



Gas Production & Processing

Enppi





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Enppi at a Glance



Enppi established in 1978 and headquartered in Cairo Egypt is an engineering and EPC Main Contractor providing fully integrated engineering, procurement, construction supervision and project management services for the petroleum, petrochemicals, energy, power and other industries in Egypt, MENA region & Latin America.

Business Fields

- Oil Production & Refining
- Gas Production & Processing.
- Petrochemicals, Chemicals and Fertilizers.
- Pipelines.
- Offshore.
- Utilities & Offsites.
- Tank Farms & Terminals.
- Water Treatment.
- Power Plants and Renewable Energy.
- Gas Production & Processing.
- Architectural Design.



Shareholders

96.61%

Egyptian General Petroleum
Corporation
(EGPC)

2.12%

Petroleum Projects &
Technical Consultations
Co. (Petrojet)

0.99%

Housing and Social Services
Fund for the Petroleum
Sector's Employees
(HSSFE)

0.14%

Egyptian Natural Gas
Holding Co.
(EGAS)

0.07%

Egyptian Petrochemicals
Holding Co.
(ECHEM)

0.07%

Egyptian Natural Gas Co.
(GASCO)

& Gas Production Offsites Profile

Enppi executed more than 250 major gas production and processing projects in the local and international markets, starting from Conceptual studies to EPC and turn-key projects. Internationally, Enppi penetrated the markets in various regions such as; Arabian Gulf, Venezuela, Syria, Yemen and UAE

Enppi has acquired an extensive experience in the design and commissioning of gas processing facilities including fractionation, LPG, NGL's recovery plants. Deep cryogenic extraction reached calculated recovery levels up to 98% for ethane, 98% for propane, 99% for butanes and 99% for pentanes.

Diverse project involvement utilizes Enppi's own integrated multi-discipline engineering resources together with state of the art design software and techniques. Various process specialized programs (Hysys, Unisim, Pro II, Flarenet, Olga, Pipe phase, Pipesim, Pipeline studio, HTRI, ...etc) and in-house developed programs together with process team specialists extensive experience and capabilities in simulation enables. Enppi to support projects with static and dynamic simulation models. for process units, pipelines and flare systems (reference projects utilizing Hysys dynamic simulation: West Harbor Expansion Project for PhPc and Qasr compression station for KPC. Reference projects utilizing Olga dynamic simulation: Assil & Karam gas development and PAGMI project phase I).

Through many years of experience in the gas treatment field, Process Division has acquired extensive experience in various facilities including acid gas removal, dehydration, mercury removal, compression, gas-oil separation, fuel gas treatment, ...etc.

Further to the accumulated priceless expertise and knowhow that have been gained in the processing and treatment facilities, Enppi designed and commissioned several gas pipelines in both onshore and offshore territories.

The experience and capabilities gained from the above engineered projects support and assist Enppi to offer development packages for projects that cover the entire Gas Handling and Processing value chain including but not limited to LPG & NGLs extraction.

Enppi integrated team experience / capabilities cover the following:

- Studies (upgrading, debottlenecking, environmental, safety assessment, flow assurance & surge studies,...etc)
- Pre-front-end engineering and design (Pre-FEED) studies
- Front-end engineering and design (FEED) studies
- Basic Engineering
- Detailed Engineering
- Revamping
- Rehabilitation
- Expansions
- Engineering, procurement and construction (EPC) Projects
- Turn-key Lumpsum Projects



Samples of technologies employed in different designs performed by Enppi integrated team:

- Sweetening
- Turbo-expanders
- Absorption
- Adsorption
- Refrigeration
- Cold-Box
- Deep Cryogenic extraction

» C₂/C₃ production

» Selective fractionation for propane, iso-butane, normal butane, pentane, gasoline and heavy ends recovery

Samples for the fields experienced by Enppi in gas processing, treatment, storage and transportation projects:

Gas Production

- Onshore production facilities (launchers, receivers, slug catchers, separators, ...etc)
- Offshore platform topside facilities/structure (HIPPS, Compressors, de-sanding...etc)
- Processing facilities (gas lift, gas injection, dew-pointing...)
- Receiving terminals
- Export terminals
- Compression stations
- Metering stations
- Control and safety systems (PLC, DCS, ESD, HIPPS, CEMS on heaters and SCADA)

Gas Storage and Transportation

- Storage facilities (LPG, LNG, NGLs, condensate, C₂/C₃, Propane...etc)
- Pipelines
- Loading Arms and shipping terminals facilities

Gas Processing

- Gas processing and fractionation facilities, to supply ethane and propane, at the required purity, as make-up to the refrigeration cycles
- Heat transfer fluid facilities to provide heat & refrigerants for various fractionation columns & chilling purposes respectively
- Gas treatment facilities (mercury removal, acid gas removal, dehydration / drying, sweetening...etc)
- Gas scrubbing facilities
- Sales gas conditioning facilities
- LPG production facilities
- Condensate recovery and stabilization facilities
- Condensate processing and blending facilities
- C₂/C₃ production facilities
- Gas transportation facilities
- Condensate storage and transportation facilities
- NGL and cryogenic storage and transportation facilities
- LNG and cryogenic storage facilities





Gas Production Processing Experience



INTERNATIONAL PROJECTS

Replacement & Segregation of Khuff Gas at Uthmaniyah Gas Plant (UGP)

Client

Saudi Aramco, KSA

Contract Type

EPC LSTK- Main Contractor

Scope of Services

Detailed Engineering, Procurement, Construction, Pre-commissioning and Commissioning & Startup Assistance

Project Description

The project aims to the replacement & segregation of KHUFF Gas Piping at Uthmaniyah Gas Plant (UGP) (that carries 1200 MMSCFD of total sour gas containing high chloride content) through the replacement of the existing stainless-steel header and branch connection piping at the KHUFF Gas Trains that is failing due to Chloride Stress Corrosion Cracking (CI- SCC) with CI-SCC resistant material carbon steel internally clad with 3mm Alloy 825.

The project also necessitates to segregate the KHUFF Gas Trains into two independent trains which will improve operational flexibility and minimize the impact on the KSA Master Gas System. expansion of DCS and ESD systems.

Satah Off Gas Compressor Project at ZIRKU's Island

Client

ADNOC Offshore

Contract Type

EPC LSTK - Main Contractor

Scope of Services

Engineering, Procurement, Fabrication, Transportation, Construction, Pre-Commissioning, Commissioning, Handover, Startup and completion of Performance Test

Project Description

A new Off Gas Compressor (OGC) and associated facilities will be installed at Zirku Satah plant to perform the function of the existing Amine Bypass Compressor in Bypass mode (unit 412). Following the implementation of the project, the existing Amine Bypass Compressor will be operated in Export Mode in parallel with the Export Gas Compressor (unit 411) to increase the export gas handling capacity at Zirku As The existing Export Gas Compressor, with a capacity 65 MMSCFD, is expected to become bottleneck beyond year 2021 to handle the forecast export gas profile.



