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# Newsletter

Summer 2018 No. 15




## Message From Market

### Asset Management

Increasing revenue for a company by enhancing its asset performance and ensuring optimal return on new asset investments are the main objectives of Asset Management. ISO 55000 defines that Asset is an item, thing or entity that has potential or actual value to an organization. The value will vary between different organizations and their stakeholders, and can be tangible or intangible, financial or non-financial. Decision making and consideration of Reliability and Lifecycle of assets during design, construction, commissioning, operating, maintaining, repairing, modification, replacing and decommissioning and disposal of physical and infrastructure assets such as transmission lines, high voltage substations, power plants, transportation systems can be easily covered by asset management.

The benefits of asset management can include, but are not limited to the following:

- Improve of financial performance
- Informed asset investment decisions
- Managed risk
- Improved efficiency and effectiveness
- Improved services and outputs
- Demonstrated social responsibility
- Demonstrated compliance
- Enhanced reputation
- Improved organizational sustainability

For achieving successful asset management practices, the organizations should have systematic and suitable asset management system that needs to be defined by specialized and experienced person according to strategies of organization.

An asset management system provides a structured approach for the development, coordination and control of activities undertaken on assets by the organization over different life cycle stages, and for aligning these activities with its organizational objectives. Benefits of an asset management system are listed below:

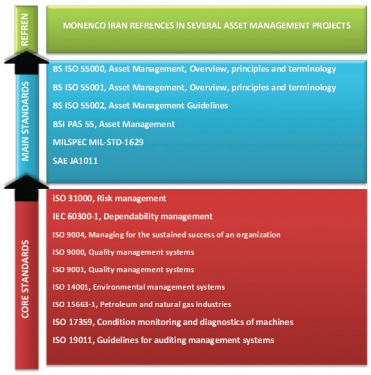
- Creating an asset management system provides benefits in itself
- Top management benefits from new insights and cross functional integration
- Financial functions benefit from improved data and linkages
- Many parts of the organization benefit from an asset management system

The asset management system requirements described in ISO 55001 are grouped in a way that is consistent with the fundamentals of asset management:

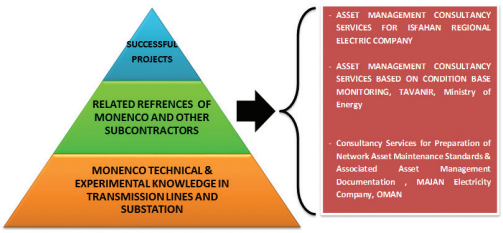
- Context of the organization
- Leadership
- Planning
- Support
- Operation
- Performance evaluation
- Improvement

Relevant asset management subject areas addressed by other published international, regional, or national standards include, but are not limited to, the following diagram:


Asset management standards stems from some fundamentals and core standards as shown blow. There are also related asset management standards which are consist of principals, requirements, guide lines and applications. Deep understanding from these standards, enable Monenco Iran to handle Asset Management projects.




Monenco Iran Asset Management References and background in professional consultancy services especially in the industrial projects in the fields of power transmission Lines and high voltage substations and also deep understanding from quality management standards and techniques, enable us to have successful asset management project.




Faramarz Ghelichi, Transmission and Ditribution Director
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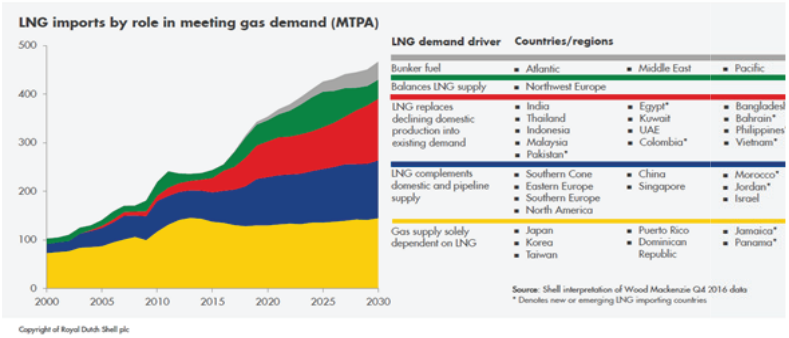
New Field

