Who We Are
Contents

- History of Commitment
- PGESCo 2025
- Conventional & Thermal Projects

I- Combined Cycle Power Plants
II- Simple Cycle Power Plants
III- Steam Power Plants
IV- Supercritical Power Plants

V- Renewables

VI- Transmission & Distribution

VIII– Water Solutions

VIII- Intake / Discharge Water Structures

IX- Housing and Buildings
X- Technical & Economical Studies

XI- Tenders Documents
XII- Industrial Projects
HISTORY OF COMMITMENT

Power Generation Engineering and Services Company “PGESCO” is a leading company in the Middle East and Africa offering integrated innovative engineering, procurement and construction management solutions.

For more than two decades, we have manifested proven capabilities by providing landmark projects for energy and industrial sectors in Egypt and the MENA region with focus on timely response, safety, value and quality deliverables.

From business planning up to operation and maintenance, PGESCO provides advanced integrated services to the governmental utilities, EPC contractors, independent and private developers using State-of-the-Art design and communication technology platforms.
Fact Numbers

Power Projects
60 Projects (54+ GW)

Substations
84 Extra High/High Voltage Switchyards
500/400/220/66 kV

Desalination & Water Treatment
29 Water & Waste Water Treatment Facilities
15 Desalination Projects with largest installed 80,000 M³/Day
- Egypt: 85,000 M³/Day
- Libya: 200,000 M³/Day

Renewables
1870 MW Solar
250 MW Wind Farm

Offshore Intake Basin
Open Sea
8 Offshore Water Structure & Pipes including Jetty Concrete, HDPE Offshore & GRP Onshore

Studies
38 Specific Project Development Techno-economic Studies

Housing and Buildings
6 Major Housing Colonies
- Gasoline Stations, Housing, Administrative Buildings, Villas & Apartments
TOWARDS
STRATEGIC DIRECTION

Building Culture Dynamics
People and system are not enough.
Building Culture Dynamics is essential for people and system success.
Our organization culture should establish the required incentives to integrate its dynamics for better business life and innovative environment.

Speed
Agility is not enough to cope with the market.
Speed is the new strategic direction.
Our tools, process and deliverables will challenge our rivals by prompt response.

Creativity & Innovation
Imagination is leading the innovation.
Hologram, virtual reality and augmented reality will not be only applied for our product but will be realized in organization, team formation & business communication.

Capacity
Our capacity is variable and easy to be magnified to cover wide spectrum of business lines by productivity, cellular level organization and pillars team.
Our capabilities and proven experience for highly sophisticated, automated and integrated engineering services allow us to determine future today.

With fully automated services provided through our customized intelligent Three-Dimensional Model (3DM), we provide our Clients with the virtual reality of their projects at fingertips through our unique Plant Information Modeling (PIM).

Our Core Proficiency

Management
- Provide high quality management and safety standards to prevent accidents
- Establish complete integrated project services
- Adopt latest technologies to maximize resource efficiency

Companionship
- Maintain the highest standards of integrity, honesty, and loyalty to Clients
- Continually improve and share the best value added with stakeholders

Know-how
- Add new technologies to promote new business
- Undertake Innovative technology and solutions
- Incorporate IT system as the basic foundation for engineering
PGESCo SERVICES

PGESCo offers technical services to support project planning and implementation that includes the following:

- **Project Management Services**
  - Establish work plans, schedules, budgets, and project procedures
  - Support and implement the overall financial plan of the project
  - Provide project cost and schedule control
  - Provide project quality and safety program
  - Establish and implement project status and reporting system
  - Implement budget controls

- **Studies**
  - Feasibility studies and concept development
  - Site studies and cost estimate
  - Plant betterment studies
  - Power plant re-powering studies
  - Environmental studies including modeling and monitoring studies for the following:
    - Air quality/metrological monitoring program
    - Air quality modeling analysis
    - Water and wastewater quality analysis (for the entire plant)
    - Environmental impact assessments and reports
  - Power plants development studies

- **Engineering Services**
  - Engineering services and designs for civil, mechanical, electrical, control and communication systems.

    The following activities are usually performed by PGESCo engineering:
    - Performance of Licensing procedures
    - Concept and preliminary engineering designs
    - Final detailed design for project components and systems
    - Preparation of technical specifications
- Preparation of tender documents
- Technical evaluation of bidding documents
- Design review
- Interface management among different suppliers and contractors
- Preparation, review, and release of quality assurance plans
- Training and technology transfer programs

- **Civil/Structural/Architecture**
  - Analysis and design of complex structural systems and turbine pedestals
  - Design of steel structures
  - Design of reinforced concrete offshore/onshore water structures
  - Design of reinforced concrete buildings and foundations
  - Substations analysis and design
  - Architecture engineering including: architecture details drawings, finishing schedules, and landscape
  - Site engineering work including: site grading, storm drainage, roads, water tunnels pipes, cable, and pipe trenches
  - Geotechnical investigation/studies/design
  - Hydraulics survey/studies/design/modeling
  - Topographic survey and underground detection

- **Instrumentation and Control**
  - Conceptual and detail design and control philosophy
  - Process instruments specifications and datasheets
  - Control systems design and specifications
  - Control valves selection and sizing
  - Process and instrumentation diagrams
  - PLC/DCS sizing and I/Os list
  - Logic Diagrams
  - Graphic displays
  - Control cable wiring, termination and loop diagrams
  - Physical design including hook-up drawing, instrument location plans, etc.
  - Analytical systems
  - Continuous emission monitoring systems
• Control system factory and site acceptance test (FAT/SAT)
• Instrumentation and control systems installation support
• Instrumentation and control systems commissioning
• Verification and validation of new and existing installations

• **Plant Design**
  • Layout design
  • General arrangement
  • 3D modeling: equipment modeling, interference checking, pipe support modeling, and piping modeling routing
  • Isometric and composite piping drawings
  • Critical piping and supports design
  • Stress analysis

• **Electrical Engineering**
  • Electrical physical design including: raceway system, equipment arrangement, and cable routing
  • Cable quantities calculations: raceway fill calculations, raceway quantities and weight calculations
  • Electrical control systems including: schematic diagrams, and cable termination
  • Design and system calculations including: power system calculations, electrical equipment sizing calculations, electrical load calculations, relay coordination setting studies, cable sizing and selection, and grounding network calculations
  • Single and three line diagram

• **Mechanical Discipline Activities**
  • Power plant heat & mass balance conceptual design
  • Preliminary design report
  • Process piping and Instrument diagrams P&IDs
  • Pipe list, valve list, equipment list and specialty list
  • Detail systems design calculation including piping and mechanical equipment sizing
  • Equipment sizing calculations and data sheets
  • Equipment technical specifications
  • Bidders technical evaluation report

• **Mechanical Engineering Technical Specialists Includes:**
  • Fired heat transfer equipment (Boiler/HRSG)
  • Unfired heat transfer equipment (Deaerator/Feedwater Heaters/Heat Exchanger)
  • Rotating equipment (Compressors/Pumps)
  • Plant performance guarantee Test
  • Firefighting/HVAC
  • Water treatment group
- Environment
- Heat and mass balance

- **Construction Management Services**
  - Planning and supervision of construction programs
  - Quality control and Quality assurance programs
  - Establish and implement safety and security programs
  - Coordinate and supervise the receipt, storage, and issuance of all equipment and material for the project
  - Establish test procedures for the project and provide engineering review, management and inspection for all field construction work, field surveys, tests, and laboratory services

- **Start-up and Commissioning Management Services**
  - Coordinate and manage plant start-up
  - Establish performance and acceptance test procedures
  - Provide initial operation management and advisory services to assist operation staff
  - Supervise performance testing and review of test results

- **Procurement Services**
  - Establish contract commercial terms and conditions and evaluation criteria
  - Prepare and issue tender documents
  - Commercial evaluation of tender documents
  - Expediting
  - Traffic and Logistics
  - Equipment and material inspection
I - COMBINED CYCLE POWER PLANTS PROJECTS
**EGYPT**

**AL SHABAB POWER PROJECT PHASE II**

**COMBINED CYCLE**

**PLANT DESCRIPTION:**

The project was consisted of (8) eight Combustion Turbine Generators (CTGs) and added-on along with PGESCo as its Project Construction Management (PCM). Two Combined Cycle Modules. EDEPC requested PGESCo to evaluate the status for the plant water/steam chemistry for the critical systems and provide recommendation and corrective action in order to readjust the values to its original design.

**Owner/Client:** East Delta Electricity Production Co.  
**Location:** Al Shabab Project Site – Ismailia -Egypt  
**Date of Award:** June 2020  
**Effective date:** June 2020  
**Project Contractual Duration:** 6 Months  
**Scope:** Converting existing Simple Cycle to Combined Cycle.  
**Status:** on going
LUXOR COMBINED CYCLE PROJECT

PLANT DESCRIPTION:

LUXOR Combined Cycle Power Plant is a dual fire power plant with expected capacity of 2250 MW.

The power plant location was shifted from Behira Governorate to Luxor Governorate based on the expected increasing electricity demand in Upper Egypt.

ACWA Power as the Owner of the power plant requested PGESCo to perform the following tasks:

- Evaluate the most appropriate plant cooling system
- Collect the metrological data available at the authorities
- Evaluate the possible nearby reservoirs to discharge the plant waste water
- Provide list of permits required to build the power plant

Owner/Client: ACWA Power
Location: Luxor, Egypt
Date of Award: February 7, 2019
Project Contractual Duration: 43 days
Scope: Consultancy Services Agreement
Status: Completed
Owner/Client: East Delta Electricity Production Co. (EDEPC)

Location: West Damietta, Egypt

Date of Award: January 21, 2019

Project Contractual Duration: 18 months

Scope: Engineering, Procurement, and Construction Management Services

A. General
- Perform and manage the professional services of the Project.
- Contract closeout for all Contract and Purchase order packages, within the contract duration, including the management and follow-up of contract package agreement for the Low Pressure Turbine rotor replacement.
- Supervise construction, manage and prepare the start-up, commissioning and tests up to handing-over of the project.

B. Project Management
- Project Management Responsibilities
- Legal and Insurance
- Project Completion Report

C. Engineering Services
- Design review and Engineering
- Engineering Activities

D. Contract Administration Services (Procurement)
- Contract Management, Administration and prepare close out
- Expediting
- Quality Assurance Program
- Inspection During Equipment Fabrication

E. Construction Management
- Managing the replacement of the Low Pressure turbine rotor, and direction of the construction program
- Inspect all materials and equipment prior to their incorporation in the Project

F. Performance and Acceptance Testing
- Furnish startup and test engineers to manage the performance and acceptance tests of the completed plant and equipment.

Status: On going
WEST DAMIETTA 750 MW - NEW ROTOR REPLACEMENT

COMBINED CYCLE

PLANT DESCRIPTION:

West Damietta Power project was a modular type simple cycle plant that is converted to combined cycle with no supplementary firing in the HRSGs.

Power generation plant consists of one module which consists of 4 existing CTGs x 4 new HRSGs x 1 new STG configuration delivering 750 MW (Nominal, ISO). This output is achieved when burning natural gas in the combustion turbines. Oxides of nitrogen (NOX) emissions is controlled by dry low-NOX (DLN) combustors. Power is generated at manufacturer’s standard voltage for the STGs, stepped up through main transformers and fed to the utility unified grid via an onsite gas-insulated (GIS) switchyard. The project site is located west of the Damietta City.
**EGYPT**

**Owner:** Middle Delta Electricity Production Company

**Client:** Orascom Construction  
(Partner to Siemens AG in the EPC Consortium)

**Location:** Kafr El Sheikh, Egypt

**Date of Award:** August 2015

**Project Contractual Duration:** 32 months

**Scope:** Detailed Design of all Balance of Plant Systems, Civil Designs, Support to Procurement, Construction Management and Startup Support

**Status:** on-going
BURULLUS POWER PLANT 4800 MW

COMBINED CYCLE

PLANT DESCRIPTION:

- Eight (8) siemens combustion turbine generators (CTGs) frame (H), gas fired turbine generator equipment package with all required balance of plant systems.
- Eight (8) heat recovery steam generators (HRSGs) NEM, benson type with all required balance of plant systems.
- Four (4) siemens steam turbine generators (STGs) with all required balance of plant systems.

- Four (4) water cooled condensers with all required balance of plant systems.
- Four (4) cooling towers with all required balance of plant systems.
- The Plant utilizes Seawater as its Raw Water Source. The Plant is planned to be operated by Fuel Gas only. Two CTGs have the Capability to run on Light Fuel Oil. Power generated will be stepped up through main Transformers and fed to the Utility 500 kV Grid, via a Gas-insulated Switchgear (GIS) Switchyard.
- Major plant commodities /systems:
  - Power block (gas turbine, generator, HRSGs, STGs, water cooled condenser and auxiliaries)
  - Cooling towers, cooling system pumps
  - Balance of plant (transformers, switchgears, diesel generator, and balance of mechanical/electrical systems)
  - 500 kV gas insulated switchgear (GIS)
  - Water treatment plant
NEW CAPITAL POWER PLANT 4800 MW

COMBINED CYCLE

PLANT DESCRIPTION:

- Eight (8) siemens combustion turbine generators (CTGs) frame (H), gas fired turbine generator equipment package with all required balance of plant systems.
- Eight (8) heat recovery steam generators (HRSGs) NEM, benson type with all required balance of plant systems.
- Four (4) siemens steam turbine generators (STGs) with all required balance of plant systems.
- Four (4) air cooled condensers (ACC) with all required balance of plant systems.
- The Plant utilizes Seawater as its Raw Water Source. The Plant is planned to be operated by Fuel Gas only. Two CTGs have the Capability to run on Light Fuel Oil. Power generated will be stepped up through main Transformers and fed to the Utility 500 kV Grid, via a Gas-insulated Switchgear (GIS) Switchyard.”

- Major plant commodities/ systems:
  - Power block (gas turbine, generator, HRSGs, STGs and auxiliaries)
  - Air cooled condensers
  - Balance of plant (transformers, switchgears, diesel generator, and balance of mechanical / electrical systems)
  - 500 kV gas insulated switchgear (GIS)
  - Water treatment plant
Owner: Cairo Electricity Production Company

Client: Orascom Construction
(partner to Siemens AG in the EPC consortium)

Location: New Capital, Egypt

Date of Award: August 2015

Project Contractual Duration: 32 months

Scope: Detailed Design of all Balance of Plant Systems, Civil Designs, Support to Procurement, Construction Management and Startup

Status: On-going
Owner: Upper Egypt Electricity Production Company

Client: Orascom Construction
(GES partner in the EPC consortium)

Location: Assiut, Egypt

Date of Award: December, 2015

Project Contractual Duration: 29 Months

Scope: Detailed Design of all Balance of Plant Systems, Civil Designs, Support to Procurement, Construction Management and startup

Status: Completed
NEW ASSIUT ADD-ON POWER PLANT 500 MW

COMBINED CYCLE

PLANT DESCRIPTION:

- Two (2) STGs (GE steam turbine generator equipment package), including all required balance of plant systems
- Eight (8) HRSGs, including all required balance of plant systems
- Two (2) air cooled condensers
- All steam cycle piping and piping support systems
- Chemical feed system
- Power generated is stepped up through main transformers and fed to the utility 220 kV grid, via an extension to the existing gas insulated switchgear (GIS) switchyard
- The plant uses ground water as the raw water source

Major plant commodities/systems:

- Power Block (Steam Turbine, Generator and Auxiliaries)
- Air Cooled Condensers
- Balance of plant (Transformers, Switchgear, DCS and Balance of Mechanical/Electrical systems)
- 220 kV Gas Insulated Switchgear (GIS), extension
NEW WEST DAMIETTA ADD-ON POWER PLANT 250 MW

COMBINED CYCLE

PLANT DESCRIPTION:
- One (1) STG (GE Steam Turbine Generator equipment package), including all required Balance of Plant Systems
- Four (4) Heat Recovery Steam Generators (HRSGs), including all required auxiliary systems
- One (1) Air Cooled Condenser
- All steam cycle piping and piping support systems
- Power generated is stepped up through main transformers and fed to the utility 220 kV grid, via an extension to the existing Gas Insulated Switchgear (GIS) switchyard
- The plant uses ground water as the raw water source
- Major plant commodities/systems:
  ♦ Power Block (Steam Turbine, Generator and Auxiliaries)
  ♦ Air Cooled Condensers
  ♦ Balance of Plant (Transformers, Switchgear, DCS and Balance of Mechanical/Electrical systems)
  ♦ 220 kV Gas Insulated Switchgear (GIS), extension
**Owner:** East Delta Electricity Production Company

**Client:** Orascom Construction  
(GE’s partner in the EPC consortium)

**Location:** Damietta, Egypt

**Date of Award:** August, 2015

**Project Contractual Duration:** 29 Months

**Scope:** Detailed Design of all Balance of Plant Systems, Civil Designs, Support to Procurement, Construction Management and Startup

**Status:** on-going
Owner: East Delta Electricity Production Company

Location: West Damietta, Egypt

Date of Award: September 2013

Project Contractual Duration: 36 months

Scope:
- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management, construction management, startup and commissioning management, which included initial operation support.

