally divided into dry and wet categories. Dry cooling towers are used in areas without large water resources. Dry cooling towers are classified into two types, direct (ACC) and indirect (HELER).

### ▼ DIRECT DRY COOLING SYSTEM (ACC)

In this system, the steam output from the low pressure section of the steam turbine is transferred directly through the steam duct and the steam distribution system into a group of pipes called Tube Bundle.

These tubes, which have blades on the outer surface, are exposed to the exhaust air from the fans and the steam is distilled. In fact, there is no separate condenser in this system and the same group of pipes play the role of condenser. Cooling air passes through the tube handle, distills, and changes the vapor phase inside the tubes by capturing the latent heat of the steam.

Steam flows down from the tip of the A-shaped tubes and is distilled along the path, and the distilled fluid is collected at the end of the path and transferred to the corresponding tank. Non-distillate gases are also returned to the cycle by the exhaust system. The fluid collected in the tank is returned to the feed system by a water pump.



# JAHROM POWER PLANT COOLING SYSTEM

FARS, IRAN



### ▲ HELER DRY-COOLING TOWER

Heller dry cooling towers are used in areas where water loss and further evaporation should be avoided due to lack of sufficient water. In this system, the exhaust steam from the LP section of the steam turbine is distilled inside the spray condenser by direct contact with water. The natural air flow created by the difference in pressure and temperature above and below the tower passes through the deltas and cools the cooling water in the deltas.

Supply and installation of cooling Hellers with metal structures in Jahrom and Hamedan combined cycle power plants are among the successful achievements of Sepahan Mapna in this sector.

#### Specifications of the cooling tower of Shahid Mofteh power plant in Hamadan:

The metal structure of Tower No. 2 of Hamedan Power Plant is a space structure with tubular elements that are connected at the nodes with screw connections. The height of the tower is 135 meters with an approximate weight of 2000 tons.

#### Jahrom cooling tower specifications:

The metal structure of these towers is a type of space structure with tubular elements that are connected at the node points with screw connections. The height of each tower is 125 meters and weighs about 3100 tons with aluminum cover

These towers are designed to reduce the water temperature by 5 degrees Celsius, and in order to achieve this goal, creating a proper aeration system with aluminum sheets is of particular importance.





## Thermal Vacuum Pump (Ejector)

Thermal vacuum pumps, simply called ejectors, are devices for transporting, compressing, or mixing gases, vapors, liquids, or solid particles. Ejectors are actually vacuum pumps that have no moving parts and a gaseous fluid or liquid acts as the driving force in them.

Advantages of this equipment include:

- Having no moving parts
- High operational reliability
- Low maintenance cost
- Ability to use a wide range of materials

The main role of this system is to supply the condenser with the vacuum in the startup phase using a startup ejector (hogging) and maintain the vacuum at the time of operation using service ejectors (holding).

All the steam used in this system is condensed by the middle and end condenser, which are placed after the first and second stage ejectors, and then returns to the condensate tank. The energy resulting from the change of vapor phase to liquid will also increase the temperature of the water entering the boiler and thus enhancing the overall efficiency of the system.

The ejector is being used in various industries, including:

Petrochemical industries. Oil and gas industries. Power plant industry. Water Desalination. Steel Industries. Paper production industries. Pharmaceutical Industries. Marine industries. Water and wastewater. Perfume making. Shipbuilding industries. Food industry (beverages - dairy products - oil production - canning)

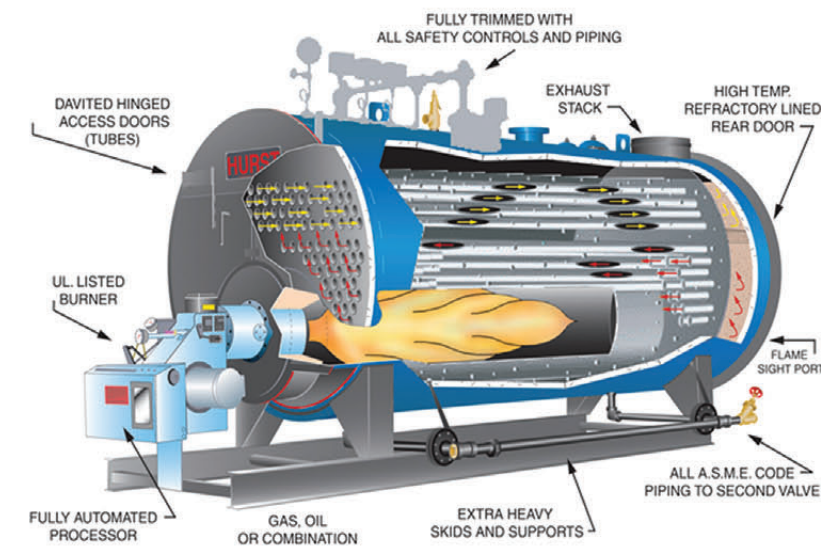
## Ejectors Testing Platform

Sepahan MAPNA Engineering & Equipment Manufacturing Company is equipped with the required facilities for testing ejectors and vacuum systems; these facilities have been designed and produced according to the latest HEI standard inside the factory environment. Using these facilities, the produced equipment is tested before being shipped out of the company.

### • Past and Ongoing Projects:

- Hogging and Holding ejectors for Qeshm thermal desalination system
- Hogging and Holding ejectors for Chabahar Power Plant
- Hogging and Holding ejectors for Rumaila Power Plant
- Hogging and Holding ejectors for Khorramabad Power Plant
- Hogging and Holding ejectors for Latakia Power Plant
- Hogging and Holding ejectors for Zanjan Power Plant
- Hogging and Holding ejectors for West Karun Power Plant
- Hogging and Holding ejectors for Toos Power Plant
- Hogging and Holding ejectors for Asaluyeh Power Plant
- Hogging and Holding ejectors for Sabzevar Power Plant
- Hogging and Holding ejectors for Torbat Heydariyeh Power Plant
- Hogging and Holding ejectors for Qeshm Ghadir Power Plant
- Hogging and Holding ejectors for Qeshm Ghadir thermal desalination system





### Past projects :

- Zanjan-2 Combined Cycle Power Plant

Designing and manufacturing startup boiler with a capacity of 24 tons per hour, 11 bar pressure, and 250°C temperature