## LNG (Liquid Natural Gas)

The world's demand for energy is expected to grow by 30% between 2015 and 2040. Rising demand is expected to be concentrated in China, India, Africa, the Middle East and South-East Asia. The UN's sustainable development goals and the Paris Agreement on climate change catalysed the global drive to cut greenhouse gas emissions and improve air quality, while providing energy to everyone. Natural gas is helping to provide more and cleaner energy around the world. Natural gas – both piped and LNG – also supports the integration of variable renewable power generation because it can quickly compensate for dips in solar or wind power supply and rapidly respond to sudden increases in demand. The rapid growth of LNG is helping increase energy supply, security, diversity and exibility. Natural gas and its main component, methane, is being known as greenest fossil fuel. Estimated trend and consumption of LNG, the liquid form of methane, is being forecasted to be as per figure 1. Estimated rate of growth of natural gas consumption is evaluated at 2%, where rate of increase in LNG consumption with be twice at 4 to 5%. Possibility of long distance transfer of LNG, freedom of selection of supply source and political influences on disruptions of gas supply trough pipe line has oriented consumers toward more utilization of LNG. Methane liquefies at -165°C in atmosphere pressure so any component, such as Ethane, which will be solidify in that temperature should be removed from gas in the process of purification. Two processes are employed for liquefaction of methane, Nitrogen (Boiling point -195.8°C) cycle versus mixed refrigerant (MR). MR technology employs the same technology which is used to produce liquid Nitrogen and Oxygen, and invented by Linde. Nitrogen cycle is safer and MR has less OPEX and easier to handle. The following facts should be considered as preliminary data on pipeline and LNG CAPEX. For high pressure -1350 psig gas pipeline 35000-45000$/inch-kilometer and almost the same price for compressor stations should be considered. For LNG the capital cost is 200-350$/mt yearly production. Current global price of natural gas is around 2.5$/MMBTU, which is equivalent to 8.8-9cents/CM and 126-130$/MT. Figure 2 shows average freight charge of LNG transportation based on US$/MMBTU:

**Changing drivers of LNG demand growth** Figure 1



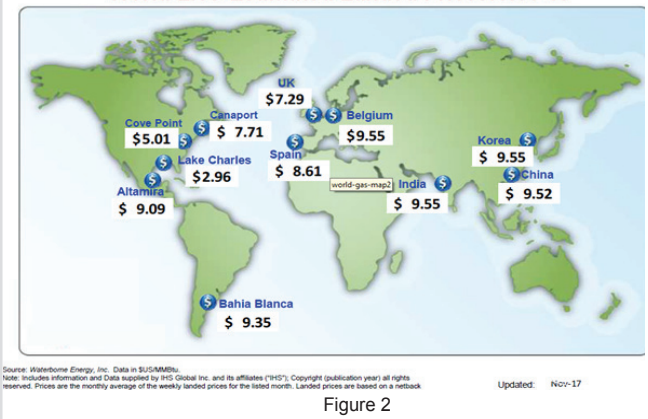




Figure 2

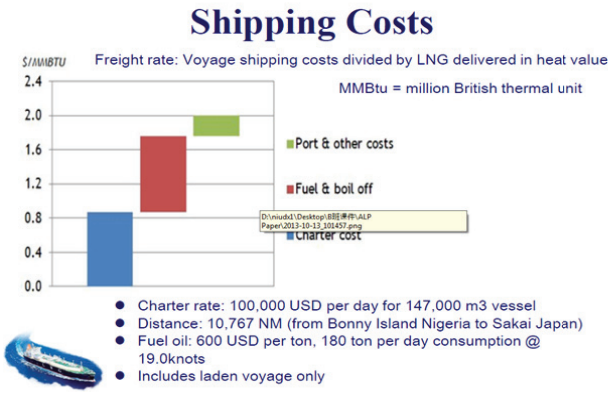



Figure 3

Transportation cost based on 2 US$/MMBTU will be 100-110 $/MT LNG. Special restrictions are governing on LNG transfer vessels:

1. LNG tanks should be perfectly clean and without any foreign material
2. During transportation there will be some loses due to evaporation
3. Due to very low temperature of LNG (-165°C) very special alloy with 9% Ni such as AISI-304L. should be used in fabrication of vessels
4. All LNG vessels on return should be empty. This will increase the transportation cost

Fig. 3 gives LNG price at end-user's ports. The average price is 9$/MMBTU and considering average price of transportation of 2$/MMBTU then operation cost of transferring gas to LNG will be less than ≈ 4$/MMBTU.