Yanbu Gas Plant Expansion

Client

Saudi Aramco, KSA

Contract Type

EPC Main Contractor - lump-sum turnkey.

Scope of Services

Detailed engineering, material supply, construction and commissioning & start-up.

Project Description

Expand Yanbu NGL plant capacity from 390 to 585 MBOD. The scope of work includes: 195 MBOD de-ethanizer with ancillaries and propane, refrigeration system, feed to the existing de-propanizer and de-butanizer columns, construction of substation with process interface room and expansion of DCS and ESD systems.



Gas Extraction And Compression Project

Client

PDVSA, Venezuela

Contract Type

Lump-sum for professional services/material supply cost plus.

Scope of Services

Basic & detailed engineering and procurement services.

Project Description

Installation of a new NGL extraction plant with processing capacity 1000 MMSCFD of natural gas.



Fractionation Capacity Increase At Jose (Acfj) Project

Client

PDVSA, Venezuela

Contract Type

Lump-sum for professional services/material supply cost plus.

Scope Of Services

Conceptual design, basic & detailed engineering, procurement services and construction supervision.

Project Description

Development of new facilities to process the increase of NGL capacity to 50000 SBPD in order to cover the requirements of the 1st Phase of NGL production increase. Each fractionation train will be designed to produce propane, iso-butane, n-butane, pentanes, gasoline and heavy ends.



Ethane Recovery Project

Client

PDVSA, Venezuela

Contract Type

Lump-Sum for Professional Services.

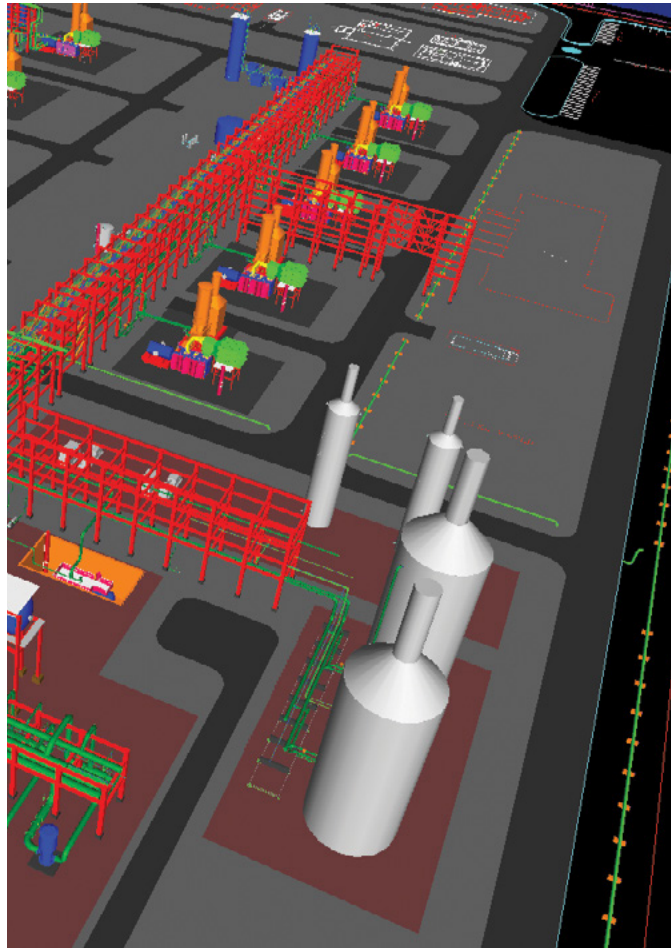
Scope Of Services

Basic & detailed engineering for sweetening package (ISBL), detailed engineering for C₂ extraction unit (ISBL) and overall project management & coordination.

Project Description

Installation of 2200 MMSCFD gas sweetening plant to completely remove the CO₂/H₂S and CO₂dehydration for the natural gas upstream. The extraction facilities in Anaco and the dehydrated CO₂ (200 MMSCFD) will be used for well gas lift, in addition to retrofit of the San Joaquin extraction facilities Trains A&B to achieve 98% ethane recovery.

The scope includes provision of molecular sieve dehydration package along with its regeneration (H₂O plus CO₂ 200 MMSCFD - well gas lift).



Pagmi Project Phase I & II – Gas Conditioning For Domestic Market

Client

PDVSA, Venezuela

Contract Type

EPCM - lump-sum for professional services, material supply cost plus and unit rates for construction works.

Scope Of Services

Basic engineering review, detailed engineering, procurement services for long lead equipment, construction management and overall management for phase I. Conceptual engineering and basic & detailed engineering for phase II.

Project Description

Treating and conditioning gas produced from the offshore area in Northeastern Venezuela to be used in the domestic market in the PDVSA CIGMA Complex, located in Güiria, Estado Sucre, Venezuela.

Phase I: Conditioning of 600 MMSCFD gas from Dragon field (mainly Methane saturated with water), molecular sieve dehydration package and all required utilities to accomplish the domestic market requirements.

Phase II: shall be designed to treat 1000 MMSCFD gas and 20197 STD bpd condensate. There will be an additional dehydration module (module B) parallel to module A in PAGMI phase I, with capacity of 600 MMSCFD with different outlet water content.



Khursaniyah Gas Plant

Client

Saudi Aramco,KSA

Contract Type

Professional services - reimbursable basis

Scope Of Services

Engineering services (main contractor – Bechtel)

Project Description

The Khursaniyah gas plant includes two gas-conditioning trains, ethane and natural gas liquids recovery units in order to process 1000 MMSCFD of natural gas, produce 550 MMSCFD sales gas, 240,000 BL/D ethane / natural gas liquids, and 1,800 metric tons / day sulfur. The complex will process natural gas from three onshore fields in the eastern province: Abu Hadriya, Fadhili and Khursaniyah.