Designing and manufacturing heating boiler with a capacity of 5.6 tons per hour, 5 bar pressure, and 160°C temperature

- Sabzevar Combined Cycle Power Plant

Designing and manufacturing startup boiler with a capacity of 24 tons per hour, 10 bar pressure, and 250°C temperature

Designing and manufacturing heating boiler with a capacity of 5.6 tons per hour, 5 bar pressure, and 160°C temperature

- Torbat-e Heydarieh Combined Cycle Power Plant:

Designing and manufacturing hybrid boiler (heating and startup) with a capacity of 22 tons per hour, 10 bar pressure, and 250°C temperature

- Khorramabad Combined Cycle Power Plant:

Designing and manufacturing startup boiler with a capacity of 21 tons per hour, 9 bar pressure, and 230°C temperature



## Auxiliary Boilers(Fite tube)

In line with the MAPNA Group's strategies and with the aim of better integration of design and supply from domestic firms, the mission of designing and manufacturing heating and startup auxiliary boilers of power plants has been given to Sepahan MAPNA Engineering & Equipment Manufacturing Company.

Heating boilers are used to provide the required energy for equipment and fuel tanks during cold seasons. Meanwhile, startup boilers, which generally have a higher capacity and tonnage, are used as a primary steam supplier during startup for major equipment such as hogging ejector and main boiler deaerator of power plants.

Due to the capacity and working pressure, these boilers are of Fire Tube type. A host of other auxiliary equipment is also put beside the main boiler inside the boiler house, including :

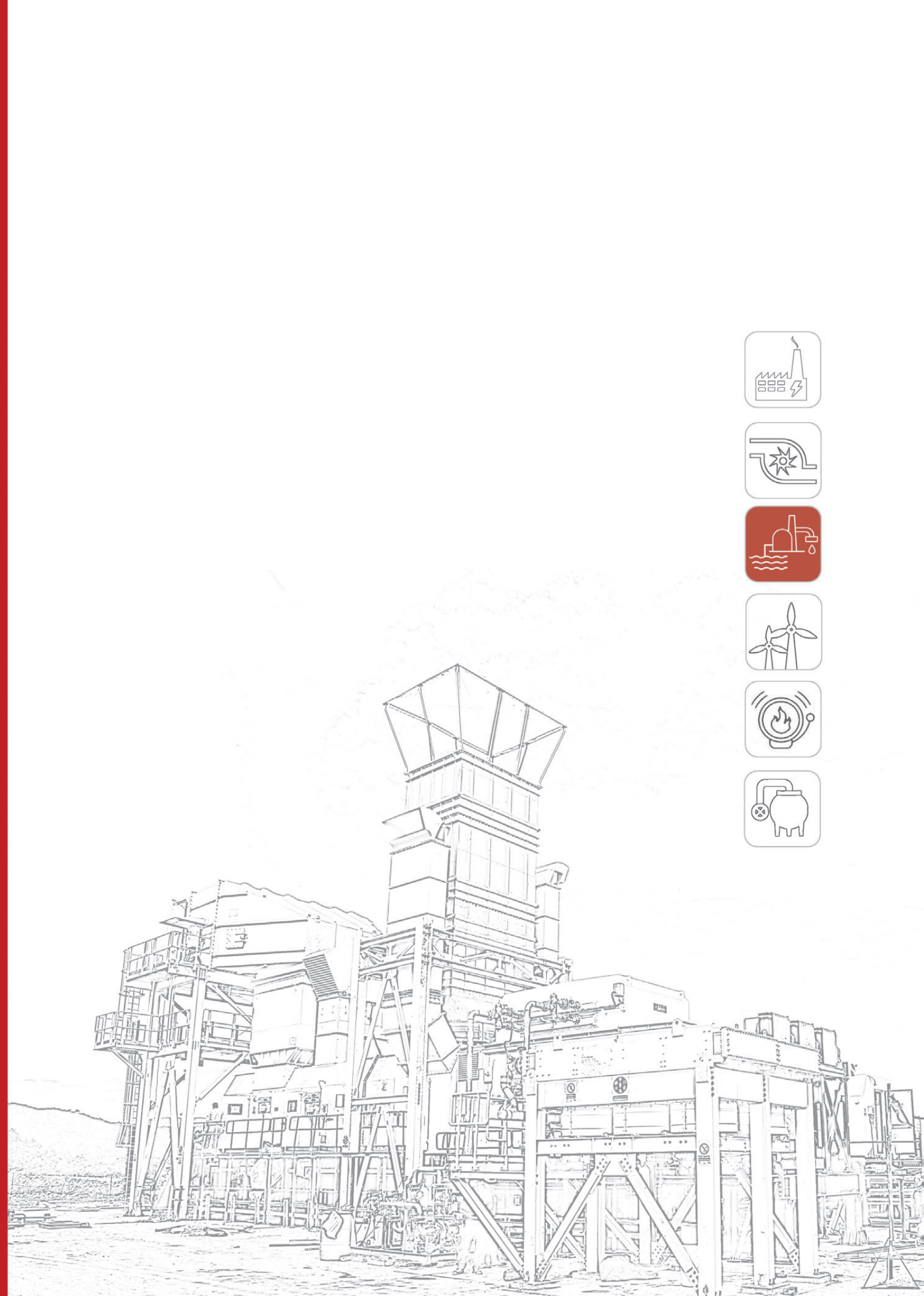
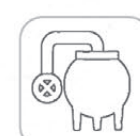
- deaerator,
- storage tank
- blowdown tank
- and fuel tank

The company enjoys the capability of designing and manufacturing all the equipment according to the needed steam capacity. A detailed thermal, mechanical, and metallurgical analysis of the equipment along with a central and integrated control system guarantees the required temperature and pressure for consumers that each has different needs and conditions.



# SIMULTANEOUS POWER PLANTS (DG-CHP)

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The mission of designing and supplying the ancillary equipment of this power plant, including the Air Intake system and the Gas Exhaust System, is on the work scope of Sepahan Mapna.

The ability to prepare, install and commission quickly to generate electricity in less than three months is one of the unique features of mobile power plants, so that this power plant can enter the circuit in less than 25 minutes. Among the measures taken in the engineering department of the company are numerical simulation of flow, calculation of sound level, structural design and vibration.

