Monenco Iran

2015 Annual Report

Bridge of Valerian

Ancient arch bridge in Shushtar, Iran,

Built in the 3rd century AD on Sassanid order, Its dual-purpose design exerted a profound influence on Iranian civil engineering and was instrumental in developing Sassanid water management techniques

Monenco Iran

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Monenco Iran

Monenco, a leading global provider of professional engineering and consulting services in Iran was formed in 1973 as a joint venture between the private sector of Iran and Montreal Engineering Company of Canada. Currently, Monenco Iran is a private entity which Mapna Group, AMEC, and MIR (employee's share) are its main shareholders. Over the past 40 years; experienced qualified personnel, using modern systems & international standards, providing high quality services, and considering principle of customer satisfaction led Monenco to grow widely and achieve significant success in the target markets. Monenco provides engineering, consultancy and supervision services in a broad range of target markets worldwide including Combined Cycle and Thermal Power Plants, Renewable and Cogeneration, Distributed Generation, Electrical Power Transmission Lines, High Voltage Substations up to EHV and HVDC Systems, Telecommunication, SCADA, Dispatching Centers and Smart Grids, Electrical Railways, Electrical Network Studies, System and Energy Studies, Oil & Gas and Mining, Architecture, Civil, Urban Design and Roads. Furthermore, in order to penetrate in the Middle East, Europe and Africa Monenco has registered offices in Oman, Germany and Nigeria also was successful to enter Oil & Gas market in Bangladesh.

In 2015, Monenco entered into telecommunication sector of Oman and it is being considered for the consultancy and studies for Iran – Oman Sub-sea Transmission Line to transfer 1500 MW electricity to Oman from Iran. In addition to above, Monenco expanded the range of services across Iran market by entering into new target market such as Repowering, Urban Trains Stations and Tunnels, High-speed Railways and Metro as well as Market Analysis, Investment & Management Consultancy in 2015.

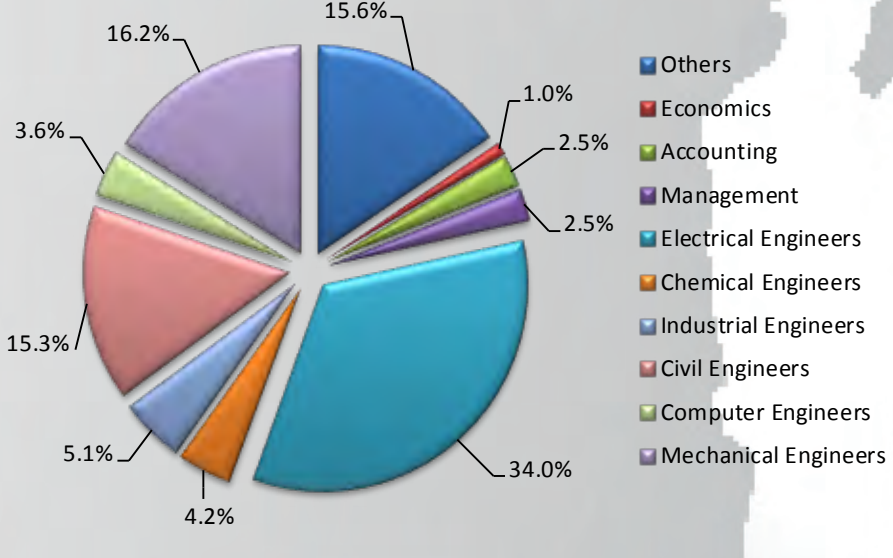
Major Experiences of Monenco

- Over 50,000 MW Power Plants
- 8 Renewable Energy Projects
- 17 Dispersed Generation Projects
- 14 Rehabilitation & Retrofitting Projects
- 22,887 Km Transmission Lines & OPGW
- 23,056 MVA Substations
- 53 National & Regional Dispatching Centers
- 53 Telecommunication Systems & Networks and Master Plans
- 27 Metro and Electrical Railway Projects
- 40 Oil & Gas Complexes
- 16 Mining & Geology Projects
- 34 Economical & Technical Feasibility Studies
- 4 Projects of Iran Power Grid Study
- 2 Heat Recovery Project in Steel Industry
- 6 Studies on Interconnection of the Network to the Grid
- 1 Study on Network Reactive Power
- 6 Bank Feasibility Reports on Investment Projects
- 3 Study on Network Master Plan
- 1 Restructuring of Electric Power Industry
- 6000 Points Advance Metering System
- 14 Heat Recovery & Energy Optimization Projects

45 Overseas Projects

- 20 Projects in the field of transmission lines, distribution networks, high voltage substations and dispatching centers
- 9 Projects in the field of thermal power plants
- 2 Projects in the field of hydro power plants
- 1 Project in the field of wind power plant
- 2 Projects in the field of Oil & Gas
- 1 Project in the field of power quality improvement of Steel Mills Factory
- 2 Projects in the field of Small Scale Power Generation Plant
- 1 Study on the interconnection of Electricity Network between Countries
- 1 Network study - synchronization of networks
- 1 project in the field of telecommunication master plan study
- 1 project in the field of network stability study
- 1 project in the field of network operation planning study

Composition of Experts in 2015



Faramarz Ghelichi

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Obtained his B.Sc. in Electrical Engineering from Ferdowsi University. He is specialist in H.V. Transmission Lines. From 1992 to 1997 he has worked in Moshanir Consulting Engineers Company as Project Engineer, Site Manager and Project Manager. In 1997, he joined Monenco Iran then in 2007 he was appointed as the Transmission and Dispatching Deputy and in 2012 was appointed as Managing Director Monenco Consulting Engineers (MCE) in Oman. In 2015, he was appointed as the Transm ission and Distribution Deputy while he is Monenco Oman member of board.

Mohammad Dana Manavi

Manavi.Mohammad@monenco.com

Obtained his B.Sc. in Civil Engineering from Sharif Universityof technology.

From 1992 to 1996 he worked for Bonyad Sazeh Consulting Engineers. He joined Monenco in 1996 as Structural Designer.

He continued his work till 2003 in Power Generation Department. From 2003 to 2006 his duty was Project Coordinator. From 2006 to 2008 he continued his duty as a Project Manager. From 2008 to 2011 he acted as the manager of Gas Turbine Power Plant and Utilities Section. In 2011 he was appointed as the Power Generation Deputy.

Safdar Mahdavi

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Obtained his B.Sc. from Iran Industrial and Science University in Electrical Engineering in 1992. From 1993 until 1994 he worked in Seaports and Shipping Organization and From 1994 to 1995 in Amin Electrical Eng. Eng. Company as Electrical Engineer. He joined Poolad Consulting Engineering as Electrical Engineer in 1995 and worked there for 4 years. In 1999, he joined Monenco Iran as Electrical Engineer then as Electrical Coordinator and Project Manager. He was appointed as Engineering Deputy in 2013.

Ahmad Massoudi

Massoudi.Ahmad@monenco.com

Obtained his Master in Chemical Engineering from Tehran Polytechnic University in 1969. He started his professional activities by joining National Petrochemical Company for 15 years, held different positions, which latest was Project Manager in Aromatic Project, then started working in Ministry of Industry for 5 years as Technical Expert. Next, in Alagas Company from 1991 to 1997 as Project Technical Manager and later as Managing Director in Nikoosarir Company from 1997 to 2003 and Kavir Phosphate from 2003 to 2008. Finally, he joined Monenco in 2008 as International Business Development Manager and in 2012 has been appointed as the Planning & System Deputy. Finally, in 2015 he was appointed as the Oil & Gas Deputy.

Amirali Bankian

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Obtained his B.Sc. in Industrial Engineering from Khaje Nasir Toosi University of Technology in 2002. Since 2002 he joined Monenco Iran and has been working for the company for 12 years. His first position was Project Engineer and later in 2005 he got into position of Planning & Project Control Engineer. In 2007 he was appointed as Head of Control and Monitoring Department. Also, since 2010 he is a PMP Certificate holder. Then, in 2014 he was appointed as Planning and System Deputy and head of Quality, HSE and Productivity office.

Siamak Khalaj

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Obtained his B.Sc. in Electrical Engineering in 1997 from Iran University of Science and Technology. Since then he joined Monenco and has been working for the company for 15 years. He was the head of Power Transmission Department and in 2010 was promoted to be the Managing Director of Monenco Engineering Limited (MEL) in Nigeria. In 2014 he was appointed as telecommunication and Dispatching Deputy in Monenco Iran.

Elham Sadeghian

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Obtained her B.Sc. in 1995 from Bahonar University and her M.Sc. in 1999 from Khaje Nasir Tusi University in Electrical Engineering. From 1999 to 2007 she worked in Niroo Research Institute as a Project Manager and as the Head of Electric Department. Since 2007 she has been working in Monenco as a Quality Manager and in 2010 she was appointed as the Financial and Administration Deputy.

Ramin Khoshkho

Khoshkho.Ramin@monenco.com

Received his Ph.D. from University of Joseph Fourier of France, M.Sc. and B.Sc. from University of Tehran all in Mechanical Engineering.

From 1990 to 1998, he worked in MATN Co. (Electric Power Research Center) as Senior Mechanical Engineer and Manager of Mechanical Department. From 1998 for two years, he has been Vice President of Power Generation Research Center and in year 2007 he has been appointed as R&D Manager of Monenco.

Rahim Zeinali

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Received his M.Sc. in Electrical Engineering (Power Systems) from Sharif University of Technology in 2008 and his B.Sc. in Electrical Engineering from Tehran South University in 2005. From 2006 to 2007 he worked in Sharif university of Technology as a researcher. From 2007 to 2008 he worked in Paziresh Novin Company, and Beheen Ertebat Mehr Company as a consultant.

Since 2008 he joinedMonenco as an Electrical Engineer in System & Energy Study Center. in 2009 he became the Project Manager and in 2012 he was appointed as Head of Power System Study Group in System & Energy Study Center. In 2015 he was appointed as Manager of System & Energy Study Center.

Mehdi Haji Javad

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Obtained his PhD in 1978 from Faculty of Chemical Engineering of the University Karlsruhe in Germany. From May 1978 to October 1990 Dr. Haji Javad worked as project manager at Fichtner Consulting Engineers in Stuttgart, Germany, having the expertise in the areas of flue gas cleaning and waste incineration. In October 1990 Dr. Javad joined AF-Consult Switzerland. From 1995 to 2012 Dr. Haji Javad was Head of the Thermal Energy Plants Department. Among other consulting services under his responsibility as Department Head and Project Director 14 combined cycle power plants and 3 coal power plants have been planned and implemented. During 2012-2013 Dr. Haji Javad was as Vice President of AF Thermal Energy Department responsible for seals and business development activities. Dr. Javad has published a number of articles on energy and environmental aspects. He is recognized by the Chamber of Industry and Commerce in Stuttgart, Germany, as a sworn expert for flue gas cleaning of firing systems and production plants. In 2016 he was appointed to be the Managing Director of Monenco Germany in Stuttgart.

Davood Moradi

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Obtained his B.Sc. in Electrical Engineering in 1998 from Tabriz University. Since then he joined Monenco and has been working for the company for 17 years. He was the Project Manager of many of OHL from 63kv up to 765Kv transmission line projects and the Project Manager of -/+ 500 Kv HVDC project (Overhead line and Convertors) also, he was the Director of Power Transmission and Distribution Networks Department from 2010 until 2014 and in 2015 was promoted to be the Managing Director of Monenco Consulting Engineerings LLC (MCE) in Oman.

Expansion of Services

- Feasibility study for GTP and GTO in Petrochemical Plants
- Studies of Vapor Control & Recovery in Refineries & Tank Farms
- Bio-ethanol Plants
- Technical Inspection in Oil & Gas plants
- Fire Protection and Alarm System of oil fields of South Iran
- Control & Monitoring System of Oil Fields (offshore/onshore)
- Consultancy Services and Supervision in Oil & Gas Pipeline
- Consultancy Services for Financed Projects by Islamic Development Banks
- Consultancy Services of Project Management Unit (PMU) of Power Transmission Projects
- Consultancy Services for Receiving Loan from International Financial Institution
- Consultancy and Supervision Services for Supplying Reliable Electric Power for Iran Cell Operator Switch Stations
- Consultancy Services of Marketing Strategy Plan for Foreign Firms in Iran Market
- Consultancy Services for Optimization of High Voltage Substation Buildings
- providing communication master plan for Iranian Railway System
- providing technical consultancy services for telecommunication equipments operation and maintenance
- Wastewater streams treatment; recovery and reuse Investigation, redesign and tender document preparation for wastewater reuse of Montazer Ghaem Power Plant
- Controlling, Coordinating, Supervision and Inspection of operation and maintenance contractor activities Supervisory and Inspection services on Operation and Maintenance contractor of Shahroud Power Plant
- Consultancy & Repowering Engineering Services for Thermal Power Plants
- Design of HVAC by low grade geothermal energy
- Wind farm electric power study to find optimum location of 400/230/63/20 KV Substation

Geographical Expansion

A. International Market

Our global operations, combined with our well-diversified Services, enable us to produce stable revenues and steady growth. This keeps us on course to deliver sustainable value for our shareholders well into the long-term.

Expanding our market in the Middle East, South East Asia and Africa also penetrating in CIS countries is our overall global achievement. We have special presence in several major countries including Oman, Nigeria, Uganda, Kenya, Bangladesh, Iraq, Tajikistan, Kyrgyz Republic, and Armenia.

B. Domestic Market

In order to penetrate and develop in domestic market, Monenco established an office in Kermanshah Province. Monenco serve the clients in Kermanshah, Kurdistan, Ilam and Kurdistan region of Iraq trough the followings:

- Presence in the region and facilitate access to all industries and clients
- Obtaining more share of the regional market
- Satisfaction of existing clients through interactive presence
- Facilitate and promote the Monenco services in short term, expansion of services in medium term and providing long-term development
- Reduce costs via using local experts and competition opportunity in regional tenders
- Making strong relationship with clients in the Kurdistan region of Iraq

Domestic Market Penetration

In Monenco, Development and Growth will be followed by reviewing the goals, program preparation, prioritizing actions and also continuous improvement.

Definitely, achieving the goals requires spreading a culture of excellence, retaining and improving values, ethical principles and observation of social responsibilities. In this regard, moving towards realization of vision statement of 1400 horizon, as specified bellow, is fundamental:

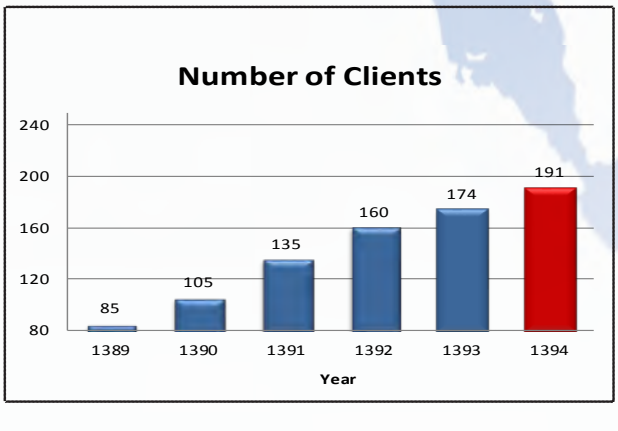
- Activity in all fields of engineering
- Retain and development the present position in the domestic market

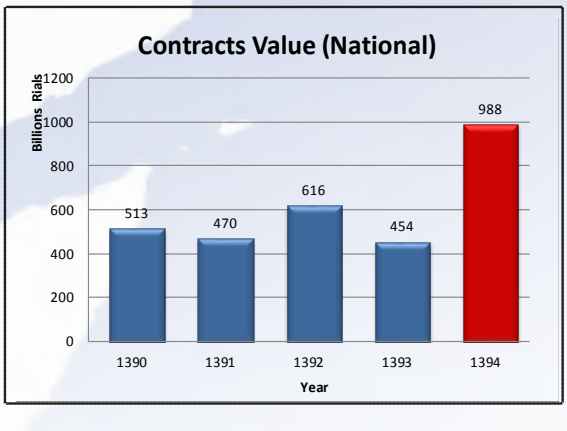
In 2015, Monenco was successful in increasing internal capacity and capabilities which led to getting awarded the projects in new, national and strategic fields including:

- Mining Operational Plans and Providing Identity
- Developing Master Plan for National Railway Telecommunication Infrastructure
- Gasoline Vapor Recovery Unit
- Consultancy services for Legal Structure and Functional Procedure to Facilitate Export and Import of Electricity
- Rehabilitation through Use of Heat loss
- Consultancy Services and Site Supervision on Converting Gas Oil Fired Utility Boiler to Natural gas
- Consultancy Services, Owners Engineer and Site Supervision on Subway Stations
- Design of Energy Management Laboratory

From the other hand, awarding projects from new clients including:

- Arvand Free Zone Organization
- Boushehr Province Electricity Energy Distribution Company
- Arya Pooya Company (PARCO)
- National Iranian Oil Products Distribution Company
- Montazer Ghaem Power Generation Management Company
- Niroo Research Institute
- Technical & Engineering Services Export and Export Development Office of Energy Ministry
- Tarasht Power Plant Operating Company
- Irancell Company
- Kowsar Yazd Institute
- Ministry of Energy
- Golestan Industrial Estate Co
- Tehran Behro Consulting Engineers





Participation in Exhibitions

In order to penetrate and develop in domestic market, Monenco participate in the following 6 international & national exhibitions and during the exhibitions, Monenco had fruitful and effective negotiations with different clients, companies & other visitors:

1) 20th International Oil, Gas, Refining & Petrochemical Exhibition
2) 15th Iran International Electricity Exhibition
3) Lateral Exhibition of National Advanced Metering Infrastructure Opening Ceremony
4) Lateral Exhibition of 30th International Power System Conference
5) Lateral Exhibition of 6th Conference on Thermal Power Plants
6) Lateral Exhibition of 8th National Electric Power Generation Conference

New Area of Experience

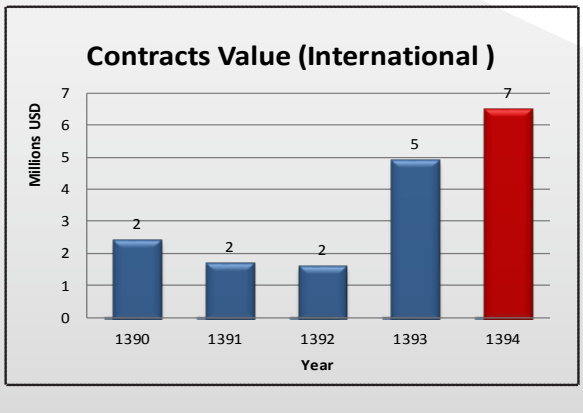
Due to Iran's situation in the region, the deal between Iran and P5+1 and unstable situations of most countries in the Middle East, Iran's market became much more attractive to foreign investors during 2015. In this process, Monenco was approached by both its long-term partners and new international companies even government authorities looking to invest in this market and looking for a reliable partner. As the first step for entering a new market, Monenco is offering comprehensive feasibility studies of Iran's different sectors of the industry for international companies, as well as doing joint marketing based on strategic partnership agreements which the contract with L&T for conducting Marketing Strategic Plan for the Company presence in Iran was one of our achievements in this section for year 2015.