Conceptual & Basic Engineering For Pirital-I Project

Client

PDVSA GAS S.A, Venezuela

Contract Type

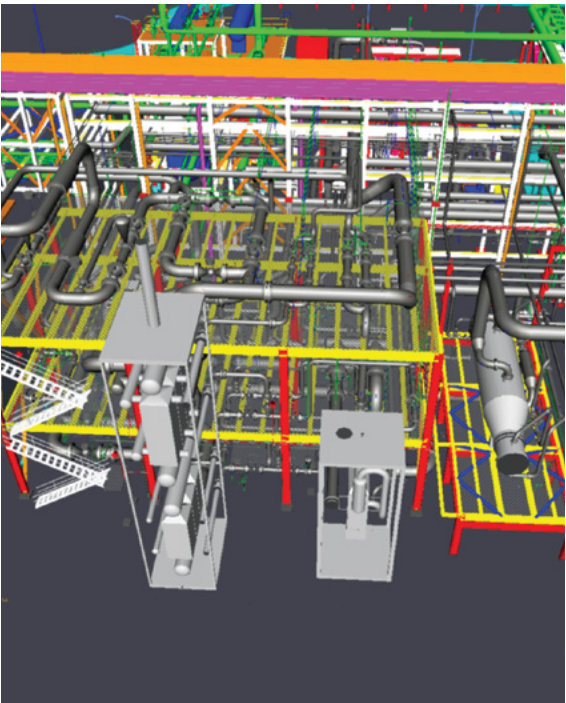
Lump-sum for professional services.

Scope Of Services

Conceptual design and basic engineering.

Project Description

Construction of new extraction plant and its utility systems, processing capacity 1000 MMSCFD of natural gas.



Install C3/C4 Refrigeration Units & Storage Tanks JNGLF Plant

Client

Saudi Aramco,KSA

Contract Type

(EPC) Lump-sum turn key - Main Contractor

Scope Of Services

Detailed Engineering, Procurement, Construction, Pre-commissioning, and Commissioning & Startup Assistance.

Project Description

- The proposed Facility is in JNGLF is situated in the Eastern Province of Saudi Arabia at about 70 km (44 miles) north of the company headquarters in Dhahran.
- The primary objective of this project is to ensure the reliable export of additional forecasted volumes of Propane and Butane products from JNGLF by providing new refrigeration and storage facilities.
- This project will install new facilities at JNGLF in refrigeration (R93) and the tank farm (R92) units which will accommodate T&I of these units.
- It will improve the onshore Propane and Butane facilities at JNGLF.



Development Of The Jordanian Gas Transmission Pipeline

Client

Jordanian Egyptian Fajr for Natural Gas Transmission and Supply Company

Contract Type

EPCM - lump-sum for engineering and construction / material supply cost plus - consortium (Petrojet, Gasco and Enppi Leader).

Scope Of Services

Engineering, material supply, construction supervision & commissioning & start-up assistance.

Project Description

Transmit Egyptian Natural Gas to Jordan through a 36"/394 km pipeline (With Throughput capacity 10 BCM/Y Gas) (From Aqaba to Syrian borders). A compression station was installed at Aqaba for gas transmission.



LOCAL PROJECTS



Ngl Project At Port Said

Client

United Gas Derivatives Company (UGDC) (BP/Eni/Gasco), Port Said

Contract Type

Lump-sum for professional services.

Scope Of Services

EPCM: basic engineering review, detailed engineering & procurement services, construction supervision, commissioning & start-up assistance and overall project management.

Project Description

Installation of processing facilities for 1100 MMSCFD feed of natural gases produced from El-Gamil & Ha'py fields to produce propane, LPG and condensates.



Damietta Ngl Export Facilities

Client

United Gas Derivatives Company (UGDC) (BP/Eni/Gasco), Damietta

Contract Type

EPC turnkey - consortium contract (Enppi & Tractebel) - lump-sum for professional services and cost plus fees for material supply and construction work.

Scope Of Services

FEED & detailed engineering, procurement, construction & commissioning & start-up assistance.

Project Description

Installation of marine export facilities - cryogenic tank capacity (30,000m³) for propane storage produced from Port Said NGL process facilities.



Maximization Of C₂/C₃ Recovery From Western Desert Gas Fields

Client

Egyptian Natural Gas Company (GASCO), Alexandria

Contract Type

Lump-sum for professional services/material supply disburseable.

Scope Of Services

EPCM: techno-economic/feasibility study, basic & detailed engineering, procurement, construction supervision, commissioning & start-up assistance and overall project management.

Project Description

The project aims to maximize C₂ and C₃ Recovery from Western Desert Gas Complex (WDGC) and Ameriya LPG plant. The recovered C₂ and C₃ in Ameriya LPG plant will be transferred to WDGC through a 12" pipeline, to be processed within WDGC where storage and loading facilities exist.

The project was executed in three phases:

Phase I: production of 600 MMSCFD

Phase II: increase of production to 800 MMSCFD

Phase III: increase of production to 900 MMSCFD



West Harbor Expansion Project



Client

Pharaonic Petroleum Company (PhPC), Port Said

Contract Type

EPC LSTK (Enppi Main Contractor).

Scope Of Services

Engineering, material supply, construction, commissioning & start-up and overall management.

Project Description

Expand West Harbor facility which is currently processing 280 MMSCFD from Ha'py and 265 MMSCFD from Taurt fields, by providing an additional HP stage Compression Train and expand the plant design capacity to 585 MMSCFD.

Simian/Sienna Development Project

Client

Burullus Gas Company (BG/Petronas/EGPC), Idku

Contract Type

EPC lump-sum turnkey - consortium (Enppi and Petrojet, Enppi leader).

Scope Of Services

Basic & detailed engineering, procurement services, construction supervision, commissioning & start-up assistance and overall project management.

Project Description

Extension to the onshore existing Scarab/Saffron facility to treat 665 MMSCFD of natural gas produced from Simian/Sienna offshore deepwater fields to feed the onshore Egyptian LNG Plant.



Sapphire Development Project

Client

Burullus Gas Company (BG/Petronas/EGPC), Idku

Contract Type

EPC lump-sum turnkey - consortium (Enppi and Petrojet, Enppi leader).

Scope Of Services

Basic & detailed engineering, procurement services, construction supervision, commissioning & start-up assistance and overall project management.

Project Description

Extension to the onshore existing Scarab/Saffron and Simian/Sienna facility to treat 665 MMSCFD of natural gas produced from Sapphire offshore deepwater fields to feed the onshore Egyptian LNG Plant.



Wddm Phase V Booster Compression Station

Client

Burullus Gas Company (BG/Petronas/EGPC), Idku

Contract Type

EPC lump-sum turnkey - consortium (Enppi and Petrojet, Enppi leader).

Scope Of Services

Engineering services, material supply, construction supervision, commissioning & start-up assistance and overall project management.

Project Description

Adding two new gas booster compression systems including waste heat recovery and other facilities required to maintain the export gas supply pressure within the fields of Simian/Sienna, Sapphire and Scarab/Saffron at Idku - Egypt.



Phase VII Main Compression Onshore Project

Client

Burullus Gas Company (BG/Petronas/EGPC), Idku

Contract Type

Lump-sum (FEED phase) and detailed engineering lump-sum/material supply cost plus (EP phase).

Scope Of Services

FEED review, basic engineering, tendering of long lead items and project management; detailed engineering and material supply at cost plus (EP scope); construction supervision (separate contract).