Status: on-going
WEST DAMIETTA ADD-ON POWER PLANT 250 MW

COMBINED CYCLE

PLANT DESCRIPTION:
The West Damietta site is located on the Mediterranean Sea north coast, 15 km west of the New Damietta port near Damietta City. The existing facility consists of four (4) outdoor combustion turbine generators (CTGs) GE Frame 9E (4 x 125 MW) installed and commissioned in 2011. The new project accommodates one combined cycle module. It has a 4x4x1 configuration consisting of four (4) combustion turbines from the existing units. Each one feeds its exhaust gases to its respective heat recovery steam generator (HRSG), for a total of four (4) HRSGs and one 250 MW nominal steam turbine unit. Steam generated from the four (4) HRSGs feeds one 250 MW, non-reheat, condensing steam turbine generator (STG).

The new facility estimated 250 MW net output is achieved by burning natural gas in the CTGs with no supplementary firing in the HRSGs. The steam exhausted from the steam turbine is discharged into air cooled condenser. Air is used for the power plant cooling demand. Power generated is stepped up through a main transformer and fed to the utility grid via an onsite GIS existing switchyard facility 220 kV overhead transmission line (OHTL). The current switchyard has space for one spare bay adequate for the new steam turbine unit.

The project contracting plan utilized a multi-package system. Eight (8) contracting packages and purchase orders procured the equipment and services.
AL SHABAB ADD-ON POWER PLANT 500 MW

COMBINED CYCLE

PLANT DESCRIPTION:
Al Shabab site is located 33 km West and 10 km South of Ismailia and El-Kassassin Cities respectively, in the Ismailia Governorate. The existing facility consists of eight (8) outdoor combustion turbine generators (CTGs) GE Frame 9E (8 x 125 MW) installed and commissioned in 2011.

The new project accommodates two (2) combined cycle modules. Both modules have a 4×4×1 configuration consisting of four (4) combustion turbines from the existing units. Each one feeds its exhaust gases to its respective heat recovery steam generator (HRSG) for a total of four (4) HRSGs and one 250 MW nominal steam turbine unit. Steam generated from the four (4) HRSGs feeds one 250 MW, non-reheat, condensing steam turbine generator (STG).

The new facility estimated 500 MW net output is achieved when burning natural gas in the CTGs with no supplementary firing in the HRSGs. The steam exhausted from the steam turbine is discharged into an air cooled condenser. Air is used for the power plant cooling demand. Power generated is stepped up through main transformers and fed to the utility grid via an onsite GIS existing switchyard facility 220 kV over head transmission line (OHTL). The current switchyard has space for two spare bays adequate for the new steam turbine units.

The project contracting plan utilized a multi-package system. Eight (8) contracting packages and purchase orders procured the equipment and services.
**Owner:** East Delta Electricity Production Company

**Location:** Ismailia, Egypt

**Date of Award:** September 2013

**Project Contractual Duration:** 36 months

**Scope:**
- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management, construction management, startup and commissioning management, which included initial operation support

**Status:** on-going
Owner: Middle Delta Electricity Production Company

Location: Dakahleya, Egypt

Date of Award: April 2010

Project Contractual Duration: 48 months

Scope:

- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management, construction management, startup and commissioning management, which included initial operation support.

Status: Completed
PLANT DESCRIPTION:
Banha power project includes a power block that consists of two 250 MW Combustion Turbine Generators (CTGs). Each one feeds exhaust gases to its respective unfired Heat Recovery Steam Generator (HRSG). Steam from the two HRSGs feeds one 250 MW, single reheat, condensing Steam Turbine Generator (STG).

The estimated 750 MW net output is achieved by burning natural gas in the CTGs without supplementary HRSG firing. Nitrogen oxides of nitrogen (NOx) emissions are controlled by dry low-NOx (DLN) combustors. An inlet air filtration system supplies filtered combustion air to the CTGs. The steam exhausted from the steam turbine feeds a once-through cooling, single-pass, divided water box condenser.

Power is generated at manufacturer standard voltage in the CTGs and the STG, stepped up through main transformers, and fed to the grid via a 220 kV, GIS switchyard. The Rayah Tawiki provides the plant cooling water.

The project contracting plan utilized a multi-package system. Sixteen (16) contracting packages and purchase orders procured the equipment and services.
GIZA NORTH I, II, & III POWER PLANT  3 X 750 MW

COMBINED CYCLE

PLANT DESCRIPTION:
Giza North power project consists of three modules each module includes two 250 MW Combustion Turbine Generators (CTGs). Each one feeds exhaust gases to its respective unfired Heat Recovery Steam Generator (HRSG). Steam from the two HRSGs feeds one 250 MW, single reheat, condensing Steam Turbine Generator (STG).

The estimated 2250 MW output is achieved by burning natural gas in the combustion turbines with no supplementary HRSG firing. Nitrogen Oxide (NOx) emissions are controlled by dry low-NOx (DLN) combustors. An inlet air filtration system is included to supply suitably filtered combustion air to the CTGs. The steam exhausted from the steam turbine is feeds a once-through cooling, single-pass, divided water box condenser.

Power is generated at manufacturer standard voltage in the CTGs and the STG, stepped up through main transformers, and fed to the National grid via a 500 kV & 220 kV, GIS switchyard. The Rayah Behery provides the plant cooling water.

The project contracting plan utilized a multi-package system. Seventeen (17) contracting packages and purchase orders procured the equipment and services.
Owner: Cairo Electricity Production Company

Location: Giza, Egypt

Date of Award: March 2010

Project Contractual Duration: 49 months

Scope:

- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management, construction management, startup and commissioning management, which included initial operation support.

Status: Completed
EL ATF POWER PLANT 750 MW

COMBINED CYCLE

PLANT DESCRIPTION:
El Atf power project consists of two 250 MW combustion turbine generators (CTGs). Each one feeds exhaust gases to its respective unfired heat recovery steam generator (HRSG) with no supplementary firing. Steam from two HRSGs feeds one 250 MW, single reheat, condensing Steam Turbine Generator (STG).

The estimated 750 MW net output is achieved by burning natural gas in the CTGs without supplementary HRSG firing. Nitrogen Oxide (NOx) emissions are controlled by dry low-NOx (DLN) combustors. An inlet air filtration system supplies filtered combustion air to the CTGs. The steam exhausted from the steam turbine feeds a once-through cooling, single-pass, divided water-box condenser.

Power is generated at manufacturer standard voltage in the CTGs and the STG, stepped up through main transformers, and fed to the National grid via a 220 kV, GIS switchyard. The Nile River provides the plant cooling water which is then discharged to the Marquase Canal.

The project contracting plan utilized a multi-package system. Sixteen (16) contracting packages and purchase orders procured the equipment and services.
**Owner:** Middle Delta Electricity Production Company

**Location:** Middle Delta, Egypt

**Date of Award:** August 2006

**Project Contractual Duration:** 49 months

**Scope:**
- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management, construction management, startup and commissioning management, which included initial operation support.

**Status:** Completed
Owner: West Delta Electricity Production Company

Location: North Coast, Egypt

Date of Award: August 2006

Project Contractual Duration: 49 months

Scope:

- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management, construction management, startup and commissioning management, which included initial operation support.

Status: Completed
SIDI KRIR POWER PLANT 750 MW

COMBINED CYCLE

PLANT DESCRIPTION:
Sidi Krir power project consists of two 250 MW combustion turbine generators (CTGs). Each one feeds exhaust gases to its respective unfired heat recovery steam generator (HRSG). Steam from the two HRSGs is fed to one 250 MW, single reheat, condensing Steam Turbine Generator (STG).

The estimated 750 MW net output is achieved when burning natural gas in the combustion turbines without supplementary HRSG firing. Nitrogen Oxides (NOx) emissions are controlled by dry low-NOx (DLN) combustors. An inlet air filtration system supplies filtered combustion air to the CTGs. The steam exhausted from the steam turbine feeds a once-through cooling, single-pass, divided water box condenser.

Power is generated at manufacturer standard voltage in the CTGs and the STG, stepped up through main transformers, and fed to the National grid via a 500 kV, GIS switchyard. The Mediterranean Sea provides the plant cooling water.

The project contracting plan utilized a multi-package system. Sixteen (16) contracting packages and purchase orders procured the equipment and services.
KUREIMAT III POWER PLANT 750 MW

COMBINED CYCLE

PLANT DESCRIPTION:
Kureimat III power project includes a power block that consists of two 250 MW combustion turbine generators (CTGs). Each one feeds exhaust gases to its respective heat recovery steam generator (HRSG). Steam from two HRSGs feeds one 250 MW (nominal), reheat, condensing steam turbine generator (STG).

The estimated 750 MW net output is achieved by burning natural gas in the CTGs without supplementary HRSG firing. Nitrogen Oxide emissions are controlled by dry low-NOx (DLN) combustors. An inlet air filtration system supplies filtered combustion air to the CTGs. The steam exhausted from the steam turbine feeds into a once-through cooling, single-pass, divided water-box condenser.

Power is generated at manufacturer standard voltage in the CTGs and the STG, stepped-up through main transformers and fed to the utility grid via the extension of the existing 220 kV, gas-insulated switchgear (GIS) switchyard. The Nile River provides the plant cooling water.

The project contracting plan utilized a multi-package system. Five (5) contracting packages and purchase orders procured the equipment and services.
Owner: Upper Egypt Electricity Production Company

Location: Upper Egypt

Date of Award: September 2005

Project Contractual Duration: 49 months

Scope:

- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management, construction management, startup and commissioning management, which included initial operation support.

Status: Completed
Owner: Upper Egypt Electricity Production Company

Location: Upper Egypt

Date of Award: November 2003

Project Contractual Duration: 49 months

Scope:
- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management, construction management, startup and commissioning management, which included initial operation support

Status: Completed
KUREIMAT II  POWER PLANT 750 MW

COMBINED CYCLE

PLANT DESCRIPTION:
Kureimat II power project includes a power block that consists of two 250 MW combustion turbine generators (CTGs). Each one feeds exhaust gases to its respective heat recovery steam generator (HRSG). Steam from the two HRSGs feeds one 250 MW (nominal), reheat, condensing steam turbine generator (STG).

The estimated 750 MW net output is achieved by burning natural gas in the CTGs without supplementary HRSG firing. Nitrogen Oxide (NOx) emissions are controlled by dry low-NOx (DLN) combustors. An inlet air filtration system is included to supply suitably filtered combustion air to the CTGs. The steam exhausted from the steam turbine feeds a once-through cooling, single-pass, divided water box condenser.

Power is generated at 21 kV (or manufacturer standard voltage) in the CTGs and the STG, stepped up through main transformers, and fed to the utility grid via the existing a new 220 kV (GIS) switchyard. The Nile River provides the plant cooling water.

The project contracting plan utilized a multi-package system. Eight (8) contracting packages and purchase orders procured the equipment and services.
PLANT DESCRIPTION:
Talkha power project consists of two 250 MW combustion turbine generators (CTGs). Each one feeds exhaust gases to its respective unfired heat recovery steam generator (HRSG). Steam from the two HRSGs feeds one 250 MW, reheat, condensing steam turbine generator (STG).

The estimated 750 MW net output is achieved by burning natural gas in the CTGs with no supplementary firing in the HRSGs. Nitrogen oxide (NOx) emissions are controlled by dry low-NOx (DLN) combustors. An inlet air filtration system is included to supply suitably filtered combustion air to the CTGs. The steam exhausted from the steam turbine feeds a once-through cooling, single-pass, divided water box condenser.

Power is generated at 21 kV (or manufacturer standard voltage) in the CTGs and the STG, stepped up through main transformers, and fed to the utility grid via the existing 220 kV (GIS) switchyard. The Damietta branch of the Nile River provides the plant cooling water.

The project contracting plan utilized a multi-package system. Eight (8) contracting packages and purchase orders procured the equipment and services.
Owner: Middle Delta Electricity Production Company

Location: Middle Delta, Egypt

Date of Award: October 2003

Project Contractual Duration: 49 months

Scope:

- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management, construction management, startup and commissioning management, which included initial operation support.

Status: Completed
**Owner:** Middle Delta Electricity Production Company

**Location:** West Delta, Egypt

**Date of Award:** November 2005

**Project Contractual Duration:** 50 months

**Scope:**

- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management, construction management, startup and commissioning management, which included initial support.

**Status:** Completed
NUBARIA III POWER PLANT 750 MW

COMBINED CYCLE

PLANT DESCRIPTION:
Nubaria III power project consists of one module 750 MW comprised of two 250 MW combustion turbine generators (CTGs). Each one feeds exhaust gases to its respective heat recovery steam generator (HRSG) with no supplementary firing. Steam from the two HRSGs is fed to one 250 MW, reheat, condensing steam turbine generator (STG). Nitrogen Oxide emissions are controlled by dry low NOx (DLN) combustors. An inlet air filtration system supplies filtered combustion air to the CTGs. The steam exhausted through the steam turbine feeds a once-through cooling, single-pass, divided water-box condenser.

Power is generated at manufacturer standard voltage in the CTGs and the STG, stepped-up through main transformers and fed to the national grid via a 500 kV, conventional switchyard. The Rayah El Nasery Canal provides the plant cooling water.

The project contracting plan utilized a multi-package system. Fourteen (14) contracting packages and purchase orders procured the equipment and services.
NUBARIA I&II POWER PLANT 1500 MW

COMBINED CYCLE

PLANT DESCRIPTION:
Nubaria I&II power project is two slides along modules delivering 1500 MW (750 MW each). Both modules include two 250 MW combustion turbine generators (CTGs). Each one feeds exhaust gases to its respective heat recovery steam generator (HRSG) with no supplementary firing. Steam from the two HRSGs feeds one 250 MW, reheat, condensing steam turbine generator (STG). Nitrogen Oxide (NOx) emissions are controlled by dry low-NOx (DLN) combustors. An inlet air filtration system supplies filtered combustion air to the CTGs. The steam exhausted from the steam turbine feeds a once-through cooling, single-pass, divided water box condenser.