International Market Penetration

Monenco as one of the leading engineering companies internationally, promises its clients excellence, quality, performance & reliability in all fields of operations. Due to our excellence and knowhow, we've been ranked as the 1st company technically in several international tenders, one of the most prominent ones being in the CIA region "CASA-1000; Consulting Services to provide construction supervision services for Design Supply and Installation of HVAC Line and associated substation works in Tajikistan and the Kyrgyz Republic".

In addition, being recognized as one of the top consultants internationally by clients empowered Monenco to simply be awarded the following projects:

- Selection of Owner's Engineer for Shahjibazar 330 Mw Combined Cycle Power Plant Construction Project (Bangladesh)
- Selection of Consultant for Consulting Services for Reliability Study of Bangladesh Power Grid System (Bangladesh)
- New Consultancy Services For New 132kV Double Circuits Lines from Rustag-Alawabi-Nakhal with a w 132/33kV GS at Al Awabi (Sultanate of Oman)
- D&E for Addition of Third & Fourth 125MVA 132/33kV Transformers at Muladah and Liwa Grid Station (Sultanate of Oman)
- Nizwa Variation Contract (Sultanate of Oman)
- Al Kamil Variation Contract (Sultanate of Oman)
- Consultancy Services for Design & Supervision of Upgrading of Seeb GS, adding 3rd & 4th Transformers at Mobella-2 & construction of Molbella-3 1 with 4x125MVA Transformer. (Sultanate of Oman)
- Consultancy Services for Design and supervision of new 132/33kV Bousher-2 and addition of third and fourth Transformer at Ghala GS, Amerat GS and Airport Heights GS (Sultanate of Oman)
- Marketing Strategic Plan for L&T Co. presence in Iran



Certificates and Awards

- Achieved 1st grade in providing consultancy services for “Oil refinery plants, Gas and Petrochemical Industries” (Awarded by Iran Planning and Management Organization)
- Achieved 1st grade in providing consultancy services for “Transmission (Microwave, Satellite, Fiber Optic, Cable and Data)” (Awarded by Iran Planning and Management Organization)
- Achieved 3rd grade in providing consultancy services for “Technical Inspection” (Awarded by Iran Planning and Management Organization)
- Achieved 3rd grade in providing consultancy services for “Renewable Energy” (Awarded by Iran Planning and Management Organization)
- Promote Monenco’s ranking in supervision section by Association of banking & credit investment consultants
- Achieved 22 gratitude certificate via Power Generation, Power Transmission Lines, High voltage Substations, Distribution Networks projects and also book publication, one of special gratitude letter in international market was achieved for comprehensive study of 400 Kv operations in MIS network and assessing the impact on the network, Client: OETC, Country: Sultanate of Oman.

Publications and Presence in the Conferences

We believe in knowledge sharing as a social commitment. In this regard, proudly, the first volume of the “Structure and Logic of Digital Protective Relays”, as our 5th published book, has been accomplished jointly with Sharif University of Technology which explains the overall structure of relays and details the protective functions and systems in Transmission Lines, Substations, Transformers and etc.

In current year, also our next books about designing of HV substations and human-resources management are finalizing.

In addition, we had 17 accepted international and 15 national papers and researches last year. Furthermore, 23 technical reports, based on the latest technologies, were prepared to support our actual and potential customers.

For being ranked as the first grade consultant for publication of “Consultancy Engineering Industry in the Developing Countries” book in the 30th international power system conference we have been awarded a certificate of appreciation and also granted a gratitude certificate from minister of power.

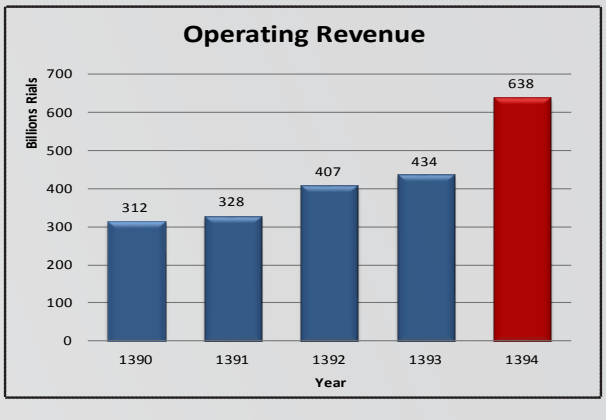
In addition, Monenco has published the book “Structure and Logic of Digital Protective Relays” with cooperation of Sharif University Press. The book is the first volume of a two-volume set which describes the overall structure of digital relays and variety of fault conditions in power network.

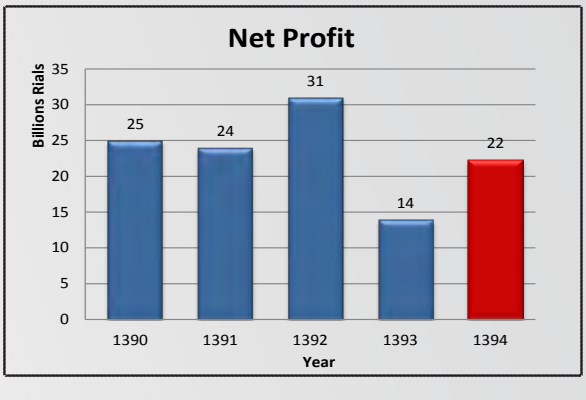
Transmission & Distribution Achievements:

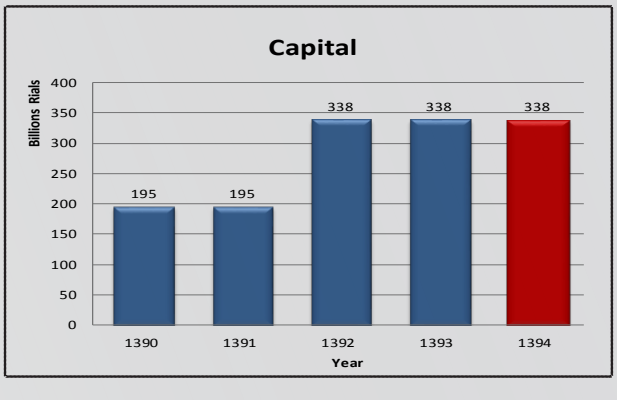
- Supreme and Site Supervision Services of Five High Voltage Substations Including Hosnije, Harand, Faradonbeh (400/63 kV) And Semirom, Lenjan (230/63 kV)
- Engineering and Design Services for Energy Management Laboratory of Energy Ministry
- Consultancy and Supervision Services for Supplying Reliable Electric Power for Iran Cell Operator Switch Stations

Power Generation Achievements

- Consultancy Services as Owner's Engineer for Construction of a 330 MW Combined Cycle Power Plant Construction in Bangladesh
- Repowering Engineering Services
- Accepted in the short list in Ghorasal 3 Unit Repowering Plant also Sending the Proposal
- Design of Tous ,Chabahar and Orumiyeh Combined Cycle Power Plants
- Design of Main Cooling System of Tous , Chabahar and Orumiyeh Combined Cycle Power Plants
- Supervisory and Inspection Services on Operation and Maintenance Contractor of Shahroud Power Plant
- Energy Conversion Management
- Consulting and Optimization for Preparation of two Units of Sea Water Purifier (MED) OF Bandar-Abbas Steam Power Plant
- Investigation, Redesign and Tender Document Preparation for Wastewater Reuse of Montazer Ghaem Power Plant
- Milnader Wind Farm Electric Power Study to Find Optimum Location of 400/230/63/20 kV Substation
- Consultancy Services and Supervision on Converting Boiler Fuel from Oil to Natural Gas on 4th unit in Montazer Ghaem Power Plant







Alireza Shirani
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Obtained his B.Sc. in Electrical Engineering from Sharif University of Technology in 1988. He has passed two years in Ministry of Energy as a System Engineer in Energy Division. From 1990 to 1997, he joined in Electric Power Research Center and from 1994 he was appointed as the Head of Electric Department. Since 1997, he has been Vice President of Research in Niroo Research Institute. Finally in 2007, he was appointed as the Managing Director of Monenco Iran.

Published data shows that in 2015 the total amount of consultancy works rendered in the world was about 600 billion$.

On the other hand, these data shows that about 15% of this amount (around 90 billion$) is coming from export of design services.

In addition, It must be noted that around 60% of the whole consultancy market is located in Asia, Middle East and Africa. Therefore, Monenco, due to its location, well preparation, well-trained experts, diversified scope of services, as well as registered offices and branches worldwide can have the greatest chance to be selected as the first priority consultancy firm by the projects' owners and clients.

Now, what makes Monenco a unique choice?

- Young qualified experts with vast experiences and up to date knowledge
- Diversified scope of services from mining to infrastructure, oil and gas to electricity, Telecommunication and ICT to smart home and smart cities and subway to electrical rail way all and all can guarantee that Monenco is not only considered as consultancy firm but also can support the client as the total solution provider.
- Accredited and trusted consultancy firm for reputable financial institutes and international banks. Means that Monenco can help the clients to finance the projects based on the carried out feasibility studies and best possible supporting from those financial organization
- Presence in the market internationally through registered officed and representatives in Africa, middle east, central and sought west Asia, and Europe.
- Having MAPNA group as one of its major shareholders, which is one of the biggest conglomerate in the middle east and top 5 in the world in turbine and generators manufacturing, among top 10 in power plant constructors, one of the best manufacturer of electric locomotive, owner of more than 12000 MW power plants (IPP) and at last but not least one of the major EPC players in Oil and gas downstream projects
- Monenco Research and Development Department with qualified scientists and well related ties with the best universities and research institutes. i.e. Sharif university of technology, Niroo Research Institute, Tehran university, Sultan Ghabos university, Dhaka university, Stuttgart university, polytechnic university

As a final point, I do believe that in a very near future, let's say next 5 years, monenco will be in top 10 consulting firms in the world and let me thanks those who helped, supported and encouraged Monenco to reach to this prestigious situation; our clients, our engineers, and finally our shareholders.

Transmission & Distribution

The Division of Power Transmission & Distribution handles projects in energy and power industries. This Division has designed, consulted and supervised +/- 500 kV HVDC system, more than 720 km Transmission Lines up to 765 kV, Hot Line OPGW with the length of more than 700 km and 10,826 MVA Substations from 33 kV up to 400 kV and more than 23 Distribution Networks in 2015.

Transmission Lines and Distribution Networks

Transmission Lines and Distribution Networks Division offers client responsive and high quality design and engineering services in all stages of projects in the fields of Network System studies, Power Transmission Lines designs and supervision, OPGW, ADSS and engineering of network distribution and Detail Design with economic studies. In addition, using the latest version of software such as PLSCADD, PLS-Tower, CYMDIST, CYMTCC, Calculux, DIALux, DIgSILENT, ETAP also latest methods like intelligent GIS system for selecting the best routes and surveying via (LiDAR) system enable us to reach the optimum design in our projects.

Grid Stations

The High Voltage Substations Department is equipped to deal with all necessary aspects of engineering and construction supervision as well as asset management of HV substations. Substation engineering covers Detail Design with economic studies, design of the HV and LV parts, as well as control systems, auxiliary services, and civil & structural design; these designs are fully accomplished based on structural 3D design software. Consultancy of the projects also falls within our area of expertise. We also deal with control systems for equipment designed for energy production (Hydroelectric and Thermal plants) and Petrochemical Plants.

Civil & Structures

By gaining experience in different fields of design and consultancy, Monenco Iran also offers Civil services for industrial facilities. This department provides consultancy and engineering services for industrial, commercial, residential buildings and civil parts of the Transmission Lines, High Voltage Substations, Dispatching centers and Railway transportation projects and other unusual structures. Also Ergonomic Control Centers and Green Buildings are in Civil & Structures Department.

Railways & Subways

By developing technical knowledge in the new fields also in line with the needs for infrastructure projects in the field of Subways, Urban Railways and stations in Iran, Monenco has expanded its services and entered into the mentioned fields. However, through the technical and engineering capabilities of Monenco, foreign partners, experienced qualified personnel and using modern technologies, Monenco is able to render high quality engineering services in different projects in mega cities of Iran such as Shiraz and Tabriz as well as different lines of Tehran Metro and Subway Railways projects.

Articles and Technical Reports

Transmission & Distribution Division has published 8 technical reports, 5 International and 1 National articles and papers in 2015 to introduce new Technologies & Systems to its clients. Below is the list of mentioned reports;

- Integrated Model Considering Effects of Zero Injection Buses and Conventional Measurements on Optimal PMU Placement (IEEE Transactions on Smart Grid, August 2015)
- Study Of Failure Mode and Effect Analysis (FMEA) On Capacitor Bank Used in Oman Distribution Power System (19th International Symposium on High Voltage Engineering (ISH 2015))
- Preventive Maintenance Activities Documentation for Circuit Breaker Used in Oman Distribution Power System (19th International Symposium on High Voltage Engineering (ISH 2015))
- Analysis of Overvoltage Variation Caused By Single Phase to Earth Fault in Vicinity of High Voltage Substations (PSC 2015)
- Technical Principle and Usage Investigation of Photovoltaic Cells in Buildings
- U-Boot Slab Modern Ceiling in Buildings
- Reliability Improvement and Optimum Topology of Automation Systems in High Voltage Substation
- Flood risk assessment in power industries asset
- Outlook Of Smart Grid in Power Distribution Network
- HVDC System Influences On Integrated National Network
- Optimal distribution system feeder reconfiguration and distributed generation placement considering different model of DG sources - International Conference on Science and Engineering Dubai-UAE
- Distribution system efficiency improvement using Multi-objective stochastic network reconfiguration and DG allocation – Sired Conference
- Software for Taking MTO in Sub-Stations
- Single Phase Systems in Distribution Network

Significant Ongoing Projects:

- Engineering, Design and Consultancy Services of two 63/20kVGIS Substations (7th line of Tehran Metro)
- Engineering, Consultancy, and Supervision on Commissioning of Shiraz Urban Railway Line 1 (Second Phase) including Installation of Electrical and Mechanical Equipment, Civil and Architecture Works of 14 Stations
- Engineering, Design Services and Site Supervision for 66/20kV Genaveh 3 and Sheshdeh Substations in Fars Regional Electricity Company (FREC)
- Consultancy Services of Project Management Unit (PMU) of Azerbaijan Power Transmission Program; Financed by Islamic Development Bank in Iran
- Supreme and site supervision services of five high voltage substations including Hosnije, Harand, Faradonbeh (400/63 kV) and Semirom, Lenjan (230/63 kV)
- Consultancy and Supervision Services for Supplying Reliable Electric Power for Iran Cell Operator Switch Stations
- Supreme and Site Supervision Services Of Kerman & Sistan Copper Industries Projects

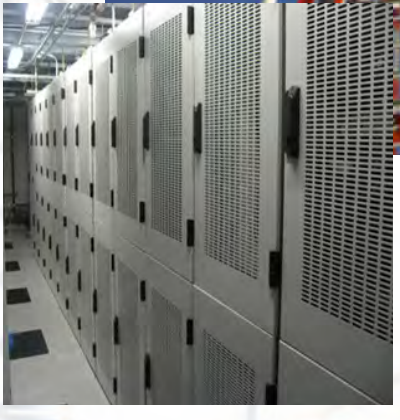
Consultancy Service for Measurement, Redesign And Optimization of 4 Switch Sites of MTN-Irancell Company in Tehran East, Tehran West, Tabriz, Isfahan

Start date: Dec-2015 **Finish date:** 2017 **Location:** Tehran , Isfehan , Tabriz (Iran)

Client: Sherkate Khadamate Ertebati –e - Irancell

Scope of work:

- Project management
- Consultancy services
- Design Review & As built preparation
- Analyses report Services
- Test Supervision Services



Description: This project has two phases. Represent proper solutions on power problems in switching centers with Data centers, namely (TE , Tw , Isfehan & Tabriz switch sites) besides Analyses report is one of the main goal in this project. On the other hand Monenco obliged to prepare the as-built drawings in mentioned switch sites based on the final extensions. The first phase in under investigation but hopefully there is more progress in second phase against the first one.

The nature of this contract besides of different companies overlap activities generate delays more than expected. So To meet the end of contract more cooperation from all parties should be done especially on test schedule that will be done by Irancell's contractors.

Comprehensive Studies to Reorganize and Development of Transmission and Distribution Network of Industrial Arvand Free Zone

Start date: 2015 **Finish date:** 2017 **Location:** Asaluye-Isfahan

Client: Arvand Free Zone

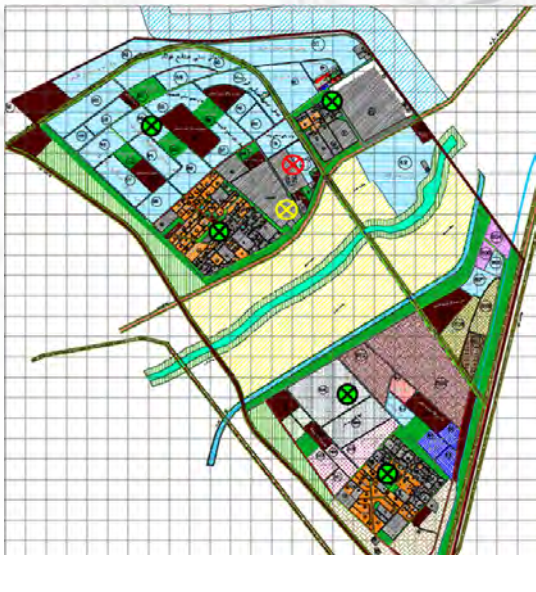
Scope of work:

- Comprehensive Studies for distribution and transmission network
- Reorganization of existing distribution network

Description: Comprehensive Studies to reorganize and development of transmission and distribution Network of industrial Arvand Free Zone include two parts as follows:

1. Comprehensive Studies for Power Supply of Khorramshahr and Abadan industrial zones:

- Data gathering of Electrical Network in Industrial zones
- Surveying and analyzing the collected data of Industrial zones
- Load forecasting of industrial zones
- Power System Studies of industrial zones
- Power System Studies for industrial zones connection to upstream network



2. Comprehensive Studies for distribution network of Khorramshahr and Abadan industrial zones:

- Data gathering of distribution Network in Industrial zones
- Load and Network modeling
- Electrical calculations and preliminary designs
- Energy and Load forecasting of industrial zones
- Recommendation for the best designs
- Reliability calculations
- Protection system designs

Supreme and site supervision services of five high voltage substations including Hosnije, Harand, Faradonbeh (400/63 kV) and Semirom, Lenjan (230/63 kV)

Start date: 2015 **Finish date:** 2017 **Location:** Iran
Client: Esfahan Regional Electric Company (E.R.E.C)

Scope of work: Engineering service for five substations Hosnije, harand, faradonbeh (400/63kV), Semirom, Lenjan (230/63kV) as follow:

- Compare detailed specifications, quality, and quantity of major substation equipment (circuit breakers, disconnectors, supports, conductors, panels, insulators, fittings, etc.) relevant buildings, transformers (autotransformers), gantries (towers) and so on with those specified and required by the technical specifications in the bidding documents.
- Conduct construction site supervision during the period of construction works and monitor construction schedule.
- Monitor progress of the project.
- Prepare a detailed Project Control Program using Microsoft Project to provide charts, curves and detailed reports of critical activities, percentage completion, interface points, etc. for design, procurement, installation and commissioning.
- Hold regular planning and progress review meetings to monitor Contractor's work progress
- Prepare monthly progress report and comprehensive quarterly progress report
- Assist client with overall quality assurance.
- Monitor construction at sites and manufacturing process in factories and advise client on quality assurance issues.
- Monitor Health and Safety procedures at construction sites. Suggest the measures to be taken in order to avoid or mitigate possible safety risks during construction and supervise implementation of such measures.

