Newsletter Spring 2018 No. 15

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Message From Market

Mini Refineries-Global Trend



The 21st century has witnessed significant volatility in the global oil market. This has put considerable pressure on refinery margins (profit). The resultant price squeeze on refining margins, had, not surprisingly, slowed investments in the sector. In turn this has introduced some amount of caution in the refining sector. One response to this caution, which was observed during the 2010s, was a resort to

establishing small refineries as an expedient and temporary measure to fill gaps appearing in the supply-demand balance for refining products. Thus in the very different, but yet huge refining markets of both China and the United States this trend can be readily observed. The modular, mobile or mini-refinery has been a feature of the refining landscape since the earliest days of the oil industry. However, with economies of scale pushing plant sizes in the direction of ever larger facilities over the past two decades, the small refinery has been relegated to playing only a minor role in modern refining. Further, the International Energy Agency (IEA) had observed in its brief, The Case for Modular/Mini-Refineries: "Despite the generally poor returns from petroleum refinery investment, modular mini-refineries, from simple diesel production units to more sophisticated cracking refineries are increasingly becoming a flexible and cost effective supply option. This IEA's recommendation underscores the article's observation that the petroleum refining sector had been, and still is, undergoing "significant rationalization over the last three decades. The performance of mini oil refineries is treated as a function of 1) their location; 2) their vintage (or level of complexity as previously discussed); 3) the availability of investment funds at the 'right price'; 4) the available supply of crude oil for the refinery; 5) the specifications and requirements associated with the products the refinery intends to produce; 6) applicable environmental laws, regulations, and standards; and 7) what are termed by industry analysts as "other applicable" regulatory standards. This performance relation immediately directs attention to, at least, seven central economic concerns, which clearly should be addressed when undertaking an economic appraisal for the establishment of every type of oil refinery, whether teapot, mini, conventional or mega. The first type of refinery we offer is the mobile field diesel production unit. This unit produces only one type of product, namely diesel. This diesel can be used for running generators and for running rigs. The second type of refinery we offer is the topping units for production of diesel, naphtha, kerosene and fuel oil. The topping unit requires proper foundations and proper infrastructure. Finally, we also offer the hydro skimming units for production of petrol and other products. These units can have a design life of 5 to 20 years depending on the usage profile. These units are largely modularized and take less than a third of the time to build a full scale refinery. The key selling point of these mini and mobile refineries is that they allow you to start production in one third of the time of a regular refinery. You can get the diesel or the gasoline in one third of the time. The smallest field diesel unit starts at 200 barrel per day going up to relatively complex hydro skimming units of 20,000 barrel per day of crude oil throughput. But now - and for a number of quite different reasons - their time appears to have come in a number of diverse parts of the world including, perhaps surprisingly, in the US. Unrest in the strife torn areas of the Middle East and Africa effectively rule out the building of plants that can easily cost over \$10 billion apiece and mini-refineries are increasingly seen as the answer to shortages of basic fuel requirements like petrol, kerosene and other refined products.

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• China: Even in China, where past governments have sought to banish the so-called 'tea pot' refineries in favor of larger more sophisticated facilities operated by the country's national oil companies (NOCs), the swing has now moved into reverse. Government legislation enacted earlier this year has given the nation's smaller operators a boost in the form of new tax and pricing initiatives. Plant modules can also be joined together to create a much larger refinery of 100,000 bpd or more, should demand dictate. This approach has already been successfully applied in locations such as Kurdistan, Indonesia, West Africa and West Siberia.

• Vietnam: Another attraction is that mini-refineries are cheap and quick to build. A plant of less than 10,000 bpd can be built for under \$200 million and in less than 18 months. This compares with the 'mega' Binh Dinh 660,000 bpd refinery planned for Vietnam, which comes with a price tag of up to \$22 billion and will take several years to build.

• Emirate: Examples of the new wave of mini-refineries include the 7,500 bpd modular refinery in Fujairah. In June 2014, a contract was signed between the gas cylinder manufacturer Cylingas, a subsidiary of Emirates National Oil Company (ENOC), and UK-based Pyramid Engineering to build the plant.