Project Description

To install 5x25% new gas turbine driven compression stations with a capacity of 500 MMSCFD each to accommodate the pressure declination from 59 barg to 28 barg, including west heat recovery system and a new figure type slug catcher.





Zohr Development Project – Phase I (Onshore Plant Facilities)

Client

Belayim Petroleum Company (Petrobel)

Contract Type

Lumpsum for professional services and procurement services in addition to engineering site support

Scope Of Services

Feed review, Detailed engineering and procurement services in addition to material management and engineering site support during the construction Phase

Project Description

The project aims to establish the onshore plant facilities of Zohr Development Project with a capacity of 2800 MMSCFD on several phases. The first phase targets to reach production capacity of 1400 MMSCFD of gas at a pressure of 84 barg and condensates at a daily production rate of 3500 standard barrels, in addition to high-quality Sulphur with purity up to 99.9% to be converted to solid shape for export with a daily production rate of 50 tons through a set of main production units for gas treatment, condensate separation and Sulphur production in its solid shape.



Zohr Development Project - Phase II (Onshore Plant Facilities)

Client

Belayim Petroleum Company (Petrobel)

Contract Type

Lumpsum for professional services and procurement services in addition to engineering site support

Scope Of Services

Feed review, Detailed engineering, procurement services in addition to engineering site support during the construction Phase

Project Description

The Second phase “Ramp Up to Plateau Project” aims to achieve Zohr Development Project target production capacity of 2800 MMSCFD of gas at a pressure of 84 barg, by adding 3 more gas trains (and provisions for a future 4th train) to the currently in progress 5 trains (EPF train + ASU 4 trains) including all required storage facilities, gas processing equipment & utilities, etc.



GASCO Western Desert GAS Complex “Train D” Project

Client

Egyptian Natural Gas Company (GASCO)

Contract Type

Consortium (Enppi/Petrojet)

Scope Of Services

Engineering & Procurement Services

Project Description

The project aims to maximize the production of commercial propane with the applicable increase in the C₂/C₃ product to meet the national petrochemical sector needs. GASCO intends to increase the complex capacity with additional 600 MMSCFD gas feed. In line with this target, the project aims to add a new train (Train-D) with a design feed capacity of 600 MMSCFD with standalone utilities systems and considering tie-in provisions for further future expansion.

The new facilities are designed to maximize the recovery of producing Commercial propane from the feed gas stream and to produce the following products:

- Sales gas to national grid with high and low pressure.
- C₂/C₃ gas mixture.
- C₃+ to existing Trains (A, B&C) De-Propanizer.

The new feed will be handled by one train with max capacity of 600 MMSCFD. The train will comprise mainly of Dehydration section, chilling section, absorption section, compression section and fractionation section. Storage and off sites are not part of this project scope.



ASSIUT/ASWAN GAS PIPELINE PROJECT

Client

EGAS

Contract Type

Lump-sum for professional services.

Scope Of Services

Route selection, surveying, basic & detailed engineering, procurement services, construction supervision and overall project management.

Project Description

Installation of gas transmission pipeline (500 km) from Assuit to Aswan as follows:

Phase I: Assiut/Gerga P/L 120km - 32”

Phase II: Gerga/Aswan P/L 380km - 30”



BED-3 Low Pressure Compressor

Client

Badr Petroleum Co. (BAPETCO) (Shell Egypt / EGPC)

Contract Type

Timesheets for Engineering and Cost Plus: Procurement

Scope Of Services

FEED, Detailed Engineering and Procurement Services for BED-3 Low Pressure Compressor skid with its related complementary units

Project Description

The project aims to Provide LP compression for the declined fields to fill the LP gas train 3.

For BED-3 it aims to tie-in the new compression skids (two mobile compressor skids) downstream a new remote LLP manifold to be located near BED 3 gas manifold, this LLP gas manifold shall receive the gas from the different wells planned to operate at LLP mode, and deliver the commingled production to the new skids.



Raven Gases Introduction to Western Desert Gas Complex (WDGC) and Amreya Plant

Client

Egyptian Natural Gas Company (GASCO)

Contract Type

Lump sum for professional services

Scope Of Services

Basic and Detailed Engineering, Procurement Services as well as Construction Supervision, Pre-Commissioning, Commissioning and Start Up Assistance.

Project Description

The project aims to introduce additional feed stream to WDGC and Amreya plant in order to compensate the depletion in the main feed streams from WD fields, where the gases produced from Raven field are considered the source of the new feed to WDGC and Amreya.



Western Desert Gas Complex

Client

Egyptian Natural Gas Company (GASCO),
Alexandria



Contract Type

Lump-sum for professional services/material supply disburseable.

Scope Of Services

EPCM: techno-economic/feasibility study, basic & detailed engineering, procurement, construction supervision, commissioning & start-up assistance and overall project management.

Project Description

Treatment of 550 MMSCFD natural gas produced from Western Desert (Obaiyed, Salam & Tarek) to produce ethane & propane mixture for 300,000 t/y ethylene, commercial propane, sales gas, condensate and LPG - Dehydration Package: 2x300 MMSCFD molecular sieve two trains.



Obaiyed Pre-Compression Project

Client

Bapetco (Shell Egypt/EGPC), Western Desert



Contract Type

EPC turnkey - lump-sum for professional services and construction works/material supply disburseable.

Scope Of Services

EPC Main Contractor: detailed engineering, procurement, construction supervision, commissioning & start-up assistance and overall project management.

Project Description

Restore Obaiyed Gas Plant (OGP) compression capacity by 420 MMSCFD through the installation of 2x50% compression train facilities to upgrade OGP pressure from 25 to 86 barg.

Dahshour Compression Station Units 5 & 6 Project

Client

Egyptian Natural Gas Company (GASCO)



Contract Type

Lump sum for professional services, construction supervision and pre-commissioning and disburseable for Material Supply

Scope Of Services

Basic & detailed engineering, procurement services, construction supervision activities and pre-commissioning assistance

Project Description

The project aims to extend Dahshour existing Compression Station by adding two new compressors units (5 & 6) to the existing Four Compressor Units Packages through a loan from the European Bank for Reconstruction and Development (EBRD). Unit 5 consists of a Gas Turbine Driven Compressor Train and unit 6 consists of two Electrical Motor Driven Compressors train in addition to five Waste Heat Recovery Units (W.H.R) installed at the outlet of each gas turbine.

Organic Ranking Cycle (ORC Technology) System shall be utilized to recover the heat from the exhaust of Gas Turbines to generate the necessary electricity required for driving the Electric Motors Driven Compressor and supply the electrical power needed by the compression station self-consumption.





Amerya Lpg Recovery Plant

Client

EGPC, Alexandria

Contract Type

Lump-sum for professional services/material supply and construction work disbursable.