Description: According to growth of energy consumption in Isfahan and Chaharmahal & Bakhtiari provinces and meet to the projected demand and in order to develop and optimize the power transmission and distribution system in the area Isfahan Regional Electric Company intends to construct five new transmission substations in different locations in said provinces (Hosnije, harand, faradonbeh, Semirom, Lenjan (through a joint financing of Islamic Development Bank (IDB).
In general, the benefits of switching substation are:

- Lack of capacity in 400 kV substations to supply the consumers demand (Hosnije, harand, faradonbeh, Semirom, Lenjan (and solve this problem.
- To overcome the increasing of electricity demand by newly built industrial units.
- To supply the energy demand of 140 MW for Foolad Chaharmahal factory as a new consumer.
- Construction of back-up 400kV substation for feeding Chaharmahal & Bakhtiary Province.
- To overcome the voltage drop due to high length of 63kV transmission lines.

Consultancy Services for Engineering, Design Review and Site Supervision for Installation of OPGW on Transmission Lines

Start date: 2015 **Finish date:** 2017 **Client:** Aryacell
Location: Western and Eastern Azerbaijan, Ardebil, Gilan, Kermanshah, Kordistan provinces

Scope of work:

- Data gathering and preliminary design for OPGW installation on transmission lines
- Surveying of transmission lines and preparation of As- Built structure list
- Preparation of technical specifications for OPGW, Fitting, OCDF/ODF, buried fiber optic cable, etc.
- Detail design and selecting the proper size of OPGW
- Loading calculation of towers after replacing the Sheild Wire with OPGW
- Calculating the distance between OPGW and conductor in the middle of span
- Preparation of tender document
- Assisting in floating the tender and assigning the contractors
- Design review and checking the technical specification and drawings that is proposed by manufacturers
- Factory and Type tests inspection
- Site supervision
- Assisting in preparation of As-Built documents

Description: The length of transmission lines for OPGW installation is about 500 km and the above scope of services shall be performed for bellow transmission lines:

1. Punel – Astara 230 kV Transmission Line
2. Gilan Power Plant – Punel 230 kV Transmission Line
3. Astara – Taghidizaj 230 kV Transmission Line
4. Ahar – Agarak 230 kV Transmission Line
5. Khoy – Jolfa 132 kV Transmission Line
6. Khoy 1 – Khoy Power Plant 132 kV Transmission Line
7. Ghasr Shirin – Sarpolzahan 63 kV Transmission Line
8. Kamyaran – Mochesh 63 kV Transmission Line
9. Ghorveh – Ghahrood 63 kV Transmission Line

Engineering Design, Supervision & Mechanization Services of the Implementation of Power Distribution Projects Engineering Design, Supervision & Mechanization Services of the Implementation

Start date: 2015 **Finish date:** 2016 **Location:** Bushehr State Distribution Network
Client: Bushehr Electrical Distribution Company

Scope of work:

- Survey of Distribution Lines
- Distribution projects supervision
- Rehabilitation of routs of distribution line
- GIS Integration and Mapping
- Capacity Building

Description: One of the most important issues in operations and management of the plans is implementation for development, modifications, service, repair and maintenance as well as updating and automation & mechanization of distribution networks in line with modern standards and in a safe situation. In this project Monenco Iran is in charge of supervision on operational plans for distribution networks in 11 regions of Bushehr Province based on modern technologies with 30 Power Distribution supervisors and 4 GIS Operators.

Consulting Services to Provide Construction Supervision Services for Design supply and Installation of HVAC Line and Associated Substation Works in Tajikistan and Kyrgyz Republic under CASA 1000 Project

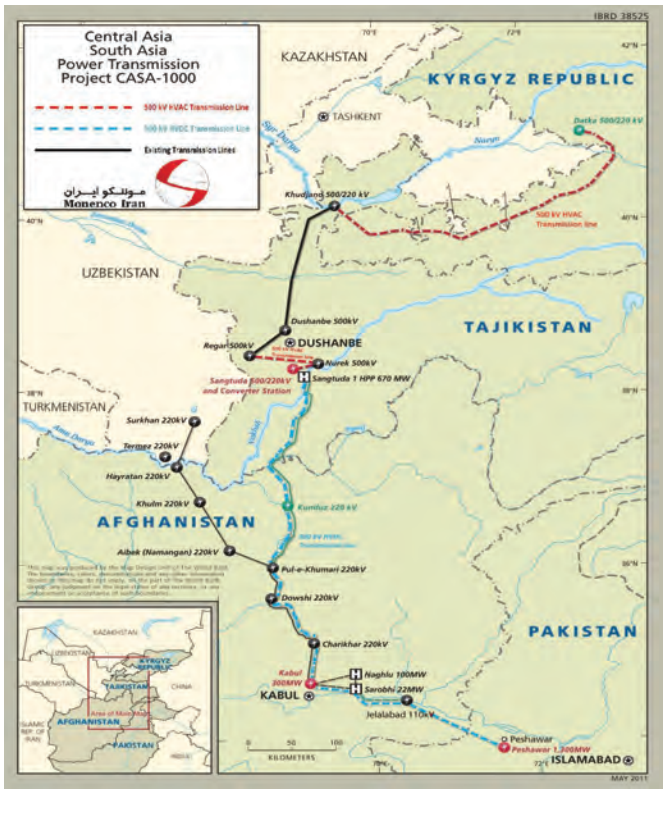
Start date: 2015 **Finish date:** 2018 **Location:** Kyrgyz Republic and Tajikistan
Client: Bark-i-Tojik Tajikistan and NEGK Kyrgyzstan

Scope of work:

- Design Review
- Preparation of Project Implementation plan, Monitoring Scheme and Cost Control
- Supervision on Project Construction Activities
- Assist Client in Implementation ESMP, RAP and HSE Plan
- Reviewing As-Built Documents

Description: In Central Asia, the Kyrgyz Republic and Tajikistan have a surplus of electricity during the summer because of most abundant clean Hydropower resources. Nearby in South Asia, Afghanistan and Pakistan cannot meet their citizens' electricity needs, especially during the sweltering summer. A new electricity transmission system, called CASA-1000, between all four countries would help make the most efficient use of clean Hydropower in the Northern Countries by enabling them to transfer and sell their electricity surplus in the summer to the deficient countries in South Asia. The selection and employment of consultants was performed under IBRD (International Bank for Reconstruction and Development) loans and IDA (International Development Association) credits & grants by World Bank borrowers. The project consists two parts: 500 kV HVAC transmission system as well as ±500 kV HVDC transmission system.
Monenco Iran was selected as the consultant for HVAC part of the project that consist bellow transmission lines and associated substations:

- 500 kV Transmission line from Datka to Khujand (475 km) and extension works for associated substations (The Kyrgyz Republic)
- 500 kV Transmission line from Regar to Sangtudeh (115 km) and extension works for associated substations (Tajikistan).



Telecommunication & Dispatching

The Telecommunication and Dispatching Division is one of the most important and fast growing division as it deals with an enter-technological, robust and progressive industry. It provides engineering and design services for dispatching centers and telecommunication networks inside and outside the country including SCADA, monitoring and dispatching, networks, telecommunication systems, metering systems and smart grids.

Benefiting from high qualified engineers, software and hardware infrastructures and the latest technology of the day in addition to the valuable experience and knowledge of the company, we provide the best quality of engineering and consulting services from conceptual, basic and detail design, technical training, site supervision and management of the most important and high tech projects of the country. Having technical teams dedicated for mobile, fiber optic, smart grid and signaling areas of knowledge and our joint cooperation with top ranked companies has made us unique in providing services to the clients.

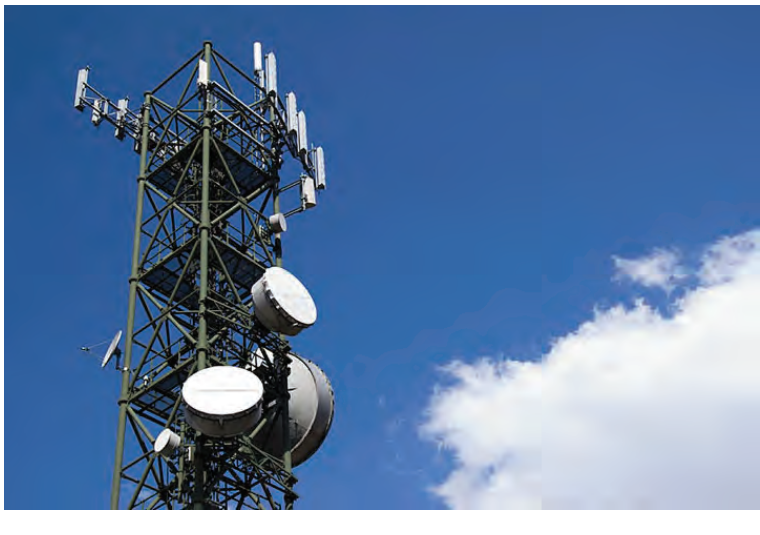
Dispatching & Automation

Dispatching and Automation Department serves consultancy services in various stages of SCADA and automation plans of electricity industry including generation, transmission and distribution, copper and steel production industries, metro & railway, oil & gas and water distribution industries. In this regard this group has been taking advantages of up to date technologies in their projects such as WAMS systems and Smart Grids.

Furthermore, in this department technical reports have been provided in various fields such as smart grids, leak detection system in oil & gas and water industries, and environment monitoring systems.

Telecommunication

As a reliable partner for large telecommunication operators, we give consultation services regarding the installation and optimization of their telecom networks in the layers of core, aggregation and access . Throughout the country, we've carried out consultation projects about deployment of fiber optic networks, radio/ microwave systems, Power Line Carriers, etc. We've also worked on the high level design, business case preparation and tendering of the National Broadband Network based on FTTx; national telecommunication infrastructure of power system; telecommunication infrastructure of oil and gas company; smart grids and advanced metering infrastructure (AMI), telecommunication network planning of airports, metro systems, etc.



Articles and Technical Reports

The Telecommunication Department has published 4 national technical reports in 2015 in order to introduce new technologies & systems to its clients. Below is the list of mentioned reports;

- Application of TETRA radio trunk network at mission critical industrial in earthquake condition
- Implementation of information security management system (ISMS) for national energy and communication infrastructures
- Technical and economic assessment of MAPNA Group contribution on in developing broad band communication network

"Kowsar Yazd" Smart City FTTx Network Design

Start date: 2015 **Finish date:** 2016 **Status:** ongoing **Location:** Yazd, Iran
Client: Yazd Kowsar Institute

Scope of work:

- Site survey and data gathering of residential-business unit
- Conceptual design of FTTx network (Select technology and architecture of Splitters)
- High level design of selected technology in ODN level
- Technical specification of passive/active equipment
- RFP preparation to set up tender documents

Description: Kowsar complex is a new smart city that is located in urban area of Yazd city. In order to cover all the telecommunication requirements of the project, FTTx technology is selected as the best optimized scenario. Monenco Iran is selected as the consultant of this project for the FTTx network design in ODN level. This network shall cover the required bandwidth as well as integrated triple play services. The total area of network is about 20 Km^2 and includes more than 2500 residential and business units. The benefits of the above mentioned project for the client are as below:

- Capex reduction due to giving different telecommunication services through an optimally designed FTTx network.
- Opex reduction due to an integrated services design and unique network monitoring system.
- Providing different telecom and businesses services on a unified network.
- Covering all future bandwidth demands due to fiber optic based network.

Iran Railways Telecommunication Master Plan

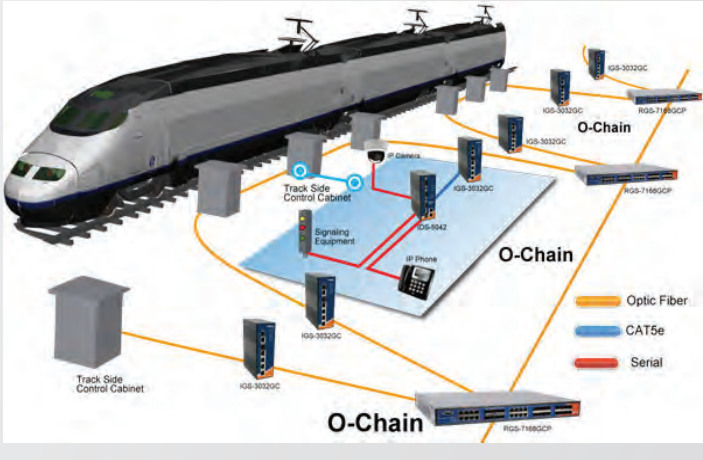
Start date: 2015 **Finish date:** 2016 **Status:** ongoing **Location:** Iran **Client:** Iran's Railway Company.

Scope of work:

- Current network status analysis.
- Target definition and guide line to meet the target
- Preparation of road map and task definition to meet the road map & SWOT matrix analysis
- Prioritizing the tasks based on technical and financial issues

Description: The primary aim of this project is to develop the fiber optic infrastructure, transmission network, PABX systems, Data switch equipment and finally radio trunk network for special functions within the railway industry. In addition to that, the Islamic Republic of Iran Railway Company owns 9000 Km fiber optic infrastructure along the railways in addition to more than 380 optical transmission nodes. In this case, this company after TIC (Telecommunication Infrastructure Company) has the largest fiber optic network in Iran. It is noticeable that the integrity of the designed network is more important and should be based on the strategic targets defined in the Vision of Iran Railway Company.
Some of the highlights of this project are:

- Reduced Capex as well as Opex due to the integration among telecommunication sections.(Fiber, Radio, PABX, Data)
- Increasing the traveling capacity of trains along railway due to the best telecommunication equipments through the latest technologies.
- Achieving more revenues due to introducing of new business cases in the fiber optic transmission section.
- Tender document evaluation will be easier than the past, because there are unique technical specifications in different parts of telecom sections as reference.



There are different fields involved in this project including fiber optic transmission & access design,Trunk Radio System, Public Access exchange , IP data & switch.

Engineering and Site Supervisory services of RDCs in Markazi, Hamadan and Lorestan Provinces

Start date: 2015 **Finish date:** 2018 (4 months Engineering + 24 months Site Supervisory)
Status: ongoing **Location:** Markazi, Hamadan and Lorestan Provinces- Iran
Client: Bakhtar Regional Electric Company (BREC)

Scope of work: Field study, basic design, preparation of tender documents, tendering, design review and site supervisory of Control Centers, telecommunication system and RTU and power interface system.

Description: In the continuation of the previous Monenco Iran's project in Bakhtar Regional Electric Company (BREC) for supply, installation, test and commissioning of RDCs and 31 substations in Markazi province, BREC plans to complement the existing Supervisory Control and Data Acquisition (SCADA) system by adding up approximately 90 (230/20, 63/20KV) new substations across all Markazi, Hamadan and Lorestan provinces to the control centers which are all equipped with "ABB Network Manager" software. These substations would be connected to their own RDC dispatching control centre in which located the capital of each province. On the flip side, three RDC dispatching control centers not only control their own substations individually but also they would have loop communication among themselves.

Technically, each Control Centre will communicate with its own Remote Terminal Units (RTUs) in the substation. Control centers will form part of a hierarchy of dispatching centers with inter-centre links to communicate with the master control centre which is West Area Operating Center (WAOC).
The scope of supply shall include the following elements:

- Supplying, installation and commissioning of the Remote Terminal Units (RTUs), modems, cabinets and their requirements;
- Supplying, installation and commissioning of SCADA battery and charger for each substation, if not existed.
- Interface system between filed equipment and RTUs;
- Updating Control Centers Software and commissioning them with their own new substations;
- Design, installation and commissioning of the Telecommunication System.

Implementation of interoperability for Iran Advanced Metering Infrastructure (AMI)

Start date: 2015 **Finish date:** 2017 **Status:** ongoing **Location:** Tehran, Iran
Client: Iran Energy Efficiency Organization

Scope of work:

- Defining FID1-Packages, Interoperability Specification and Massage structure between AHEs, MDM and applications according to IEC 61968-9
- Defining FID2-Package 1,Interoperability Specification for MI2-SI2 Interface, including related Events list and Objects list assuming IHD (in home display) and Gas and Water meters connection according to DLMS- COSEM Protocol
- Defining FID2-Package 2,Interoperability Specification for MI1-CI1 Interface, including related Events list and Objects list assuming IHD (in home display) and Gas and Water meters connection according to DLMS- COSEM Protocol
- Defining FID2-Package 3, Interoperability Specification for CI2-SI1 Interface, including related Events list and Objects list according to DLMS- COSEM Protocol
- Mapping Events and Objects between DLMS- COSEM Protocol and IEC 61968-9 Standard

Description: Interoperability can be defined as the ability of systems, components or equipment to provide services to and accept services from other systems, components or equipment and to use the services exchanged to enable them to operate effectively together. With respect to software, the term is also used to describe the capability of different programs to exchange data via a common set of exchange formats, to read and write the same file formats, and to use the same protocols.

The lack of interoperability can be a consequence of a lack of attention to standardization during the design of a system. Interoperability can have important economic consequences. If competitors' products are not interoperable (due to causes such as patents, trade secrets or coordination failures), the result may well be monopoly or market failure.

Interoperability in FAHAM system means that meters from different manufacturers should be able to work with all various types of concentrators made by other manufactures. Every O&M devices can connect to different types of meters and concentrators and CAS can manage all FAHAM devices regardless of their manufacturers. All these mentioned items shall be fulfilled without any additional devices or protocol convertors and without interfering system on line operation.

CVP:

- Prevent monopoly among FAHAM manufacturers
- Ability of systems, components or equipment of AMI system to provide services to and accept services from other systems, components or equipment of AMI system
- Grate achievement in developing National Interoperability Specifications

Power Generation

Power Generation Division covers all types of power generation projects from Combined Cycle, Thermal Power Plant, to Renewable and CHP, CCHP. More than 54,000 MW power generation projects have been Engineered, Designed, and Supervised by this department including 24,000 MW Gas Turbine and 30,000 MW Combined Cycle Power Plants. Also feasibility studies of more than 3000 MW Thermal Power Plants have been done by Monenco. In 2015, Monenco Iran was involved in 4000 MW power generation projects globally.

Desalination

The desalination plants for supplying potable and industrial water are frequently constructed as integrated part of power generation and sea water desalination plants. In this context it is very important to choose and optimize the most appropriate plant configuration and technology for the desalination process. This applies in particular to privately financed projects in public-private partnership models. That is why Monenco always designs such facilities individually to best meet the specific project requirements. This includes both processes for sea water desalination as well as raw water treatment and also post-treatment and/or conditioning of product water according to the relevant requirements.

Combined Cycle Power Plants

Due to the economical and environmental concerns, there is general tendency towards constructing combined cycle power plants or converting gas turbine power plants into combined cycle power plants, to increase efficiency. Monenco is a pioneer company in offering engineering and consultancy services for different modules of combined cycle power plants.

Feasibility Studies

To start a business, there is a need for insight and vision in terms of the viability of the proposed project concept. Most rational decisions, taken either by existing or aspiring entrepreneurs to make a business investment, is preceded by an investigation of the feasibility of the project. The analysis of the project involves a certain number of stages also some parameters and elements need to be analyzed in order to make decisions about the viability and direction of the business. In Monenco, we have an expert team for the technical and economical feasibility studies of the projects in all fields.