Power is generated at manufacturer standard voltage in the CTGs and the STG, stepped up through main transformers, and fed to the national grid via a 500 kV and a 220 kV, conventional switchyard. The Nubaria Canal provides the plant cooling water.

The contracting plan utilized a multi-package system. Twenty-two (22) contracting packages and purchase orders procured the equipment and services.
**Owner:** Middle Delta Electricity Production Company

**Location:** West Delta, Egypt

**Date of Award:** August 2002

**Project Contractual Duration:** 49 months

**Scope:**
- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management, construction management, startup and commissioning management, which included initial operation support.

**Status:** Completed
CAIRO NORTH I & II POWER PLANT 2 X 750 MW

COMBINED CYCLE

PLANT DESCRIPTION:
Cairo North power project consists of two modules each module includes two 250 MW combustion turbine generators (CTGs). Each one feeds exhaust gases to its respective heat recovery steam generator (HRSG). Steam from two HRSGs feeds one 250 MW, reheat, condensing steam turbine generator (STG).

The estimated 1500 MW net output is achieved by burning natural gas in the CTGs without supplementary HRSG firing. Nitrogen Oxide (NOx) emissions are controlled by dry low-NOx (DLN) combustors. An inlet air filtration system supplies filtered combustion air to the CTGs. The steam exhausted from the steam turbine feeds a once-through cooling, single-pass, divided water box condenser.

Power is generated at 21 kV (or manufacturer standard voltage) in the CTGs and the STG, stepped up through main transformers, and fed to the utility grid via a 220 kV (GIS) switchyard. The Ismailia Canal provides the plant cooling water.

The project contracting plan utilized a multi-package system. Sixteen (16) contracting packages and purchase orders procured the equipment and services.
**Owner:** Cairo Electricity Production Company

**Location:** Cairo, Egypt

**Date of Award:** April 2001

**Project Contractual Duration:** 48 months

**Scope:**

- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management construction management, startup and commissioning management, which included initial operation support

**Status:** Completed
AL-TAWEELAH B POWER PLANT

COMBINED CYCLE - COMPLETED

PGESCo provided services to Bechtel in the conceptual and detailed design of Al-Taweelah B Power Plant Project in the United Arab Emirates.

Al-Taweelah B is a 320 MW Combined Cycle Power Plant consisting of two (2) Combustion Turbine Generators, two (2) Heat Recovery Steam Generators, and one (1) Steam Turbine Generator.
LIBYA

**Owner/Client:** General Authority of Electricity and Renewable Energy of Libya “GAEREL”

**Location:** Benghazi / Libya

**Date of Award:** November 15, 2018

**Project Contractual Duration:** 33 Weeks

**Scope:** Consultancy Services Agreement

**Status:** Completed on February 2020
BENGHAZI WEST 2000 MW

COMBINED CYCLE

PLANT DESCRIPTION:
The Benghazi West project is approximately 15 km SW of the city of Benghazi, Libya. Located on the Mediterranean Sea, Benghazi West is two (2) modules, each module is 2x2x1 configuration with desalination and potable water plants. Major equipment of each module comprises of:
- Two (2) indoor CTG units 315 - 330 MW each ISO nominal rating
- Two (2) outdoor three-pressure HRSGs without supplemental firing
- One (1) indoor condensing reheate STG unit 330 MW nominal rating
- Steam surface condenser
- Two (2) RO desalination trains, each 30,000 m3/day (common to both modules)
- Two (2) potable water trains, each 25,000 m3/day (common to both modules)
- One (1) lifting pump station to transfer potable water to the city (common to both modules)
- One (1) natural gas reducing station with heaters, KO drums, separators, and filtration equipment to condition the gas (common to both modules)
- 220 kV Gas Insulated Switchyard (GIS)
- One (1) once-through cooling water system consisting of down exhaust surface condenser, circulating water pumps, air removal system, water box priming, tube cleaning system, and debris filter.
- DCS for the combined cycle facility

PGESCO SCOPE OF WORK:
- Select Plant Configuration
- Prepare Site Layout
- Prepare Technical Specifications including Heat and Mass Diagrams.
- Prepare the single line diagrams
- Identify the Plant Redundancy Level
- Prepare Tender Document (including Technical, commercial part and pricing schedule)
- Issue tender documents for bid
- Answer tenderer clarification questions
- Prepare addendum as applicable
- Collect bids
- Issue technical evaluation report
- Contract preparation.
PLANT DESCRIPTION:

Susah power plant is located on Libya shoreline at eastern region in Susah town. The plant is designed to generate Nominal power of 2x300 MW for Phase I (Simple Cycle operation) at ISO conditions, and with overall nominal generated capacity of 900 MW (for Phase I & Phase II) at ISO conditions. GAEREL has developed fast track program to secure the urgent power demand for this region, Susah power plant Phase I (Simple Cycle Operation) is designed to support this program.

Susah power plant Phase I consists of two (2) Gas Turbine Generators, Fuel System, Power Transformers, Switchgears, other auxiliaries and Control systems.

PGESCO scope is performing engineering, procurement and Contract management services and targeting commercial operation of the plant in the duration of 28 calendar months from the date of the NTP.

Client: USPE-LY / Ras Al Khaimah United Arab Emirates

Location: East Libya

Date of Award: November 28, 2018

Project Contractual Duration: 28 months

Scope: Technical Services Agreement

Status: On going (on Hold due to Libyan Circumstances).
Owner/Client: USPE-LY / Ras Al Khaimah United Arab Emirates

Location: East Libya

Date of Award: March 15, 2017

Project Contractual Duration: 8 Months

Scope: Engineering Consultancy Services

Status: On going (on Hold due to Libyan Circumstances).

PLANT DESCRIPTION:

PGESCo scope includes detailed design, site supervision and project management. The scope also includes Plant equipment material inspection, performance testing and EPC Contract scope of work, and technical negotiation with the EPC Contractor.
PGESCo teamed with Arabian Consultancy Engineering Services “ACESCO” in Libya
COMBINED CYCLE

Benghazi Power Plant 750 MW

Completed 2013

PGESCo scope included design review, site supervision and project management of Benghazi Combined Cycle Power Plant 2X2X1. The scope also included plant equipment material inspection and performance testing.

Misurata Power Plant 750 MW

Completed 2013

PGESCo scope included design review, site supervision and project management of Misurata Combined Cycle Power Plant 2X2X1. The scope also included plant equipment material inspection and performance testing.
COMBINED CYCLE

Benghazi North Power Plant 2 X 150 MW
Completed 2007
PGESCo scope included design review, site supervision and project management of Benghazi North 2 X 150 MW project. The scope also included plant equipment material inspection and performance testing.

Zawia Extension Power Plant 3 X 150 MW
Completed 2007 to 2008
PGESCo scope included design review, site supervision and project management of Zawia Combined Cycle project. The scope also included plant equipment material inspection and performance testing.

Zwitina Power Plant add-on 250 MW
On-going (On Hold due to Libyan Circumstances)
PGESCo scope included design review, site supervision and project management of Zwitina Combined Cycle 250 MW add-on Project. The scope also included plant material inspection and performance testing for all plant equipment. The scope is to convert the existing 2 X 250 MW Gas Turbine Power Plant into a 2X2X1 Combined Cycle Power Plant for a total capacity of 750 MW.
PGESCo teamed with Arabian Consultancy Engineering Services “ACESCo” in Libya
EGYPT

**Owner:** Upper Egypt Electricity Production Company

**Client:** Orascom Construction  
(Partner to GE in the EPC Consortium)

**Location:** Assiut, Egypt

**Award Date:** December 2014

**Project Contractual Duration:** 9 months

**Scope:** Detailed Design of all Balance of Plant Systems, Civil Designs, Procurement Support, Construction Management and Startup

**Status:** Completed

- [Image of industrial facility]
- [Image of industrial facility]
NEW ASSIUT POWER PLANT 1000 MW - FAST TRACK

SIMPLE CYCLE

PLANT DESCRIPTION:

- Eight (8) CTGs, GE (PG 9171E) dual fired Gas Turbine Generator equipment package with all required balance of plant systems.
- The plant uses heavy fuel oil (Mazout) as the main fuel and light fuel oil (Solar) as the secondary fuel.
- Power generated is stepped up through main transformers and fed to the utility 220 kV grid, via a gas-insulated switchgear (GIS) switchyard.
- The plant uses ground water as its water source.
- Major plant commodities/systems:
  - Power block (gas turbine, generator and auxiliaries)
  - Balance of plant (transformers, switchgears, diesel generator, auxiliaries, boiler, DCS and balance of mechanical/electrical systems)
  - 220 kV GIS
  - Heavy fuel oil treatment plant
  - Fuel tank farm
  - Water treatment plant
NEW WEST DAMIETTA 500 MW - FAST TRACK

SIMPLE CYCLE

PLANT DESCRIPTION:

- Four (4) CTGs, GE (PG 9171E) gas fired turbine generator equipment package with all required balance of plant systems.
- The plant runs on fuel gas only.
- Power generated is stepped up through main transformers and fed to the utility 220 kV grid, via a Gas-insulated switchgear (GIS) switchyard.
- The plant uses ground water as its water source.
- Major plant commodities/systems:
  - Power block (gas turbine, generator and auxiliaries)
  - Balance of plant (transformers, switchgears, diesel generator, and balance of mechanical / Electrical systems)
  - 220 kV (GIS)
  - Water treatment plant
**Owner:** East Delta Electricity Production Company

**Client:** Orascom Construction  
(Partner to GE in the EPC Consortium)

**Location:** Damietta, Egypt

**Award Date:** December 2014

**Project Contractual Duration:** 7 months

**Scope:** Detailed Design of all Balance of Plant Systems, Civil Designs, Procurement Support, Construction Management and Startup

**Status:** Completed
Owner: Cairo Electricity Production Company

Location: 5th of October City, Egypt

Award Date: June 2013

Project Contractual Duration: 17 month

Scope: Engineering, Procurement, Project and Construction Management Services

Status: Completed
The 6th of October II Extension power project is a simple cycle power generation project located beside the Extra High Voltage Researches Lab fence area, 25 km from Cairo on the Cairo - Alexandria desert road. It consists of four indoor gas turbines with a total capacity of 640 MW. The facility includes all necessary auxiliary equipment including a new natural gas reducing and handling facility. Power generated at the manufacturer standard voltage for the CTG is stepped up through main transformers and fed to the utility unified grid via a 220 kV Gas Insulated Switchyard (GIS). The project was executed through a lump sum turnkey contract.

The project utilized an EPC contracting plan. As the Owner authorized representative, PGESCo was responsible for the overall project management, design review, and construction management as well as startup and commissioning management.
6th OF OCTOBER I POWER PLANT 4X150 MW

SIMPLE CYCLE

The 6th of October I power project is simple cycle power generation project located inside the Extra High Voltage Researches Lab fence area, 25 km from Cairo on the Cairo - Alexandria desert road.

The project consists of four indoor gas turbines with a total capacity of 600 MW. The facility includes all necessary auxiliary equipment including a new natural gas reducing and handling facility and water treatment facilities.

Power generated at the manufacturer standard voltage for the CTG is stepped up through main transformers and fed to the utility unified grid via an onsite 220 kV Gas Insulated Switchyard (GIS). The project was executed through a lump sum turnkey contract. The project utilized an EPC contracting plan.
**Owner:** Cairo Electricity Production Company

**Location:** 6th of October City, Egypt

**Award Date:** March 2011

**Project Contractual Duration:** 17 months

**Scope:**
- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management, construction management, startup and commissioning management

**Status:** Completed
Owner: East Delta Electricity Production Company

Location: Damietta, Egypt

Award Date: March 2011

Project Contractual Duration: 11 months

Scope: Design review, project management, construction management, startup and commissioning management.

Status: Completed
WEST DAMIETTA POWER PLANT 4X125 MW

SIMPLE CYCLE

West Damietta power project is a simple cycle power generation project located within the vicinity of the existing West Damietta power station. It consists of four outdoor gas turbines with a total capacity of 500 MW. The facility includes all necessary auxiliary equipment including a new natural gas reducing and handling facility and wastewater treatment facilities. Power generated at the manufacturer standard voltage for the CTG is stepped up through main transformers and fed to the utility unified grid via an onsite 220 kV Gas Insulated Switchyard (GIS). The project was executed through a lump sum turnkey contract.
DAMIETTA POWER PLANT 4X125 MW

SIMPLE CYCLE

Damietta power project is a simple cycle power generation project located near the vicinity of the existing Damietta power station. It consists of four outdoor gas turbines with a total capacity of 500 MW.

The facility includes all necessary auxiliary equipment including a new natural gas reducing and handling facility and wastewater treatment facilities.

Power generated at the manufacturer standard voltage for the CTG is stepped up through main transformers and fed to the utility unified grid via an onsite 220 kV Gas Insulated Switchyard (GIS). The project was executed through a lump sum turnkey contract.

The project utilized an EPC contracting plan.
**Owner:** East Delta Electricity Production Company

**Location:** Damietta, Egypt

**Award Date:** October 2010

**Project Contractual Duration:** 9 months

**Scope:**

- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management, construction, startup and commissioning management.

**Status:** Completed
AL SHABAB POWER PLANT 8X125 MW

SIMPLE CYCLE

Al Shabab power project is a simple cycle power generation project located near the vicinity of the existing Al Shabab power station.

It consists of eight outdoor gas turbines with a total capacity of 1000 MW.

The facility includes all necessary auxiliary equipment including a new natural gas reducing and handling facility and wastewater treatment facilities.

Power generated at the manufacturer standard voltage for the CTG is stepped up through main transformers and fed to the utility unified grid via an onsite 220 kV Gas Insulated Switchyard (GIS). The project was executed through a lump sum turnkey contract.

The project utilized an EPC contracting plan.
Owner: East Delta Electricity Production Company

Location: Ismailia, Egypt

Award Date: October 2010

Project Contractual Duration: 8 months

Scope:

- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management, construction, startup and commissioning management.

Status: Completed
IRAQ

**Owner:** Ministry of Electricity of IRAQ, General Directorate for Gas Power Plants Projects, a Corporation Incorporated Under the Laws of the Republic of Iraq

**Client:** Orascom Construction

**Location:** Baiji, Salahaldeen, Iraq

**Date of Award:** July 2012

**Project Contractual Duration:** 21 months

**Scope:** Responsible for performing the engineering scope of works including developing detailed engineering works, preparing technical specifications, preparing project material requisitions, preparing technical portions of tender documents, evaluating technical bids, supporting EPC Contractor during the pre-award phase to select the appropriate bidders and pre-award negotiations, reviewing subcontractors technical submittals, preparing detailed project time schedules, supporting the EPC Contractor in preparing works breakdown for billing purposes to the Owner and following up the Owner approval of engineering documents.

**Status:** Completed
BAIJI POWER PLANT 1014 MW (6XSGT5-PAC 2000E, DUAL FUEL + HEAVY FUEL OIL

SIMPLE CYCLE

PLANT DESCRIPTION:

Baiji power project is a 1014 MW gas fired simple cycle power generation project of appx 1014 MW at BAIJI, Iraq. The Contractor was engaged to provide engineering, procurement and construction services to the Owner. These included the design, manufacture, delivery, erection and installation of equipment including gas turbine-generator sets supplied by SIEMENS, engineering and design for balance of plant (BOP) items, tie-in to existing infrastructure, painting, setting to work, BOP commissioning and testing, and providing training programs for plant personnel in equipment design, operation and maintenance within the scope of the Contractor scope on a lump sum price basis.
SIMPLE CYCLE

ZAWIA POWER PLANT 2 X 150 MW

Completed 2007

PGESCo scope included design review, site supervision and project management of Zawia 2 X 150 MW project. The scope also included plant equipment material inspection and performance testing.