Scope Of Services

Basic & detailed engineering, procurement services, construction supervision and commissioning & start-up assistance.

Project Description

Installation of LPG recovery plant with inlet gas production capacity of 300 MMSCFD producing 360 T/D of LPG. The scope includes Dehydration of 330 MMSCFD of gas by molecular sieve (one train).



Egyptian Lng Project

Client

Egyptian Natural Gas Company (GASCO), Idku

Contract Type

S/C: Lump-sum for engineering services (Bechtel USA).

Scope Of Services

Detailed engineering for: Inlet treating unit, buildings for power generation, LNG storage, flares, marine facilities and utilities.

Project Description

The 1st LNG project in Egypt; two trains LNG plant with a capacity of 3.6 MMTY LNG production each, located in Idku, Beheira, Northern Coast of Egypt.



Transgulf Lpg Plant

Client

EGPC, Ras Bakr

Contract Type

EPC turnkey - lump-sum for professional services/ material supply and construction works disbursable.

Scope Of Services

Detailed engineering, procurement services, construction supervision and commissioning & start-up assistance.

Project Description

Inlet gas production 130 MMSCFD - producing 960 T/D of LPG. The scope includes provision of molecular sieve dehydration package.



Seth Offshore Development Project

Client

Belayim Petroleum Company (PETROBEL) (Eni / EGPC)

Contract Type

EPC LSTK – Consortium (Enppi, Petrojet & Tecnomare).

Scope Of Services

Detailed engineering for topside facilities, Procurement Services and material supply and assistance for commissioning & Start-up.

Project Description

The project aims to install a new platform at water depth 83.3m at PTB Seth gas field in Ras El barr concession west Nile Delta area (Mediterranean Sea), with total field production flow rate of 4.5 MMSCMD.





Rosetta Gas Field Development

Client

Rashid Gas Company - Rashpetco (BG / Edison / EGPC), Rashid

Contract Type

Lump-sum for basic & detailed engineering, reimbursable for construction supervision and commissioning & start-up assistance.

Scope of Services

Detailed engineering, procurement services, construction supervision and commissioning & start-up assistance.

Project Description

The project aims to install Rashid onshore gas processing facilities (275 MMSCFD FEED) including the onshore terminal with gas treatment and export; stabilization unit, condensate export facilities, dehydration & dew-pointing system, gas export facilities, chemical injection package, heating medium, oily water treatment, control system, electricity generation and distribution and utilities in addition to 30km 24" pipeline to transmit sales gas to national grid, and 23km 6" onshore condensate pipeline for gas exported to WEPCO facilities.

Rashid-2 Platform Project

Client

Rashid Gas Company - Rashpetco
(BG / Edison / EGPC), Mediterranean Sea

Contract Type

Lump-sum for professional services.

Scope Of Services

Basic & detailed engineering and procurement services.

Project Description

Installation of four legged unmanned steel jacket platform located in Rosetta at 49 m water depth, with capacity of 275 MMSCFD, weight 450 tons through a 24" subsea pipeline to the onshore terminal for final processing, 3 (1x70 mm2) XLPE 12 / 20 KV 61km submarine cable with fiber optical bundle.



Semman Field Development

Client

Belayim Petroleum Company (PETROBEL) (Eni / EGPC), Mediterranean Sea.

Contract Type

Professional services reimbursable.

Scope Of Services

Basic engineering review, detailed engineering and procurement services.

Project Description

Installation of new Semman platform (tripod plus deck) and laying of new 18" sea line from Semman to existing Darfeel platform with total length 20km.



Denise B Development Project - Tnw2 - Platform Upgrade

Client

Belayim Petroleum Company / PETROBEL (Eni / EGPC), Mediterranean Sea

Contract Type

Lump-sum for professional services.

Scope Of Services

Basic & detailed engineering and procurement services.

Project Description

Upgrade of TNW2 existing platform to suit Denis gas field production, transmit additional capacity onshore via 61km 32" offshore pipeline and 1km 32" onshore pipeline and upgrade of El Gamil onshore facilities.



Assil & Karam Gas Development Project

Client

Badr Eldin Petroleum Company (Bapetco) (SHELL / EGPC)

Contract Type

Professional Services & Construction Lump-sum, Material Disbursable – EPC Turnkey.

Scope of Services

Detailed engineering, material supply, construction, commissioning & start-up

Project Description

Installation of CO₂ removal plant, utility facilities to support CO₂ removal plant, 29km P / L, gas turbine generator, air cooler, 2 separators, flare package.



Qasr Compression Station

Client

Khalda Petroleum Company

KPC (Apache / EGPC)

Contract Type

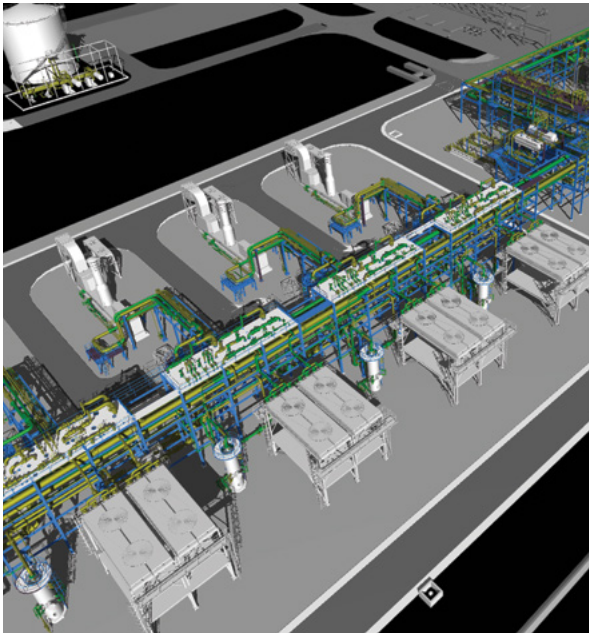
EPC LSTK.

Scope of Services

Detailed engineering, Procurement, construction and Pre commissioning & commissioning.

Project Description

Aims to install a gas compression station (four trains), to maintain gas pressure and the condensates produced from the wells at 123 bar. The produced gas will be sent for treatment at Salam and Obayed stations. The pressure of gas produced from the wells is expected to drop from 120 bar to less than 30 bar in the coming years.



Atoll Development Project

Client

Pharaonic Petroleum Company (PhPC)

Contract Type

Lumpsum for professional Services, Cost Plus for Procurement Services and reimbursable time sheets for Construction Supervision

Scope of Services

Basic & Detailed Engineering, Procurement Services & Construction Supervision

Project Description

Phase I:

The project aims to process the production from Atoll offshore field at the existing West Harbor onshore plant at Port Said with a daily production of 360 MMSCFD of gas and 15,000 BPD of condensate. The Project comprises the installation of new equipment and the modification and development of the existing facilities to accommodate the additional produced quantities.