Gas Turbine Power Plants

Currently a significant fraction of electrical power in Iran is generated through gas turbine power plants and this is growing rapidly. Monenco has long experience of offering engineering, design and consultancy services for gas turbine power plants.

Renewable/Green Energies & Distributed Generation

Monenco actively participates in eco-friendly and clean energy projects such as, renewable energy generation from water, wind and sunlight and distributed generation with use of combine heat and power generation (CHP). We are well aware that protecting and preserving the environment is both a social responsibility and a crucial element to sustainable development. The renewable energy generation and distributed generation in Iran is increasing with a significant rate and this can be seen as an emerging market for Monenco. Monenco started participating in this market since 2009.

Repowering

Monenco Participates in studying and rendering engineering services in repowering projects of existing thermal power plant not only for extending the lifetime of existing plants but also for reducing the life-cycle costs in order to remain competitive in comparison to new power plants.

Repowering targets existing thermal power plant under certain conditions to make such an effort viable for competitive power generation costs. Monenco started to study different thermal power plants in Iran to fulfill the goal of modernization and repowering in order to increase the economics and dispatch ability of existing power assets. These Market have been started in Monenco since 2013.

Consulting Services

Monenco started rendering consulting services as owner engineer for power plant projects. As a consultant the scope includes: review of design & drawing as submitted to client for approval, engineering & Project management, supervision of construction , installation ,testing, commissioning, quality control, dismantling & disposal procedures and other activities throughout pre-construction/ construction/commissioning stages of project. Supervision of all activity in the site such as site leveling, excavation, foundation, steel structure, concrete structure, welding, test of material and equipments, piping, cabling, termination, etc.

Wastewater Streams Recovery and Reuse

Due to the lack of available potable water resources in the most parts of Iran, arid and semi-arid climate in our country, also for the sake of protecting and preserving the environment from pollution, using our available experiences and technologies for recovery and reuse of wastewaters in industrial plants as well as sewage recovery would be very applicable. Based on that, Monenco started participating in this market by rehabilitation and redesign of waste water treatment plants in old industrial and power plants.

Design of Tous Combined Cycle Power Plant

Project Type: Combined Cycle Power Plant **Start Date:** 2015
Location: Mashhad (Khorsan), Iran
Owner: MAPNA Tous power generation Company
Capacity: 480 MW (3 STG * 160 MW)

Scope of work: Monenco provides Basic Design, Detail Design, 3D Modeling of Plant and overall engineering

Description: The plant is located near Mashhad city in KHORASAN province and is consisting of 3 steam portions of combined cycle power plant each consisting of two (2) HRSGs and one steam turbine generator set & main and auxiliary cooling system including 400 ks AIS substation for the existing simple cycle V94.2 gas turbine power plant including 6 GTG units to be converted to the combined cycle power plant in “2+1” configuration for the Tous site.

Design of Chabahar Combined Cycle Power Plant

Project type: Combined Cycle Power Plant **Start Date:** 2015 **Location:** Chabahar, Iran
Owner: Saba Southwest Power Generator Company
Capacity: 1 STG* 160 MW (E-type)

Scope of work: Monenco provides Basic Design, Detail Design, Interfacing review, 3D Modeling of Plant and Site Technical Office Coordination

Description: The plant is located at 15Km far away from Chabahar city. 2 GTGs are under operation in the existing portion. 2 HRSGs+1 steam turbine and generator will be constructed in extension portion. Produced power will be sold to the national authority and transfer via electricity grid for urban and industrial demand.

Consulting and Optimization for Preparation of two Units of Sea Water Purifier (MED) OF Bandar-Abbas Steam Power Plant

Project Type: rehabilitation Case study of two in-use 2400M3/day MED units
Start Date: 2014 **Client:** Bandar Abbas Steam Power Plant

Description: As announced by the owner, the efficiency of these two units dropped to 55% of their designed ones. Therefore, the units need to be analyzed in order to detect the reasons of the deficiency and report the result to the owner to solve the problem.

Design of Jahrom Combined Cycle Power Plant

Project Type: Combined Cycle Power Plant **Start Date:** 2015 **Location:** Jahrom City, Iran
Owner: Matin Tam Company
Capacity: 480 MW (3 STG * 160 MW)

Scope of work: Monenco provides Basic Design, Detail Design and 3D Modeling of Plant.

Description: The plant is located near Jahrom city province and is consisting of 3 steam portions of combined cycle power plant each consisting of two (2) HRSGs and one steam turbine generator set & main and auxiliary cooling system including 230 ks AIS substation for the existing simple cycle V94.2 gas turbine power plant including 6 GTG units to be converted to the combined cycle power plant in “2+1” configuration for the Jahrom site. In addition, the system of cooling type is Heller. It should be noted that this project was terminated in 2010 by the client and was started again in 2016.

Consulting Services of Shahjibazar Power Plant

Project Type: Combined Cycle Power Plant **Start Date:** 2015
Location: Shahji bazar Bangladesh
Owner: Bangladesh Power Development Board
Capacity: 2 x 110 MWGTG + 110 MW steam Turbine

Scope of work: Monenco provides Consultancy services as owner's Engineer for construction of Shahjibazar 330 MW gas based combined cycle power plant project .
Consulting services will be done during the 32 months from KOM meeting date. (The guarantee period included)

Description: The plant is located at 150Km far away from capital Dhaka City. The project includes 1 x 110 MW ST and 2 x 110 MW GT units in Shahjibazar power station. The awarded plant will consume natural gas. It seems the allotted gas can be considered enough for the operation of the plant.
The scope of Combine cycle power plant comprises one block of combined cycle Power plant are as follow:

- Two gas turbine generator supplied by GE
- Two heat recovery steam generators supplied by Hangzhou Boiler Group Co. Ltd
- Boiler Feed Water Pump supplied by Hangzhou Boiler Group Co. Ltd.
- Condensate Extraction Pump supplied by Hunan XEMC Changsha Pump works Co. Ltd.
- One steam turbine supplied by Dongfang Turbine Co. Ltd
- Air Compressor supplied by Shanghai Compare Compressor Co. Ltd.
- Cooling Tower supplied by Zhejiang Lianfang Co. Ltd.
- Generator Switchgear supplied by ABB (Hong Kong) Limited

The EPC Contractor is JVCA of Guangdong Power Engineering Corporation and Guangdong Electric Power Design Institute, China. The steam cycle will be proceed in continuation of gas cycle.

Design of Orumiyeh Combined Cycle Power Plant

Project Type: Combined Cycle Power Plant **Start Date:** 2015 **Location:** Orumiyeh City, Iran
Owner: Tadbir sazan saramad Company
Capacity: 480 MW (3 STG * 160 MW)

Scope of work: Monenco provides Basic Design, Detail Design, Vendor Design Review, 3D Modeling of Plant and overall engineering

Description: The plant is located near Orumiyeh city province and is consisting of 3 steam portions of combined cycle power plant each consisting of two (2) HRSGs and one steam turbine generator set & main and auxiliary cooling system including 230ks AIS substation for the existing simple cycle V94.2 gas turbine power plant including 6 GTG units to be converted to the combined cycle power plant in "2+1" configuration for the Orumiyeh site. In addition, the system of cooling type is Air Cooled Condenser.

Supervisory and Inspection Services on Operation and Maintenance Contractor of Shahroud Power Plant

Project Type: supervisory and Inspection services **Start Date:** 2015 **Location:** Shahrood
Client: Semnan Regional Electric Company

Scope of work: Monenco provides Controlling, Coordinating, Supervision and Inspection of operation and maintenance contractor activities

Description: The capacity of plant is about 500MW CCPP – that now it consists of 2*162 Gas Turbine Generators (324 MW). The Steam turbine portion of this plant is to be designed. Therefore, Monenco is reponsible for inspection on operation and maintenance contractor activities, consulting and guiding on occurring problems to be solved, giving technical feedbacks and recommendations to the client which some of them are as follow:

- Control of Fuel Prices, Approval and Submission of Their Invoices Subject to Observation Payment Deadline
- Coordination and Supervision over the Reading and Completion of Monthly Approved Forms Related to Main and Auxiliary Energy and Fuel Meters
- Completion of Daily, Monthly, and Annual Forms for Monitoring the Function of Power Plant in Connection with Generation Durability, Availability, Limitations, Load, Outage, Load Variations, Number of Commissions, etc. (Main and Auxiliary Fuel)
- Provision and Submission of Temporary and Final Invoices for Client's Approval Subject to Observation of Time Limitations Stipulated in the Contract
- Coordination and Supervision over Execution of the Tests the Necessity of Which are determined throughout of Operation Period and Report its Result to the Client

Repowering Engineering Service of Tarasht Power plant

Project Type: Repowering **Start Date:** 2015 **Location:** Iran **Owner:** Tarasht Power Plant Co
Capacity: 2 x 12.5 steam Turbine

Scope of work: Monenco provides Engineering Service and Technology transfer of Tarasht Power Plant Repowering, Monenco responsibility is supervision on design for repowering of plant which will be accomplished by Mitsubishi-Hitachi (MHPSES).

Description: Nowadays, due to high price of oil as well as low efficiency of steam turbines, mostly those came into operation in early 1980s, repowering is a way to be used in order to increase the efficiency of these steam turbines. In this technology a gas turbine equipped with HRSG will be placed in front of existing steam turbines; sometimes with total replacement and sometimes with modifications of the existing boilers.

Tarasht Power Plant Repowering Project will be the first repowering project in Iran. The project will be executed by using Hot Wind Box method. In this 25 MW steam turbine project, a new gas turbine will be installed and its outlet heat will be used for heating in existing boiler and organize a combined cycle power plant. In this project, Monenco is responsible for engineering, and construction supervision of the selected EPC contractor.

Investigation, Redesign and Tender Document Preparation for Wastewater Reuse of Montazer Ghaem Power Plant

Project Type: wastewater treatment plant design **Start Date:** 2015 **Location:** Karaj
Client: Montazer Ghaem Power Plant

Scope of work: Monenco is reponsible for sampling and analyzing the variety types of wastewater in mentioned power plant, redesign of existing documents and plans, new comprehensive design and calculation for wastewater treatment and all related equipments for both sewage and industrial wastewater included basic and detail design (process, mechanical, electrical, civil and I&C documents)

Description: The power plant is located near Karaj city. Its steam part has been constructed between 1970 and 1972 and combined cycle power plant has been constructed between 2000 and 2002. Due to high water consumption of wastewater discharge, the power plant has faced many problems with Iran's environment protection organization (IEPO). Therefore, the client decided to recycle and reuse of all produced wastewater streams inside the power plant for its cooling system. Therefore, Monenco is responsible for below tasks:

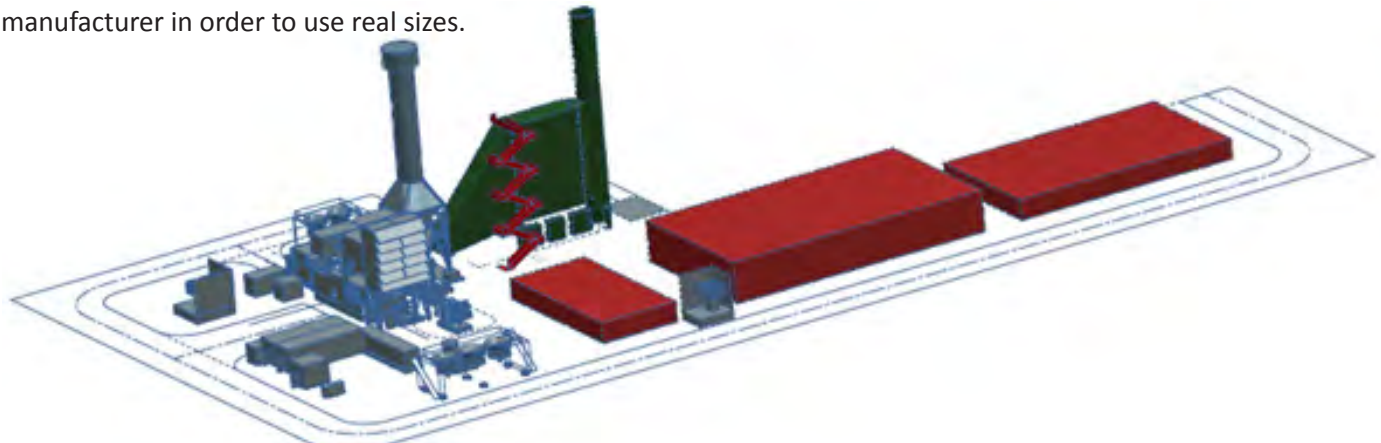
- inspection and visiting all suspected parts of power plant to identify wastewater sources
- sampling and analyzing of the wastewater streams to detection of composition of each one
- review of existing documents and redesign the units to solve some parts of problems
- Utilization of probable waste water treatment technologies modeled to provide decision makers with economic projections.
- preparation of detailed and executive drawings & documents
- Tender document preparation

Consulting and engineering services for power block arrangement of MAPNA Gas Turbine 40 MW (MGT40)

Project Type: Consulting and engineering services & 3D Modeling **Start Date:** 2016/01/17
Location: In PARAND city in Tehran Province **Client:** MAPNA Group

Scope of work: Monenco provides Basic Design of power block arrangement and 3D Modeling of power plant in PDMS Coordinating between vendors and client.

Description: Parand Power Plant has been erected on an area of 100 hectares of land in southwest of Tehran, 30 km from Tehran-Saveh Highway. In this project, MAPNA Group is considered to use one set of new 40 MW Gas Turbine (MGT 40) in combined cycle plant beside of the old combined power plant. MGT40 is a new product of TUGA factory which is reversed engineering design of General Electric Frame 6 gas turbine.
Therefore, Monenco is responsible for preparing optimum arrangement of equipment's and prepare basic documents that is related to power block. also in this project 3D model of all power block's equipment in PDMS software shall be prepared. All sizes and locations of equipments shall be coordinated with the manufacturer in order to use real sizes.



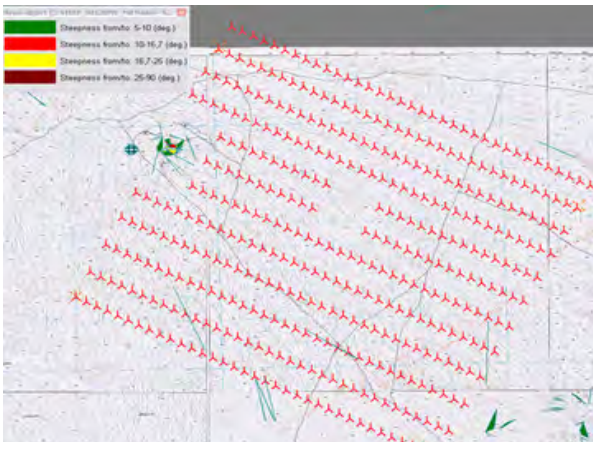
Milnader Wind Farm Electric Power Study to Find Optimum Location of 400/230/63/20 kV Substation

Project Type: Wind Farm Electric Power Study **Start Date:** 2015 **Location:** Iran

Client: Sistan and Balouchestan Electric Power Company

Scope of work: Monenco provides land segmentation for different capacities, finding optimum location of substation according to land segmentation, connection report of segments to substation and technical report of access road.

Description: Milnader is located in the 46 Km far in the northwest of Zabol city. It includes 400 wind turbines and has capability to produce 1000 MW and site area is about 17000 hectare. It must be noted that other than this wind farm there is no similar one in Iran. The main purpose of this project is finding the best way to connect 1000 MW wind farm to the power grid. Which means that minimum electrical losses shall be achieved. Accordingly, location of substation is very important and the project shall be cost benefit. First, Monenco's experts visits the site and assesses different aspects such as geographical location, the nearest substation and power transmission line, etc. Second, chosen site area must be divided into typical segments with 5, 10, 30, 50 and 100 MW capacities. Third, the best location of substation and the best voltage for each segment will be selected. This will be done by WindPRO software. WindPRO is a professional software that contains many modules for wind field. eGRID is the electrical module of the software that calculate electrical grid connections. Connection of all segments to the substation with appropriate voltage level is defined as a typical instruction for each specified capacity.



Fourth, access road drawing must be prepared as a technical report. Also, transport procedures of turbines and O&M period must be considered in access road report. Finally, the client of Milnader project, "Sistan and Balouchestan Electric Power Company", will give over these segments to investors. Therefore, cost and benefit of both of them must be considered.

Consultancy Services and Supervision on Converting Boiler Fuel from Oil to Natural Gas on 4th Unit in Montazer Ghaem Power Plant

Project Type: Consulting and Engineering Services and Site Supervision **Start Date:** 2015

Location: Malard city in Tehran Province

Client: Montazer Ghaem Power Generation Management Company

Scope of work:

- Feasibility Study
- Conceptual design
- Tender preparation
- Supervision on site

Description: This plant is located in 7 Km of Karaj-Malard Road near to Tehran city. The pollution in this power plant is higher than international standard level and sometimes it has been suspend by Department of Environmental in Iran from power generation. Therefore, Montazer Ghaem Power Generation Management Company decided to convert fuel of boilers from oil to natural gas.

Monenco is responsible for preparing feasibility study, preparing bankable report, conceptual design for rehabilitation in burner and boiler control system, preparing Bid document and evaluation of tenderer and supervision on site during to rehabilitation.

Oil & Gas

Oil & Gas and Petrochemical consultants across the globe are looking for timely solutions to help them address the current challenges of a global economic down turn, decline the overall margins and increase emphasis in process safety compliance.

Monenco offers innovative engineering solutions that provide unique answers to these challenges in areas of auditing, metering, upstream and process safety management consulting of petrochemical plants, Oil & Gas complexes and transmission lines. Our technical team has delivered leading methodologies, best practices and robust so ware solutions that reflect Oil & Gas industry insights and vast experience in our core competencies.

We are, and will continue to be, second to none in understanding our client's needs and the most worthy steward of their resources.

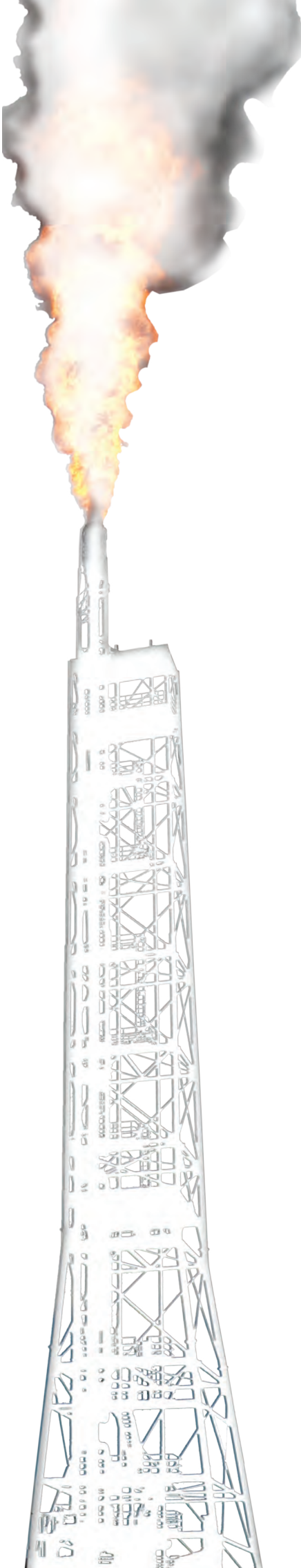
This department benefits from participation and cooperation with prominent International and regional Engineering consultancy companies in joint ventures in rendering consulting and engineering services abroad.