According to above, Monenco Iran penetrated in this field in 2017 in Bangladesh. Natural gas is the only indigenous commercial energy resource in Bangladesh and currently accounts for 72% of the commercial needs. Most of the natural gas is used in generation of electricity and production of urea fertilizer, with significant uses in industrial, commercial and domestic purpose as well as fuel for CNG operated vehicles. Gas demand is increasing sharply keeping pace with the economic development and diversified use of gas. Presently there is gas shortage in Bangladesh resulting less power generation, low gas pressure and no new gas connection in industrial, captive and CNG sector impeded in whole gas pipeline network areas. To meet up the upcoming energy supply challenge, Government of Bangladesh has planned to construct the land based LNG re-gasification terminals at Moheshkhali and Kutubdia under COX's Bazar district and payra under Patuakhali district each having 7.5 MTPA@ capacity 1000 MMSCFD. In this project Monenco Iran is responsible for top-supervision, monitoring of techno-economic feasibility study and related works of consulting firm and selection of terminal developer or any other designated entity for construction of land based LNG terminals.

## Consultancy Services for Revising and Updating the Conditions of Contract for EPC (industrial/non-industrial) Projects

**Start Date: 2018**
**Client: Plan and Budget Organization**
**Location: Tehran - Iran**

**Description:** Considering that EPC contracts' terms and conditions implemented since 10 years ago, now it is essential to revise and upgrade the EPC contracts rules and conditions (industrial and non-industrial). Accordingly, Plan and Budget Organization has assigned the required consultancy services to Monenco Iran. Below matters are considered as the major reasons in this project:

- Obstacles and experiences that stakeholders confronted during the implementation of this contractual model so far
- Enquiries and clarifications requested by employers, contractors and consultants from the country's technical and executive system over the past few years
- Country's development which is heading towards private sectors from public sectors also the position of the joint companies in the public and private sectors as a client in the development and infrastructure projects
- The growing trend of EPC model as the top model for the implementation of the country's development and infrastructure projects
- Changes in the international standards to assign the EPC contracts and contractual patterns/regulations
- Changes in the national laws and regulations and executive directives in recent years and the need to apply their effects on the contractual patterns
- The necessity of applying new legal, financial, insurance regulations in the contractual models

In this project, Monenco Iran is responsible to render following services;

- Data gathering and information analysis
- Conforming to the international standards and regulations
- Providing amendments and updating the current EPC contract
- Approval of the contract
- Documentation of the project

# Sample Projects

## Consultancy Services for Kish Submarine Fiber Optic Cable

**Start date: 2018**
**Client: Telecommunication Infrastructure Company**
**Location: Tehran - Iran**

**Description:** Kish Island is one of the most important islands in Iran in terms of communication infrastructure. Therefore, presence of TIC Company in this Island is very important. In this regard, Monenco Iran will be responsible to design the submarine fiber optic cable and intends to prepare an appropriate RFP for selecting the best design and implementation method based on standards and environmental considerations.

In this project, Monenco Iran is responsible for

- RFP preparation based on engineering principles and standards to provide and implement 24 core submarine fiber optic cable from Kish Island to mainland,
- providing design, implementation and supervision instructions,
- identifying contractors,
- providing contractor's assessment instruction
- estimating the project cost,
- determining the methods of FAT,
- physical testing and delivery,
- presenting the methods of PAC and FAC,
- project control software proposal,
- proposal of required items for maintenance period

## Development of a Master Plan for Transmission and Sub-Transmission Network of Yazd Regional Electric Company

**Start Date: 2018**
**Client: Yazd Regional Electric Company**
**Location: Yazd Province - Iran**

**Description:** The main purpose of this project is to provide a development master plan for transmission and sub-transmission network of Yazd Regional Electric Company up to 2026. Considering the consumption increase in electrical energy, it is essential to provide an appropriate power system expansion plan to increase the electrical energy generation with high reliability in order to respond to consumer needs.

Accurate planning is of great importance since it causes reduction in economic risks for the electrical utilities and supports the targeted investments.

Power system planning objective is therefore to determine a minimum cost strategy for long-term development of electricity generation, transmission and distribution systems to supply the forecasted load within a set of technical, economic and political constraints until 2026.