The project scope also includes laying of a new 6" pipeline with a length of 6 km to deliver the separated condensate from West Harbor plant to El Gamil plant.

Phase II:

The project scope is then modified under the supplementary scope to install new condensate stabilization package and new condensate storage tanks within PhPC and to send the stored stabilized condensate from PhPC via a new 6 km 10" pipeline for further pumping via PPC existing shipping pumps to el Suez refinery through PPC pipeline.





Taurt Onshore Detailed Engineering

Client

Gulf Of Suez Petroleum Company - Gupco (BP Egypt / EGPC), Port Said

Contract Type

Professional services reimbursable.

Scope of Services

Detailed engineering for onshore part of Taurt gas field development project.

Project Description

The Project aims to develop Taurt field through a sub-sea production system (SPS) that consists of seven sub-sea wells tied with a manifold with well testing capability.



Offshore North Sinai Field Development

Client

North Sinai Petroleum Company - NOSPCO (BP / Gasco / Perenco), North Sinai

Contract Type

Lump-sum for professional services/material supply disburseable.

Scope of Services

Detailed engineering for offshore topside facilities and onshore gas central processing facility, overall procurement services except for pipelines and offshore structure steel, and construction supervision.

Project Description

Development of Tao offshore gas field, 60km north of Rommana producing 180 MMSCFD of gas. The development includes offshore production wells, production platform, submarine pipeline, onshore gas treatment plant and sales gas pipeline in addition to gas dehydration.



Tamsah-4 Platform

Client

Belayim Petroleum Company / PETROBEL (Eni / EGPC), Mediterranean Sea

Contract Type

Lump-sum for professional services.

Scope of Services

Basic & detailed engineering and procurement services.

Project Description

Installation of a new platform: four legs, 12-slot unmanned fixed offshore production platform at 85m water depth and capacity of 10 MMSCMD gas plus 3000 BPD condensate.



Areas of Expertise

As an Engineering and EPC Main Contractor, Enppi areas of expertise lies in the value chain of its role as an Engineering, Procurement, Project Management and Construction Supervision Contractor.

Engineering Process Technology

Enppi has considerable experience in the design of oil & gas, onshore/offshore, gas processing, oil refining, and petrochemicals facilities in the areas of:

- Process optimization and selection
- Studies (techno-economic and technical)
- Flow assurance engineering (steady state & dynamic)
- Debottlenecking and revamps
- License evaluation and selection
- Review of basic engineering for others
- Oil & Gas separation
- FEED, conceptual, basic & detailed engineering
- HAZOP, HAZID, QRA, SIL and other safety studies
- Performance analysis and guarantees
- Operating manuals development
- Commissioning and start-up procedures
- Field assistance for construction and start-up

Mechanical Engineering

Enppi has qualified specialists in all aspects of mechanical engineering. The following services are offered to support FEED and detailed design activities or independently as specialized services.

Static equipment design, covering:

- Pressure vessels, heat exchangers, columns, reactors, heating and power boilers and tank design.

Rotating equipment design, covering:

- Compressors, gas and steam turbines, pumps, turbo expanders, HVAC, etc..

Material selection, covering:

- Material selection guides
- Cathodic protection
- Painting

Field assistance for construction and start-up Solid handling designs, covering:

- Solids Conveying, Transport, Storage and Processing Systems in the fields of Chemical, Petrochemical, Mining and Mineral Processing Industries
- Cranes

HVAC systems design and engineering works, covering:

- Industrial Applications such as control, switch-gear, battery, laboratory, warehouses and workshop buildings.
- Administration buildings.

Electrical Engineering

Enppi has a fully experienced team in electrical system design, with wide experience in both onshore & offshore applications; covering :

- Power generation and distribution
- Electrical systems analytical studies
- Relay coordination studies
- Overhead transmission lines design
- UPS systems
- Solar power units
- Plant power distribution & cabling systems
- Lighting systems
- Lightning protection facilities
- Navigational aid systems
- Grounding systems
- Heat tracing systems
- Hazardous Area Classification, Plans & Elevations and Electrical enclosure selection criteria
- Field assistance for construction and start-up.



Instruments & Control and Telecommunications Engineering

The company's competencies in Instrument & Control and Telecommunication Engineering cover:

- Field instruments & Process Measurements.
- Final Control Elements: Control Valve Sizing & Selection, On-Off Valves, Shut Down & Blow Down Valves.
- Process Control Applications (Burner Management System, Boiler Control, Compressor Control, etc..).
- Process Control Systems (DCS, PLC)
- Pneumatic, Hydraulic Controls
- Safety Instrumented System (SIS)
- High Integrity Pressure Protection System (HIPPS)
- SCADA & Communication Systems
- Pipeline Management System
- Fiscal Metering Systems
- Automatic Tank Gauging
- Oil & Gas Wellhead Control System.
- Tele-communication Systems such as:
 - Private Automatic Branch Exchange (PABX), VoIP
 - Public Address & Alarm System (PA&A)
 - Fiber Optic Cables / System
 - Wireless Systems (Satellite, Microwave, VHF UHF)
 - Security Systems (Closed Circuit Television (CCTV),
 - Access Control System & Intrusion Detection System)
 - Video Conference.
- Field Assistance for Construction and Start-up



Civil / Structural / Architectural Engineering

Enppi possesses considerable design experience in different phases of Civil / Structural / Architectural Engineering design, covering the following activities for plant facilities and other onshore structures:

- General site preparation drawings
- Road and paving drawings
- Building design (architectural / structural detailed drawings)
- Detailed drawings (steel / concrete) and MTO preparation
- Tanks and basins drawings
- Foundation drawings
- General specifications, MRQs & MRPs preparation
- Field assistance for construction and start-up

Offshore Structures Engineering

Enppi offshore structural design capabilities cover the following areas:

- Offshore fixed platforms analysis and design
- Deep & shallow foundation engineering
- Dynamic & fatigue assessments
- Earthquake Analysis
- Nonlinear Analysis
- Finite element Analysis
- Construction support engineering
- Transportation & Installation engineering
- Weight & COG engineering
- Structural Integrity Management
- Ports & Terminals engineering
- Subsea structural engineering
- Specification & Fabrication drawings
- Field assistance for construction and start-up