Sepahan MAPNA Engineering & Equipment Manufacturing Company has been given the mission to design and supply auxiliary equipment of the latter in the form of 6, 4, and 2 trailers.



## CONSTRUCTION OF EQUIPMENT FOR DISTRIBUTED / SIMULTANEOUS POWER PLANTS (DG-CHP)

Energy losses in the field of power plants, as well as peak consumption times, have always been one of the main problems of the country's electricity industry. In order to increase efficiency, reducing losses and managing the network, Mapna Group has introduced the design and construction of small-scale power plants as a suitable solution. Design and construction of Mobile power plant with a capacity of 25 MW are among the actions of Mapna Group in this sector.





# GESHM

## THERMAL DESALINATION PLANT

### THERMAL DESALINATIONS

The mission of designing, supplying and installing MED heat water desalinations in Mapna Group is among the responsibilities of Mapna Sepahan . Multistage distillation systems (MED) are generally used in the refining and petrochemical industries. Today, the design of dual-purpose power plants to produce fresh water and electricity is more cost-effective than other methods due to the availability of boiler steam generated from the energy recovery of turbine exhaust gases. This technology, in addition to having low operating temperature and pressure, also has low power consumption.

#### Advantages of MED and MED-TVC systems

- Low electrical energy consumption
- High thermal efficiency
- Operation at low temperature and concentration ratio to prevent corrosion
- No need for special filtration or pre-treatment of incoming water
- Ease of erection and operation (no use of complex equipment and special pumps)
- High quality of produced water
- Low consumption of chemicals
- Long equipment life
- High reliability and accessibility of the system
- Ability to use excess thermal energy

Sepahan Mapna is one of the reputable companies in the field of design, supply, installation and commissioning of seawater desalination plants. Having the appropriate engineering knowledge and infrastructure in this field, we can build all kinds of desalination units with different capacities and high efficiency.

#### Accomplished Projects:

- Qeshm Power and Water Power Plant project with a production capacity of 50 MW of electricity and 18,000 cubic meters of fresh water per day
- Qeshm Combined Cycle Power Plant project with a capacity of 500 MW of electricity and 8000 cubic meters of fresh water per day

Sepahan Mapna has been awarded the "Energy Globe Certificate" by European Green Management Association for the Qeshm Water and Power Project

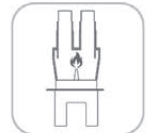
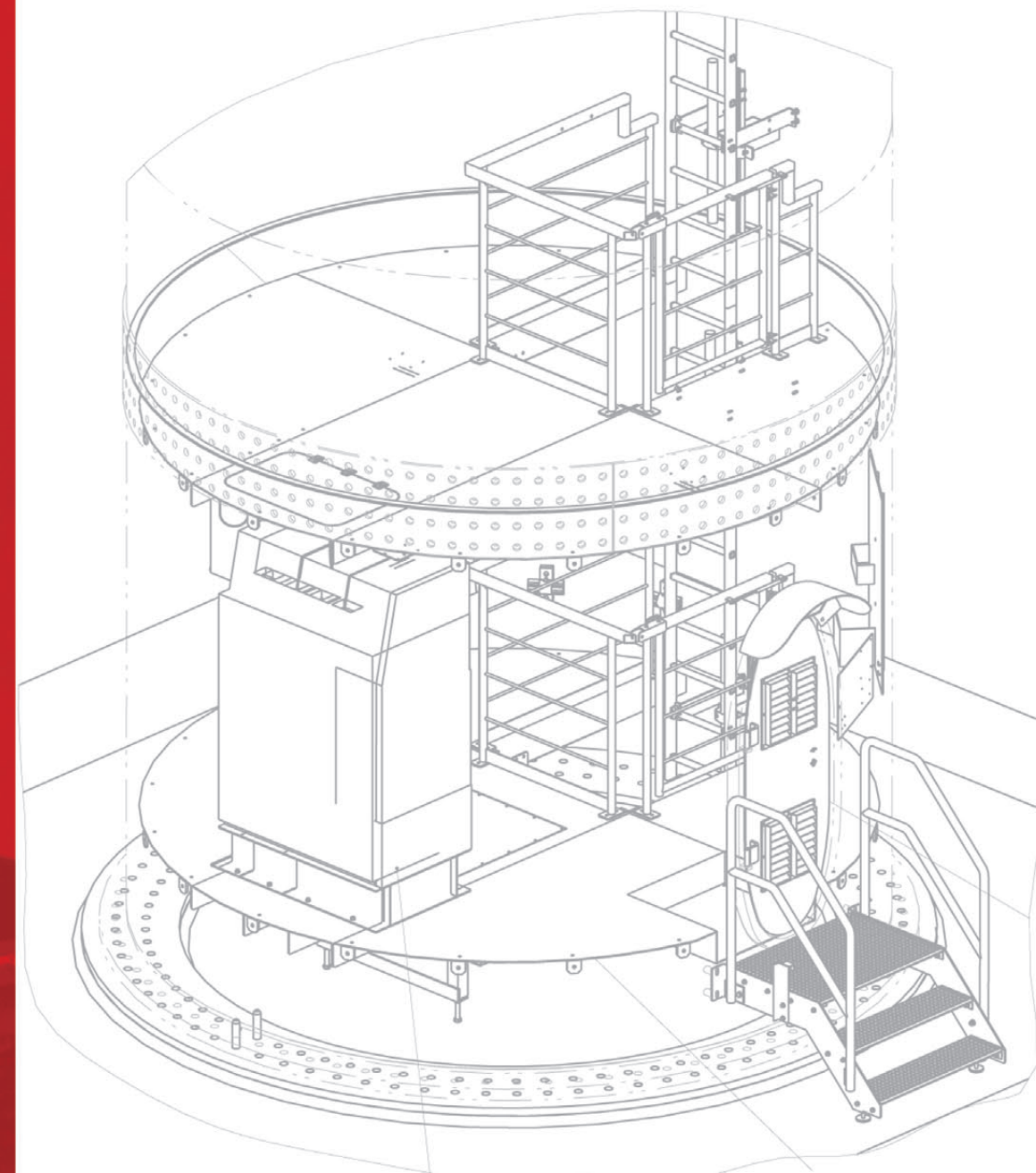


• Renewable energy provides clean energy. It is non-pollutant and non-contributor to greenhouse effects and global warming.