• Iraq & Syria: The first of the company's small, portable refinery units is being built in a factory and will be sent by sea to Iraq, trucked inland and then put down on a prepared foundation. The portable refinery is expected to be completed by 2016. When commissioned, its daily production capacity will be about 10 per cent that of a medium-scale refinery. However, while the proliferation of mini-refineries can be a cheap and resourceful way of tackling fuel poverty, in those regions of the world where it is endemic the technology's simplicity and accessibility enables it to be placed out of reach of the central authorities and in the hands of smugglers and rebels. Such is the case in the parts of Syria and Iraq that are controlled by Islamic State (ISIS) and where the existence of rebel-held mini-refineries is thought by some to have lengthened the conflict. At its height, ISIS was believed to control up to 30 mini-refineries.

• Pakistan: Honeywell is also providing modular equipment to help Pakistan Refinery (PRL) meet growing domestic demand for gasoline in Pakistan. PRL's Penex unit will process 5,000 bpd of light naphtha. The unit is expected to start up by mid-2015.

• Nigeria: Nigeria's burgeoning market for mini-refineries is also being targeted. The outgoing government led by President Goodluck Jonathan approved the establishment of a modular refinery initiative to ease the local supply difficulties of petroleum products, especially household kerosene (HHK). Nigeria is Africa's largest producer of crude oil, and currently has four refineries, with a combined nameplate capacity of 445,000 bpd.

Ahmad Massoudi, Oil & Gas Director massoudi.ahmad@monencogroup.com

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New Field

Smart City Market

A smart city is an urban area that uses different types of electronic data collection sensors to supply information which is used to manage assets and resources efficiently. A smart city may therefore be more prepared to respond to challenges than one with a simple "transactional" relationship with its citizens.



ICT is used to enhance quality, performance and interactivity of urban services, to reduce costs and resource consumption and to increase contact between citizens and government. Smart city applications are developed to manage urban flows and allow for real-time responses. A smart city may therefore be more prepared to respond to challenges than one with a simple "transactional" relationship with its citizens. According to Prof. Jason Pomeroy, in addition to technology, smart cities "acknowledge and seek to preserve culture, heritage and tradition", such as Barcelona in Spain. Yet, the term itself remains unclear to its specifics and therefore, opens to many interpretations.

Theoretically, any area of city management can be incorporated into a smart city initiative. A classic example is the smart parking meter that uses an app to help drivers find available parking spaces without prolonged circling of crowded city blocks. The smart meter also enables digital payment, so there's no risk of coming up short of coins for the meter.

Also in the transportation arena, smart traffic management is used to monitor and analyze traffic flows to optimize streetlights to prevent roadways from becoming too congested based on time of day or rush-hour schedules. Smart public transit is another facet of smart cities, used to ensure public transportation meets user demand. Smart transit companies are able to coordinate services and fulfill riders' needs in real time, improving efficiency and rider satisfaction. Ride-sharing and bike-sharing are also common services in a smart city.

Energy conservation and efficiency are major focuses of smart cities. Using smart sensors, smart streetlights dim when there aren't cars or pedestrians on the roadways. Smart grid technology can be used to improve operations, maintenance and planning, and to supply power on demand and monitor energy outages.

Monenco Iran, as a leading consultant in energy and industrial automation and design of ICT & Smart Solutions for plants and enterprises, is planning to enter the Smart City market. Developing appropriate concepts and roadmaps are in progress to offer win-win proposals to related clients.





Dokouheh Combined Cycle Power Plant (Andimeshk)

Start Date: 2018 Client: Mapna Group - Tose 3 Location: Khuzestan Province - Iran

Description: Andimeshk Combined Cycle Power Plant is located in west north of Andimesh city. This project is consists of one block of combined cycle power plant with F class gas turbine with capacity of 307 MW, one HRSG, and one steam unit with capacity of 144 MW and total capacity is 451 MW. Due to lack of electricity in this region and also high efficiency of this type of power plants, implementation of this plant that is one of the first series of F class power plant is very important. In this project, Monenco Iran is responsible for engineering services including basic and detail design for civil works and installation systems, common (BOP) systems, main and auxiliary cooling system.