Piping Engineering

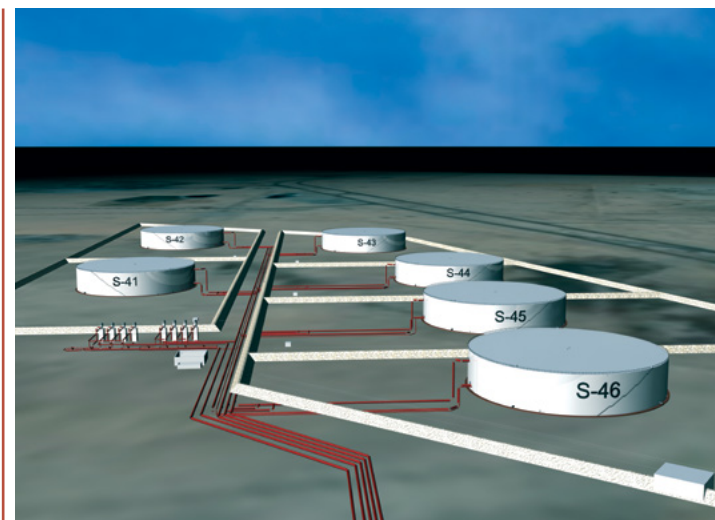
Enppi piping engineering design covers:

- Plot plans and equipment location plans
- Piping general arrangement drawings for the above ground piping
- Orientation drawings of tower, vessel, tank, etc...
- Piping isometrics drawings
- Stress analysis reports for critical lines using Caesar II program
- Piping supports distribution and design
- Piping material specification and supply specification for packages
- MRQs and MRPs preparation for piping bulk and valves
- Underground Composite Drawing
- Detailed design of underground piping systems
- Update of drawings and 3D CADD model to “AS-BUILT” status
- Detailed and block plastic model building
- Field assistance for construction and start-up

Pipeline Engineering

Enppi Pipeline Engineering is responsible for onshore/offshore pipelines engineering (FEED & Detailed Design), pre-commissioning and installation supporting; The main pipelines engineering activities cover the following:

- Pipeline design basis
- Pipeline mechanical design
- Route selection
- Planimetry and profile
- Riser/Spools Layout
- Crossing details
- Field assistance for construction and start-up
- Subsea Equipment
- Analysis reports
- Standard details
- Material requisitions and Specifications
- Bidders evaluations



The following section gives detailed description of the various deliverables:

For onshore & offshore pipelines:

- Pipeline specifications
- Material selection and wall thickness calculations
- Stress analysis studies
- P/L alignment sheets
- Pipeline approach drawings
- Thermal expansion calculations
- Buckling calculations
- Coating and wrapping
- Cathodic protection
- Material take-off
- Material requisitions and purchase orders

For Offshore Pipelines:

- Stability analysis
- P/L Alignment drawings
- Field Layouts
- Deepwater technology
- Free span analysis
- Seabed irregularities analysis
- Upheaval buckling analysis
- Latest buckling analysis
- Installation analysis
- Trenching study
- Pipeline survey, installation and trenching bid packages
- Riser and spool piece design
- Cathodic protection



Procurement

Enppi's strategy in procurement is to provide quality goods and services, at the right time, at the lowest cost, produced and delivered safely. We have the experience, the tools, and the know-how for procurement services by providing integrated, reliable, and cost-efficient supply chain management services to ensure the success of projects.

We have capabilities in:

- Procurement Management
- Purchasing and contracting services
- Purchase orders expediting and subcontracts administrations
- Supplier quality surveillance
- Material Logistics
- Material control on site



Enppi's supply management services leverage today's technologies and logistics' methods to make efficient decisions which streamline the supply management process.

We have a global track record of ensuring timely and accurate material receipt through innovative expedition and quality assurance with vendors to minimize receiving delays and errors. We optimize transportation networks, operating hand-in-hand with global freight forwarders with dedicated assets. We offer the expertise, processes and tool utilization needed to facilitate frequent status updates on all material control information including material quantities required.

Project Management and Control

The design and execution of large scale onshore and offshore projects necessitates the strict adherence to sound management and control practices. In such projects, Enppi provides specialized management, control and quality assurance services covering:

- Contracts/subcontracts preparation and administration
- Overall project management and control
- Front-end planning and detailed project scheduling
- Engineering coordination and control
- Cost control and budget monitoring
- Change management
- Identifying and solving problems hindering project execution
- Technical and economic studies
- Risk management

Construction Management

Enppi provides construction management services as part of the overall project management function covering:

- Construction management and quality assurance/control
- Construction safety management
- Construction planning and control
- Onshore fabrication, installation and load-out supervision
- Offshore installation supervision
- Commissioning and start-up assistance



Software Applications

The latest software programs have been widely used in Enppi to optimize the efficiency of the different disciplines' processes.

Process Technology Programs

DNV Phast	Pipeline Studio
Smart plant P & ID "Intergraph"	OLGA
Flare Net	Pipenet
Flare Sim	Pipephase
Fri	Pipesim
Hextran	Process Eng. Suite (Pes)
HTRI	Sil Core
Hysys	Smart Plant P & Id
Network Inplant	Primatech

Mechanical Engineering Programs

Cadna	Pv Elite
Compress	Signal Ffs
E-Tank / ITS	Solid Works Simulation

Offshore Software Programs

SACS	USFOS
SMART 3D	PLAXIS
SESAM MARINE	TEKLA
E3D	GRLWEAP
ANSYS	

Civil / Structural / Architectural Engineering Programs

Afes	Pds 3d (Frameworks Plus)
Arch	Safe
Autodesk Revit	sap 2000 V15.0.1
Etabs	Staad Pro

Electrical Engineering Programs

ETAP 12.0.0 Electrical Transient Analyzer Program	Smartplant® 3D Cable Management Interface
PLS-CADD and PLS-Pole	Micro-Station
DIALUX	Oracle and Electrical Cable Sizing
PDS	Electrical Load Analysis (ELA)
PDMS	

Subsea Software Programs

FLEXCOM	USFOS
AUTOPIPE PLUS	SACS
SAGE PROFILE	TEKLA
AGA-PRCI	E3D
OFFPIPE	GRLWEAP
CS8	OLGA
PLAXIS	PIPEPHASE
SMART 3D	PIPESIM
SESAM MARINE	

Projects Control Programs

Planning Division	Cost Division
Primavera P6 Team member / Collaborator	The Decision Tools Suite Professional @ Risk
Primavera Project Management	Comfar Iii Expert
Primavera Risk Analysis	
Risky Project Professional	

Procurement Programs

Site Material Management System	Vendor E-registration
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Pipeline Programs

OFFPIPE	AUTOPIPE PLUS
SAGE PROFILE	AGA-PRCI

Instrumentation, Control and Telecommunication Engineering Programs

Aveva Instrumentation	Smart Plant 3D
Aveva (PDMS)	PDS 3D Model
Aveva Cable Design	CONVAL
Smart Plant Instrumentation (Intools)	INSTRUCALC

Plant Design & Piping Programs

Autodesk Navisworks Simulats	Orthogen
Vpe Workbench	PDMS
Aveva Area Based Automatic Drawing Production	PDS 3D
Aveva Final Designer	Microstation / J
Aveva Laser Model Interface	Sewer Cad
Aveva Multi Discipline Supports	Smart Plant 3D
Aveva PDMS	Smart Plant Review -Api
Aveva Review	Smart Plant Review-Photo Realism
Caesar II	Smart Plant Review- Simulation &Visual Effects
Isogen	Smart Plant Sketch
Lmi	Smart, Plant Review

QEHs Management System



In line with our commitment to continuous growth and sustainable development for the future, Enppi works in the best possible manner to balance Quality, Environment, Energy and Health & Safety (QEHS) considerations into our daily business decisions and operations.