# WIND TURBINE TOWER

• Renewable and Environmentally Friendly

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# AQKEND

## WIND FARM

EAST AZERBAIJAN , IRAN



**2.5 MW MAPNA Wind Tourbine Tower :**  
 Mapna 2.5 MW wind turbine tower is made of Tubular Steel with a height of about 85 meters, which consists of 5 segments in total. The design and supply of wind turbine towers is of great importance due to the special conditions of the operating environment. Internal equipment and accessories, including mechanical and manual elevators for carrying people and equipment, are important parts of wind turbine towers.

**2 MW National Wind Tourbine Tower :**  
 This tower is made of Tubular Steel and consists of 4 segments with a height of about 80 meters and a weight of 210 tons.

**250 KW Wind Tourbine Tower :**  
 This tower is made of Carbon steel with a height of about 30meters and a weight of 24 tons.

**Completed projects:**

- Aqkand wind farm
- Kahak wind farm
- Dorah and Nashtifan wind farms
- Binalood wind farm (Solar Air Research Institute)
- aliabad wind farm
- Milnader wind farm



 Wind Tourbine Towers

MAPNA Group has invested in designing and supplying wind turbines in the framework of its social responsibilities and the development of the renewable energies industry.

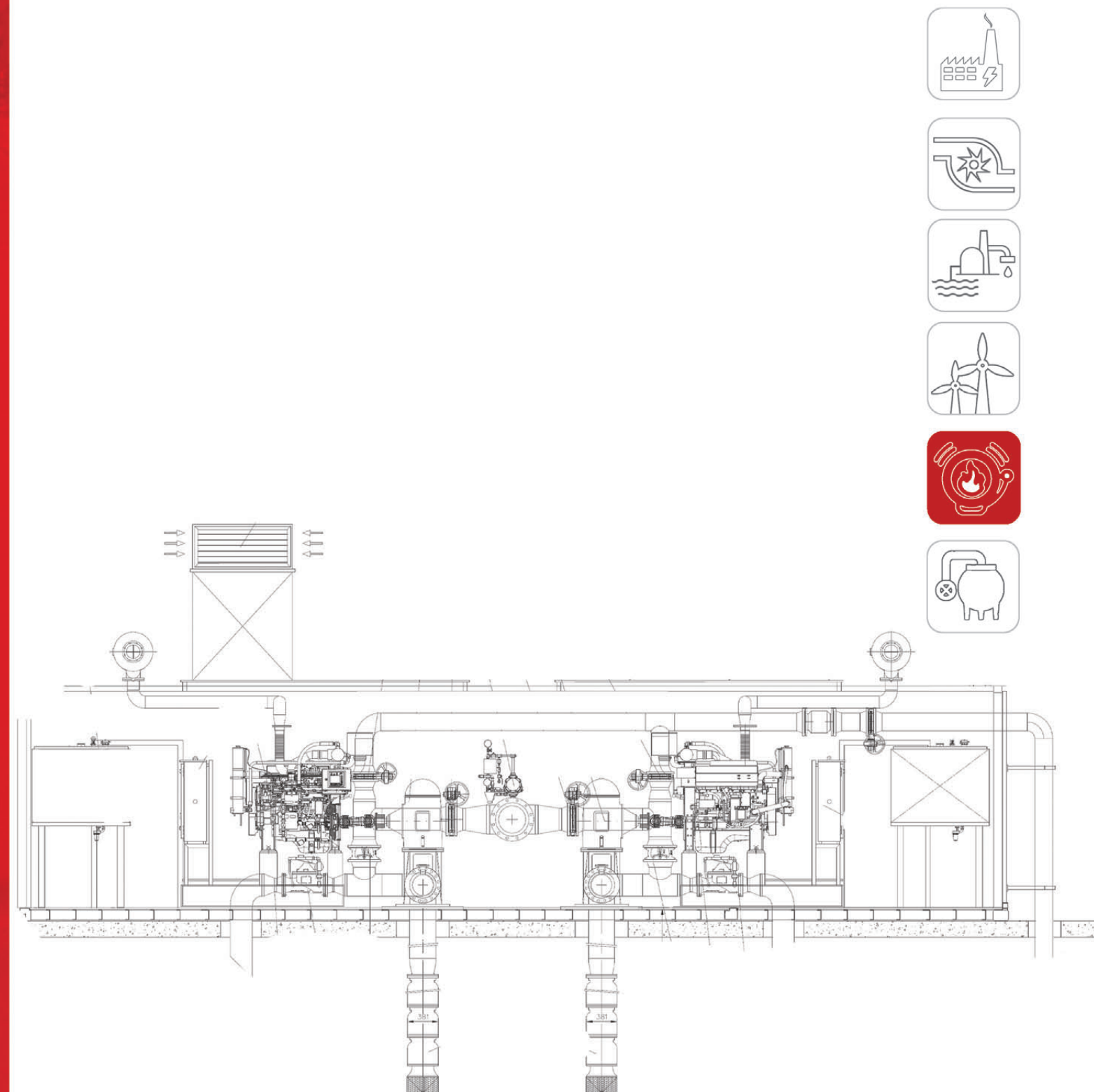
As the Group entered the realm of producing and operating wind power, Sepahan Mapna Engineering & Equipment Manufacturing Company was tasked with constructing wind turbine towers. The company is the only one across Iran that enjoys the capacity of building towers for turbines in the range of megawatts.