At the same time this partnership provides broader opportunities for serving domestic clients with higher quality. Monenco, by having the major Oil and Gas projects in the work history has established an outstanding presence in this industry and expanded the scope of services in order to spread its presence in this market. Entering into the new target markets such as metering, GTP, GTO in Petrochemical Plants, vapor control & recovery in refineries & tank farms, Bio-ethanol and Technical Inspection and Know How Transfer have been the most remarkable achievements for the department in 2015. Engineering and consultancy of new petrochemical complexes with gas as their feed and renovation and optimization of existing refineries are the targets of Oil and Das Division. Challenging with our international competitors all around the world in the fields of oil and gas transportation, LNG storage and regasification terminals and small scale refineries - mini refineries - are extended global services of this division.

Articles and Technical Reports

Oil & Gas Division has published 2 technical reports, 1 international and 1 national article and papers in 2015 in order to introduce new technologies and systems to its clients. Below is the list of mentioned reports;

- Project's Experience of 110 off shore Platforms, 3D Model Preparation for Iranian Offshore Oil Company in PDMS with Laser Scan Technology
- Investigation of Methods for Removing the Asphaltenes of Heavy Crude oil



Furnishing Import & Export Stations of Iran Ministry of Petroleum with Custody Metering System

Start Date: 2014 **Location:** Iran
Client: Iran Ministry of Petroleum

Scope of work:

- Contributing PMC services including Review, endorsement, modification, Completion and approval of basic design
- Sites Visits and Sites Data Gathering
- Detail Design
- Procurement Engineering Services (including providing budgetary and final material take off)
- Tender Bid Evaluation, Vendor Review
- Pre-commissioning, Commissioning and Construction Services
- Technical Office and Sites Supervision Services

Description: In this project the production transaction points (export & import) of the ministry of petroleum will be equipped with custody meters (to measure crude oil & condensate production for 52 points across the country) and data transferring equipment to send on line information to central office in Tehran (16 points across the country). At the first stage of this project 10 points including of 8 points for national Iranian south oil company and 2 points for Iranian offshore oil company will be equipped with Custody Metering System.

Extension of contract for conceptual, Basic Design and Detailed Design of Heat recovery from Olefin and VC units in Abadan Petrochemical Company

Start date: 2014 **Locatin:** Abadan, Iran
Client: Abadan Petrochemical Co.

Scope of work: Monenco is responsible for performing all Design and Engineering Services in all phases of engineering including Conceptual Design studies, Basic Engineering Services and Detailed Engineering Services in this project.

Description: Abadan Petrochemical Company intends to perform heat recovery project in Abadan petrochemical in order to increase efficiency and operational performance from energy losses point of view. The purposes of this project are Heat Recovery from process streams of olefin furnace units and VC units and heat recovery from the flue gases of these two units in Abadan Petrochemical Company.

Comprehensive Technical & Financial Feasibility Study, Business Plan for GTP (Gas TO Propylene), GTO (Gas to Olefin) plant

Start date: 2014 **Locatin:** South Pars Gas Fields, Iran
Client: Iran Industries Development and Renovation Organization (IDRO)

Scope of work:

- Marketing study report
- Technical study report
- Economical study report
- Business plan report

Description: Market saturation due to excess production of methanol in recent years on one hand, and the importance of olefin production as a feed which is required as substantial material for petrochemical productions chain so low price of natural gas in the country on the other hand, and in order to increase the added value, have been caused the direction of Iranian petrochemical industries to be changed to installation of, GTO, GTP, MTP, MTO, plants.
As the first step, a comprehensive feasibility study has been defined by IDRO to start the basic works in this regard.

Extension of Rendering Preliminary Feasibility Study for Increasing of Capacity of Abadan Petrochemical Plant based on Receivable Feed from Abadan Refinery

Start date: 2014 **Locatin**: Abadan, Iran
Client: Abadan Petrochemical Co.

Scope of Works:

- Extraction of all data regarding capital investment of the plant, fixed – variable cost, production parameter and analysis by comfar software
- Final report, acceptable for credit & financial organizations
- Updating cost estimation for performing of the project
- Cost – Revenue analysis of performing the plan and priorities
- Sensitivity analysis of the plant versus price changes and product quantities

Description: Abadan petrochemical company intends to perform feasibility study based on two scenarios:
1. To indicate feed price with consideration rate of 25% IRR
2. To indicate rate of interest based on feed price at present
The main goal of this project is a comprehensive study for MAPNA Group in order to help them in strategic planning and facilitate their entrance into Pipeline market.

Contributing Engineering Services for Transfer of Technology, Procurement,Installation, Commissioning of four Vapor Recovery Units at Ahvaz, Mashhad & Arak Gasoline Storage Tanks

Start Date: 2014 **Location:** Ahvaz, Mashhad, Arak - Iran

Client: National Iranian Oil Refinery and Distribution Company

Scope of Work: Monenco is responsible to render engineering services for transfer of technology, procurement, installation, commissioning of four vapor recovery units.

Description: NIORDC intends to install four vapor recovery units at its gasoline storage tanks at Ahvaz, Mashhad and Arak areas. The purpose of this project is to control and recover of the released volatile organic compound at storage tanks to avoid the emission of harmful substances due to strict emission limits have been defined in country.

Extension of contract for Engineering Services of Production of Formalin, Acetaldehyde and Pentaerythritol in Shahid Rasouli Petrochemical Complex

Start Date: 2014 **Location:** Mahshahr Free Zone, Iran

Client: Shahid Rasouli Petrochemical Complex

Scope of work in Phase 1:

- Preparation Scope of Work for Phase 2
- Economical Study
- Preparation List of Basic, Feed, Detail & … Document

Scope of work in Phase 2:

- Basic design
- Detail designs
- Management & Supervision over procurement
- Training of client staff
- Supervision over erection and commissioning of a petrochemical complex located in Mahshahr (South of Iran)

Description: Shahid Rasouli Petrochemical Company (SRPC) is being established for producing Formaldehyde, Acetaldehyde and Pentaerythritol in Mahshahr Free Zone. The required raw materials for this complex are methanol, ethanol and caustic soda. This plant includes three process units; one unit for production of formaldehyde from methanol with 64,000 TPD capacity, one unit for production of acetaldehyde from ethanol with 5000 TPD capacity and one unit for production of pentaerythritol from acetaldehyde, formalin and caustic with 10500 TPD capacity.

Esfahan Refinery Upgrading (Package C)

Start Date: 2015 **Locatin**: Esfahan, Iran
Client: National Iranian Oil Engineering and Construction Co. (NIOEC)

Scope of work:
Contributing PMC services including:

- Review, Endorsement, Completion and approval of basic design Package prepared by Technip
- Basic and detail design of flare system
- Basic and detail design of storage system,
- Basic and detail design of fixed & floating tanks,
- Basic and detail design of LPG storage and Loading system and Sphere tanks
- Procurement Engineering
- Preparing technical bids documents and evaluation of contractors
- Engineering management Services
- Design review of vendors documents
- Interface engineering and management
- 3D modelling
- Detail design of units including, Flare network, Fuel system, Air system, interconnection, Fire Fighting system, Steam and Power system, Water system (Including Demine water, BFW, Plant water, Potable water, Cooling water)
- Site Supervision
- Residue Hydro treating Unit (RHU), Residue Fluid Catalytic Cracking (RFCC), Propylene Recovery Unit (PRU), Diesel Hydro treating Units (2units), SRU (2units), Amine Treating Units (Two Trains, for RFCC and Common), Sour Water Stripping Units (Two trains, for RFCC and Common), RFCC Gasoline Hydro treating Unit (Prime G+) and RFCC LPG Merox.

Description: Esfahan oil refinery upgrading project generally is categorized to the following three sections:
a. New Process Units
b. New utilities and Offsite Units
c. Revamp all the existing units

Project Management Engineering Services for Kermanshah Bio-ethanol Production Plant

Start date: 2013 **Locatin**: Bisoton Industrial Zone (Kermanshah)
Client: Gostaresh Sokht Sabz Zagros (Zagros Green Fuel Development Co.)

Scope of Works: Project Management Engineering Services for all phases of Bioethanol Production Project such as;

- Pre-commissioning
- Commissioning
- Test Production
- Steady Production service
- Feasibility Study
- Basic Design Engineering
- Detail Design Engineering
- Procumbent
- Construction

Description: This project is very important since it reduces the air pollu on caused by gasoline fuels through using bioethanol fuel instead of MTBE which is a chemical and carcinogen material also increases the Octane of Gasoline. Accordingly, 200,000 liter/day Ethanol Alcohol (66 Million liter/year) and other auxiliary production from corn and other cereal feeds will be produced in this project.

Extension of Contract for Consulting Services, Engineering Document Review, and Site Technical Services for Unit No. 106 of Phase 19

Start Date: 2013 **Location:** South Pars Gas Fields Developments, Iran **Client:** Petropars Iran Company

Scope of work:

- Engineering consulting services, contractors design review and vendors print check
- Preparing technical reports
- Field engineering in site technical office Construction Supervision

Description: Phase 19 onshore complex is located on the Iranian coast of Persian Gulf in TOMBAK. The total capacity of phase 19 onshore facilities is 2000 MMSCFD of dry reservoir fluid. The lean gas from Ethane recovery unit (105) serves compression and export gas unit (106) to recompression. Unit106 includes six centrifugal compressors in parallel plus two spare, each compression section includes one suction drum, one compressor and associated gas turbine and one ACR cooler. Compressed Export gas in unit 106 is delivered at 90.8 bars via metering system to connect to IGAT9.

Consultancy Services for Installation of 3000bbl/Day Capacity Catalytic Reforming Unit (CRU) and 4000bbl/Day Condensate Fractionation Plant (CFP) at Rashidpour with Associated Facilities on Turn Key Basis Under EPC

Start date: 2015 **Locatin:** Bangladesh **Client:** Sylhet Gas Filed limited Company

Scope of work:

Contributing PMC services to the client including:

- Providing tender documents for CFP & CRU
- Technical bid evaluation of contractors
- Basic design review
- Participation in technical meetings with client and contractors
- Basic & detail design review
- Procurement engineering documents review
- Supervision of construction and commissioning of two plants, etc.

Description: The main purpose of this project is to produce high octane gasoline, Kerosene, Diesel oil. LPG is the product that its production should be minimized. The Feed comes from BIBYANA gas field of Chevron which contains Gas Condensate. This line goes to 4000 bbl /day Condensate Fractionation plant to Fractionate Condensate to Naphtha (Motor Spirit), Diesel oil, and Kerosene. Then Naphtha (Motor Spirit) will go through the pipe to 3000 bbl /day catalytic reforming unit including Naphtha hydro treating unit(NHT). Final products of this stage are Reformate, and LPG.

Reformate will have a minimum RON 99 (Research Octane No.) that will be blended with other hydrocarbon stream (light naphtha) to reach an acceptable octane no for gasoline product, based on Bangladesh government standards and market demand.

Mining & Geology

Monenco is committed to provide high quality services in the field of Geology, Exploration and Mining through its experienced staff also to establish cooperation with international well-known firms in the mentioned field. However, the services include; Geology, Exploration, Resource Geology, Geochemistry, Geophysics, Mining, Resource Estimate, Grade Control, Monitoring, Feasibility Studies, Soil Mechanics, Rock Mechanics, Open Pit Mine Design, Underground Mine Design, Mine Optimization, Environmental Studies, Mine Planning and Hydrology.

In addition, Monenco is equipped with sophisticated professional so ware such as Gemcom Surpac, Downhole Explorer, dataminestudio, FLAC, Gems, UDEC and prepared to provide consultancy services in exploration and extraction of mineral deposits while partnering with highly skilled international companies by using modern equipment and machineries.

Introduction of New Technologies

Monenco as a consultancy company takes this responsibility to continuously update its knowledge. Therefore, several studies in related to the following fields were conducted and in the form of seminars, white papers etc. presented to the clients, competitors etc.

Directional Core Drilling

Exploration drilling is one of the most important steps in Geometry identification and estimation of reserves. Drilling is considered one of the most expensive mining activities.

Geology and Mining Department with the introduction of new method of drilling as "Directional Core Drilling" to Iranian Clients active in mining is step forward saving me & money and improvement in exploration drilling in Iran.

Laser Scanning System for Mine Survey

In mining operations determination block extraction in different period, geometry changes in place of extraction, volume of mineral depot, volume of waste depot, volume of waste depot are basis of mine design and planning. These works performed by manually surveying and followed by this method with human and system tolerance. Geology & Mining Department with the introduction of new method of surveying as "Laser Scanning System for mine surveying" to Iranian clients active in extraction mining is step toward saving me & money and improvement in mining in Iran.

Significant Completed Projects

- Preliminary and Detailed Exploration of Iron Ore Anomalies in Yazd Province, Iran
- Detailed Exploration of Baba Ali 2 Iron Ore Deposit in the Hamadan Province
- Detailed Exploration of Galaly 2 Iron Ore Deposit in the Kurdistan Province
- Consultancy Services and Design Coke Making Plant in Central Alborz Coal Field, Savadkoh, Mazandaran Province Iran
- Consultancy Services of Exploration and Supervision on Contractor Operations in Central Alborz Coal Field, Mazandaran Province, Iran
- Engineering Services, Site Supervision, Additional Detailed Studies and Exploration Drilling of
- Water, Mining and Power Plant in Mazino I Tabas CoalMine
- Consultancy Services, Study of Current Designs and Providing Detailed Design of Pabdana Coal Mine, Iran
- Coal Exploration Operations in Mazandaran, Zirab City
- Preliminary Coal Exploration in Takht Coal Mine in Golestan Province

Detailed Exploration of Baba Ali 2 Iron Ore Deposit in the Hamadan Province

Duration: 24 Months **Location:** Mazandaran, Iran **Client:** SN (Saba Noor) Steel Co.

Scope of Work:

- Economic studies, design and production planning in mining operation
- Services for exploration, geology and resource estimates
- Management, Planning and HSE
- Preparing topographical and geological maps at various scales
- Prepare a comprehensive information system in GIS environment
- Engineering services and supervision
- Geotechnical engineering services
- Feasibility studies, preparation of technical and economical plans

Description: The main purpose of this project is to execute geology studies, investigate new mines or improve the operations of existing mines with a primary focus on safely, achieving optimum output and return on investment. Monenco experts bring a business perspective to the technical challenges of mining and geology engineering.

Consulting Services, Review of the Current Plans and Detailed Design from the lower level of +2400 to the Last Exploration Level of Main Pabdana Coal Mine

Duration: 6 months **Location:** Kerman, Iran **Client:** Kerman Coal Mine Company

Scope of Work:

- Revising and updating the reserves of the lower level of +2400
- Detailed Design of the underground network during the opera on
- Detailed Design of the utilities and infrastructure services
- Technical and Economical Study of the plan

Description: Pabedana Mine is located 60 kilometers from Zarand City in Kerman Province. In 1969, the geological and exploration studies was started, in 1970 the design has been completed then in 1971, the mining opera on has begun. For the time being, the reserves above the +2400 level are being operated and Kerman Coal Mine Company is intended to start the operation of the lower level of +2400. Therefore Monenco is responsible in rendering consultancy services for this project to analyze and study the reserves of lower level of +2400 for planning, preparing and excavation.

Consultancy Services of Exploration and Supervision on Contractor Operations in Central Alborz Coal Field

Duration: 24 Months **Location:** Mazandaran, Iran
Client: Iran Minerals Production and Supply Co. (IMPASCO)

Scope of Work:

- Geological and technical data gathering
- Preparing an archive of maps, documents and project documentation
- Topographical and geological mapping at 1:20000, 1:5000 and 1:1000 scales
- Provide geodatabase
- Design exploration plan
- Preparation of tender documents
- Site supervision
- Feasibility study

Description: The project area is located between Firozkouh and Haraz road in central Alborz coal field. The project will be implemented in two phases. The first phase deals with data collection all the previous information therefore a comprehensive database is presented. In the second phase of drilling contractor monitoring and evaluation of promising locations in that area can be identified coal reserve volume

System and Energy Studies Center

Energy and System Studies Center (ESSC) as a special studies division in Monenco was established in 2008 in order to provide services based on the new business environment and to enhance its technical capabilities. This center by means of its talented experts and devoting efforts made it possible to take part in different consulting areas.

Activities of ESSC can be categorized into four groups as follow:

- Power System Studies
- Electricity Market and Economic Feasibility Study
- Energy System Planning
- Strategic Planning and Management

Besides, ESSC has held different trainings, workshops and seminars to spread its achieved technical knowledge to everyone involved in Iranian power industry and other related industries.

Articles and Technical Reports

Energy and System Studies Center has published 5 papers in international conferences and 1 paper in a national conference in 2015 in order to introduce new technologies and systems to its clients. Below is the list of these papers;

- "Analysis of transient over-voltage in distribution network terminals of the customers caused by capacitor bank switching in sub-transmission substations taking into account voltage susceptibility curves of the customers", 20th power distribution conference of Iran
- "Operational cost reduction tools of intelligent micro-grid", 2nd international conference of Electrical, Computer Sciences and IT
- "Double-layer, multi-port model of a power system for transient electromagnetic studies", 3rd national and 1st international conference of applicable researches in power, mechanical and mechatronic engineering
- "A new approach to clear a reactive power market using Particle Swarm Optimization", 3rd national and 1st international conference of applicable researches in power, mechanical and mechatronic engineering
- "A comparison between two different approaches to load balancing in low voltage distribution networks", 3rd national and 1st international conference of applicable researches in power, mechanical and mechatronic engineering
- "Review and improvement of protection coordination for Tous power plant and its substation", 3rd national and 1st international conference of applicable researches in power, mechanical and mechatronic engineering

Strategic Planning and Management Group

Strategic Planning and Management Group has been performing as a consultancy group to provide services in the areas of strategic planning and management, evaluation of effectiveness and efficiency and planning for cascading strategies. Besides, this group has experiences in management processes, operational planning, evaluating performance of companies and organizations, etc.

Energy System Planning

Energy System Planning Group has been responsible for comprehensive study of energy (electricity, Oil and Gas, etc.), studying the effect of economical, environmental, and social aspects of using new technologies to optimize and reduce energy consumption, establishment of energy management system, providing a road map for optimizing energy consumption in major processes, studies to identify bottlenecks and provide solutions to improve the energy consumption, energy auditing and proposing tactics to save energy.

Power System Studies Group

Power System Studies Group as the main part of ESSC offers services and activities related to the generation, transmission and distribution sectors. It provides consultancy services for feasibility studies of power plants, analyzing power system events, studying application of new technologies in power system, studying power quality, reducing loss in electrical networks, etc.

Economic Feasibility Study and Electricity Market

Economic Feasibility Study and Electricity Market Group activities cover all consulting services in the areas of economic feasibility and market studies. These services are not limited to electricity industry and cover all industrial projects. Some of the major tasks of this section are economical feasibility study for investment projects, developing regulations related to the electricity market, electricity energy and services pricing, providing energy bidding strategy for private owners in the electricity market, competitive market analysis indicators, economic studies on electricity transit and exchange and studying and predicting the behavior of other market players. Moreover, this part has recently entered Stock Valuation area and public private-partnership and tried gaining experiences in the field of energy exchange, electricity market design, market policy and authority, market monitoring, etc. and organizations, etc.