WESTERN MOUNTAIN POWER PLANT 4 X 156 MW

Completed 2007

PGESCo scope included design review, site supervision and project management of Western Mountain 4 X 156 MW project. The scope also included plant equipment material inspection and performance testing.

WESTERN MOUNTAIN EXTENSION POWER PLANT 2 X 156 MW

Completed 2013

PGESCo scope included design review, site supervision and project management of Western Mountain 2 X 156 MW project. The scope also included plant equipment material inspection and performance testing.

SARIR POWER PLANT 3 X 285 MW

Completed 2013

PGESCo scope included design review, site supervision and project management of Sarir 3 X 285 MW project. The scope also included plant equipment material inspection and performance testing.
PGESCo teamed with Arabian Consultancy Engineering Services “ACESCo” in Libya
SIMPLE CYCLE

ZWITINA POWER PLANT  2 X 285 MW

Completed 2011

PGESCo scope included design review, site supervision and project management of Zwitina 2 X 285 MW project. The scope also included plant equipment material inspection and performance testing.

OBARI POWER PLANT  4 X 160 MW

On-going (on hold due to libyan circumstances)

PGESCo scope included design review, site supervision and project management of Obari 4 X 160 MW (crude oil fired) project. The scope also included plant equipment material inspection and performance testing.
III - STEAM POWER PLANTS PROJECTS
MAZAR POWER PLANT

PLANT DESCRIPTION:

The plant shall supply electricity to the national electricity grid owned by Da’Afghanistan Breshna Sherkat (DABS). It’s natural gas fired reciprocating engine based Power Plant with a net power output between 45 and 55 MW.

The Mazar independent power plant (IPP) project involves the design, development, engineering, procurement, installation, construction, erection, permitting, commissioning, testing, operation and maintenance of a 50MW (approx.) gas-fired reciprocating engine power plant.
AFGHANISTAN

Owner/Client: Afghan Power Plant Company – APPC established by Ghazanfar Group- GG”

Location: Mazar-e-Sharif in the northwestern region of Afghanistan.

Date of Award: 2020

Project Contractual Duration: 18 months

Scope: Consultancy Services Contract

Status: Ongoing
SUEZ THERMAL 650 MW

CONTRACT CLOSE OUT SERVICE

PLANT DESCRIPTION:

Suez Thermal Power Plant 650 MW located in Suez City. The plant have 650 MW Steam Turbine Generator subcritical unit operating on duel fuel (Natural Gas and Mazout oil). Services extension to close the project contract.
CLOSE OUT SERVICE PROJECT

Owner/Client: East Delta Electricity Production Co. (EDEPC)

Location: Suez, Egypt

Date of Award: May 15, 2019

Project Contractual Duration: 6 months

Scope: Contract Close Out Service

Status: Completed
Owner: East Delta Electricity Production Company

Location: Suez, Egypt

Award Date: July 2010

Project Contractual Duration: 57 months

Scope:

- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management, construction management, startup and commissioning management, which included initial operation support

Status: Completed
SUEZ POWER PLANT 650 MW

STEAM

PLANT DESCRIPTION:

Suez power projects is designed to include a 1 x 650 MW steam thermal power plant to interconnect with the National Unified Power System (NUPS) through a 220 KV GIS switchyard. The power block is comprised of one Rankine cycle turbine generator unit with a nominal rated capacity of 650 MW. The unit is capable of generating rated capacity using natural gas, residual (mazout) oil, or a combination of both. The unit station arrangement includes an enclosed turbine building, an open boiler building, a control room, and all associated structures and facilities.

The project contracting plan utilized a multi-package system. Nineteen (19) contracting packages and purchase orders procured the equipment and services.
PLANT DESCRIPTION:

Abu Qir power project is designed to include a 2x650 MW steam thermal power plant to interconnect with the National Unified Power System (NUPS) through a 500 KV GIS switchyard.

The power block is comprised of two identical Rankine cycle turbine generator units, each with a nominal rated capacity of 650 MW. The units are capable of generating rated capacity using natural gas, residual (mazout) oil, or a combination of both. The two-unit station arrangement includes an enclosed turbine building, an open boiler building, a common control room, and all associated structures and facilities.

The project contracting plan utilized a multi-package system. Nineteen (19) contracting packages and purchase orders procured the equipment and services.
Owner: West Delta Electricity Production Company

Location: Alexandria, Egypt

Award Date: July 2007

Project Contractual Duration: 53 months

Scope:
- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management, construction management, startup and commissioning management, which included initial operation support.

Status: Completed
**Owner:** Cairo Electricity Production Company

**Location:** Cairo, Egypt

**Award Date:** October 2006

**Project Contractual Duration:** 53 months

**Scope:**
- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management, construction management, startup and commissioning management, which included initial operation support.

**Status:** Completed
CAIRO WEST POWER PLANT 2X350 MW

STEAM

PLANT DESCRIPTION:

Cairo West power project is designed to include a 2x350 MW thermal power plant to interconnect with the National Unified Power System (NUPS) through a GIS 500 KV switchyard.

The power block is comprised of two identical Rankine cycle turbine generator units, each with a nominal rated capacity of 350 MW. The units are capable of generating rated capacity using natural gas, residual (mazout) oil, or a combination of both. The two-unit station arrangement includes an enclosed turbine building, an open boiler building, a common control room, and all associated structures and facilities.

The project contracting plan utilized a multi-package system. Sixteen (16) contracting packages and purchase orders procured the equipment and services.
EL TEBBIN POWER PLANT 2X350 MW

STEAM

PLANT DESCRIPTION:

El Tebben power project is designed to include a 2x350 MW thermal power plant to interconnect with the National Unified Power System (NUPS) through a GIS 220 kV switchyard. The power block is comprised of two identical Rankine cycle turbine generator units, each with a nominal rated capacity of 350 MW. The units are capable of generating rated capacity using natural gas, residual (mazout) oil, or a combination of both. The two-unit station arrangement includes an enclosed turbine building, an open boiler building, a common control room and all associated structures and facilities. The facility includes a water treatment plant that provides make-up water to the cycle. A 220 kV GIS switchyard evacuates the generated power to the national grid.

The project contracting plan utilized a multi-package system. Eighteen (18) contracting packages and purchase orders procured the equipment and services.
Owner: Cairo Electricity Production Company

Location: Cairo, Egypt

Award Date: May 2005

Project Contractual Duration: 53 months

Scope:
- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management, construction management, startup and commissioning management, which included initial operation support.

Status: Completed
PLANT DESCRIPTION:

Ayoun Moussa 1&2 station consists of:

- Two indoor condensing steam turbine generator (STG) units, each capable of delivering 320 MW net power at the generator terminals.
- Two outdoor, dual firing, pressurized furnace steam generators.
- Auxiliary equipment including onsite oil storage, a natural gas pressure reducing and handling facility, a desalination plant for plant make-up water, an off-shore cooling water intake structure, a water and waste water treatment facility, a GIS 220 kV indoor switchyard, 220 kV transmission lines, and a housing colony.

Procurement activities for the project included the full scope of contract/purchase order formation and administration activities covering pre-qualification and evaluation of bidders, issuance of bid documents, bid evaluation, contract negotiations, contracts awarding and expedition.

The project contracting plan used a multi-package system. Twelve (12) contracting packages and seven (7) purchase orders were awarded to different contractors and suppliers to provide the station goods and services. The plant owner awarded the different packages while PGESCO acted as the owner authorized representative. The plant was turned over to the owner and is in stable commercial operation since 2001.
Owner: East Delta Electricity Production Company

Location: Sinai, Egypt

Award Date: July 1994

Completion Date: January 2001

Scope: Engineering, Procurement, Project and Construction Management Services

Status: Completed
**Owner:** InterGen, American Company

**Location:** Alexandria, Egypt

**Award Date:** December 1998

**Completion Date:** November 2001

**Scope:** The project was awarded to Bechtel/PGESCo on an EPC Basis. The scope included full engineering details to support the procurement of project equipment and commodities and to meet the project contractual guarantees. Scheduling, planning, and cost control were important aspects of the project team scope.

**Status:** Completed
PLANT DESCRIPTION:

Sidi Krir 3&4 power project consists of two 340 MW steam turbine generator units and two outdoor dual fired, pressurized furnace steam generators with all associated balance of plant equipment. Procurement activities were done directly by Bechtel/PGESCo through numerous material requisitions and purchase orders. The project procurement scope expanded to include traffic and logistics, marine cargo insurance, custom clearances, and in country freight. The project Owner was InterGen from the USA. The current Owner is PowerTech.
SIDI KRIR 1&2 POWER PLANT 2 X 325 MW

STEAM

PLANT DESCRIPTION:

Sidi Krir 1&2 station consists of:

- Two indoor condensing steam turbine generator (STG) units, each capable of delivering 320 MW net power at the generator terminals.
- Two outdoor, dual firing, pressurized furnace steam generators.
- Auxiliary equipment including onsite oil storage, a natural gas pressure reducing and handling facility, a desalination plant for plant make-up water, an off-shore cooling water intake structure, a water and waste water treatment facility, a GIS 220 kV indoor switchyard, 220 kV transmission lines, and a housing colony.

Procurement activities for the project included the full scope of contract/purchase order formation and administration activities covering pre-qualification and evaluation of bidders, issuance of bid documents, bid evaluation, contract negotiations, contract award and expedition.

The project contracting plan used a multi-package system. Thirteen (13) contracting packages and seven (7) purchase orders were awarded to different contractors and suppliers to provide the station goods and services. The plant Owner awarded the different packages while PGESCo acted as the Owner authorized representative. The plant was turned over to the Owner and is in stable commercial operation since 2000.
Owner: West Delta Electricity Production Company

Location: Alexandria, Egypt

Award Date: May 1994

Completion Date: September 2000

Scope: Engineering, Procurement, Project and Construction Management Services

Status: Completed
In 1998, PGESCo provided services to Bechtel in the detailed engineering scope of Ghazlan power plant project in Saudi Arabia. Ghazlan is a four-unit steam power plant with unit size of 600 MW. The plant is located on the Arabian Gulf coast 20 km northwest of Ras Tanura. Bechtel was responsible for engineering, procurement, project management, and construction management services.
SYRIA
In 1996, PGESCo provided services to Bechtel in the detailed engineering scope of Aleppo power plant project in Syria. PGESCo engineering personnel were seconded to Bechtel at the project site and Bechtel power headquarters. Aleppo is a five-unit steam power plant with a unit size of 200 MW. The plant is located 8 km east of Aleppo. Bechtel provided engineering and procurement services for the Project Balance of Plant (BOP).
IRAQ

**Owner:** Ministry of Electricity of IRAQ, General Directorate for Energy Production Projects, a corporation incorporated under the laws of the Republic of Iraq

**Location:** Zobidia, Wasit Governorate, Iraq

**Date of Award:** May 2014

**Project Contractual Duration:** 12 months

**Scope:** Engineering Consultancy Services

**Status:** Completed
PLANT DESCRIPTION:

Wassit Steam Power Plant project is a two phase project located in Zobidia, Wassit Governorate, Iraq; 137 Km East south of Baghdad. Phase II consists of 2 x 630 MW units. The contractor scope of work includes the design, equipment and material procurement, factory fabrication, transport and delivery to site, erection, testing and commissioning. Furthermore it is the responsibility of the contractor to perform plant startup including getting all plant sections into operation. Additionally, the contractor is responsible for performance and reliability testing of the plant upon completion followed by a warranty period after the issuance of Provisional Acceptance Certificate “PAC”. The project is being executed on an EPC Contract “Turnkey” basis. The contracting plan for the project utilizes the EPC concept. PGESCo, the Owner Engineer, is responsible for providing engineering consultancy services.
IV - SUPERCritical Power Plants Projects
Owner: Cairo Electricity Production Company

Location: Cairo, Egypt

Award Date: July 2015

Project Contractual Duration: 56 months

Scope:
- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management, construction management, startup and commissioning management, which included initial operation support

Status: On-going
CAIRO WEST POWER PLANT 650 MW

SUPERCritical

PLANT DESCRIPTION:

Cairo West power project is designed to include one 650 MW steam thermal power plant to interconnect with the National Unified Power System (NUPS) through a 500/220 KV GIS switchyard.

The power block is comprised of one Rankine cycle sub-critical turbine generator unit with a nominal rated capacity of 650 MW. The unit is capable of generating rated capacity using natural gas and/or heavy fuel oil (mazout). The unit arrangement includes an in-door turbine building, an out-door boiler structure, a control room, and all associated structures and facilities.

The project contracting plan utilized a multi-package system. Seventeen (17) contracting packages and purchase orders procured the equipment and services.
ASSIUT POWER PLANT 650 MW

SUPERCRITICAL

PLANT DESCRIPTION:

Assiut power project is designed to include one 650 MW steam thermal power plant to interconnect with the National Unified Power System (NUPS) through a 500 KV GIS switchyard. The power block is comprised of one Rankine cycle sub-critical turbine generator unit with a nominal rated capacity of 650 MW. The unit is capable of generating rated capacity using heavy fuel oil (mazout). The unit arrangement includes an in-door turbine building, an out-door boiler structure, a control room, and all associated structures and facilities.

The project-contracting plan utilized a multi-package system. Sixteen (16) contracting packages and purchase orders procured the equipment and services.
Owner: Upper Egypt Electricity Production Company

Location: Assiut, Egypt

Award Date: March 2015

Project Contractual Duration: 56 months

Scope:
- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management, construction management, startup and commissioning management, which included initial operation support.

Status: On-going
SOUTH HELWAN POWER PLANT 3X650 MW

SUPERCritical

PLANT DESCRIPTION:

South Helwan power project is designed to include 3x650 MW steam thermal power plant to interconnect with the National Unified Power System (NUPS) through a 500 KV GIS switchyard.

The power block is comprised of three identical Rankine cycle turbine generator units, each with a nominal rated capacity of 650 MW. The units are capable of generating rated capacity using natural gas, residual (mazout) oil, or a combination of both.

The three-unit plant arrangement includes an enclosed turbine building, an open boiler structure, a common control room, and all associated structures and facilities. The project contracting plan for the project utilizes the multi-package system. Seventeen (17) contracting packages and purchase orders procured the equipment and services.
Owner: Upper Egypt Electricity Production Company

Location: South Helwan, Egypt

Award Date: October 2011

Project Contractual Duration: 67 months

Scope:
- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management, construction management, startup and commissioning management, which included initial operation support.

Status: Completed
**Owner:** East Delta Electricity Production Company

**Location:** Sinai, Egypt

**Award Date:** June 2008

**Project Contractual Duration:** 68 months

**Scope:**
- All conceptual and detailed design of plant systems
- Preparation of all tenders, the documents included commercial and legal terms and followed the financing institutes and Owner procurement guidelines
- Project management, construction management, startup and commissioning management, which included initial operation support

**Status:** Completed
EL AIN EL SOKHNA POWER PLANT 2X650 MW

SUPERCRITICAL

PLANT DESCRIPTION:

El Ain El Sokhna power project is designed to include a 2x650 MW steam thermal power plant to interconnect with the National Unified Power System (NUPS) through a new 500 kV GIS switchyard. The power block is comprised of two identical Rankine cycle turbine generator units, each with a nominal rated capacity of 650 MW. The units are capable of generating rated capacity using natural gas, residual (mazout) oil, or a combination of both. The two-unit station arrangement includes an enclosed turbine building, an open boiler building, a common control room, and all associated structures and facilities.