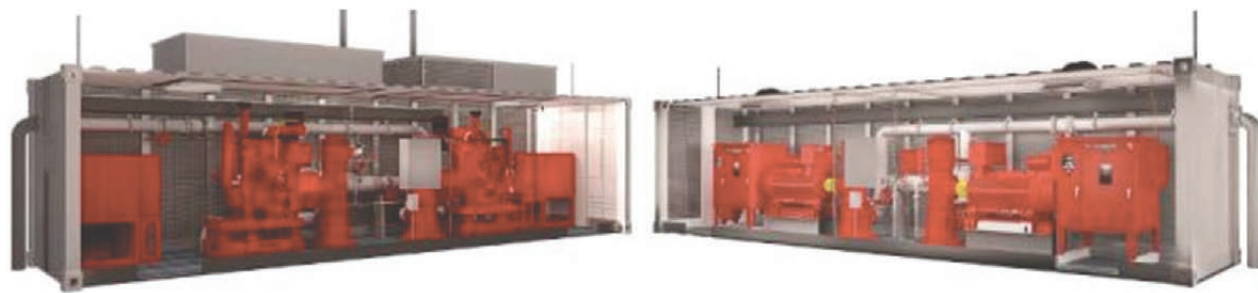
# FIRE FIGHTING SYSTEM

- Fire pump package
- Fire detection, alarm and suppression system

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## Fire pump package

The containerized fire pump package is a prefabricated pump package that is designed in the form of one or several containers with standard dimensions for transport based on customers' needs. Choosing the equipment and designing the pump package are done according to NFPA 20 standard.

Based on the plant's design, these packages can be installed on or besides firefighting water storage tanks. This company is able to supply the equipment based on credible international certificates in firefighting such as UL and FM and supply the equipment from inside the country based on international standards.

The company's current containerized fire pump package consists of two containers with four main vertical turbine fire pumps, comprising of two diesel fire pumps and two electrical fire pumps, and two (jockey) pumps. A collection of auxiliary equipment of the pump package are also supplied, including:

- Local fire pump control panel
- Piping and valves
- Fire detection, alarm, and suppression system
- Test line
- Daily fuel storage for each diesel pump
- Lighting and ventilation system



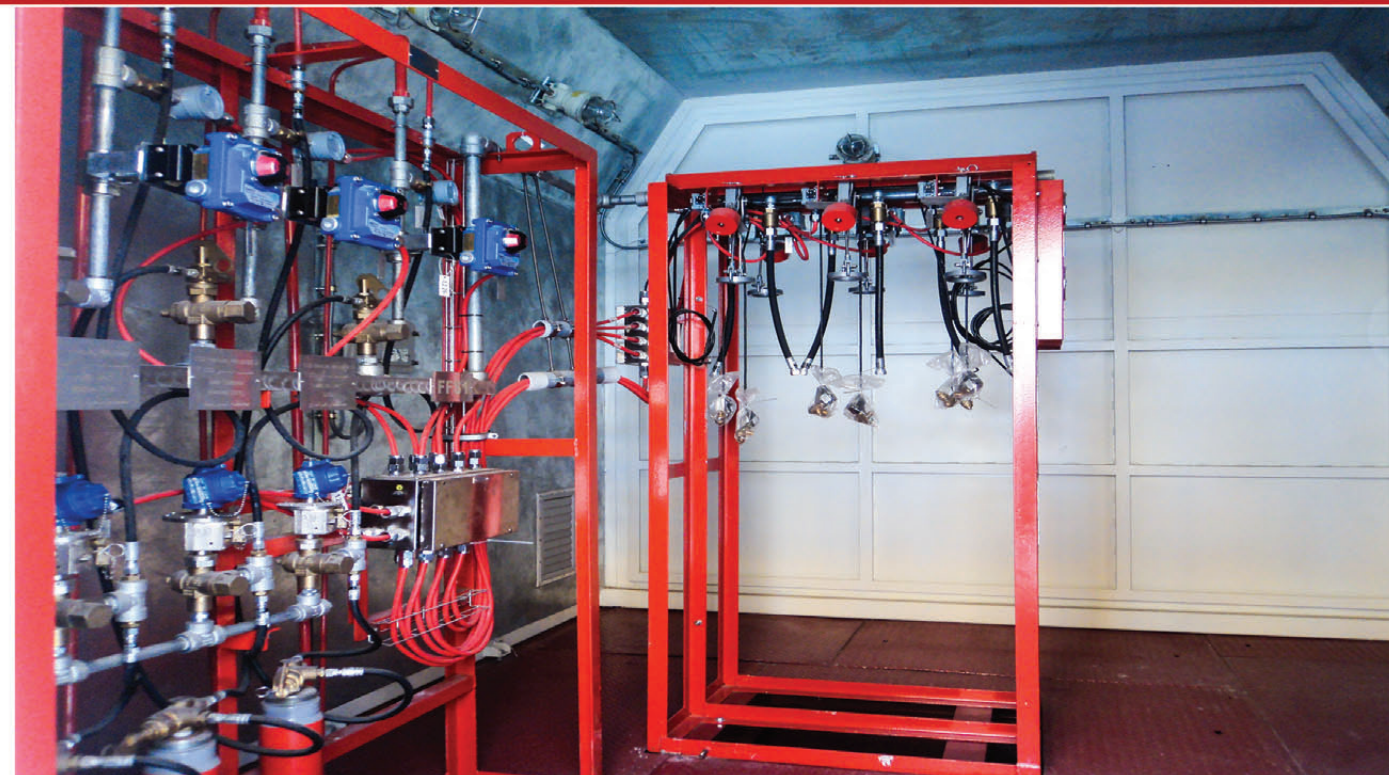
### Fire detection, alarm and suppression system:

Relying on long years of the MAPNA Group's experience in designing and supplying fire protection systems for power plants, Sepahan MAPNA Engineering & Equipment Manufacturing Company has put the following on the agenda:

- Designing and supplying fire and gas (F&G) detection systems
- Designing and supplying fire suppression systems using water, foam, powder, and gas
- Supplying software and control panels for fire alarm and suppression system according to EN54/NFPA72 standard

Supplying containerized fire pump packages for power plants in:

- Zanjan
- Sabzevar
- Torbat Heydariyeh
- Zarand
- Khorramabad and Do Kuhe

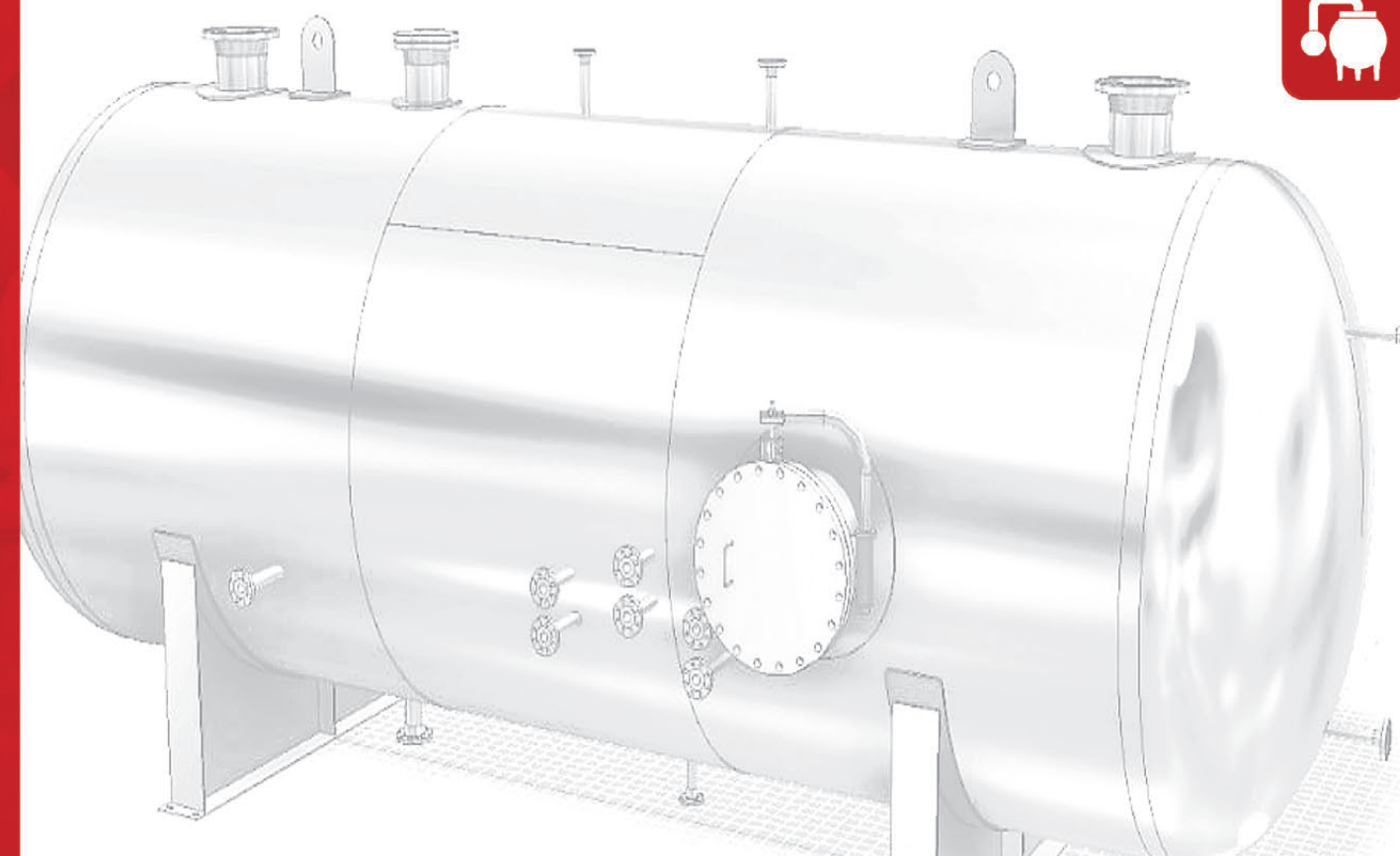




# Industrial Pressure Vessels

designing,  
supplying,  
manufacturing,  
and testing different Pressure Vessels

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## Pressure Vessels

Pressure tanks have vast industrial and non-industrial applications. These types of tanks are made of a strong container and used mainly to store fluids (liquid or gas) at different pressures.

Pressure tanks include tanks for storing compressed gas (such as air, oxygen and nitrogen), anhydrous ammonia tanks, oil gas tanks, autoclaves, hot water storage tanks, chemical reactors, and cooling tanks.

The pressure difference is a dangerous parameter and abnormal pressure changes in these tanks can lead to explosion and destruction. Accordingly, the design, construction, and operation of these tanks must be done by engineering organizations that operate under legal supervision.

Sepahan Mapna Engineering & Equipment Manufacturing Company enjoys the experience of designing, supplying of needed material, manufacturing, and testing different pressure tanks.



## Cryogenic Tanks

Cryogenic tanks are used to store industrial and laboratory gases such as oxygen, nitrogen, argon, helium, carbon dioxide, hydrogen.

The storage pressure of these gases can be 18, 22, or 36 bar with temperatures ranging between -196 to 50°C. Gases can be stored in the form of liquid at very low temperatures in cryogenic tanks.

Furthermore, this type of tank is used for transferring gaseous liquids.

As the good record of Sepahan Mapna in manufacturing such tanks indicate, the company is able produce this product.



- With each kiln that we build, we continue to refine new technologies and to surpass ourselves.

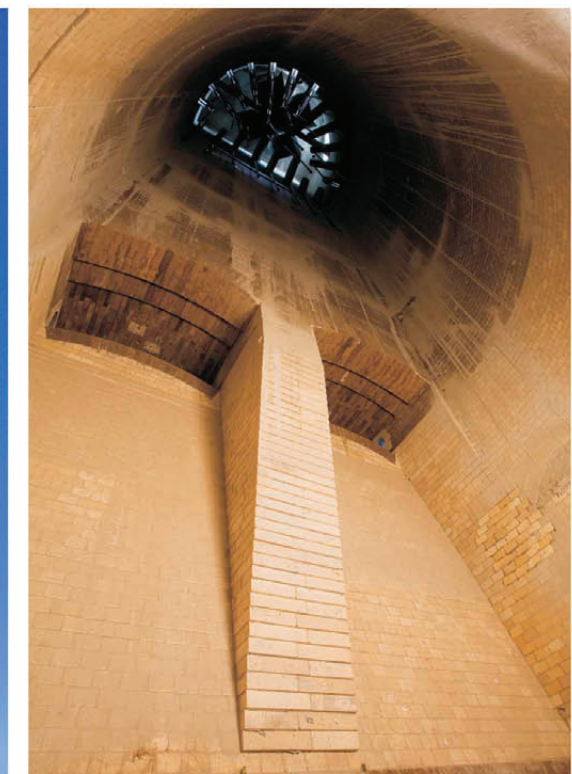
## PFR (PARALLEL FLOW REGENERATIVE SHAFT) KILNS

- High Energy Efficiency, With Every Fuel.