Consultancy Services to attract financer from one of the International Banks Such as JAICA, Islamic Development Bank or Asian Infrastructure Investment Bank

Start Date: 2018 Client: Gharb Regional electric Company (GREC) Location: Azarbayjan, Kordestan & Kermanshah Provinces, Iran

• Description: In order to connect the power transmission network between North and South of the west area of the country as well as supplying sustainable energy, Gharb Regional electric Company intends to review the various methods of financing and attract financer from one of the international banks. In this project, Monenco Iran is responsible for consultancy services including inception report, detailed explanatory report, environmental and social studies in order to attract the financer to construct Miandoab – Sanandaj- Mersad 400 kV transmission line with 350 km length.

Sample Projects

Site Supervision Services for Implementation of Fiber Optic Cable and Telecommunication Buildings of North-Northeast 6th Gas Transmission Pipeline (3rd and 2nd Section)

Start date: 2018

Client: Iran Gas Engineering and Development Co.

Location: 3rd Section: Sabzevar, Bojnourd, Turkmenistan Border - Iran 2nd Section: Shahrud, Mayamey, Sabzevar Airport Area - Iran

• **Description:** The purpose of this project is to build a telecommunication infrastructure in data transmission and telecommunication buildings sectors at the third section of north to northeast 6th gas transmission pipeline between Sabzevar and Turkmenistan boarder. In this project Monenco Iran is responsible to render site supervision services for implementation of fiber optic cable (about 420 km) and telecommunication buildings.



Review of Passive Defense and Cyber Security Requirements of NWAOC-ERDC Building and SCADA Systems

Start date: 2018 Client: Azerbaijan Regional Electric Co. Location: Tabriz, Iran

• **Description:** NWAOC-ERDC building has been constructed in Tabriz. However, it is required to verify if the National Building Codes (Passive Defense requirements) and operational requirements have been met. Therefore, it is necessary to review the following factors related to the building such architecture, structure, mechanical and electrical installations, entries, diesel room and etc. In addition to observe the existing systems such as SCADA hardware, software, firewalls, switches, demilitarized zones, access control policies and etc. to ensure that Cyber Security requirements of SCADA systems have been met.

Sample Projects

Engineering Services for BOP and Main Cooling Systems of Rudshoor Combined Cycle Power Plant

Start date: 2018 Client: Mapna Power Plants Construction & Development Co. Location: Tehran-Saveh, Iran

Description: The main intention of this project is to increase the efficiency of the existing power plant to a combined cycle power plant. Rudshoor Combined Cycle Power Plant capacity is 1132 MW including 3 gas turbines each with the capacity of 264 MW, 3 HRSGs and 1 steam turbine with the capacity of 340 MW. Also, the cooling system is ACC. In this project Monenco Iran is responsible for conceptual, basic and detail design of the cooling system with F class steam turbines.



Consultancy Services for Design, Tendering and Supervision of Smart Distribution Monitoring System in Tehran International Airport

Start Date: 2018 Client: Imam Khomeini Airport city Location: Tehran - Iran

• **Description**: Imam Khomeini Airport city is in required to have a smart network for its electrical power distribution. In this project, Monenco Iran is responsible to review the employer requirements in order to design the smart distribution network. Afterward, technical and commercial tender documents will be prepared in order to hold the tender. Evaluation of tender participants and supervision of the project is another responsibility of Monenco Iran.



Engineering Services for Construction of Solar Power Plant to Provide %20 of the Energy of Administration Buildings of Telecommunication Infrastructure Company

Start Date: 2018 Client: Telecommunication Infrastructure Company Location: Tehran, Iran

• **Description:** The main purpose of this project is to provide 20% of energy consumption of the administrative building of Telecommunication Infrastructure Company. The followings are considered as the main objectives in this project; using the unique source of renewable energy, transforming the sun's energy into other forms of energy such as heat and electricity, reducing greenhouse gases and protecting the ozone layer, reduce the consumption of fossil fuels, reducing of energy generation costs in long-term and also significantly reducing maintenance costs for photovoltaic power plant. In this project, Monenco Iran is responsible for initial studies and feasibility studies, technical studies, network connection study, economic studies, preparation of tender documents, preparing detail design and providing training course.