In this project, Monenco Iran is responsible for:

- Task 1: Gathering and verifying required Data
- Task 2: Power System Studies and analysis in base year (2019)
- Task 3: Development of a master plan for transmission and sub-transmission network (to 2026)
- Task 4: complementary studies
- Task 5: Preparing comprehensive report
- Task 6: Workshop

## Sample Projects

### Business Plan for Establishment the Power Plant Repair and Maintenance Company

**Start Date: 2018**
**Client: Thermal Power Plant Holding Company**
**Location: Tehran - Iran**

**Description**: Iran electricity generation comprises different technologies: Simple gas cycle, Conventional steam cycle, Combined cycle, Hydro, Nuclear steam cycle, Renewable (solar and wind) and Diesel. Total power generation capacity has been increased by 3.5% in recent years and now it is 78,900 MW. Share of thermal power plants (gas cycle, conventional steam cycle and combined cycle) is about 65,000 MW that is 82.3% of total power generation capacity.

Considering existing power generation facilities, original equipment manufacturers O&M procedures and standards and limited repair and maintenance capacity, there is an interesting market on operation, maintenance and repair of these thermal power plants. At present, there is only two main repair and maintenance companies in Iran and some specific repair and maintenance service (such as gas turbine blade refurbishment) is not fully provided by them. So, there is a gap between market demand and market supply at present time.

Considering the facts that thermal power plants capacity is expected to reach nearly 100,000 MW until 2026, limited capacity of existing companies and future plant technologies (F class and H class), the repair and maintenance service market definitely will increase in future.

Based on above facts, TPPH has decided to establish a new maintenance and repair facility in Iran. And in this project, Monenco Iran is responsible to provide a business plan establishment the Power Plant Repair and Maintenance Company including;

- Market Study and Market Segmentation
- Site Selection
- Market Targeting & Define Scope of Service
- Organization Chart, Human Resource Plan and Legal Issues
- Feasibility Study for Company Establishment

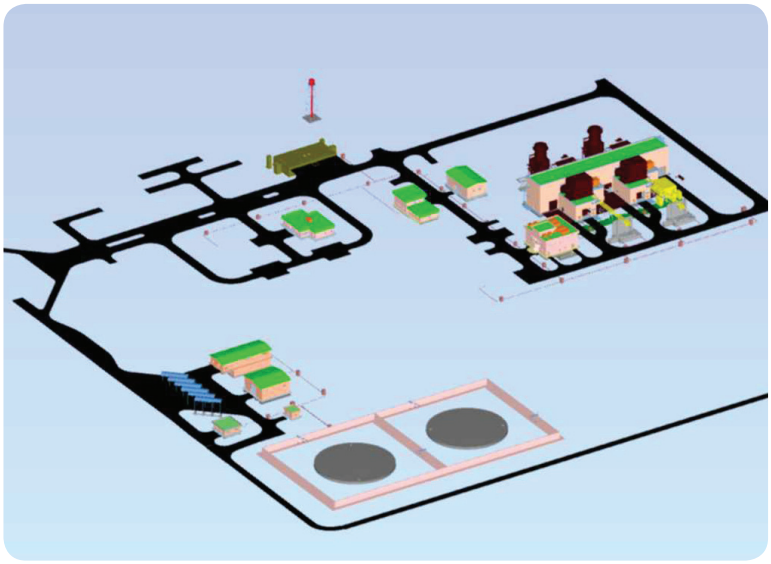
### Zarand Combined Cycle Power Plant (Gas Portion)

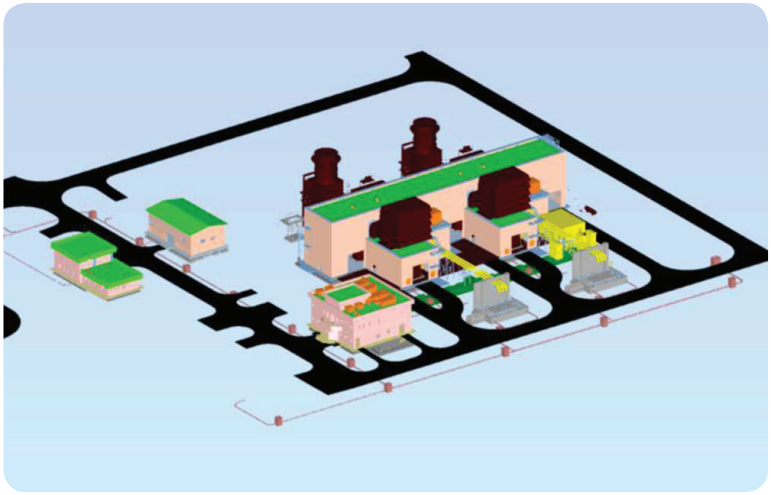
**Start date: 2018**
**Client: Thermal Power Plant Holding Company**
**Location: Kerman Province, Iran**

**Description:** Zarand Combined Cycle Power Plant with the total capacity of 480 MW includes 2 gas units with the capacity of 324 MW and 1 steam unit with the capacity of 160 MW.