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### TWIN KILNS FOR THE PRODUCTION OF INDUSTRIAL LIME

Lime is used in many industries, including steel, copper, building construction and road construction, asphalt, cement, brick, glass, agriculture, dam construction, water, sugar, paint, rubber and other industries. The main furnaces in operation in the country are of rotary type, which consume 2 to 3 times more energy per ton of product than two-shaft furnaces. Sepahan Mapna Company has stepped into design and building a two-shaft lime kiln in accordance with Swiss MEARZ technology for the first time in Iran in order to reduce energy consumption and improve the efficiency of this equipment. This machine with a nominal capacity of 150 tons per day offers its products in various granulations and with quality accepted by the steel and mining industries. The charge of limestone is 40-80 mm in size and the total tonnage is 300 tons. This type of furnace consumes natural gas, coke or fuel oil. 100 cubic meters of gas is used to cook each ton of lime, if natural gas is used. Each furnace operating cycle lasts between 10 and 15 minutes. At the end of the cycle, the reversal time (shaft cycle replacement) takes about 70 seconds. After cutting off the gas and air, the inlet valves of the rock and the outlet of the lime are opened and the rock is charged in the shaft where the cooking was done and also the lime is discharged from the outlet valves. The process of this reaction is as follows:





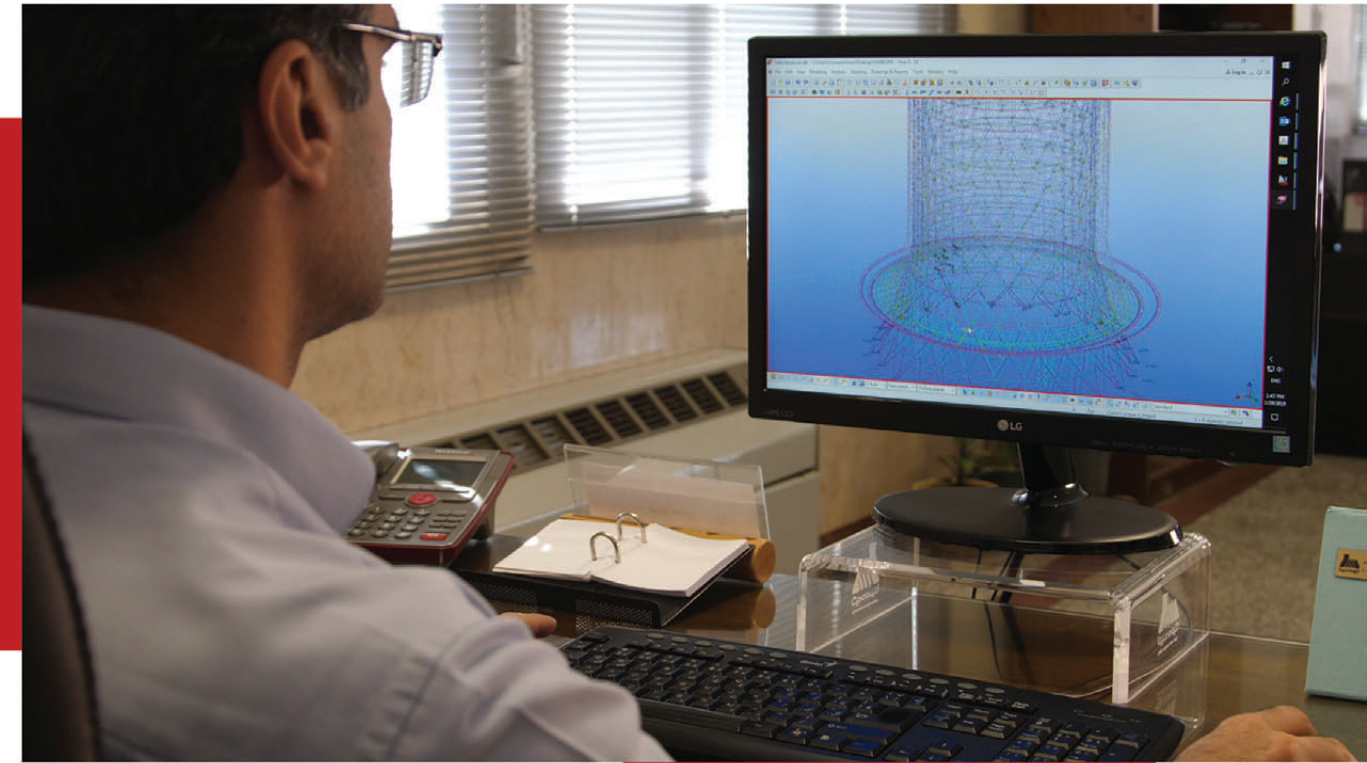
Capabilities of Sepahan Mapna Engineering and Equipment Manufacturing Company in hardware and software sectors are among the important factors in creating quality products and services in this company. The most important capabilities of the organization in the areas of production, supply, research and development, sales, etc. can be mentioned as follows:

- Light and heavy industrial sheds equipped with overhead cranes with different capacities
- Various and specialized production workshops including workshops for parts making, assembly, welding, machining, heat treatment, paint, sandblasting and packaging

- Existence of up-to-date hardware and software infrastructures and utilization of specialized forces in order to design and develop products and services
- Product technology support
- Existence of infrastructure and technology transfer platforms from knowledgeable companies
- Effective communication with scientific, research and academic centers



**MAPNA SEPAHAN**  
**CAPABILITIES**



- Material flow management and use of proper methods of material storage and storage
- Reliable supply networks and its development by improving the process of identifying, evaluating and continuous capabilities of suppliers



- Optimal and effective planning of organizational resources and creating a correct and timely decision-making platform with the help of correct and fast flow of information with the tools of integrating organizational resources.(SAP-ERP)





# PROJECT MANAGEMENT SYSTEM



- Integrated structure in attracting and planning commitments
- Project management based on professional management standards
- Agile and confident response to customer expectations
- Continuous monitoring of customer satisfaction