The project contracting plan utilized a multi-package system. Eighteen (18) contracting packages and purchase orders procured the equipment and services.
V - RENEWABLES
EGYPT

Solar Power

**Owner/Client:** ACWA Power

**Location:** BENBAN-Egypt

**Date of Award:** May 2020

**Effective date:** June 2020

**Project Contractual Duration:** 4 weeks

**Scope:** Consultancy Services Agreement

**Status:** Completed

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**ALCOM PV 50 MW POWER PROJECT**

**PLANT DESCRIPTION:**

Provide consultancy services for the evacuation scheme in order to retain the 100% evacuation ability. ALCOM has installed a 50 MW PV power plant in BENBAN solar energy project.

The PV generation is divided into 3 sections; 2×20 MW and 1×10 MW, where each section (outgoing feeder) is connected to EETC 22 kV switchgear through 3 single-core, 630 mm² XLPE cable.
BENBAN SOLAR PARK PROJECT – GREEN FIELD 32 – DEVELOPERS 1456 MW

PLANT DESCRIPTION:

BenBan project is a large solar energy park in Aswan, South of Egypt. The project is feed-in-Tariff Program for the solar energy and includes 32 investors. EETC is responsible of providing all the tie in facilities to the national grid. EETC has developed and awarded multi contracts for supply and construction and requested PGESCO support for overall project management. In addition, PGESCO has reviewed EETC standard procurement documentation and process for Substation and OHTL and provided recommendation for update.

PROJECT BACKGROUND

The Benban Solar Energy Project is developed under the program implemented by the Egyptian government offering feed-in tariffs to projects between 20 to 50 MW capacities to stimulate private investment in over 1,600 MW of solar power. This scheme aims to support Egypt to move to a more environmentally sustainable and diverse electricity sector by exploiting the country’s vast renewable energy potential.

The plant is located at Benban project site, Kom Ombo, Aswan. The Benban solar project comprises a 37 square kilometer (km²) area located in the Western Desert, 15 km west of the River Nile and approximately 1 km west of Aswan – Luxor highway. The plant is approximately 650 km from Cairo. The project is completed in December 2019.

PGESCO SERVICES

EETC is responsible of providing all the tie in facilities to the national grid. EETC has developed and awarded multi contracts for supply and construction.

PGESCO, as the Project Manager, is providing the overall management services and master plan for the Benban Project including the overall coordination of project activities on behalf of EETC. In addition, PGESCO is reviewing and comment/approve the design documents of the Benban – Nagaa Hamadi 500kV OHTL contractor’s design.

PROJECT SCOPE

The overall project scope breakdown includes the following three major divisions:

a. Four 220 kV Substations and one 500 kV Substation
b. Three Overhead Transmission Lines (OHTL) with Communications and Protection Equipment

c. Power Plant Interconnections 22 kV Cables and Accessories

Owner: Egyptian Electricity Transmission Company - EETC
Client: Astrom
Location: Kom Ombo/Aswan-Egypt
Date of Award: September 06, 2018
Effective date: February 19, 2019
Project Contractual Duration: 8 Months
Scope: Consultancy Services Agreement
Status: Completed
LEKELA WEST BAKR 250 MW WIND FARM PROJECT

PLANT DESCRIPTION:

The project is part of the Egyptian Government’s Build, Own, and Operate (BOO) framework. Taking advantage of the excellent wind resource in the Gulf of Suez, the project will increase Egypt’s wind energy capacity by 18%, and will be a key pillar of Egypt’s ambition to generate 20% of its electricity from renewable energy sources by 2022.

Lekela Power, a joint venture of private equity firm Actis Capital (60%) and Mainstream Renewable Power (40%), is developing the project, as part of the Egyptian Government’s build, own, and operate (BOO) scheme. West Bakr will be the first wind farm to be developed by Lekela Power in Egypt.

The West Bakr wind project is 250 MW onshore wind farm with the capacity to generate more than 1,000 GWh of clean energy per year that will be sufficient to power more than 350,000 homes in the region. It will have the capacity to offset 550,000 tons of carbon dioxide emissions per year.
WIND FARM PROJECT

Owner/Client: Tractebel Engineering S.A.

Location: Suez, Egypt

Date of Award: November 14, 2019

Project Contractual Duration: 20 months

Scope: PGESCo signed a sub-consultancy agreement with Tractebel for site construction and commissioning supervision and Technical Assistance to be provided by PGESCo to Tractebel during the construction of the Lekela West Bark Wind Farm. The scope will be executed by providing number of PGESCo’s technical construction expertise to work under Tractebel site manager directions & follow Tractebel and project procedures and safety & quality manuals for site management of an EPC contractor (Siemens Gamesa Renewable Energy) at site for delivery, installation and commission.

Status: Ongoing
AL KUFRA 100 MW PHOTOVOLTAIC POWER PROJECT

PLANT DESCRIPTION:
Photovoltaic Power Project

The scope includes the inverters, switchgear station and substation for interconnection with network.

Engineering and Procurement Management for the Development of Tender documents (Phase I) and Evaluation of offers (Phase II).

- Preparation of the Technical specifications for soil investigation
- Plant Description
- Technology selection
- Bidding document preparations including selection criteria
- Development of Project execution schedule
- Tender Evaluation and awarding support

LIBYA

Owner/Client: General Authority of Electricity and Renewable Energy of Libya “GAEREL”

Location: Al Kufra, South East Libya

Date of Award: November 15, 2018

Project Contractual Duration: 33 weeks

Scope: Consultancy Services Agreement

Status: Completed on February 2020
TAMNHANT 250 MW PHOTOVOLTAIC POWER PROJECT

PLANT DESCRIPTION:

Photo Voltaic Power Project

The scope includes the inverters, switchgear station and substation for interconnection with network.

Engineering and Procurement Management for the Development of Tender documents (Phase I) and Evaluation of offers (Phase II).

- Preparation of the Technical specifications for soil investigation
- Plant Description
- Technology selection
- Bidding document preparations including selection criteria
- Development of Project execution schedule
- Tender Evaluation and awarding support

Owner/Client: General Authority of Electricity and Renewable Energy of Libya “GAEREL”

Location: Tamnhat, Libya

Date of Award: November 15, 2018

Project Contractual Duration: 33 Weeks

Scope: Consultancy Services Agreement

Status: Completed on February 2020
PGESCO carries out PV system detailed study, system sizing, equipment selection and hourly simulation for the total energy production per year considering weather data from Meteonorm servers and shading losses analysis by using sophisticated design tools.
PGESCO PREMISES PV SYSTEMS

PGESCO has designed, integrated, supervised construction, commissioned and put into operation its own 7 kW on-grid PV system which has been in operation since August 2014.

In order to have a long term experience with PV plants operation and maintenance, PGESCO decided to carry out an experimental test to determine soiling impacts on PV plants energy yield and the optimum cycle for modules cleaning in Cairo weather.

In addition, PGESCO commissioned a PV car shed module located at the company premises. The module is a hybrid on/off grid system with Li-ion batteries targeted to produce 13.5 kW and feed some emergency loads during power cut-offs. All design, shop drawing, installation works are being carried out by PGESCO engineering and maintenance teams.

ROOFTOP ON-GIRD PV SYSTEMS

PGESCO has carried out the detailed design of 216 KWP rooftop on-gird PV systems inside Al-Shabab and West Damietta Power Plants.

20 MWP PV POWER PLANT (UNDER THE EGYPTIAN FEED-IN TARIFF (FIT) PROGRAM)

As an expression of our ultimate commitment to the Egyptian renewable energy program, PGESCO has decided to invest in and develop 20 MWP PV power plant under the Egyptian Feed-in Tariff (FIT) program. In January 2015, PGESCO has been qualified under FIT program for the development of 20MWp ground mounted PV power plant in partnership with some international specialized companies in the field of PV systems.
EL EQTSADIYA (2)
500/220/66/22 KV GIS

PLANT DESCRIPTION:

500 kV GIS (XD-EGEMAC) Bus Bar Rating: 550 kV, 3150 A, 50 kA, 1 Sec, Breaker Rating 3150A

220 kV GIS (XD-EGEMAC) Bus Bar Rating: 245 kV, 3150 A, 63 kA, 1 Sec, Breaker Rating 2500A

66 kV GIS (XD-EGEMAC) Bus Bar Rating: 72.5 kV, 2500 A, 40 kA, 1 Sec, Breaker Rating 1600 A

22 kV (EGEMAC), Bus Bar Rating: 24 kV, 2500A, 25 kA, 3 Sec, Breaker Rating 1250 A

500 KV GIS: 10 Bays, Double Busbar-Double Breaker with Space for Two bays for future extension

220 KV GIS :14 Bays, Double Busbar-Single Breaker with Space for Three bays for future extension

66 KV GIS: 16 Bays, Double Busbar-Single Breaker with Space for Two bays for future extension

22 KV AIS: 46 Breakers with 11 breakers for future extension
(4)* 9MVAR CAPACITOR BANKS

Transformers:
500/220 KV 7*250 MVA AUTO TR. (XD-EGEMAC)
220/66 KV 3*175 MVA TR. (XD-EGEMAC)
66/22 KV 4*40 MVA TR. (XD-EGEMAC)
22/0.4 KV 2*1000 KVA AUX. TR (ELMACO-EGEMAC)
ZAHRAA NASR CITY
220/66/11 KV GIS

PLANT DESCRIPTION:

220 kV GIS (XD-EGEMAC) Bus Bar Rating:
245 kV, 2500 A, 63 kA/1 Sec, Breaker Rating 2000A

66 kV AIS (EGEMAC) Bus Bar Rating:
72.5 kV, 2500 A, 31.5 kA/1 Sec, Breaker Rating 2000 A

11 kV (Schneider Breakers), Bus Bar Rating:
12 kV, 2500A, 31.5 kA/3 Sec, Breaker Rating 1250 A

220kV GIS (10) Bays, Double Busbar-Single Breaker including (2) bays for future extension

66kV AIS (16) Bays, Double Busbar-Single Breaker including (2) bays for future extension

11kV Single bus-Single Breaker with total 50 Breaker [4 incoming breakers (2500A each), 4 BC breakers (2500A each), 4 BR breakers (2500A), 38 outgoing breakers (1250A each), 4 measuring cells]

Transformers:
220/66 KV 3*175 MVA TR. (XD-EGEMAC)
66/11 KV 4*40 MVA TR. (EGEMAC)
CONSULTING SERVICE FOR CAIRO REGIONAL CONTROL CENTER UPGRADE PROJECT “CRCC”

PROJECT: CRCC UPGRADE PROJECT

PLANT DESCRIPTION:

The main objectives of the CRCC Upgrade Project is to achieve the proper and effective monitoring, managing and controlling of all the 66/11 kV (22kV) substations and its 66kV transmission network as well as monitoring of 500 & 220 kV transmission network in Cairo area. The project aims to implement full-scale modern communication and SCADA systems to monitor, manage and control in a safe and reliable manner the relevant network as well as monitoring energy exchanges in the zone interconnections with other zones under the authorization of the National Energy Control Center (NECC).
**Owner/Client:** Egyptian Electricity Transmission Co. (EETC)

**Location:** Cairo, Egypt

**Date of Award:** November 8, 2019

**Project Contractual Duration:** 44 Months

**Scope:** Consultancy Services for Technical Assistance Component for Procurement and Supervision of the implementation of Cairo Regional Control Center (CRCC) Upgrade Project.

**Status:** On going
OWNER: Egyptian Electricity Transmission Company

Client: XD-EGEMAC

Location: East Qena- Upper Egypt

Date of Award: October 01, 2018

Effective date: June 2020

Project Contractual Duration: 12 Months

Scope: Technical Services Agreement

Status: on going

EAST QENA 500/220/66/22KV GIS SUBSTATIONS

PLANT DESCRIPTION:

GIS substations

Detailed Engineering and issuing Material Requisitions for the balance of the substation equipment excluding Major Equipment for the Substation.

500 kV GIS (XD-EGEMAC) Bus Bar Rating: 550 kV, 3150 A, 50 kA, 1 Sec, Breaker Rating 3150A.

220 kV GIS (XD-EGEMAC) Bus Bar Rating: 245 kV, 3150 A, 63 kA, 1 Sec, Breaker Rating 2500A.

66 kV AIS (EGEMAC) Bus Bar Rating: 72.5 kV, 2500 A, 40 kA, 1 Sec, Breaker Rating 1600 A.

22 kV (Schnider Breakers), Bus Bar Rating: 24 kV, 2500A, 25 kA, 3 Sec, Breaker Rating 1250 A.

9 Bays, Double Busbar-Double Breaker with Space for Two bays for future extension.

14 Bays, Double Busbar-Single Breaker with One Bus Coupler Bay.

8 Bays, Double Busbar-Single Breaker with One Bus Coupler Bay and Space for Four bays for future extension.

20 Breakers and One Bus Coupler Single Bus Single Breaker.
PLANT DESCRIPTION:
GIS Substations Project

Detailed Engineering and issuing Material Requisitions for the balance of the substation equipment excluding Major Equipment for the Substation.

500 kV GIS (XD-EGEMAC) Bus Bar Rating: 550 kV, 3150 A, 50 kA, 1 Sec, Breaker Rating 3150A.

220 kV GIS (XD-EGEMAC) Bus Bar Rating: 245 kV, 3150 A, 63 kA, 1 Sec, Breaker Rating 2500A.

66 kV AIS (EGEMAC) Bus Bar Rating: 72.5 kV, 2500 A, 40 kA, 1 Sec, Breaker Rating 1600 A.

11 kV (Schnider Breakers), Bus Bar Rating: 12 kV, 2500A, 31.5 kA, 3 Sec, Breaker Rating 1250 A.

11 Bays, Double Busbar-Double Breaker with Space for Two bays for future extension.

11 Bays, Double Busbar-Single Breaker with Space for Two bays for future extension.

8 Bays, Double Busbar-Single Breaker with Space for Two bays for future extension.

24 Breakers with 11 breakers for future extension.

Owner: Egyptian Electricity Transmission Company
Client: XD-EGEMAC
Location: Naga Hamady - North-West of Luxor- Upper Egypt.
Date of Award: March 16, 2018
Project Contractual Duration: 12 Months
Scope: Technical Services Agreement
Status: on going
TOSHKA SUBSTATION AND RELATED TRANSMISSION LINE PROJECT

PLANT DESCRIPTION:

Engineering design review, project and construction management services of the Project and overall coordination of project activities on behalf of EETC.

**Owner/Client:** Egyptian Electricity Transmission Company (EETC)

**Location:** Toshka - Aswan - Egypt

**Date of Award:** December 2019

**Project Contractual Duration:** 12 Months

**Scope:** Consultancy Services Contract

PGESCo is providing the consulting services consisting of engineering design review, project and construction management services and overall coordination of project activities on behalf of EETC.

**Design Review and Construction Management**

**Status:** on going
SOUTH EAST COAST OVERHEAD TRANSMISSION LINE & SUBSTATIONS

PLANT DESCRIPTION:

Engineering design review, project and construction management services of the South East Coast Development Project and overall coordination of project activities on behalf of EETC.

Owner/Client: Egyptian Electricity Transmission Co. (EETC)

Location: South East Coast (Elqusseir, Marsa Alam and Bernees), Egypt

Date of Award: August 2019
Project Contractual Duration: 7 Months

Scope: Consultancy Services Contract

Status: Completed
The following substations have been implemented under supervision of PGESCo. The scope of PGESCo encompasses technical Specifications, tendering, evaluation of offers, material procurement from successful bidders, contractors’ technical submittals review and finally construction management.