Assessment of 400 kV Voltage Level Impact on Operation of MIS Grid

Start Date: 2015 **Location:** Oman
Client: Oman Electricity Transmission Company (OETC)

Description: Higher voltage levels in transmission network are capable of transmitting more power over longer distances. At the same time, there are more concerns and considerations for operation of such high voltage levels especially when the System Operator confronts them for the first time.

Oman power system is going to introduce new voltage level by operation of 400 kV transmission lines. In order to assess and measure the impact of new 400 kV transmission lines (Sur-Jahloot and Sur-Izki) on the operation of MIS system, it is necessary to conduct some studies. In the following, the main steps to address the issues concerning the operation of new 400 kV transmission lines in Oman power system and determine what kind of mitigation can be implemented to overcome such issues that should be proposed in this project are given:

- Development of Commissioning and Energizing\de-Energizing Procedures
- Development of Initial Standard Operating Procedure
- Development of Final Standard Operating Procedure

Under Frequency Load Shedding and Islanding Scheme in Dhofar System

Start Date: 2015
Location: Oman
Client: Oman Electricity Transmission Company (OETC)

Description: Dhofar Power System Transmission is operated by Oman Electricity Transmission Company (OETC). Connection of Dhofar Power System to Main Interconnected System could shape dynamic behavior of the network especially from frequency control perspective. In fact, different control areas with specific characteristics might require different under frequency settings approach. Therefore, it is needed to harmonize and coordinate under frequency settings approaches in Dhofar Power System. The goal of this project is to develop and coordinate Automatic under Frequency detection and appropriate load shedding and Islanding scheme to protect the network from collapse in case of any severe disturbances such as loss of a total power station or main interconnected lines.

Operating Reserve Management in MIS and Dhofar Systems of OETC

Start Date: 2015 **Location:** Oman
Client: Oman Electricity Transmission Company (OETC)

Description: Oman Electrical Transmission Company (OETC) is comprised of MIS and Dhofar networks which are connected through 132 kV Petroleum Development Oman (PDO) network. Moreover, MIS network has an international interconnection to GCCIA system through Transco of Abdu Dhabi 220 kV.

MIS and Dhofar systems must have sufficient operating reserve in order to maintain the security and reliability of power system while achieving economic operation. The goal of this project is to determine appropriate operating reserve for both MIS and Dhofar systems under following conditions:

- Operating isolated from PDO (for MIS and Dhofar separately)
- Operating synchronously with MIS through PDO connection
- Operating synchronously with MIS through PDO connection in parallel with Transco

Reliability Study of Bangladesh Power Grid System

Start Date: 2015 **Location:** Bangladesh
Client: Power Cell, Power Division, Energy & Mineral Resources, Govt. of Bangladesh

Description: The level of reliability of a power grid is required to be substantially enhanced to address the increasing electricity demand, generation planning program, the operational problems, and equipment breakdowns. To improve the reliability of the system to international standards, upgrade/modernize it with required protections so that the system can dispatch the load growth, and provide a safe operation. The system should be able to tolerate any unanticipated disturbances. This level of operation should prevail throughout the rapid development phase also. A reliability-cum-protection study of the Bangladesh power grid system is therefore required to assess system capacity and fragility; identify faults; recommend solutions & upgrading; required to improve the system for secured, safe and reliable operation.

In this project, a reliability study of entire power grid system for stable system operation, with short-term, mid-term and long-term recommendations is done. As a result, technical recommendations for the system in 2021 to improve the reliability of the system will be proposed. In this regard, the scope of the project is as following:

- Preparing Reserve Management Policy
- Determining the Zonal Operating Constraints
- Review of scope of a pump storage power plant (PSPP)
- Review of relay settings & protection philosophies for entire power system
- Carrying out Islanding operation study for safe Islanded operation
- Identifying suitable technology for system security, safety & reliability
- Improvement of existing 'Grid code' to ensure reliable & stable grid operation
- Evaluating the utilizing of 'Smart Grid'
- Transfer of technology based on-the-job training

Synchronous Interconnection of Iran-Iraq Grids

Start Date: 2014
Location: Iran & Iraq
Clients: Ministry of Electricity of Iraq & TAVANIR Co

Description: A cross-border interconnected grid is one of the main pivots that positively affect the development process between neighboring countries. Following the plan of developing an interconnected electrical network in Iran, it is time to investigate options concerning connection to neighboring countries. As the first step, it was decided to conduct a comprehensive study regarding integration and synchronization of Iranian network to Iraqi power grid. In this project, by means of internal and global experiences of networks integration, a feasibility study about interconnection and synchronization of Iranian and Iraqi electrical networks is performed and all strength and weakness points along with advantages and disadvantages of the plan will be investigated through an inclusive study from different technical and economical points of view. The scope of these studies includes the recognition of the problem, feasibility study of the plan and preliminary requirements. The main objectives of the project are:

- Recognition of advantages and disadvantages of interconnection plan
- Technical consequences of interconnection and synchronization plan
- Determination of more appropriate interconnection plan
- Determination of synchronism feasibility and its requirements and infrastructure
- Determination and proposing required protection schemes

Development of a master plan for transmission and sub-transmission network of Gilan Regional Electric Company

Start Date: 2015 **Location:** Iran
Client: Gilan Regional Electric Company

Description: This project aims at providing a development planning for transmission and sub-transmission network of Gilan Regional Electric Company for the time period of 2016-2026. Planning for new power generation to accommodate rise in demand and power grid expansion to transfer the increased generation to new customers is among the most objectives of regional electric companies. To achieve this goal, the following phases are followed in this project:

- Data Gathering, Updating and Authentication including:
- Analysis for evaluating the existing network
- Load forecasting studies
- Planning for reinforcement and expansion of transmission and sub-transmission networks

Development of a Master Plan for Electricity Export

Start Date: 2015 **Location:** Iran
Client: Ministry of Energy of Iran

Description: Considering 20-Year Perspective Document for Iran and also third and fourth development plan in power and energy sectors, increasing power export and making Iran as the power industry hub of the region and involvement of Iranian private sector in different areas of power industry are of great importance.
The aim of this project is to determine legal, executive and structural shortcomings of the Iranian power industry regulations. This is done to facilitate power trade with neighboring countries and contribution of the private sector in this field. Different proposals are also offered to simplify entrance of the private companies into these fields of power industry. To achieve these goals the following phases are done in this project:

- Calculating price of natural gas fired in private power plants with the aim of exporting the generated power
- Data gathering and analysis of data of power industry in neighboring countries related to power trading between the two countries
- Investigating rules, legal structures and power trading procedures in Iran and comparing it with those of other countries
- Proposing master plan of power industry expansion and trading

Significant Ongoing Projects

- Assessment of 400 kV Voltage Level Impact on Operation of MIS Grid
- Reliability Study of Bangladesh Power Grid System
- Synchronous Interconnection of Iran-Iraq Grids
- Under-Frequency Load Shedding and Islanding Scheme in Dhofar System
- Operating Reserve Management in MIS and Dhofar systems of Oman Electricity Transmission
- Company (OETC)
- Technical and Economical feasibility study of converting generators of Islamabad power plant to synchronous condensers
- Development of a master plan for electricity Export

Significant Completed Projects

- Studies on Static Voltage Stability Improvement and Reactive Power Compensators Placement in Khuzestan Power Grid.
- Feasibility Study of Exporting Electricity to Iran's Neighboring Countries.
- Master Plan Development for Transmission and Sub-transmission Networks of Tehran Province.
- Consultancy Services for Connection of Abadan Refinery to National Power Grid.
- Power Quality Improvement of Modern Steel Mills (MSM) in Oman.
- Feasibility Studies and Engineering Services for Super Grid (765 kV Transmission Lines and Associated Substations) in Nigeria.
- Economical Analysis of the Coal Mine and its Coal-Burning Power Plant in Tabas.
- Economical Analysis of Carbon Dioxide Capture in Gharbe-Karoun and Genaveh Power Plants.
- Economical, Technical, and Market Studies for Stock Valua on of Power Distribution Companies.
- Feasibility Studies of 750 MW Wind Farm in Iran.
- Island simulator design and manufacturing.
- Feasibility studies of constructing new power plants in Iran.
- Supervision of SVC Designing & Manufacturing of Looshan Project.
- Feasibility Study for Allocation of PST in Iran Power System.
- Assessment of Using Magnetically Controlled Shunt Reactor in Iran Grid.
- Detailed design of rules and tools for day-ahead spot market pricing.
- Iran Power Industry Restructuring.
- SAVEX Feasibility Studies

Research and Development

Research and Development (R&D) in Monenco aims to apply new ideas in energy industries in order to enhance efficiency, reliability and productivity. We meet the present and future demands of industries, while helping clients to make a better use of available resources to reduce the environmental impact and maintenance costs by developing the systems and products. The main goals of R&D office are as follow:

- Exploring research capabilities and capacities in different sections of Monenco
- Developing technical and scientific knowledge in new areas
- Know-how transfer of the new technologies to the design disciplines of Monenco
- Communication with academic and research centers in order to define and execute necessary research projects

Articles and Technical Reports

Research and Development Division has published 10 technical reports, 3 international and 7 national articles and papers in 2015 in order to introduce new technologies and systems to its clients as follow;

- Thermal Design of Heat Exchanger pipes in Abadan Petrochemical Unit
- Repowering Old Steam Power plants or Constructing new Combined Cycle power plants: Technical and Economical Comparison
- Design and Use of Gas Turbine Test Bench: Performance Analysis
- Technical and Economical Analysis of CCPP and CCHP for 25 MW Gas Turbine
- Parametrical Analysis of Sarvestan Oil Desalting Plant
- A Practical Method for Hot Wind Box Repowering in Iran
- Effect of Soot on Boiler of Shahid Montazeri Power plant Using WSGG Method
- Techno-Economical Comparison of MED and RO Desalination in a Large Power and Water Cogeneration Plant in Iran
- Multiobjective Optimization of MED-TVC Desalination System with Exergetic and Heat Transfer Analysis
- Feasibility Study of Incinerator for Maraghe Hospital

Main ongoing R&D projects

%100 Gas Firing of unit 4 of Montazer Qaem Steam Power Plant

Client: Montazer Qaem Power Generation Management Co.

Montazer Qaem power plant has 4 steam units of 156 MWe. It was designed for fuel oil and natural gas firing in 1970. From the commissioning time till 10 years ago, the power plant works with fuel oil and after natural gas (NG) supply, they work with two fuels. At now, the owner of power plant wants to reach the maximum load by %100 NG firing. For this purpose, it is necessary to change old burners and install Low-NOx burners and BMS. In this project, the conceptual design for required modifications was implemented and tender documents for this goal were prepared. By executing of proposed modifications, the unit shall be commissioned and tested at maximum available load with NG firing in April 2017.

Study of Desalination Opportunities in South Coast (Persian Gulf and Oman Sea) of Iran

Client: MAPNA (Investment Projects Division)

This project concentrates on a feasibility study on desalination opportunities in Iran according to different site conditions, water demand, economical situation etc. The project consists of four phases (16 technical reports). First phase consists of literature survey, water and desalination statistical study (especially in MENA and Iran), governmental studies in water and desalination, activities of other companies in the region and the history of desalination in MAPNA. Second phase is about evaluating conventional and non-conventional water recourses, water demands, future development plans, water crisis parameters and ranking of 30 provinces of Iran considering other civil and electrical infrastructures. Specific locations are proposed for constructing power and water cogeneration plants in selected region.

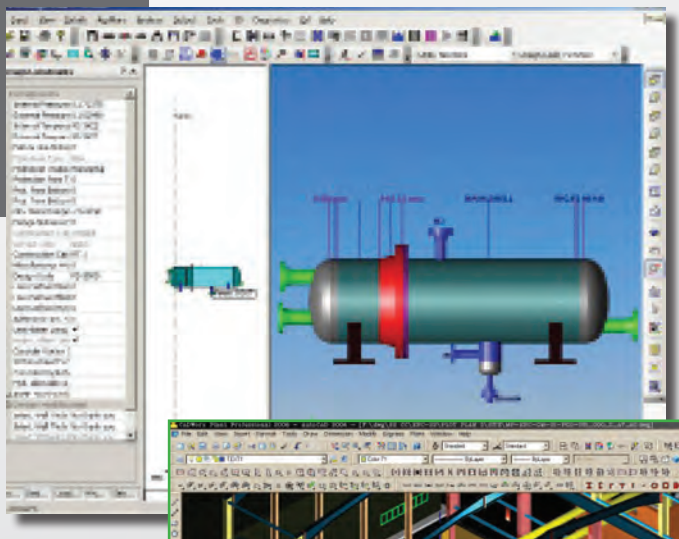
Third phase concentrates on techno-economical analysis of various power and water cogeneration plants. 48 Scenarios are derived based on variety of gas turbines (MGT30, MGT70, V94.3), power block types, desalination types (MED, MSF, SWRO, Hybrid). Technical and economical models are developed and final cost of water is estimated in each scenario. Finally the fourth phase focuses on studying water market, evaluating water costumers, evaluating investments in different desalination technologies and proposing a development plan for MAPNA group based on the last three phases of the study.

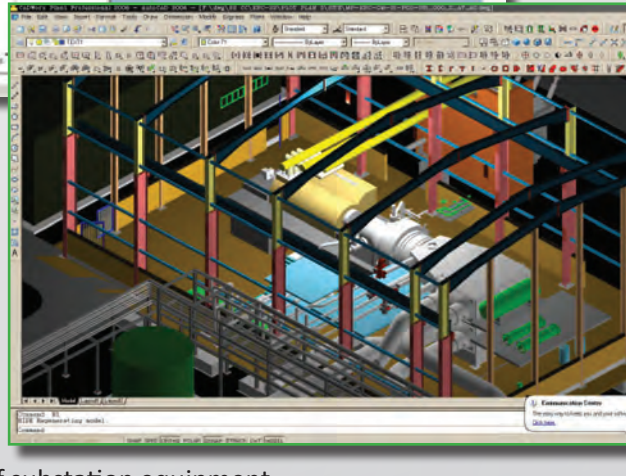
Design of Membrane Desalination Systems

The aim of this project is to get know-how of membrane desalination systems' basic design. Project consists of seven reports. First report is introduction on membrane systems and their application. Three reports concentrate on designing RO desalination system by different intake water characteristics (Brackish water, High brackish water and saline water). The fourth report focuses on designing NF system. Next report is about application of RO systems for treatment of hyper saline intakes. The last report title is designing RO treatment plant for sewage intake by MF/UF pretreatment.

Engineering Capability

Engineering Division is the most significant division in Monenco that provides engineering services for a wide range of projects carried out in this company. Seeking for the latest science and technologies keeps this division up to date in its tasks, providing services to the other divisions in a matrix based forma on.



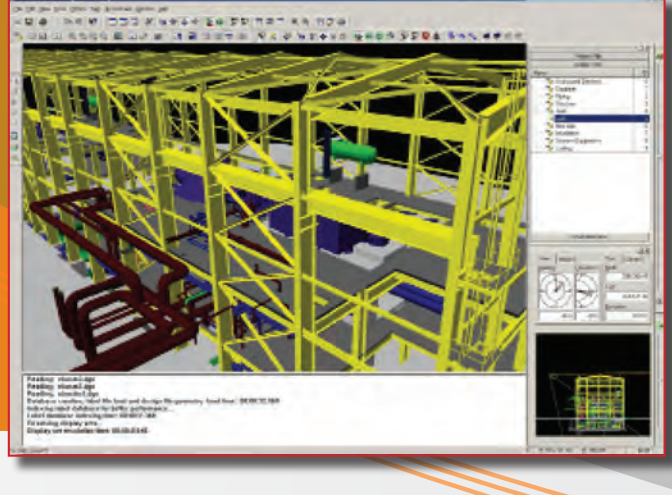


Articles and Technical Reports

Engineering Division has published 4 technical reports, 1 international and 3 national articles and papers in 2015 in order to introduce new technologies and systems to its clients as follow;

- simulation of air-water two phase flow in inclined channel
- Endurance time method is one of the best performance based method for analyzing structure. Endurance time records are intensifying artificial record which should evaluate structure in several level of performance by just one test. In this study, three Endurance time records are produced according to IEEE 693 criteria for seismic qualification test of substation equipment. This record also has appropriate peak ground acceleration and peak ground velocity which can be used for shake-table testing of substation equipment
- Survey of advantages and objections of usage industrial lined valves
- Technical and Economical Analyze Of New Margin In 63 KV Double Circuit Transmission Lines With Finite Element Method

Moreover, this division has collaboration with Research and Development Department as well as several outstanding international companies in order to stay strong and innovative in the energy market. This division consists of seven professional departments; Civil & Structure, Piping, Mechanical, Process & Environment , Electrical, Instrumentation & Control (I&C) and General. The specialized experts of this division, design, review, endorse and modify all engineering documents if needed, based on Monenco contractual scope of work, project specification and client technical requirements



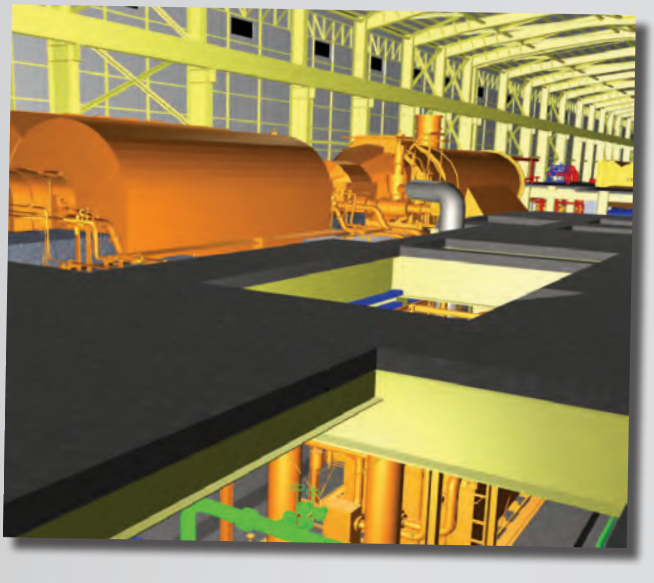
In 2015, this division besides giving services for all projects of the company, it was successful to extend its knowledge to the following fields and subjects:

- Auxiliary Equipment and basic and detail BOP (including process, mechanical, electrical, piping and civil) engineering design for 40 MW Gas Turbines
- Direct Contact (DC) Jet Condenser process and mechanical design and producing detail drawings for Heller Cooling System for 150 to 320MW steam Turbine
- Review, re-design for waste water treatment plant that is including treatment of cooling towers blow down for reusing in the process and achieving waste water quality parameter directed to out of power plant determined by the Environment protection organization.
- 3D Design of Pentaerythritol & Acetaldehyde Petrochemical Plant
- Basic and Detail Design of F&G and Fire Fighting System of Plants (Oil & Gas Field)
- Preparation of Specifications and API Data sheet for Rotary Equipment, Evaluation and Purchase in Oil
- & Gas Field
- Entering to Revamping and Rehabilitation of Old Power Plants
- Entering to Revamping and Rehabilitation of Old MED Type Desalination Units

Design Engineering Software Tools

Monenco, by relying on its experienced personnel and valuable experiences in the field of three-dimensional design soft ware, has launched a number of engineering soft ware of AVEVA Company while upgrading the PDMS 11.5 to PDMS 12.1. Using this so ware causes integration among engineering data plus reduces the time and cost of the projects. Also, Monenco has recently installed AMETANK and AMPREVA soft ware. Below is the description of the mentioned soft ware:

- PDMS Global: global provides automatic project synchronization and sharing work processes between Monenco office locations while retaining project and system control
- Aveva P&Id: a P&ID design system which stores intelligent engineering data onto graphical entities in an autocad drawing while the designer draws and annotates the P&IDS
- Aveva Instrumentation: instrument and systems engineering, design, documentation and management for the en re asset lifecycle
- Aveva Electrical: electrical engineering and design system, documentation and management for the entire lifecycle
- Aveva Engineering: creates schematics, diagram, datasheets, engineering lists and indexes
- Aveva Bocad: powerful structural steelwork design and detailing for different plants
- AMETank: AMETank is application software for atmospherioc storage tank that automates the process of 3D modeling, mechanical and structural design, manufacturing detailing, and generation of production components and assemblies, material purchase list, and costing data.