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Sample Projects

Technical, Quality and Financial Supervision Services of Power Distribution Projects in the Western and Eastern District of Golestan Province

Start Date: 2018 Client: Golestan Province Electric Power Distribution Company Location: Golestan Province - Iran

• **Description**: One of the most important issues in operation and management of Electric Distribution Networks is implementation of the projects in terms of development, modification, maintenance and updating as well as automation and mechanization in line with the latest standards in a safe condition. Nowadays, considering the development in modern distribution networks equipment and systems, high quality supervision on the operation and performance of these systems is an essential matter. Accordingly, power distribution companies are always looking for the first class consultant engineers to handle the above-mentioned issues in the distribution network under their authority.

In this project, Monenco Iran is responsible to provide engineering, consultancy and supervision services of distribution networks projects in the eastern and western part of Golestan Province.



Engineering Services and Technical and Economic Assessment for Power Distribution Projects in Eastern District of Golestan Province

Start Date: 2018

Client: Golestan Province Electric Power Distribution Company Location: Golestan Province, Iran

• **Description:** In this project, Monenco Iran is responsible to provide engineering, consultancy and supervision services of designs of operational projects for distribution networks in east and west part of Golestan Province Electrical Distribution Company comprising 8 regions, based on modern technologies as follow:

• Preparation of Planning and Drawings

- Technical & Economic Analysis of:
 - MV & LV Networks (Overhead and Underground Lines)
 - Pole Mounted and Ground Mounted Distribution Substations
 - Street Lighting
 - Line Clearance Management and Installation Replacement/Displacement

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Events

Monenco Iran Attended in Oman Energy & Water Exhibition & Conference

• Monenco Iran attended in Oman Energy & Water Exhibition & Conference which was held on April 30th to May 2nd 2018 in Oman, Muscat. This international event is dedicated to water and wastewater industry along with power generation, renewable and alternative energy, transmission and distribution-related industries.

This event is an annual gathering for PAEW Company where they meet their partners, contractors and suppliers and is designed to be the largest platform for stakeholders to discuss real issues and solutions pertaining to the automation, energy and water challenges and opportunities in Oman.

The headline topics of the conference was as the following:

- 1. Water Economy
- 2. Water Production
- 3. Water Resources Management
- 4. Waste Water and Drainage

Around 40 scientific papers were presented during the conference and more than 150 companies were participated in the exhibition internationally in which 3 papers were presented in the conference by Monenco Iran's representatives as described below;

- Methods of chemical wastewater treatment in electrical power plants by focus on reverse osmosis process; presented by Susan Haeri, Process and Environmental Engineering Coordinator and Project Manager
- Water Resource Management in Kashan Combined Cycle Power Plant, presented by Farzaneh Geramiraz, Process
 Coordinator
- Challenges and Trends in Produced Water Treatment, presented by Dr. Amir Fouladitajar, Project Manager, Water and Wastewater Treatment Expert





Organized by

Oman Water & Wastewater Conference 2018 Tuesday, 1 May 2018 - Conference day two

Session 4: Water Production & Water Resources	
10:30	Methods of chemical wastewater treatment in electrical power plants by focus on reverse osmosis process Susan Haeri, Process and Environmental Engineering Coordinator and Project Manager, Monenco Iran Consulting Engineers
12:30	Water Resource Management in Kashan Combined Cycle Power Plant Farzaneh Geramiraz, Process Coordinator, Monenco Iran Consulting Engineers

Session: 5: Water Treatment and Utilization		
15:00	Challenges and Trends in Produced Water Treatment Dr. Amir Fouladitajar, Water and Wastewater Treatment Expert, Monenco Iran Consulting Engineers	

Monenco Consulting Engineers Attended in Oman Oil & Gas Exhibition and Conference

• Monenco Consulting Engineers Participated in Oman Oil & Gas Exhibition and Conference together with Mapna Group which was held from 26th to 28th of March 2018 in Oman. The event is recognized as one of the biggest and most important energy events in the Middle East region. In this event Monenco Consulting Engineers had fruitful discussions with the clients and other local and international oil and gas companies.