The purpose of this project is to increase the power generation capacity in the region and network's sustainability also to provide part of the demand for national electricity grid and respond to the growing need for energy consumption due to local industries and agricultural development, to promote the technical knowledge in construction of thermal power plants.

In this project, Monenco Iran is responsible to provide engineering and design services for civil and utility's, design of B.O.P (balance of operation) for mechanic, electric, process, instrument and control for 2 gas turbine V94.2 type.





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Sample Projects

## MC Services and Site Supervision of Basht Fuel Bioethanol and By-product Production

**Start date: 2018**
**Client: Zagros Green Fuel Development co.**
**Location: Basht, Kohgiluyeh and Boyer Ahmad Province, Iran**

**Description:** Basht Bioethanol production project is considered as the second project in Iran after Kermanshah bioethanol production project. As the bio-fuel will be used as a supplement/improver of gasoline in the future, gasoline consumption or gasoline petrochemical supplements elimination (especially MTBE) will be reduced. However, reduction of pollution is one of the most important benefits and advantages for the environment and public health.
In this project, Monenco Iran is responsible to render project management engineering services for all phases of project including asic design, details design, procumbent, construction, pre-commissioning, commissioning, test production and steady production service for bioetanol plant in products rate of 200000 liter per day (66 million liter per year) ethanol alcohol (99.5%) and other by products (including DDGS; Co2 & fusel oil) from corn & other cereal feeds.

## Technical, Economical, Financial, Social, Cultural, Environmental and Passive Defense Feasibility Studies and Obtaining a License from PBO

**Start Date: 2018**
**Client: Communication Regulatory Authority (CRA)**
**Location: Iran**

**Description**: Proposing new capital assets acquisition projects (for annual development plans) in the annual budget bills will be submitted to the Parliament for approval if it is based on the technical, economic, financial and environmental studies and in accordance with passive defense requirements. The proposal should be provided by a competent consultant and approved by Iran's Planning and Budgeting Organization.
Accordingly, due to experiences of Monenco Iran, the client, selected this consulting engineers as the consultant.
In this project, Monenco Iran is responsible for providing the feasibility plan for five national capital assets acquisition projects for Communication Regulatory Authority to be approved by Planning and Budgeting Organization.

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# Events

## Monenco Iran participated in the second session of Asia-Pacific Information Superhighway Steering Committee in Thailand

Monenco Iran participated in the second session of Asia-Pacific Information Superhighway Steering Committee which was organized by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and held in Bangkok during 27-28 August. This meeting focused on issues related to ICT connectivity, including the digital divide and was attended by governmental officials and policy makers from Asia and the Pacific.

Monenco Iran had a presentation with regard to AP-IS Master Plan 2019-2022 project which aims to increase the availability and affordability of broadband Internet across Asia and the Pacific by strengthening the underlying Internet infrastructure in the region. Monenco Iran presentation focused on Feasibility Study on connectivity & broadband, Infrastructure Sharing and Project management office (PMO). Also other well-known companies such as IBM, Google and Huawei had presentations with the presence of ambassadors and ICT ministers from other countries such as France, Britain, Azerbaijan, Kazakhstan, Thailand, Afghanistan, Pakistan and Pacific islands as well as ESCAP technical committees. Also, Monenco Iran attended in the exhibition of the event while having its own booth and had a fruitful negotiations. High authorities visited Monenco Iran such as ambassadors and ICT representatives from other countries including Thailand Minister of Digital Economy and Society and Executive Secretary of ESCAP. Also ICT representatives of Iran including Presidential Administration, Pardis Technology Park and Foreign Affairs Ministry visited Monenco Iran booth.


## Development of 400/230/63/20 kV Amin Al-asharfi (TehranParse) Substation

Development of 400/230/63/20 kV Amin Al-asharfi (TehranParse) Substation project was launched on Aug 29th with the presence of Minister of Power.

400/230/63/20 kV Amin Al-asharfi (TehranParse) Substation is one of the main substations in Tehran Regional Electricity Company. Due to increased demand of electricity, development of the mentioned substation with the aim of strengthening the network was considered as priority. The mentioned substation is the most important substation since it transmits the huge amount of electricity from Damavand Combined Cycle Power Plant to East of Tehran which installing the 400 kV autotransformers in this project will increase the reliability of the network.