## QA/QC QUALITY ASSURANCE QUALITY CONTROL

- Designing systematic and planned processes to ensure the quality and compliance of products and services with predetermined standards  
 - Strict monitoring of all phenomena affecting production, including controlling the process of purchasing raw materials, controlling the production process and the final product, reviewing feedback and analyzing the results in order to achieve all the desired features in the products through:

1. Timely and correct tests and inspections required, including non-destructive welding tests based on control plans with technical documents of the contract
2. Periodic evaluation of output product quality and extraction of quality data and their analysis
3. Controlling tools and equipment and calibrating them at regular intervals
4. Implementing the process of statistical quality control (SQC) and identifying the root causes of errors and their complication

- Utilization of modern equipment, technologies and systems, including the implementation of ISO14001 and OHSAS18001.
- Prevention of accidents and diseases and minimizing the safety and health risks resulting from work for all stakeholders, equipment, establishment of resources and assets of the organization.
- Commitment to protecting the environment, preventing pollution and reducing the environmental consequences of the organization's activities, products and services.

# HSE HEALTH, SAFETY ENVIRONMENT











# ACCOMPLISHED PROJECTS OF MAPNA SEPAHAN COMPANY

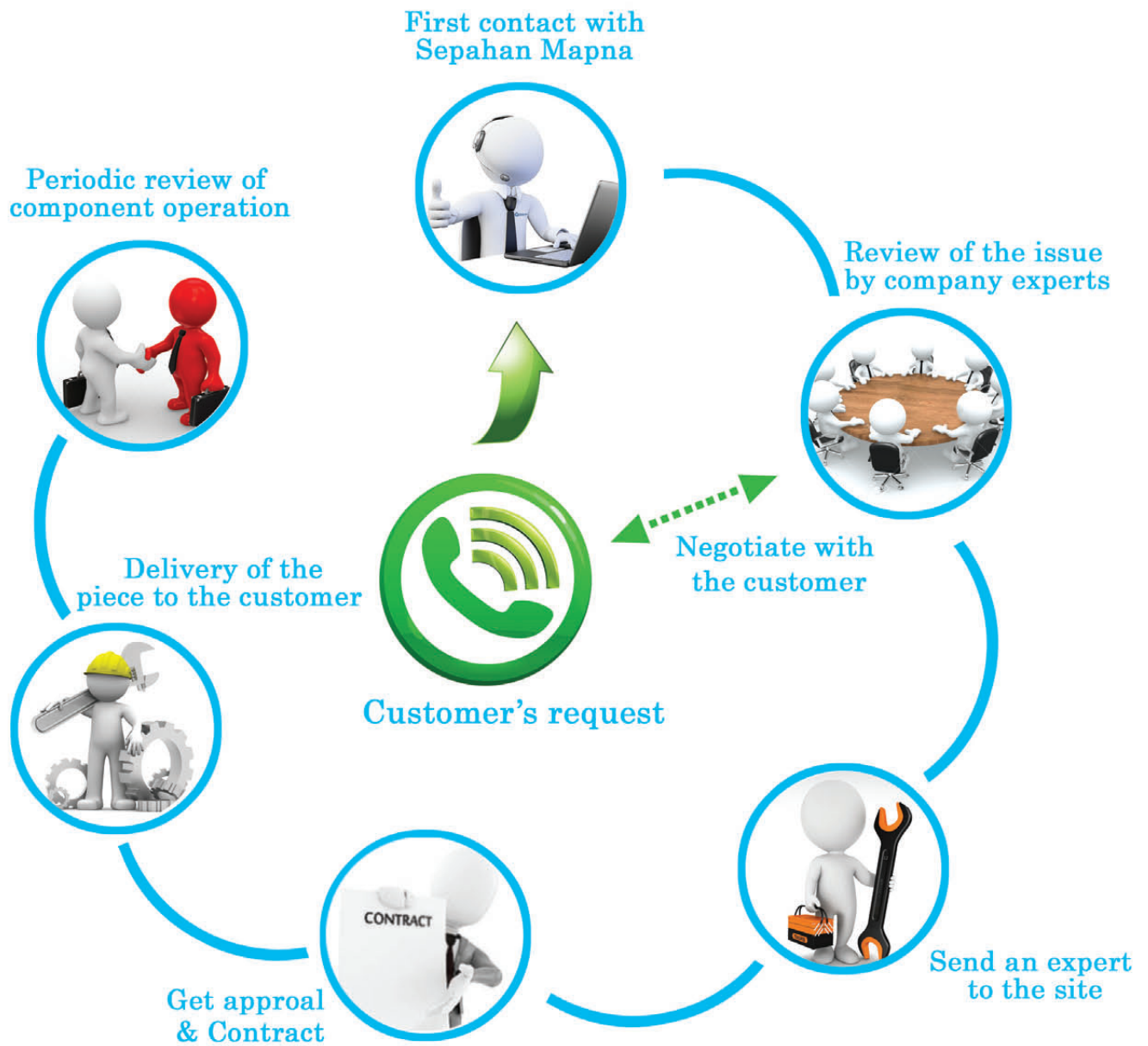
- Participation in the construction of international projects:
- Tishreen(Sria) combined cycle power plant
  - Jandar(Syria) combined cycle power plant
  - Al Sadr(Iraq) power plant
  - Heidarieh(Iraq) power plant
  - Rumaila combined cycle power plant
  - Latakia(Syria) combined cycle power plant :

### MAP LEGEND:

-  AUXILIARY EQUIPMENT FOR THERMAL POWER PLANTS
-  POWER PLANT COOLING SYSTEMS
-  TURBO-COMPRESSOR ACCESSORIES
-  WIND TURBINE TOWERS
-  THERMAL WATER DESALINATION
-  LIME KILN







## CUSTOMER SERVICE AND PRODUCT SUPPORT

Gaining customer satisfaction is one of the core values of Sepahan Mapna, which is why the company's relations and commitments with customers are always beyond the contractual scope

The following can be mentioned among the services that can be provided in this area:

- Providing product support services in various stages
- Providing product development services
- Providing training services based on customer needs
- Supply of goods, equipment and spare parts based on customer demand
- Providing a variety of solutions to increase equipment efficiency and technical and engineering support





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