Events

Monenco Iran at the "23rd Iran International Oil, Gas, Refining & Petrochemical Exhibition"

• 23rd Iran International Oil, Gas, Refining & petrochemical Exhibition was held 6-9 May 2018 in Tehran International Permanent Fairground. Iran International Oil, Gas and Petrochemical Exhibition displays a wide range of technical and industrial abilities of Iran and other countries worldwide in the area of Oil, Gas and Petrochemical. It is one of the most important oil and gas exhibitions in the Middle East and also among the most significant oil and gas events in the world in terms of the number of participants and

its diversity. The exhibition provides a platform for local and international companies to take advantage of major opportunities in the industry as well as to learn about the developments in the local and global markets. Over 2500 domestic and foreign oil companies from 35 countries participated in the event.

Monenco Iran, also attended in this exhibition in which the presence of well-known companies provided a good chance for mutual cooperation and exchanging the information on the latest cuttingedge technology. In addition, high authorities visited Monenco Iran booth including Mr. Bitaraf, Deputy to Minister of Petroleum in which fruitful and effective negotiations was conducted during these meetings.





Synchronization of the first steam unit of Jahrom Combined Cycle Power Plant

• On April 15th, the first steam unit of Jahrom Combined Cycle Power Plant was synchronized. Jahrom Combined Cycle Power Plant consists of six gas units (v94.2) each with a capacity of 159 MW (Total 954 MW) and three steam units each with a capacity of 160 MW (Total 480 MW). The project was terminated in 2010 by the client and started again in 2016. In this project, Monenco is responsible to render engineering services for Steam Portion Extension of the plant including BOP.

Monenco Iran at the exhibition of the "23rd Electrical Power Distribution Conference"

• Monenco Iran attended in the exhibition of "23rd Electrical Power Distribution Conference" which was held on 9th and 10th of May 2018 in Tehran, Niroo Research Institute while having its own stand. During the exhibition, Mr. Haeri Deputy to Iran Energy Minister of Energy and Dr. Haghifam Deputy of Tavanir visited Monenco Iran. Also, top level managing directors of distribution companies from different provinces of Iran visited Monenco Iran and had fruitful and effective negotiations.





Clients Perspective

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To WHOM IT MAY CONCERN CERTIFICATE OF COMPLETION & APPRECIATION

Name of Assignment: Technical and Economical Feasibility Study of 500-600 Plant in Bafgh, Yazd province. DAELIM ENERGY

Contract Reference: Contract agreement entered between DAELIM Energy Co Consulting Engineering on 13 June 2016. Scope of Consulting Activities:

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Technical corridors / Comlection points aminations of Power Plant Connection to the regional Grid Conceptual Design of fight Voltage Substation and way of connecting to the Preliminary arrangements for the proposed Substations reliminary single to designs of the proposed Substations The network study consists of load flow studies, network studies, short ci selected option Obtain load estimation of rational grid and Regional Electric Company a Power plant to be grid in tobut maximum and minimum loads Define rational grid file with regard to projects approved and under w DigSLENT Presented different scenarios for connection of the above-mentioned power Inn

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- Impacts Associated with Operation Phase
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 Preparation of Fan Report

Contract Value: IRR 6.170.552.887 (six billion one hundred seventy million five hundred fifty two eight hundred eighty seven Rials) hundred eighty seven Rials)
Duration of Contract: 22 months from date of contract signing

certify that Monenco Iran Consulting Engineering has provided consultancy services for the showe generat as per aforementioned retains and performance of Monenco Iran Consulting Engineering is audiatory and of high standard, Patruer Monenco Iran Consulting Engineering has successfully he assignment and submitted all determined deliverables as per contract.







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