Enppi achieved certification to the revised standard ISO 9001:2015, ISO 14001:2015, ISO 45001: 2018, ISO 50001:2018 for QEHS management systems and also implements API Spec Q1 for quality management system in petroleum, petrochemicals and natural gas industries.

All our operations are covered by ISO 9001:2015, ISO 14001:2015, ISO 45001: 2018, ISO 50001:2018, API **Spec Q1**.



Quality Management System (QMS)

In compliance with the needs defined by the international codes and standards and in order to achieve a competitive edge in the global oil and gas sector, Enppi moves towards expanding alliances with its customers to continually boost productivity and keep our projects on-schedule and within budget aiming to achieve customer satisfaction.

Our applied Quality Management Systems provide strict controls, monitor work, track projects and streamline procurement and materials management activity.

The acquisition of globally acknowledged certification/accreditation is a crucial step toward continual improvement for achieving customer satisfaction through providing high quality services with time commitment and at competitive cost.



It is worth mentioning that Enppi has established a quality management system certified to ISO 9001 since 1995. In 2014, Enppi has implemented API spec Q1 of the American Petroleum Institute as sector specific certification for Quality Management System for oil and gas companies to become one of the leading companies in the world to implement these international standards.

- For every project the company executes, QMS covers the following:
- Issuing Project Quality Plan
- Developing Project KPIs
- QMS auditing

Enppi takes an additional responsibility in encouraging customers, suppliers and contractors to consider the QMS requirements in their activities. Also, Enppi offers a wide range of QMS consultation and training services related to:

- ISO 9001 requirements
- Quality management system auditing
- API spec. Q1 requirements
- Self-assessment
- Documentation management



Environmental Management System (EMS)

As a part of Enppi's contribution towards sustainable development, Enppi has established, implemented and maintained an environmental management system as per ISO 14001. The system objectives are compliance with all applicable environmental legal and other requirements, minimizing pollution and conservation of resources. For every project the company executes, the EMS covers the following:

- Establishment and implementation of environmental - policy and objectives
- Aspects/impacts analysis
- Identification of legal and other requirements
- Development and implementation of environmental - management plans
- Emergency preparedness and response
- Environmental management system auditing

Enppi encourages customers, suppliers and contractors to consider the environmental impacts of their activities, mainly through one or more of the following actions:

- Organizing and conducting awareness sessions / courses
- Requesting suppliers and contractors to declare their environmental policies & commitment to environmental protection
- Following up supplier/contractor implementation of environmental management systems
- Working with customers to design environmentally friendly projects

Enppi also has wide experience in EMS related services as awareness and training, environmental management systems auditing and environmental performance evaluation.

Health & Safety Management System (HSMS)

Enppi recognizes the importance of protecting the health and safety of its employees, customers, suppliers and contractors personnel within work premises over which it has control. Enppi implements and continually improves a health and safety management system in accordance with ISO 45001 to achieve improvement in the overall company health and safety performance, including prevention of injury and ill health. For every project the company executes, HSMS covers the following:

- Establishment and implementation of Health & Safety policy and objectives
 - Provision of safe working environment
 - Hazards identification
 - Risk assessment
 - Implementation of necessary control measures to ensure that risks are reduced as low as reasonably practicable
 - Identification and compliance with applicable Health & Safety legal and other requirements
 - Development and implementation of Health & Safety management plans
 - Emergency preparedness and response
 - Encouragement of customers, suppliers and contractors to consider Health & Safety requirement in their activities
 - HSMS auditing
- FMEA technique
- Perform safety audits
 - Provide training courses related to health and safety:
 - ISO 45001 requirements
 - Loss prevention
 - HAZOP (basic and advanced)
 - Risk analysis techniques
 - Fire protection systems
 - Hazardous area classification
 - Detection and alarm systems
 - Preparation of Safety case studies

Related services provided by Enppi can be summarized as follows:

- Design of fire protection systems
- Review plot plans (layout with respect to safety distance and prevailing wind)
- Quantitative risk analysis using "PHASt Software / Fault Tree Analysis and Event Tree Analysis"
- Qualitative risk analysis by HAZOP review,





Energy Management System (EnMS)

In terms of Enppi role as a leader in the field of projects in the region and in order to keep pace with global and national trends for energy efficiency improvement, Enppi has developed, implemented and maintained EnMS as per the international standard ISO 50001 since 2012 and became the first company in the sector acquiring an accredited ISO 50001 certificate.

Enppi EnMS services includes

- 1- Establishing energy management systems.
- 2- Conducting Energy Reviews.
- 3- Determining:
 - Energy baseline, Energy targets and action plans.
 - Energy performance indicator.
- 4- Energy studies including definition/prioritization of opportunities for energy efficiency improvement.
- 5- Designing and procurement of energy efficient products and energy management system solutions.
- 6- Conducting training energy courses and workshops.
- 7- Conducting Energy Audits.

CERTIFICATES

Enppi Headquarters



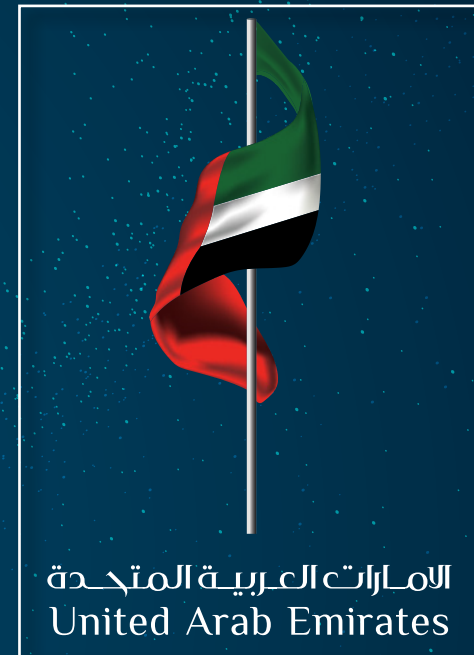
CERTIFICATES

Enppi / KSA



CERTIFICATES

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