All the listed substations in Section (1) and Section (2) are within Power Plants and include the systems listed below:
- Air Insulated/Gas Insulated Switchgears (AIS/GIS)
- AIS/GIS Conventional Control Panels
- Substation Automation System (SAS) in recent substations
- Substation Protective Relays
- Communication Systems:
  - SDH Fiber Optic System
  - Power Line Carrier System
- Electro –Mechanical Work (Fire Fighting, HVAC, Plumbing, Lighting...etc.)

1) Implemented Projects

<table>
<thead>
<tr>
<th>#</th>
<th>Substations</th>
<th>Sub-contractor</th>
<th>Year</th>
<th>Equipment Type/Rating</th>
<th>Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SIDN KRIR</td>
<td>Groupe Schneider</td>
<td>1996</td>
<td>220 kV GIS (Hexablock H9S), Busbar rating: 245 kV, 4000 A, 40 kA, 1 sec, Breaker rating: 2500 A</td>
<td>5 Diameters, Breaker and a half</td>
</tr>
<tr>
<td>2</td>
<td>AYOUN MOUSA</td>
<td>Cogelex Alsthom</td>
<td>1998</td>
<td>500 kV GIS (Gec Alsthom Type T155), Busbar rating: 525 kV, 3000 A, 40 kA, 1 sec, Breaker rating: 3000 A</td>
<td>5 Bays, Double Busbar-Double Breaker</td>
</tr>
<tr>
<td></td>
<td>500 kV</td>
<td></td>
<td></td>
<td></td>
<td>1 x 500/220 kV Tie Transformer</td>
</tr>
<tr>
<td></td>
<td>220 kV</td>
<td></td>
<td>1998</td>
<td>220 kV GIS (Gec Alsthom Type T105), Busbar rating: 245 kV, 3000 A, 40 kA, 1 sec, Breaker rating: 3000 A</td>
<td>6 Bays and one Bus-Tie, Double Busbar, Single Breaker</td>
</tr>
<tr>
<td>3</td>
<td>CAIRO NORTH</td>
<td>Siemens</td>
<td>2003</td>
<td>220 kV GIS (Siemens Type 8DN9), Busbar rating: 245 kV, 3150 A, 50 kA, 1 sec, Breaker rating: 1600 A</td>
<td>6 Diameters and two Bus-Ties, Breaker and a half</td>
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<tr>
<td></td>
<td>220 kV</td>
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<td></td>
<td></td>
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<tr>
<td>#</td>
<td>Substations</td>
<td>Sub-contractor</td>
<td>Year</td>
<td>Equipment Type/Rating</td>
<td>Configuration</td>
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<tr>
<td>4</td>
<td>NUBARIA (1) &amp; (2)</td>
<td>Consortium: Japan AE, Sumitomo and ConIsys</td>
<td>2005</td>
<td>500 kV AIS (Hitachi Power Systems), Busbar rating: 500 kV, 3000 A, 40 kA, 1sec, Breaker rating: 2000 A</td>
<td>11 Bays, Double Busbar-Double Breaker</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3 x 500/220 kV Tie Transformers (manufactured by ZTR)</td>
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<tr>
<td></td>
<td>Cairo 500 kV AIS Extension</td>
<td>Consortium: Japan AE, Sumitomo and ConIsys</td>
<td>2006</td>
<td>500 kV AIS, Busbar rating: 500 kV, 3000 A, 40 kA, 1sec, Breaker rating: 2000 A</td>
<td>Single Bay, Double Busbar, Double Breaker</td>
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<tr>
<td></td>
<td></td>
<td>ABB</td>
<td></td>
<td>220 kV AIS (ABB), Busbar rating: 245 kV, 3000 A, 40 kA, 1sec, Breaker rating: 1600 A</td>
<td>12 Bays Double Busbar-Single Breaker and one Bus-Tie</td>
</tr>
<tr>
<td>5</td>
<td>NUBARIA (3)</td>
<td>Areva T &amp; D</td>
<td>2007</td>
<td>500 kV AIS (Areva Type GL 317), Busbar rating: 500 kV, 3000 A, 40 kA, 1sec, Breaker rating: 2000 A</td>
<td>3 Bays, Double Busbar-Double Breaker</td>
</tr>
<tr>
<td>6</td>
<td>KUREIMAT</td>
<td>Siemens</td>
<td>2006</td>
<td>220 kV GIS (Siemens Type 8DN9), Busbar rating: 245 kV, 3150 A, 50 half kA, 1sec, Breaker rating: 1600 A</td>
<td>8 Diameters, Breaker and a Busbar</td>
</tr>
<tr>
<td>7</td>
<td>TEBBIN</td>
<td>Siemens</td>
<td>2008</td>
<td>220 kV GIS (Siemens Type 8DN9), Busbar rating: 245 kV, 3150 A, 50 half kA, 1sec, Breaker rating: 1600 A</td>
<td>5 Diameters, Breaker and a Busbar</td>
</tr>
<tr>
<td>8</td>
<td>EL ATF</td>
<td>Siemens</td>
<td>2009</td>
<td>220 kV GIS (Siemens Type 8DN9), Busbar rating: 245 kV, 2000 A, 50 half kA, 1sec, Breaker rating: 2000 A</td>
<td>5 Diameters, Breaker and a Busbar</td>
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<tr>
<td>9</td>
<td>SIDI KRIR (5) &amp; (6)</td>
<td>Siemens</td>
<td>2007</td>
<td>500 kV GIS (Siemens Type 8DQ1), Busbar rating: 550 kV, 3150 A, 40 kA, 1sec, Breaker rating: 2000 A</td>
<td>4 Bays, Double Busbar-Double Breaker</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 x 500/220 kV Tie Transformer</td>
<td></td>
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<tr>
<td>10</td>
<td>CAIRO WEST</td>
<td>Areva T &amp; D</td>
<td>2010</td>
<td>500 kV GIS Extension (Areva Type GL 317), Busbar rating: 500 kV, 2000 A, 40 kA, 1sec, Breaker rating: 2000 A</td>
<td>Installing one breaker and a GIB in a single Diameter, Breaker and a half</td>
</tr>
</tbody>
</table>
SUBSTATIONS IMPLEMENTED BY PGESCo
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<table>
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<tr>
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<tr>
<td>11</td>
<td><strong>ABU QIR</strong></td>
<td>Siemens</td>
<td>2012</td>
<td>500 kV GIS (Siemens Type 8DQ1), Busbar rating: 550 kV, 3150 A, 40 kA, 1sec, Breaker rating: 2000 A</td>
<td>6 Bays, Double Busbar-Double Breaker, 1 x 500/220 kV Tie Transformer (Manufactured by Hyundai)</td>
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<tr>
<td></td>
<td>500 kV</td>
<td></td>
<td></td>
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<tr>
<td>12</td>
<td><strong>DAMIETTA</strong></td>
<td>Hyosung</td>
<td>2011</td>
<td>220 kV GIS (Siemens Type 8DN9), Busbar rating: 245 kV, 2000 A, 50 kA, 1sec, Breaker rating: 2000 A</td>
<td>4 Diameters, Breaker and a half</td>
</tr>
<tr>
<td></td>
<td>220 kV</td>
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</tr>
<tr>
<td>13</td>
<td><strong>SHABAB</strong></td>
<td>Siemens</td>
<td>2010</td>
<td>220 kV GIS (Siemens Type 8DN9), Busbar rating: 245 kV, 2000 A, 50 kA, 1sec, Breaker rating: 1600 A</td>
<td>8 Diameters and two Bus-Ties, Breaker and a half</td>
</tr>
<tr>
<td></td>
<td>220 kV</td>
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<td></td>
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<tr>
<td>14</td>
<td><strong>WEST DAMIETTA</strong></td>
<td>Hyundai</td>
<td>2011</td>
<td>220 kV GIS (Hyundai Type 300 SR), Busbar rating: 245 kV, 2000 A, 50 kA, 1sec, Breaker rating: 2000 A</td>
<td>4 Diameters, Breaker and a half</td>
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<tr>
<td>15</td>
<td><strong>AIN EL SOKHNA</strong></td>
<td>EGEMAC</td>
<td>2012</td>
<td>500 kV GIS (Xian Type ZF8A 550 GIS), Busbar rating: 550 kV, 3150 A, 40 kA, 1sec, Breaker rating: 2000 A</td>
<td>4 Bays Double Busbar-Double Breaker</td>
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<tr>
<td></td>
<td>500 kV</td>
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<td></td>
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<tr>
<td>16</td>
<td><strong>BANHA</strong></td>
<td>Hyundai</td>
<td>2012</td>
<td>220 kV GIS (Hyundai Type 300 SR), Busbar rating: 245 kV, 2000 A, 40 kA, 1sec, Breaker rating: 2000 A</td>
<td>4 Diameters, Breaker and a half</td>
</tr>
<tr>
<td></td>
<td>220 kV</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td><strong>GIZA NORTH</strong></td>
<td>Hyundai</td>
<td>2013</td>
<td>500 kV GIS (Hyundai Type 550 SR), Busbar rating: 550 kV, 3150 A, 40 kA, 1sec, Line Breaker rating: 2000 A</td>
<td>13 Bays, Double Busbar-Double Breaker, 2 x 500/200 kV Tie Transformer (Manufactured by Hyundai)</td>
</tr>
<tr>
<td></td>
<td>1) 500 kV</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>2) 220 kV</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8 Bays and one Bus-Tie, Double Busbar, Single Breaker</td>
</tr>
<tr>
<td>#</td>
<td>Substations</td>
<td>Sub-contractor</td>
<td>Year</td>
<td>Equipment Type/Rating</td>
<td>Configuration</td>
</tr>
<tr>
<td>----</td>
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<td>---------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>18</td>
<td>6th OCTOBER 220 kV Phase (1)</td>
<td>Ansaldo/ABB</td>
<td>2011</td>
<td>220 kV GIS (ABB Type ELK-14/300), Busbar rating: 245 kV, 2500 A, 50 kA, 1sec, Breaker rating: 2000 A</td>
<td>4 Diameters, Breaker and a half</td>
</tr>
<tr>
<td>19</td>
<td>6th OCTOBER 220 kV Phase (2)</td>
<td>Ansaldo/ABB</td>
<td>2013</td>
<td>220 kV GIS (ABB Type ELK-14/300), Busbar rating: 245 kV, 2500 A, 50 kA, 1sec, Breaker rating: 2000 A</td>
<td>4 Diameters, Breaker and a half</td>
</tr>
<tr>
<td></td>
<td>Extension of Phase (1) GIS by one diameter</td>
<td></td>
<td></td>
<td></td>
<td>1 Diameter Breaker and a half extension to Phase (1) GIS</td>
</tr>
<tr>
<td>20</td>
<td>SUEZ 500 kV</td>
<td>Siemens</td>
<td>2015</td>
<td>500 kV GIS (Siemens Type 8DQ1), Busbar rating: 550 kV, 3150 A, 40 kA, 1sec, Breaker rating: 2000 A</td>
<td>3 Bays, Double Busbar-Double Breaker</td>
</tr>
<tr>
<td>21</td>
<td>BAUI 400 kV, Iraq</td>
<td>Siemens</td>
<td>2014</td>
<td>400 kV GIS (Siemens Type 8DQ1), Busbar rating: 420 kV, 4000 A, 50 kA, 1sec, Breaker rating: 2000 A, Bus-Tie rating: 4000 A</td>
<td>7 Diameters and two Bus-Ties, Breaker and a half</td>
</tr>
<tr>
<td>22</td>
<td>NEW ASSIUT 220 kV</td>
<td>Siemens</td>
<td>2015</td>
<td>220 kV GIS (Siemens Type 8DN9), Busbar rating: 245 kV, 2000 A, 50 kA, 1sec, Breaker rating: 1600 A</td>
<td>8 Diameters and two Bus-Ties, Breaker and a half</td>
</tr>
<tr>
<td>23</td>
<td>NEW WEST DAMIETTA 220 kV</td>
<td>Alstom</td>
<td>2015</td>
<td>220 kV GIS (Alstom Type B105), Busbar rating: 245 kV, 2000 A, 50 kA, 1sec, Breaker rating: 1600 A</td>
<td>4 Diameters, Breaker and a half</td>
</tr>
<tr>
<td>24</td>
<td>7X 400 kV SUBSTATIONS</td>
<td></td>
<td>2008</td>
<td>PGESCo Scope included design review, site supervision and project management the project. The scope also included equipment material inspection and performance testing as well as training and technology transfer to GPCOEWG (General People's Committee of Electricity, Water and Gas). The project consists of seven (7)400/ 220 kV substations throughout Libya.</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>SOUTH HELWAN 500 kV</td>
<td>Alstom Grid</td>
<td>2015</td>
<td>500 kV GIS (Alstom Type T155), Busbar rating: 550 kV, 3150 A, 40 kA, 1sec, Breaker rating: 2000 A</td>
<td>7 Bays, Double Busbar-Double Breaker</td>
</tr>
</tbody>
</table>
SUBSTATIONS IMPLEMENTED BY PGESCO
SUBSTATIONS IMPLEMENTED BY PGESCO
<table>
<thead>
<tr>
<th>#</th>
<th>Substations</th>
<th>Sub-contractor</th>
<th>Year</th>
<th>Equipment Type/Rating</th>
<th>Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td><strong>SHABAB</strong></td>
<td>Siemens</td>
<td>2015</td>
<td>220 kV GIS (Siemens Type BDN9), Busbar rating: 245 kV, 2000 A, 50 kA, 1sec, Breaker rating: 1600 A</td>
<td>Two Diameters, Breaker and a half</td>
</tr>
<tr>
<td></td>
<td>220 kV switchyard</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Extension</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td><strong>WEST DAMIETTA</strong></td>
<td>Hyundai</td>
<td>2015</td>
<td>220 kV GIS (Hyundai Type 300 SR), Busbar rating: 245 kV, 2000 A, 50 kA, 1sec, Breaker rating: 2000 A</td>
<td>One Diameter, Breaker and a half</td>
</tr>
<tr>
<td></td>
<td>220 kV Switchyard</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Extension</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td><strong>NEW ASSIUT</strong></td>
<td>Siemens</td>
<td>2016</td>
<td>220 kV GIS (Siemens Type BDN9), Busbar rating: 245 kV, 2000 A, 50 kA, 1sec, Breaker rating: 1600 A</td>
<td>Two Diameters, Breaker and a half</td>
</tr>
<tr>
<td></td>
<td>220 kV Switchyard</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Extension</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>29</td>
<td><strong>NEW WEST DAMIETTA</strong></td>
<td>Alstom Grid</td>
<td>2016</td>
<td>220 kV GIS (Alstom Type B105), Busbar rating: 245 kV, 2000 A, 50 kA, 1sec, Breaker rating: 1600 A</td>
<td>One Diameter, Breaker and a half</td>
</tr>
<tr>
<td></td>
<td>220 kV Switchyard</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Extension</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2) Ongoing Projects:
The following listed projects are under construction

<table>
<thead>
<tr>
<th>#</th>
<th>Substations</th>
<th>Sub-contractor</th>
<th>Year</th>
<th>Equipment Type/Rating</th>
<th>Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>NAGA HAMADY</strong></td>
<td>XD-EGEMAC</td>
<td>2018-2019</td>
<td>500 kV GIS (XD-EGEMAC) Bus Bar Rating: 550 kV, 3150 A, 50 kA, 1 Sec, Breaker Rating 3150 A</td>
<td>11 Bays, Double Busbar-Double Breaker with Space for Two bays for future extension</td>
</tr>
<tr>
<td></td>
<td>500/220/66/11 kV</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>220 kV GIS (XD-EGEMAC) Bus Bar Rating: 245 kV, 3150 A, 63 kA, 1 Sec, Breaker Rating 2500 A</td>
<td>11 Bays, Double Busbar-Single Breaker with Space for Two bays for future extension</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>66 kV AIS (EGEMAC) Bus Bar Rating: 72.5 kV, 2500 A, 40 kA, 1 Sec, Breaker Rating 1600 A</td>
<td>8 Bays, Double Busbar-Single Breaker with Space for Two bays for future extension</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>11 kV (Schnider Breakers), Bus Bar Rating: 12 kV, 2500A, 31.5 kA, 3 Sec, Breaker Rating 1250 A</td>
<td>24 Breakers with 11 breakers for future extension</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