Information Technology Management

Due to Monenco's strategy to expand geographically, the need for efficient solution for communication and interconnection is fundamental. In this respect we implemented:

- VOIP solution for telecommunication between offices abroad.
- Portals based on SharePoint platform, for data exchange.
- Virtual environment for massive data management.
- Distance services both software and network.

More than ever, we are convinced that this is an exciting time as we enter a new era for Business Intelligence (BI). Monenco design and publish Human Resource, Quality assurance and HSE dashboards just like the financial one that already implemented which was one of the most valuable innovations of Monenco.

For information retention and archiving, security, compliance and storage optimization including data de-duplication, availability and virtualization, an EMC storage solution considered and became part of our infrastructure.

In order to enhance the reliability, speed and performance, 25% of servers replaced with most recent technology, meanwhile half of end user's desktop systems replaced with the high-performing systems designed to address capacity, security and speed related issues.

Knowledge Management (KM)

Following the development and implementation of knowledge management system, we concentrate our efforts on implementation phases which were defined on four steps; Analyzing the Current Status, Culture, Structure and Modeling. In assistance with a professional consultant and applying proper technology, we created knowledge repository of KM Document. In addition, the experiences achieved from the projects define the Knowledge Tree.

Besides, the KM Pilot Project on Water and Power Cogeneration of Qeshm is carrying out in collaboration with MAPNA Group.

Developing Systems and Methods

As before, we insist on creating and developing mistake-proofing systems and processes. We designed an automatic multipurpose reporting system which reports in arbitrary time period even detailed as per engineer production.

We defined the productivity instruction in order to monitor and improve the company, divisions and departments' productivity trend, using international indexes such as Labor and Capital productivity indexes. It is noteworthy that Monenco Iran was nominated as a productive company in the National Productivity Competition last year.

Also, the EQHSE vision document was published to facilitate and dispose the QA and HSE processes.

Strategic Management

Following our published strategies which are aligned with our parent company, Mapna, we modeled a 6-year Vision, based on income and customers development.

We strongly believe that our targets will not be achieved without employee's involvement and individual achievements. Accordingly, to cascade down the strategic plan and goals to the division and department levels, the annual development program has been aligned with the strategic plan. We have started to define and monitor detailed KPIs and focus on respective training, simultaneously. This approach eventuated in great improvements in many fields last year, such as income, profit, human-resources, amount of contracts, customers and spread of global presence.

In addition, through market observations and transportation industry developments, we reviewed our organizational chart and added the Subway& Railway division to meet the market requirements.

Project Control & Monitoring Department

Productivity would be never achieved accidently. Monenco Control & Monitoring department greatly gets benefited from more than 25 experienced experts in the fields of project planning, controlling and monitoring. In this case, procedures which are in line with updated methodologies like PMBOK and ISO 21500 have been implemented systematically throughout projects with an ultimate goal of achieving projects' predetermined objectives. Our great passion is to increase projects efficiency and effectiveness in terms of cost, time and quality with intelligent planning; running monitor and control activities to ensure that all the desired results are delivered and the projects are on-track. Also, early identifying of any deviations in projects performance using specific tools and techniques is one of the key responsibilities of our team which leads to take on-time corrective actions as well as preventive ones. For instance, as a result of our team efforts in the last year, we reached the minimum deviations from our budgeted income and cost which were less than 10%.

In 2015, specifically the main concerns of our team were cost management and risk management. In the former field, in order to achieve more accurate estimate of project costs, a structured formula for EAC was obtained using nonlinear programming techniques. The result of this formula would present the total man-hour used on the projects and it was successfully implemented through our projects. For the latter field, risk management was successfully accomplished in many of our selected projects using PERT Master software. It is our honor that in these aforementioned scopes, two papers was submitted and presented at international conferences.

Moreover, integrated change management was the other focused area of our group during this year. Therefore, all the occurred changes in different aspects of projects have been recorded and documented in a comprehensive and traceable system. Last but not least, in terms of training, all members of the team were certified with the basics of PMBOK 5th edition standard which gave the capability of using project management standards towards the projects.

The main goals of our team for 2016 can be summarized as:

- Obtaining the required knowledge regarding risk management area and incorporating it into company main projects
- Developing the claim management skills to cover all company projects concerns
- Running cost control activities much more intensively to efficiently use the company resources.
- Focusing on providing and documentation of all the needed procedures for MC (Managing Contractor) projects

Global Presence

Monenco is prepared to meet the challenges of tomorrow. The company's success relies on developing leaders of the future, at all levels within the company. Through its comprehensive talent management programme and strategic planning, Monenco is committed to support and groom high-potential people to have the skills and behavior required for global presence.

Globalization is our key growth strategy. We aim to deliver sustainable growth by going into new markets around the world through partnerships, acquisitions and registration of Independent companies. Additionally, we aim to deepen our existing presence in our chosen markets.

Accordingly, prominent success was achieved in Africa, Middle East, South East Asia and successful partnerships were formed with reputable International and local firms.

Monenco was selected as one of the top 3 companies in Power sector in Sultanate of Oman and was in the short list of major clients in Sultanate of Oman to bid directly for major contracts. In Nigeria Monenco achieved prominent success by creating powerful networks and Sign several memorandum of Understanding to be assigned as clients consultants, furthermore in Middle East and Africa our valuable partners have supported us to better serve our clients worldwide.

Bangladesh has became an important opera on hub in South East Asia region and Monenco was awarded several contracts on that region, Monenco also has representative offices in markets such as Europe as well as growing markets such as eastern parts of Africa.

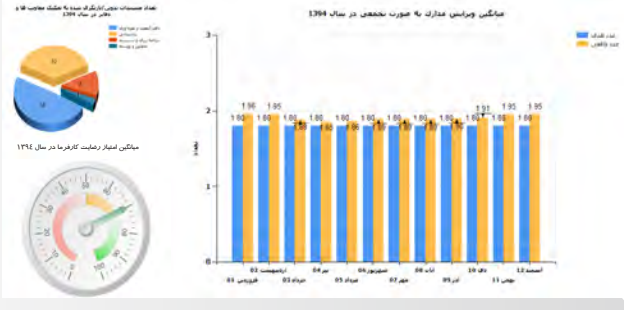
Quality Assurance

In 2007 Monenco established and implemented a Quality Management System (QMS) and got certified according to International Standard ISO 9001:2000 in order to improve the quality of its engineering services and enhance the customer satisfaction. In 2011, Monenco upgraded ISO 9001 standard from 2000 edition to 2008 edition and got certified in accordance with ISO/TS 29001:2010 for petroleum, petrochemical and natural gas projects. Furthermore, change of Certification Body BV to IMQ was accomplished in 2014. The main achievements of QMS in 2015 are as follow:

- Improving procedures to control actual and potential non-confirming products to define and eliminate root causes,
- Ranked first technical score in 26.47% of tenders in all fields including new businesses.
- obtaining the client's letter of appreciation for 17 projects,
- Increasing the Revisions of approved issued drawings and technical documents by 0.16 (11.94%) in comparison to the last year.
- Improving data analysis system to coordinate all activities in the company
- Collecting key quality indicators and completing QHSE dashboard in cooperation with IT center in order to make a general view of QHSE office, so that everyone who is checking it can judge how good/bad our performance is.
- Passed the External Surveillance Auditing;
- Revising and Performing Sites technical feedbacks procedure;

Ranking 1st for writing & publishing a book

National Iranian Copper Industries



Great Tehran Electrical Distribution Company

Iranian National Financial Management Award

Health, Safety & Environment

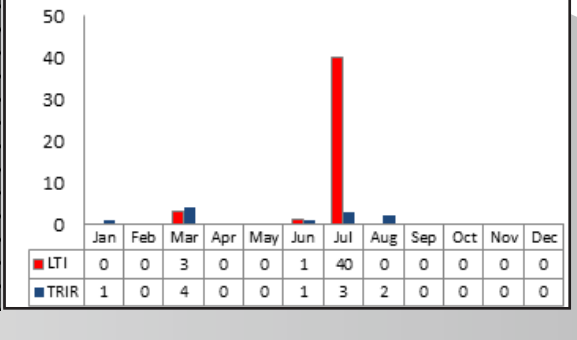
In 2011, Monenco established HSE Management system and got certified according to ISO 14001:2004 and OHSAS 18001:2007 in order to maintain and increase personnel health, safety and environmental requirements. Change of Certification Body from BV to IMQ was done in 2014. The main achievements of HSE management system in 2015 are as follow:

- Gaining HSE-MS certificate for supervision,
- Training Matrix for all employees (Total Man-Hours: 1588),
- Environmental risk evaluation review was done in office (According to HEMP approach) and sites (According to FMEA approach),
- Measuring workplace harmful factors considering threshold limit values and performing corrective or preventive actions,
- LTI, TRIR & vehicle crashes

Health, Safety& Environment

	LTI	TRIR		vehicle crashes
		near miss	accident	
2015	44	8	3	0

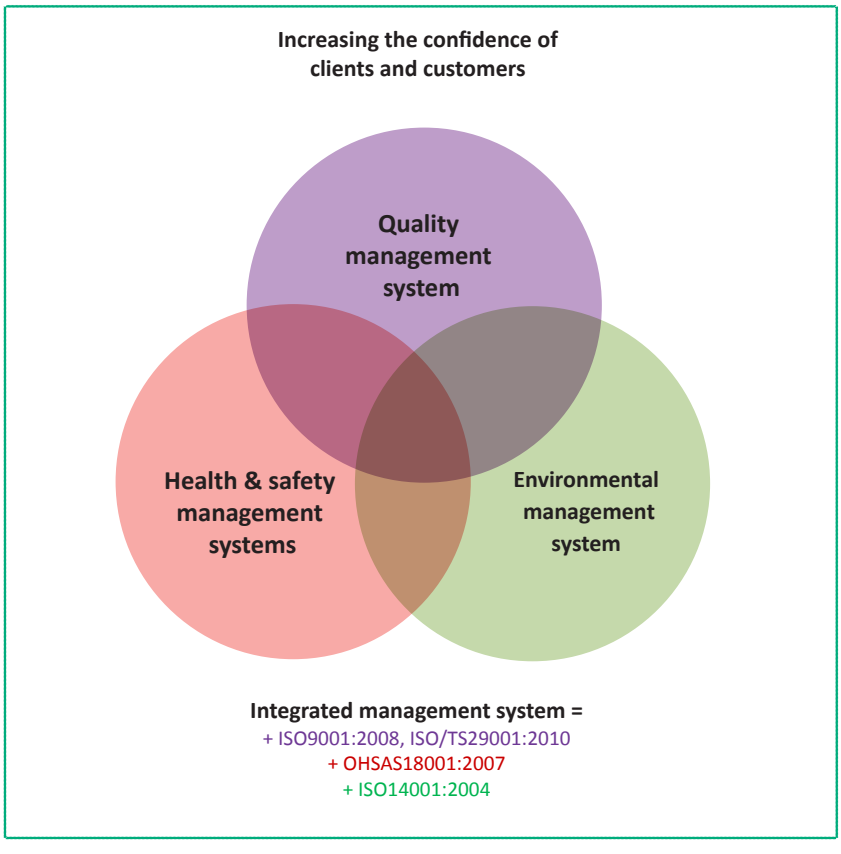
Month's 2015	LTI	TRIR
Jan	0	1
Feb	0	0
Mar	3	4
Apr	0	0
May	0	0
Jun	1	1
Jul	40	3
Aug	0	2
Sep	0	0
Oct	0	0
Nov	0	0
Dec	0	0
SUM	44	11



Integrated Management System

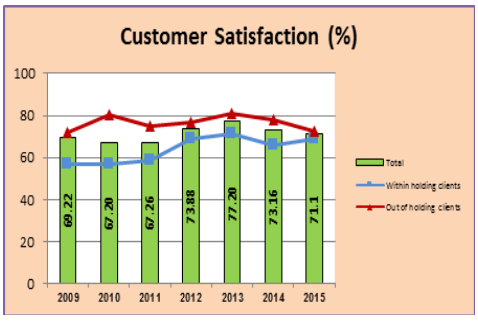
In 2014, Integrated Management System (IMS) in Monenco was implemented in order to achieve:

- Reduction of planning cost, establishing and maintaining QHSE management systems
- Increasing the productivity and efficiency of the systems
- Avoiding repeated tasks and omitting reworks
- Optimum usage of resources



Customer Satisfaction

To ensure meeting customer requirements and perform corrective & preventive actions in appropriate time and efficient manner, QM section independently communicates with customers according to Monenco CRM method through face to face meetings, phone calls and sending questioners.



Objectives & Development plans

Based on IMS policy & Monenco strategies, objectives and development plans of each department are determined yearly by "Monenco Enhancement Work-Group" established by "QHSE & Productivity Office". Each department is responsible for performing the relevant plans & reporting the progress monthly. QHSE & Productivity Office is responsible for controling progress plans and defining appropriate corrective & preventive actions to achieve objectives. In 2015, 63.78% of company's objectives and 81% of quality, HSE and productivity's objectives have been met.

Productivity

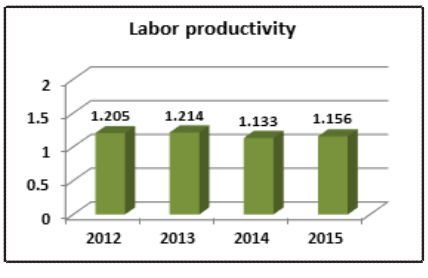
- Monenco Iran has successfully achieved the first rank of "4th Iranian national festival of productivity" in the main section of Technical & Engineering services group, based on financial and economic results, from 2007 to 2011.
- Monenco Iran has been nominated to be awarded Certificate of Appreciation of the "7th Iranian national festival of productivity" in the main section of Technical & Engineering services group, from 2011 to 2014.
- Publishing and performing Productivity manual and calculating productivity of personnel, Departments and organization;

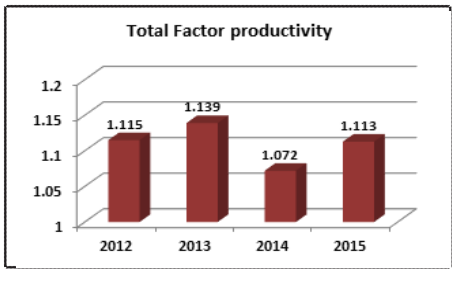
The Productivity Indicators and its last improvement period from 2012 to 2015 are demonstrated as below:

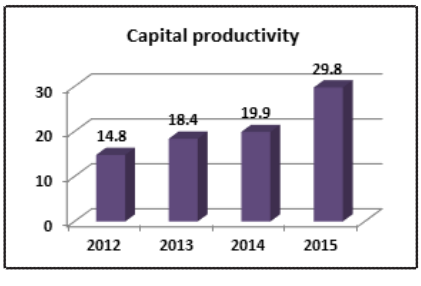
Iran National Festival of Productivity

Productivity

Indicator	2012	2013	2014	2015	Improvement %
Labor productivity	1.205	1.214	1.133	1.156	2.03%
Capital productivity	14.8	18.4	19.9	29.8	49.75%
Total Factor productivity	1.115	1.139	1.072	1.113	3.82%







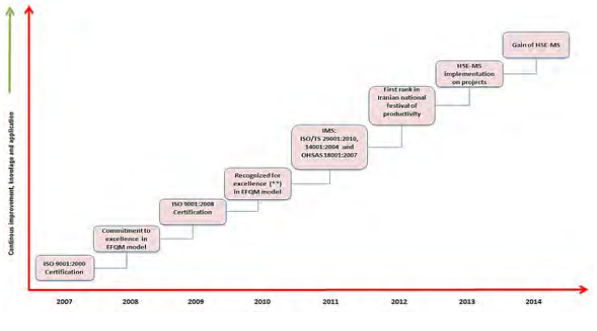
Excellence Model

In order to provide sustainable excellence and achieve balanced results in all sectors of organization, Monenco performance has been assessed based on EFQM excellence model and awarded "Committed to excellence" level in 2009. In 2011, Monenco has been awarded "Recognized for Excellence", based on EFQM model (2010 version). Improvement of projects has been continuously defined and developed in Monenco based on EFQM framework.

Self-Evaluation of sites and the office was performed based on "EFQM model" in 2014 and in 2015 plan, external evaluation by declaration has been considered.

Continuous Improvement

The effectiveness of implemented models & systems yearly is being controlled by QHSE and Productivity Office. The trend of Monenco's Continues Improvement is demonstrated as shown in the picture below.