In this project, Monenco Iran Consulting Engineers was responsible to provide engineering, design and supervision services.

# Events

## Monenco Iran at the 47th Paris Cigre Session

Monenco Iran participated in CIGRE Session 2018 which was held from Aug 26th to 31st in Paris with a record number of 3,600 delegates among 9600 participants from 98 countries. Cigre Session is an international leading event for power system industry, gathering worldwide experts in even numbered years to discuss and learn about the future of the industry and to display the latest solutions for the whole value chain, from generation to distribution. The topics of the conference are as follow:

- Future electricity markets and business models
- The future sustainable power system: Organic, disruptive and secure
- Large disturbances: market disturbances & System disturbances
- Integrated power system: changing from consumers to presumes
- System aspects of HVDC grids
- DC circuit breakers
- Safe working in substations

Monenco Iran participated in the conferences, technical meetings, tutorials, workshops and the technical exhibition. Also, two papers from Iran were presented in the poster session which one of them was provided by Monenco Iran as follow:

- Experimental Investigation on Ungrounded Conductive Objects Effects Approximate to Power Transformer during IVPD Test

(F. Ghelichi, A.A. Abbasi, A. Tofighi, S. Emrani Saravi, K. Gharani Khajeh)

In addition to above, Monenco Iran participated in the CEO Event. In this event, gives a better understanding of Cigre's work to decision makers and executives in order to promote the necessary engineering resources to Cigre work groups and study committees.

## Commissioning of 230 kV transmission line in Ilam Province

Construction of a 230 kV transmission line in Ilam Province; Seymareh-Abedanan-Dehloran, that connects the Seymareh dam to the country's electricity grid and strengthen the connections in west of Iran, has been successfully commissioned.

In this project, Monenco Iran was responsible to provide design, engineering and supervision services.

The mentioned transmission line has an efficient role in transferring the electricity from Seymareh Power Plant to the northern part of Khuzestan Province and south of Ilam Province at the peak time in current year also reducing the electricity outages. The job was done in the period of 3 months from April to July this year due to the urgent demand of Ministry of Energy, Tavanir Co., West Regional Electric Co. and Khuzestan Regional Electric Co.

Project Specifications:

- Length: 113 km and 337 tower
- Route Complications: Crossing Dinar and Kabir mountains with severe areas. The project could have been done in 14 months in normal conditions.
- Location: Ilam Province; Dareh Shahr, Abdanan and Dehloran cities


## Clients Perspective

سلطنة عمان

Diam ديام

رقم: paew/9133/2018

تاريخ: 10-July-2018

To: **M/s. Monenco Consulting Engineers**
P.O. Box 1389 P.C. 133,
Muscat, Sultanate of Oman

**Project:** **Consultancy Services for Construction Supervision of Water Supply Scheme to Yetti, AlHesn & Bandar Jissah in Muscat Governorate (Tender no. 60/2013)**
**Subject:** **Letter of Appreciation**

This is to certify that Monenco Consulting Engineers has provided consultancy services for Construction supervision for Construction of Water Supply Scheme to Yeti, Al Hesn, Bandar Jissah as the Project Consultant for PAEW. The project was completed with good quality and we appreciate Monenco Consulting Engineers efforts as client's consultant in this project.

**The project particulars are as follows:**
**Client:** Public Authority for Electricity and Water (PAEW),
**Client's Consultant:** Monenco Consulting Engineers,

**Project Construction Scope:**

- Pump Station Capacity of 2 pumps 525 m3/h each and additional pump for future demands up to 2035 year.
- Underground and on Ground combined break pressure tank 800 m3, 600 m3 and 200 m3 capacity.
- Main Transmission pipeline DI 600 mm, 6.2km, DI 400 mm,16km and DI 300 mm, 1.2km.
- 200 villas water service house connection and 2 Chlorination unites & 6 PLC rooms.
- Distribution pipelines HDPE, DI 225,160,110 mm, 20km at Al Hesn & Yeti villages.
- 3 Nos PRVs chambers (Muscat Bay, Shangrila & Yeti Resorts).

**Location:** Wadi Kabeer, Al Hesn, Yetti, Muscat Governorate, Sultanate of Oman,
**Duration:** 16 November 2014 up to 04 February 2018,

This letter is issued upon the M/s. Monenco Consulting Engineer's request and it does not constitute any legal obligation with PAEW.

Best Regards,

Yours Faithfully,

**Fahad Said Al-Mandhari**
Projects Manager
Public Authority for Electricity & Water (PAEW)

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