Monenco in the Middle East

We served clients globally across the energy and power sectors and provide local services in our core markets. In past year Monenco has been very active in Oman as one of leading companies in that region; our focus sectors were power generation, transmission & distribution. Across several successful bidding in last year we won new three years contract with OETC providing various engineering services right across the Sultanate. Also Monenco was able to penetrate new markets in fields of Oil and Gas and Water by serving the major clients such as Petroleum Development Company (PDO) and Public Authority for Electricity and Water (PAEW) as per our defined mission. Previously, we were awarded a prestigious Certificate of Appreciation for 4.5 Million Safe Man hour from Dhofar Power Company (DPC) and being shortlisted as one of the recognized consultant providing consultancy engineering services in field of Oil and Gas by achieving JSRS Certificate. Some of our projects in 2015 are as follow:

- Detailed Engineering Services for Construction for Upgrade Shinas 33/11kV Primary Substation from
- 2X20 to 3X20 MVA (Majan Electricity Company (SAOC))
- Detailed Engineering Services at MEP (Mechanical, Electrical and Piping) parts for Engineering,
- Procurement & Construction of 2 X 10 MVA, 33/11kV Step Down Primary Substation for Gumdah at
- Musandam Governorate (RAECO)
- Consultancy Services for Construction and Supervision of Water Supply Scheme to Ye , Al Hsen and
- Bander Jissah in Muscat Governorate
- Detailed Engineering Services for Construction for New 3X20 MVA, 33/11kV Primary Substation at Al
- Khuwair South – Muscat Electricity Distribution Company (MEDC)
- Consultancy Services for Construction and Supervision of Upgrading of 33/11 kV Qairoon Hairi PSS from 2x10 MVA to 2x20 MVA Capacity
- Consultancy Services for Design & Supervision of New 132/33 kV Jebreen Grid Stations
- Load Cycle Study of Electric Arc Furnace (EAF) for Modern Steel Mills
- Consultancy Services For Design and Tendering Services for Construction of 3X20 MVA Primary Substation at Rusayl-08 in Knowledge OASIS Muscat
- Consultancy Services for Design & Supervision of New 132 kV Grid Stations at Dil Abdusalam (DAS) &
- Suwaiq
- 3 Years Framework Agreement with OETC for Power System Studies
- Comprehensive Analysis, Strategy Development, and Business Planning for Global LLC
- Consultancy Services for Construction and Supervision of Construction of 11kV Outgoing Cable feeders from Salalah Port-GCT Primary Substation
- Consultancy Services for New 132kv Double Circuits Lines from Rustag-Alawabi-Nakhal With A New 132/33kv GS at Al Awabi
- Detailed Engineering Services for Construction for of 132/33kV Liwa Grid Station.
- Detailed Engineering Services for Construction 132/33kv Mulladha Grid Station.
- Consultancy agreement for LNT strategic Marketing Plan.
- Consultancy Services for Design and Supervision of New 132/33kv Bousher-2 and Addition of Third and Fourth Transformer at Ghala Grid Station, Amerat Grid Station and Airport Heights Grid Station
- Consultancy Services for Design and Supervision of Upgrading of Seeb Grid Station, Adding 3rd and 4th Transformers at Mobella (2) & Construction of Mobella (3) with 4X125MVA Transformers
- Request for Proposals for the Engagement of a Consultant for the Realization of a Telecommunication Architecture Study Throughout PAEW Service Area

Commissioned Projects:

- Construction of Madinat Nizwa 132/33 kV Grid Station and Associated Transmission Line
- Up grade of 33/11 kV Qairoon Hairity Primary Substation from 2 x 10 MVA to 2 x 20 MVA Capacity
- 33/11kV, 20 MVA Primary Substation, designated as Salalah Port GCT PSS
- Consultancy Services for Preparation of Network Asset Maintenance Standards & Associated Asset Management Documentation
- 33/11kV, 20 MVA Primary Substation, designated as Rusail
- 33/11kV, 20 MVA Primary Substation, designated as Alkhuwair South
- 33/11kV, 20 MVA Primary Substation, designated as Shinas

Monenco Certificates in Oman

- Oman Ministry of Commerce and Industry
- Oman Chamber of Commerce and Industry
- Professional Indemnity Policy
- Oman Tender Board
- Oman Ministry of Defense
- Muscat Municipality for Issuing Permit Building
- Oman Oil & Gas Industry's Joint Supplier Registration System (JSRS) Ministry of Oil & Gas
- Vendor Approval - Petroleum Development Oman (PDO)

Number of projects with each Client

Client	No. of Project in 2012
Oman Electricity Transmission Company (OETC)	7
Muscat Electricity Distribution Company (MEDC)	3
Modern Steel Mills (MSM)	2
Majan Electricity Company (MJEC)	2
Modern Light Trading & Contracting Co. LLC (MLTC)	1
Dhofar Power Company (DPC)	4
Public Authority for Electricity & Water (PAEW)	3
Oman Power and Water Procurement Company (OPWP)	1
Rural Areas Electricity Company (RAECO)	1
Atlas International Engineering Consultants Co.	2
Bahwan Engineering Company (BEC)	2
Larsen & Tubro Company (LTO)	1

Ongoing Project:

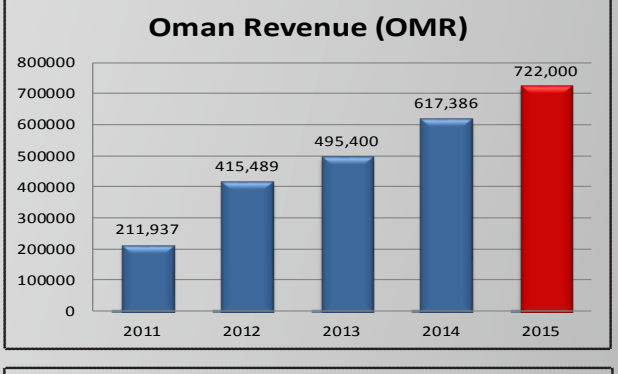
3 Years Framework Agreement with OETC for Power System Studies

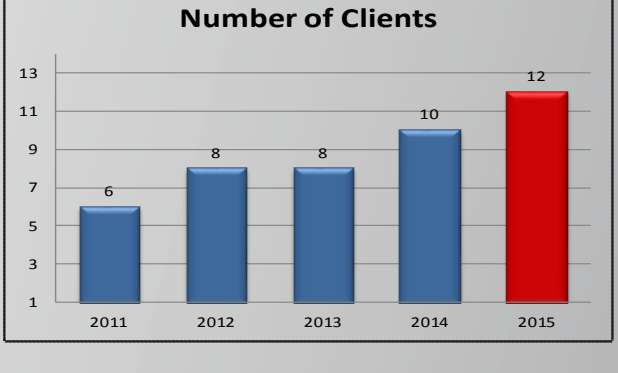
Start Date: 2015 **Finish Date:** 2018 **Location:** Muscat, Oman
Client: OETC (Oman Electricity Transmission Company)

Scope of Services:

- Dispatch scenario when any new power plant connects to the system
- Operational effects of new major loads connected to the system
- Economic Dispatch requirements
- Spinning reserve management
- Under frequency settings
- Islanding procedures
- Black start procedures
- Preparation and modification of System Opera on Procedures
- System opera on studies
- Study the system behavior for any new connection
- Study the difficulties in the international connection
- Study the voltage issues in winter me
- Study the major incidents and partial blackouts
- Help to prepare the contingency plan
- Advice for real me opera on
- Study n-1 criteria by modeling the network system
- Study the PDO-MIS and PDO-Dhofar connections
  - Risks of the interconnection.
  - Risk of inter-area oscillations.
  - Specific issues linked to energization (overvoltage, resonance)
  - Tuning of system protections to face emergency conditions like loss of synchronism, evaluation of maximum power transfer

Description: As preferred consultant for all operating requirements in 3 years of OETC and wide projects in operating fields show the capabilities of Monenco in system studies.





Monenco Germany GmbH
Consulting Engineers

Monenco Germany Outlook

The business idea of Monenco Germany GmbH is offering high quality consulting and engineering services to German, Iranian and international owners, private investors, financial banks, contractors and governmental authorities. The cooperation with the main shareholders of the Company, Monenco Iran and PUT GmbH in Stuttgart, shall enable Monenco Germany for implementation of all kind of highbrow international projects on a competitive price basis.

The consulting and engineering services shall be provided for the following sectors:

- Thermal power and heat plants (gas, oil and coal fired)
- Biomass heat and power plants
- Waste incineration plants
- Renewable energy sector and energy storage systems
- Flue gas cleaning system
- Water and waste water treatment system
- Power transmission systems
- Oil and gas sector
- Infrastructure sector

The provided services of the company shall be as follows:

- Project management and coordination services
- Support services for the mother companies (Monenco Iran & PUT) regarding project development and sales services during bidding phase (preparation of offers, presentations, etc.)
- Expertise, due diligence and project appraisal reports
- Technical, environmental and financial reports
- Feasibility studies and business plans
- Conceptual design reports
- Efficiency improvement reports
- Environmental impact assessment reports (EIA)
- Tender documents (e.g. for EPC) and tender evaluation reports
- Design reviews and review of engineering documents
- Site management, site supervision and quality assurance services during the construction and commissioning phase
- Assistance in settling disputes and supervision of guarantee work

Monenco in Africa

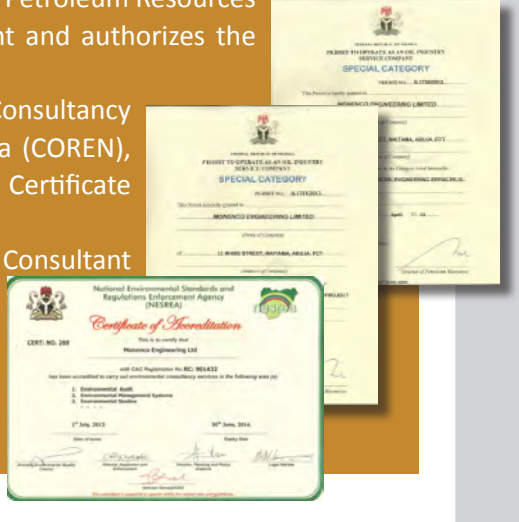
In 2015 Monenco Engineering Ltd. (MEL) finished the 5th year of operation. Combination of the international expertise with local experiences led us to become a strong and professional company. As a result at the very beginning of operation, two projects were awarded to the company from different Nigerian clients. Our goal is to achieve 100% client's satisfaction, so our focus would be on service quality; we will be by the side of our clients from very beginning to the end and assist them from investment to the commissioning. At MEL we focused on delivering life of asset support to our clients' assets and deploy both international and local expertise in order to meet clients' needs. MEL provides consultancy and engineering services to infrastructure with focus on energy sector. Despite being new in Nigeria, MEL has contributed significantly in developing projects within the country and became a well reputable consulting Company. As part of MEL business development strategy also in order to extend business opportunities, MEL has entered into partnership agreement with different international and local companies and participated in several pre-qualification and bidding exercises within Nigeria. Also, in order to expand its services in the field of telecommunication and smart metering, MEL has negotiated with related organizations such as NCC & Galaxy. Feasibility Studies and Engineering and Design of 765 kV Nigeria Super Grid project including 4600 Km Transmission Lines and 11 Substations

Monenco Nigeria has won the following tenders and expected to be awarded in near future;

- Feasibility Studies and Engineering and Design of 765 kV Nigeria Super Grid project including 4600 Km Transmission Lines and 11 Substations
- Consultancy Service, Project Management & Site Supervision of 132kV Transmission Line and associated Substations
- Little Gombi – Mubi – Gulak 132 kV Double Circuit Transmission Line (125km)
- 2 × 60MVA, 132/33 kV Substation at Mubi
- 2 × 132 kV Line Bay Extension at Mubi Substation
- 2 × 60 MVA, 132/33 kV Substation at Gulak

Professional Affiliations

- Consultancy certificate for Oil & Gas sector: With regards to recent field development and international investment in Nigeria Hydrocarbon Sector, MEL has put on place necessary provision in order to initiate its business in Oil & Gas sector. As the first step MEL has been granted a Consultancy Certificate for Oil & Gas Sector from Department of Petroleum Resources (DPR) of Nigeria. This certificate identifies MEL as a consultant and authorizes the company to engage in Oil & Gas Projects.
- General Consultancy Certificate: MEL has applied for a Consultancy Certificate under Council for Regulation of Engineers in Nigeria (COREN), the Individual Certificates has been secured and the Corporate Certificate will be granted in near future.
- Environmental Consultant: MEL is accredited as Environmental Consultant with Nigeria National Environmental Standards and Regulations Enforcement Agency (NESREA) in the following category:



- Environmental Management System
- Environmental Audit
- Environmental Studies

Projects

- Feasibility Studies, Engineering Design and Preparation of Contract Documents for 34MW Dadinkowa Hydro Dam: The engineering service was completed and relevant bankable feasibility study report submitted to the client. Job Completion certificate was granted.
- Engineering Services for Kabompo Gorge Hydro power plant in Zambia: MEL received job satisfaction certificate from the client
- EPC Bid evaluation (PHCN-TCN): Satisfaction certificate was issued by the client

A brief introduction about MIR Engineering and Technology Management Company Up to now (2016)

For over 10 years, MIR Engineering and Technology Management Company , as a fully owned subsidiary of Monenco Iran Consulting Engineers , has been dedicated to making a better world through diverse businesses that today span Information and Communication Technology (ICT), General and Professional Training Services , Energy Consumption Management and Management Consultancy services.

As far as ICT is concerned, it is an integral part of all activities of organizations and since MIR Company has been evolving in a full-service solution provider rendering services to many other companies, he entered this market by doing some projects such as Document Archive System for Iran Power Development Center (IPDC) and another project in terms of Design, Analysis and Implementing Interoperability infrastructure among Systems in the National Faham Project by supervision of Iran Energy Efficiency Organization (SABA).

Experienced qualified personnel and using modern systems led us to provide high quality services in the field of Management Consultancy services either. More specifically we have focused on Designing Strategic Plans , Business Plans and ICT Master plans . For instance, we designed and implemented Strategic Plans for Modje Niroo Company, Kharazmi Information Technology Development Company and Monenco Co.. Also, we participated as a Consultant in auction of contractor selection for Milad Tower Company as the client.

MIR company provides building energy modeling and management consultancy services for Design, Implementation and Commissioning phase by taking advantage of Advance Techniques. Some of our services include energy simulation in buildings , examining and reporting of annual energy consumption reports of buildings, provide energy saving solutions, providing Building parametric optimization, energy audit of buildings under operation, Building management system (BMS) consultancy services, etc. We made a general agreement on energy saving in buildings on behalf of Tehran Construction Engineering Organization, it mainly focused on reducing energy consumption in largest energy consuming sectors. Also, we provided Energy Efficiency solutions in buildings for Monenco Co. under another contract. We are in charge of providing Engineering and Design Services for the National Training Centers of Ministry of Energy too.

MIR

Engineering Management and Technology Company

MIR Company has been offering so many services in the field of training such as creating training courses with E-learning methods that we can call two recent projects in this respect and Monenco Co. as the client. One of them has been specifically designed and implemented for newly hired staff of Monenco Co. in terms of Introduction to the Regulations and Instructions of Monenco Co. and another one is about Design and Implement E-learning HSE in 2015. Other such services include Research & Development on new teaching methods, providing ICT-based training courses and, providing appropriate training space,providing advanced equipment for scientific and practical courses , providing valid training certificate. In this sense, MIR Company has hold over 1000 training course hours on Industrial Automation and 3D Modeling in Engineering, Mechanical and Management for known clients like Mapna Group Companies (Touga, Mapna Boiler, Meco, Pars, Iranian Gas Transmission Company (IGTC), National Iranian South Oilfields Company (NISOC) and Monenco Co.

Profit (Loss) Statement at 20 March 2015

	1393 (at 20 March 2015) Rials	1394 (at 20 March 2016) Rials
Services Income	434,491,309,018	637,965,829,040
Services Finished Price	-343,970,977,257	-534,861,863,141
Gross Profit	90,520,331,761	103,103,965,899
General & Administrative Costs	-65,864,838,015	-56,813,006,775
Other Operating Incom (net)	0	0
	-65,864,838,015	-56,813,006,775
Operating Profif	24,655,493,746	46,290,959,124
Financial Costs	-25,152,966,416	-24,051,489,568
Other non-operating income	14,961,196,397	2,716,412,324
	-10,191,770,019	-21,335,077,244
Profit Before Tax	14,463,723,727	24,955,881,880
Tax on Income	-202,648,029	-2,628,192,867
Net profit	**14,261,075,698**	**22,327,689,013**
Accumulated Profit/Loss Account Turnover		
Net profit	14,261,075,698	22,327,689,013
Accumulated Profit in the beginning	208,653,665,450	217,781,212,810
Annual Modifications	12,295,280,884	14,350,148,974
Accumulated Profit in the beginning-modified	220,948,946,334	232,131,361,784
Approved Dividend	-2,368,332,750	-1,488,666,300
	218,580,613,584	230,642,695,484
Profit Distribution	232,841,689,283	252,970,384,497
Appropration of Profit		
Legal Reserve	-710,327,499	-1,116,384,451
	-710,327,499	-1,116,384,451
Accumulated Profit in the Final Period	**232,131,361,784**	**251,854,000,046**

Monenco Head Quarter

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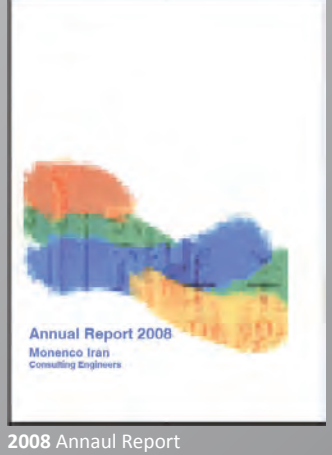
2012 Annaul Report

2013 Annaul Report

2014 Annaul Report



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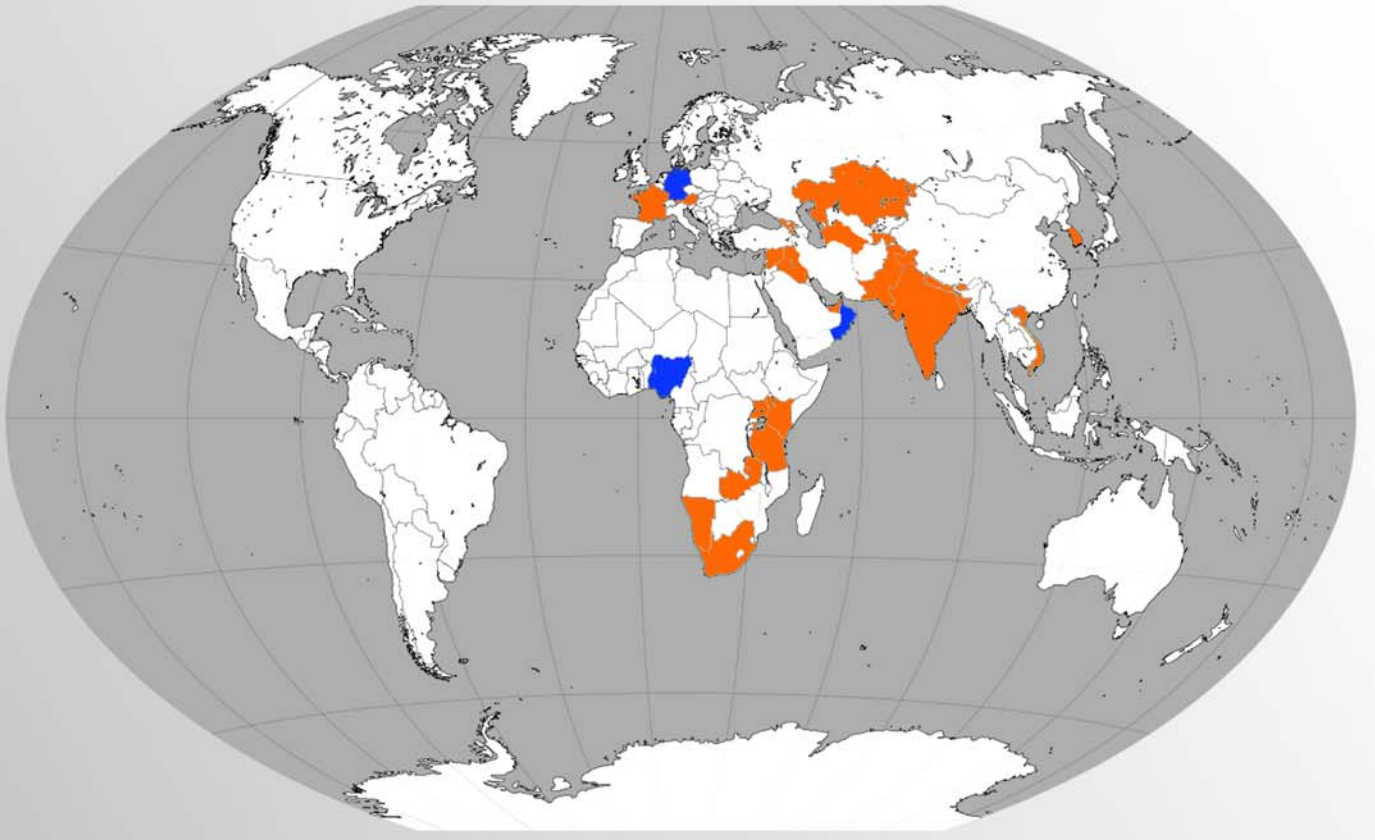
2010 Annaul Report

2011 Annaul Report



Monenco global networking and project foot prints:
Monenco Registered Companies Internationally
Monenco International Presence

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