145PGESCo 2020
SUBSTATIONS IMPLEMENTED BY PGESCO
<table>
<thead>
<tr>
<th>#</th>
<th>Substations</th>
<th>Sub-contractor</th>
<th>Year</th>
<th>Equipment Type/Rating</th>
<th>Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>EAST QENA</td>
<td>XD-EGEMAC</td>
<td>2018-2019</td>
<td>500 kV GIS (XD-EGEMAC) Bus Bar Rating: 550 kV, 3150 A, 50 kA, 1 Sec, Breaker Rating 3150A</td>
<td>9 Bays, Double Busbar-Double Breaker with Space for Two bays for future extension</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>220 kV GIS (XD-EGEMAC) Bus Bar Rating: 245 kV, 3150 A, 63 kA, 1 Sec, Breaker Rating 2500A</td>
<td>14 Bays, Double Busbar-Single Breaker with One Bus Coupler Bay</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>66 kV AIS (EGEMAC) Bus Bar Rating: 72.5 kV, 2500 A, 40 kA, 1 Sec, Breaker Rating 1600 A</td>
<td>8 Bays, Double Busbar-Single Breaker with One Bus Coupler Bay and Space for Four bays for future extension</td>
</tr>
<tr>
<td>3</td>
<td>14X220 kV SUBSTATIONS</td>
<td>PGESCO Scope included design review, site supervision and project management of fourteen (14) 220kV substations. The scope also included material inspection. The project consists of seven 220 kV substations throughout Libya.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4</td>
<td>3X220/400 kV SUBSTATIONS-SABHA, TUBROK AND MELITA</td>
<td>PGESCO Scope included design review, site supervision and project management of three (3) 220/400 kV substations. The scope also included material inspection.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5  **LEKELA WEST**  
Bakr 250 MW Wind Farm Project

<table>
<thead>
<tr>
<th>#</th>
<th>Substations</th>
<th>Sub-contractor</th>
<th>Year</th>
<th>Equipment Type/Rating</th>
<th>Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>LEKELA WEST</td>
<td>Tractable Engineering S.A.</td>
<td>2019</td>
<td>PGESCO signed a sub-consultancy agreement with Tractebel for site construction and commissioning supervision and Technical Assistance to be provided by PGESCO to Tractebel during the construction of the Lekela West Bakr Wind Farm. The scope will be executed by providing number of PGESCO's technical construction expertise to work under Tractebel site manager directions &amp; follow Tractebel and project procedures and safety &amp; quality manuals for site management of an EPC contractor (Siemens Gamesa Renewable Energy) at site for delivery, installation and commission. Review firefighting system; with civil defense.</td>
<td>The project is part of the Egyptian Government’s Build, Own, and Operate (BOO) framework. Taking advantage of the excellent wind resource in the Gulf of Suez, the project will increase Egypt’s wind energy capacity by 18%, and will be a key pillar of Egypt’s ambition to generate 20% of its electricity from renewable energy sources by 2022. Lekela Power, a joint venture of private equity firm Acts Capital (60%) and Mainstream Renewable Power (40%), is developing the project, as part of the Egyptian Government’s build, own, and operate (BOO) scheme. West Bakr will be the first wind farm to be developed by Lekela Power in Egypt. The West Bakr wind project is 250 MW onshore wind farm with the capacity to generate more than 1,000 GWh of clean energy per year that will be sufficient to power more than 350,000 homes in the region. It will have the capacity to offset 550,000 tons of carbon dioxide emissions per year.</td>
</tr>
</tbody>
</table>
500 kV Overhead Transmission Line - Project
(Benban III - Toshka II-500 KV OHTL- 255 Km)

The scope of work of the contract package of the 500kV double circuit triple bundle for Benban III/Toshka II include lattice steel self-supporting double circuit structures with bolted connections. The line is divided into three lots as follows:

Lot 4: Approximately 85 km route length of a double-circuit, three-bundle conductor, overhead transmission line starting from Benban III substation.

Lot 5: Approximately 85 km route length of a double-circuit, three-bundle conductor, overhead transmission line starting from the end of lot 4.

Lot 6: Approximately 85 km route length of a double-circuit, three-bundle conductor, overhead transmission line starting from the end of Lot 5 to Toshka II substation.

490/65 ACSR conductors (bundle of three per phase) were used for the three lots of the line. Galvanized steel shield wire of 108 mm2 cross sectional area was used as the first earth wire while OPGW is used as a second shield wire and communication purposes. An insulation level of 40 mm/kV was applied for this line.

SCOPE OF PGESCO IN THIS PROJECT

· Project and site management supervision including design review, equipment and material inspection.

500 kV Overhead Transmission Line - Project
(Benban III – Nagaa Hamadi-500 KV OHTL- 195 Km)

The scope of work of the contract package of the 500kV double circuit Quadruple bundle for Benban III – Nagaa Hamadi include lattice steel self-supporting double circuit structures.

490/65 ACSR conductors (Quadruple bundle per phase) were used for the line. Galvanized steel shield wire of 108 mm2 cross sectional area was used as the first earth wire while OPGW is used as a second shield wire and communication purposes. An insulation level of 40 mm/kV was applied for this line.

SCOPE OF PGESCO IN THIS PROJECT

· Project management supervision including design review.
220 kV Overhead Transmission Line - Project (El Qusair/Marsa Alam/Bernes 220 KV OHTL- 300 Km)

The scope of work of the contract package of the 220 kV double circuit three phase for El Qusair/Marsa Alam/Bernes include lattice steel self-supporting double circuit structures with bolted connections. The line is divided into six lots as follows:

Lot 1: Approximately 50 km route length of a double-circuit, twin-bundle conductor, overhead transmission line starting from El Qusair.

Lot 2: Approximately 50 km route length of a double-circuit, twin-bundle conductor, overhead transmission line starting from the end of lot 1.

Lot 3: Approximately 50 km route length of a double-circuit, twin-bundle conductor, overhead transmission line starting from the end of lot 2.

Lot 4: Approximately 50 km route length of a double-circuit, twin-bundle conductor, overhead transmission line starting from Marsa Alam.

Lot 5: Approximately 50 km route length of a double-circuit, twin-bundle conductor, overhead transmission line starting from the end of lot 4.

Lot 6: Approximately 50 km route length of a double-circuit, twin-bundle conductor, overhead transmission line starting from the end of lot 5 to Bernes.

405 mm² AAAC conductors (bundle of two per phase) were used for the six lots of the line. OPGW was used as the earth wire for shielding the line as well as communication purposes. An insulation level of 40 mm/kV was applied for this line.

SCOPE OF PGESCO IN THIS PROJECT

- Project and site management supervision including design review, equipment and material inspection.
OVER HEAD TRANSMISSION LINES - OHTL

500 kV overhead Transmission Line - Project (Sidi Krir- Nubaria- Cairo)

Completed

The scope of work of the contract package of the 500kV single circuit for Cairo 500kV/Nubaria/Sidi Krir include Self supported lattice towers for single circuit in horizontal formation. The line is divided into two parts as follows:

1- Cairo-Nubaria 500 kV OHTL
Approximately 100 km route length of a single-circuit, three-bundles conductor, overhead transmission line from Cairo 500 kV substation to Nubaria Power Station.

An insulation level of 40 mm/kV was applied for this part of the line. 490/65 ACSR conductors (bundle of three per phase) were used for this part of the line. Galvanized steel shield wire of 108 mm² cross sectional area was used as the first earth wire while OPGW are used as a second shield wire and communication purposes.

2- Sidi Krir-Nubaria 500 kV OHTL
Approximately 130 km route length of a single-circuit, three-bundle conductor, overhead transmission line from Sidi Krir 500 kV substation to Nubaria Power Station.

An insulation level of 40 mm/kV was applied for this part of the line, except for the last 30 km of the line (Sidi Krir direction) where 45 mm/kV insulation level was applied. 490/65 ACSR conductors (bundle of three per phase) was used for this part of the line, except for the last 30 km of the line (Sidi Krir direction), 506 mm² AAAC (bundle of three per phase) was used. Galvanized steel shield wire of cross sectional area of 108 mm² was used, except for the last 30 km of the line (Sidi Krir direction), 94.1 mm² AACSR was used as the first earth wire while OPGW was used as a second shield wire and communication purposes for the whole line.

PGESCO Scope:
• Tender preparation and evaluation,
• Project and site management supervision including design review, equipment and material inspection.

500 kV – Suez Canal Crossing Towers

Completed

Assist the Owner for specific activities such as:
• Evaluation of piling foundation
• Manage and schedule for the foundation and tower erection
BRAK – SABHA 220 KV OHTL
COMPLETED 2014

PGESCo scope included design review, site supervision and project management of 220 kV overhead transmission line 100 KM. The scope also included plant equipment, material inspection and performance testing.

RWES – BIR GANAM 220 KV OHTL
COMPLETED 2014

PGESCo scope included design review, site supervision and project management of 220 kV overhead transmission line 100 KM. The scope also included plant equipment, material inspection and performance testing.
1000 KM 400 kV OHTL

Completed 2008

PGESCo scope included design review, site supervision and project management of the project. The scope also included plant equipment material inspection and performance testing as well as training and technology transfer to GPCOEWG (General People’s Committee of Electricity, Water and Gas). The project consists of two (2) 400 kV overhead transmission lines with total length of 1000 km. The first line is Zawia-Sidi Banour (500 km) and the second line is Sirt-Agdabia (500 km).

SABHA – GAMRA 400 kV OHTL

Completed 2014

PGESCo scope included design review, site supervision and project management of 400 kV overhead transmission line (260 km). The scope also included plant equipment material inspection and performance testing.
EGYPT

Owner: Cairo electricity Production Company

Location: Giza, Egypt

Date of Award: 2018

Project Contractual Duration: 32 months

Scope: Engineering Procurement and Construction Management

Status: Ongoing
NEW CAIRO WEST WATER TREATMENT FACILITIES

New Cairo West project includes water/waste water treatment systems to serve the power plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. Raw water from Nile River is supplied via intake structure to feed the water treatment system through plant pump house where supply pumps and raw water screens are located. The water/waste water treatment installed in New Cairo West project includes:

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intake Design</td>
<td>Open intake</td>
<td></td>
</tr>
<tr>
<td>Chlorination System</td>
<td>Chlorine Gas feed system</td>
<td>3 x 1300 kg cl₂/h</td>
</tr>
<tr>
<td>Raw Water Pretreatment System</td>
<td>Ultra filtration</td>
<td>2 x 3000 m³/day</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Reverse Osmosis + Electrodeionization (EDI)</td>
<td>2 x 1560 m³/day</td>
</tr>
<tr>
<td>Waste water treatment system</td>
<td>Oil separation / clarification / 1440 m³/day filtration / pH adjustment</td>
<td></td>
</tr>
<tr>
<td>Potable water treatment</td>
<td>UF + activated carbon filtration + chlorination</td>
<td>100 m³/day</td>
</tr>
</tbody>
</table>

160PGESC0 2020
Owner: Upper Egypt electricity Production Company

Location: Assiut, Egypt

Date of Award: 2018

Project Contractual Duration: 32 months

Scope: Engineering Procurement and Construction Management

Status: Ongoing
NEW ASSIUT WATER TREATMENT FACILITIES

New Assiut project includes water/waste water treatment systems to serve the power plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. Raw water from Nile River is supplied via intake structure to feed the water treatment system through plant pump house where supply pumps and raw water screens are located. The water/waste water treatment installed in New Cairo West project includes:

<table>
<thead>
<tr>
<th>Intake Design</th>
<th>Open intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorination System</td>
<td>Chlorine Gas feed system</td>
</tr>
<tr>
<td>Raw Water Pretreatment System</td>
<td>Ultra filtration</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Reverse Osmosis + Electrodeionization (EDI)</td>
</tr>
<tr>
<td>Condensate polishing System</td>
<td>Externally Regenerated Mixed Beds</td>
</tr>
<tr>
<td>Waste water treatment system</td>
<td>Oil separation / clarification / filtration / pH adjustment</td>
</tr>
</tbody>
</table>
Owner: Upper Egypt Electricity Production company

Location: South Helwan, Egypt

Date of Award: November 2015

Project Contractual Duration: 25 Month

Scope: Engineering, Procurement, and Construction Management Services

Status: Completed
SOUTH HELWAN WATER TREATMENT FACILITIES

South Helwan power project includes water/waste water treatment systems to serve the plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. Raw water from Nile River is supplied via intake structure to feed the water treatment system through power plant pump house where supply pumps and raw water screens are located. The water/waste water treatment installed in South Helwan power project includes:

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intake Design</td>
<td>Open intake</td>
<td></td>
</tr>
<tr>
<td>Chlorination System</td>
<td>Chlorine Gas feed system</td>
<td>3 x 1300 kg cl₂/h</td>
</tr>
<tr>
<td>Raw Water Pretreatment System</td>
<td>Ultra filtration (UF)</td>
<td>3 x 2400 m³/day</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Reverse Osmosis + mixed bed demineralizer</td>
<td>3 x 1200 m³/day</td>
</tr>
<tr>
<td>Condensate polisher System</td>
<td>Externally Regenerated Mixed Beds</td>
<td>3 x 900 m³/h</td>
</tr>
<tr>
<td>Waste water treatment system</td>
<td>Oil separation / clarification / filtration / pH</td>
<td>1920 m³/day</td>
</tr>
<tr>
<td>Potable water treatment</td>
<td>adjustment</td>
<td></td>
</tr>
<tr>
<td>Sewage treatment plant</td>
<td>Extended aeration</td>
<td>100 m³/day</td>
</tr>
</tbody>
</table>
**Owner:** Cairo Electricity Production company

**Client:** ORASCOM CONSTRUCTION

**Location:** New Capital, Egypt

**Date of Award:** August 2015

**Scope:** Detailed Engineering, Procurement Support, and Design Review

**Status:** On-going
NEW CAPITAL WATER TREATMENT FACILITIES

New Capital power project includes desalination and water/waste water treatment systems to serve the plant water demand of high purity demineralized water required for HRSG feed as well as various power plant users. City water is supplied via pipe line to feed the water treatment system. The water/waste water treatment installed in New Capital power project includes:

<table>
<thead>
<tr>
<th>Pretreatment System</th>
<th>Ultra filtration (UF)</th>
<th>3 x 1800 m³/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desalination System</td>
<td>reverse Osmosis (RO) system</td>
<td>3 x 1200 m³/day</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Electro Deionization</td>
<td>3 x 960 m³/day</td>
</tr>
<tr>
<td>Waste water treatment system</td>
<td>Oil separation / clarification / filtration / pH adjustment</td>
<td>2 x 480 m³/day</td>
</tr>
<tr>
<td>Sewage treatment plant</td>
<td>Extended aeration STP</td>
<td>2 x 100 m³/day</td>
</tr>
</tbody>
</table>
BURULLUS DESALINATION AND WATER TREATMENT FACILITIES

Burullus power project includes desalination and water/waste water treatment systems to serve the plant water demand of high purity demineralized water required for HRSG feed as well as various power plant users. Sea water from Mediterranean Sea is supplied via intake structure to feed the desalination system through power plant pump house where supply pumps and sea water screens is located. The desalination and water/waste water treatment installed in Burrulus power project includes:

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intake Design</td>
<td>Open intake</td>
<td></td>
</tr>
<tr>
<td>Chlorination System</td>
<td>On-site Hypochlorite Generation</td>
<td>3 x 40kg/hr Cl₂</td>
</tr>
<tr>
<td>Pretreatment System</td>
<td>Ultra filtration (UF)</td>
<td>3 x 2760 m³/day</td>
</tr>
<tr>
<td>Desalination System</td>
<td>Double Pass reverse Osmosis (RO) system with energy recovery system</td>
<td>3 x 1,000 m³/day</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Electro deionization</td>
<td>3 x 960 m³/day</td>
</tr>
<tr>
<td>Waste water treatment system</td>
<td>Oil separation / clarification / filtration / pH adjustment</td>
<td>2 x 480 m³/day</td>
</tr>
<tr>
<td>Potable water treatment</td>
<td>Activated carbon filters/remineralization filters</td>
<td>2 x 100 m³/day</td>
</tr>
<tr>
<td>Sewage treatment plant</td>
<td>Extended aeration STP</td>
<td>2 x 100 m³/day</td>
</tr>
</tbody>
</table>
**Owner:** Middle Delta Electricity Production company

**Client:** ORASCOM CONSTRUCTION

**Location:** Mediterranean sea, Egypt

**Date of Award:** August 2015

**Scope:** Detailed Engineering, Procurement Support, and Design Review

**Status:** On-going
Owner: Middle Delta Electricity Production company

Location: Middle Delta, Egypt

Date of Award: July 2012

Project Contractual Duration: 19 Month

Scope: Engineering, Procurement, and Construction Management Services

Status: On Going
BANHA WATER TREATMENT FACILITIES

Banha power project includes water/waste water treatment systems to serve the plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. Raw water Nile River is supplied via intake structure to feed the water treatment system through power plant pump house where supply pumps and raw water screens is located. The water/waste water treatment installed in Banha power project includes:

<table>
<thead>
<tr>
<th>Intake Design</th>
<th>Open intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorination System</td>
<td>Hypochlorite Solution injection system</td>
</tr>
<tr>
<td>Raw Water Pretreatment System</td>
<td>Clarification + Ultra filtration (UF) 2280 m³/day</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Cation / degasifier / anion / mixed bed deionizer 3 x 1800 m³/day</td>
</tr>
<tr>
<td>Waste water treatment system</td>
<td>Oil separation / clarification / filtration / pH adjustment 2400 m³/day</td>
</tr>
<tr>
<td>Potable water treatment</td>
<td>UF + Activated carbon filtration + chlorination 100 m³/day</td>
</tr>
<tr>
<td>Sewage treatment plant</td>
<td>Packaged Type - Extended aeration 100 m³/day</td>
</tr>
</tbody>
</table>
**GIZA NORTH WATER TREATMENT FACILITIES**

Giza North power project includes water/waste water treatment systems to serve the plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. Raw water Nile River is supplied via intake structure to feed the water treatment system through power plant pump house where supply pumps and raw water screens is located. The water/waste water treatment installed in Giza North power project includes:

<table>
<thead>
<tr>
<th>Intake Design</th>
<th>Open intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorination System</td>
<td>Chlorine Gas feed system</td>
</tr>
<tr>
<td>Raw Water Pretreatment System</td>
<td>Clarification + Ultra filtration (UF)</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Cation / degasifier/anion/mixed bed de-ionizer</td>
</tr>
<tr>
<td>Waste water treatment system</td>
<td>Oil separation/clarification/filtration/pH adjustment</td>
</tr>
<tr>
<td>Potable water treatment</td>
<td>UF + activated carbon filtration + chlorination</td>
</tr>
<tr>
<td>Sewage treatment plant</td>
<td>Extended aeration</td>
</tr>
</tbody>
</table>

- **Intake Design:** Open intake
- **Chlorination System:** Chlorine Gas feed system
  - 3 x 1200 kg Cl₂/h
- **Raw Water Pretreatment System:** Clarification + Ultra filtration (UF)
  - 3 x 2520 m³/day
- **Demineralization System:** Cation / degasifier/anion/mixed bed de-ionizer
  - 3 x 2040 m³/day
- **Waste water treatment system:** Oil separation/clarification/filtration/pH adjustment
  - 5280 m³/day
- **Potable water treatment:** UF + activated carbon filtration + chlorination
  - 80 m³/day
- **Sewage treatment plant:** Extended aeration
  - 80 m³/day
**Owner:** Cairo Electricity Production Company  
**Location:** Giza, Egypt  
**Date of Award:** March 2013  
**Project Contractual Duration:** 17 Month  
**Scope:** Engineering, Procurement, and Construction Management Services  
**Status:** Completed
**Owner:** Cairo Electricity Production Company

**Location:** Cairo, Egypt

**Date of Award:** June 2008

**Project Contractual Duration:** 17 Month

**Scope:** Engineering, Procurement, and Construction Management Services

**Status:** Completed
CAIRO WEST WATER TREATMENT FACILITIES

Cairo West power project includes water/waste water treatment systems to serve the plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. Raw water from Nile River is supplied via intake structure to feed the water treatment system through power plant pump house where supply pumps and raw water screens is located. The water/waste water treatment installed in Cairo West power project includes:

<table>
<thead>
<tr>
<th>Intake Design</th>
<th>Open intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorination System</td>
<td>Hypochlorite Solution injection system</td>
</tr>
<tr>
<td>Raw Water Pretreatment System</td>
<td>Clarification / Multi Media Filtration</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Cation / degasifier /anion / mixed bed deionizer</td>
</tr>
<tr>
<td>Condensate polisher System</td>
<td>Externally Regenerated Mixed Beds</td>
</tr>
</tbody>
</table>

174PGESCo 2020
Owner: West Delta Electricity Production company

Location: North Coast, Egypt

Date of Award: June 2008

Project Contractual Duration: 17 Month

Scope: Engineering, Procurement, and Construction Management Services

Status: Completed
Sidi Krir water treatment facilities

Sidi Krir power project includes water/waste water treatment systems to serve the plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. Sea water from Mediterranean Sea is supplied via intake structure to feed the existing desalination plant and water/wastewater treatment system through power plant pump house where supply pumps and sea water screens are located. The desalination and water/waste water treatment installed in Sidi Krir power project includes:

<table>
<thead>
<tr>
<th>Intake Design</th>
<th>Open intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorination System</td>
<td>On site hypochlorite generation</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>mixed bed deionizer</td>
</tr>
</tbody>
</table>
EL TEBBIN WATER TREATMENT FACILITIES

El Tebbin power project includes water/waste water treatment systems to serve the plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. Raw water from Nile River is supplied via intake structure to feed the water treatment system through power plant pump house where supply pumps and raw water screens is located. The water/waste water treatment installed in Al Tebbin power project includes:

<table>
<thead>
<tr>
<th>Intake Design</th>
<th>Open intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorination System</td>
<td>Hypochlorite Solution injection system</td>
</tr>
<tr>
<td>Raw Water Pretreatment System</td>
<td>Clarification / Multi Media Filtration</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Cation / degasifier /anion / mixed bed deionizer</td>
</tr>
<tr>
<td>Condensate polisher System</td>
<td>Externally Regenerated Mixed Beds</td>
</tr>
<tr>
<td>Waste water treatment system</td>
<td>Oil separation</td>
</tr>
</tbody>
</table>
Owner: Cairo Electricity Production Company

Location: Cairo, Egypt

Date of Award: October 2007

Project Contractual Duration: 24 Month

Scope: Engineering, Procurement, and Construction Management Services

Status: Completed
Owner: Upper Egypt Electricity Production Company
Location: Upper Egypt
Date of Award: February 2006
Project Contractual Duration: 18 Month
Scope: Engineering, Procurement, and Construction Management Services
Status: Completed
KUREIMAT WATER TREATMENT FACILITIES

Kureimat power project includes water/waste water treatment systems to serve the plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. Raw water from Nile River is supplied via intake structure to feed the water treatment system through power plant pump house where supply pumps and raw water screens is located. The desalination and water/waste water treatment installed in El Kureimat power project includes:

<table>
<thead>
<tr>
<th>Intake Design</th>
<th>Open intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorination System</td>
<td>Hypochlorite Solution injection system</td>
</tr>
<tr>
<td>Raw Water Pretreatment System</td>
<td>Clarification / Multi Media Filtration</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Cation / degasifier / anion / mixed bed deionizer</td>
</tr>
<tr>
<td>Waste water treatment system</td>
<td>Oil separation / clarification / filtration / pH adjustment</td>
</tr>
<tr>
<td>Potable water treatment</td>
<td>Activated carbon filtration+ chlorination</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Talkha power project includes water/waste water treatment systems to serve the plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. River water from Nile River is supplied via intake structure to feed the water treatment system through power plant pump house where supply pumps and raw water screens is located. The water/waste water treatment installed in Talkha power project includes:

<table>
<thead>
<tr>
<th>Intake Design</th>
<th>Open intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorination System</td>
<td>Hypochlorite Solution injection system</td>
</tr>
<tr>
<td>Raw Water Pretreatment System</td>
<td>Clarification / Multi Media Filtration</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Cation / degasifier / anion / mixed bed deionizer</td>
</tr>
<tr>
<td>Waste water treatment system</td>
<td>Oil separation / clarification / filtration / pH adjustment</td>
</tr>
</tbody>
</table>
Owner: Middle Delta Electricity Production Company
Location: Middle Delta, Egypt
Date of Award: September 2005
Project Contractual Duration: 18 Month
Scope: Engineering, Procurement, and Construction Management Services
Status: Completed
Owner: Middle Delta Electricity Production Company

Location: Middle Delta, Egypt

Date of Award: January 2004

Project Contractual Duration: 14 Month

Scope: Engineering, Procurement, and Construction Management Services

Status: Completed
NUBARIA WATER TREATMENT FACILITIES

Nubaria power project includes water/waste water treatment systems to serve the plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. River water from Nubaria canal is supplied via intake structure to feed the water treatment system through power plant pump house where supply pumps and raw water screens is located. The desalination and water/waste water treatment installed in Nubaria power project includes:

<table>
<thead>
<tr>
<th>Intake Design</th>
<th>Open intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorination System</td>
<td>Hypochlorite Solution injection system</td>
</tr>
<tr>
<td>Raw Water Pretreatment System</td>
<td>Clarification / Multi Media Filtration</td>
</tr>
<tr>
<td></td>
<td>3 x 2016 m³/day</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Cation / degasifier /anion / mixed bed</td>
</tr>
<tr>
<td></td>
<td>deionizer</td>
</tr>
<tr>
<td></td>
<td>3 x 1500 m³/day</td>
</tr>
<tr>
<td>Waste water treatment system</td>
<td>Oil separation / clarification / filtration / pH adjustment</td>
</tr>
<tr>
<td></td>
<td>2 x 1440 m³/day</td>
</tr>
<tr>
<td>Potable water treatment</td>
<td>Activated carbon filters and disinfection with sodium hypochlorite dosing</td>
</tr>
<tr>
<td></td>
<td>400 m³/day</td>
</tr>
<tr>
<td>Sewage treatment plant</td>
<td>Extended Diffused Aeration system</td>
</tr>
<tr>
<td></td>
<td>2 x 0.22 m³/day</td>
</tr>
</tbody>
</table>
CAIRO NORTH WATER TREATMENT FACILITIES

Cairo North power project includes water/waste water treatment systems to serve the plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. River water from Nile River is supplied via intake structure to feed the water treatment system through power plant pump house where supply pumps and raw water screens is located. The water/waste water treatment installed in Cairo North power project includes:

<table>
<thead>
<tr>
<th>Intake Design</th>
<th>Open intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorination System</td>
<td>Hypochlorite Solution injection system</td>
</tr>
<tr>
<td>Raw Water Pretreatment System</td>
<td>Clarification / Multi Media Filtration / Sludge Dewatering</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Cation / degasifier /anion / mixed bed deionizer</td>
</tr>
<tr>
<td>Waste water treatment system</td>
<td>API Oil separation / DAF oil separation</td>
</tr>
</tbody>
</table>

2 x 1680 m³/day

2 x 1680 m³/day

2400 m³/day

18SPGESC5 2020
**Owner:** Cairo Electricity Production Company

**Location:** Cairo, Egypt

**Date of Award:** December 2002

**Project Contractual Duration:** 18 Month

**Scope:** Engineering, Procurement, and Construction Management Services

**Status:** Completed
AL ATF WATER TREATMENT FACILITIES

Al Atf power project includes water/waste water treatment systems to serve the plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. River water from Nile River Rosetta Branch is supplied via intake structure to feed the water treatment system through power plant pump house where supply pumps and raw water screens is located. The desalination and water/waste water treatment installed in Al Atf power project includes:

<table>
<thead>
<tr>
<th>Intake Design</th>
<th>Open intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorination System</td>
<td>Hypochlorite Solution injection system</td>
</tr>
<tr>
<td>Raw Water Pretreatment System</td>
<td>Clarification / Multi Media Filtration</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Cation / degasifier / anion / mixed bed delonizer</td>
</tr>
<tr>
<td>Waste water treatment system</td>
<td>Oil separation / clarification / filtration / pH adjustment</td>
</tr>
</tbody>
</table>
Owner: Middle Delta Electricity Production Company

Location: Middle Delta, Egypt

Date of Award: June 2008

Project Contractual Duration: 17 Month

Scope: Engineering, Procurement, and Construction Management Services

Status: Completed
Owner: East Delta Electricity Production Company
Client: Orascom Construction
Location: Damietta, Egypt
Date of Award: November 2014
Project Contractual Duration: 5 Month
Scope: Detailed Engineering, Procurement Support, and Design Review
Status: Completed
New West Damietta Fast Track power project includes desalination and water/waste water treatment systems to serve the plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. Ground Water is supplied via deep well field to feed the desalination and water treatment systems. The desalination and water/waste water treatment installed in West Damietta power project includes:

<table>
<thead>
<tr>
<th>Pretreatment System</th>
<th>Ultra filtration modules (UF)</th>
<th>3 x 3250 m³/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desalination System</td>
<td>Double pass reverse osmosis (brackish water)</td>
<td>3 x 2400 m³/day</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Electro deionization System</td>
<td>3 x 1800 m³/day</td>
</tr>
<tr>
<td>Condensate polisher System</td>
<td>Pre-coat filters</td>
<td>2 x 600 m³/h On-going</td>
</tr>
<tr>
<td>Waste water treatment system</td>
<td>Oil separation / clarification / filtration / pH adjustment</td>
<td>2400 m³/day</td>
</tr>
<tr>
<td>Potable water treatment</td>
<td>UF + RO + Activated carbon + Chlorination</td>
<td>100 m³/day</td>
</tr>
<tr>
<td>Sewage treatment plant</td>
<td>Extended aeration</td>
<td>100 m³/day</td>
</tr>
</tbody>
</table>
New Assiut Fast Track power project includes desalination and water/waste water treatment systems to serve the plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. Ground Water is supplied via deep well field to feed the desalination and water treatment systems. The desalination and water/waste water treatment installed in West Damietta power project includes:

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretreatment System</td>
<td>Ultra filtration modules (UF)</td>
<td>4 x 5040 m³/day</td>
</tr>
<tr>
<td>Desalination System</td>
<td>Double pass reverse osmosis (brackish water)</td>
<td>(12,000 m³/day)</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Electro deionization System</td>
<td>5 x 2400 m³/day</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Electro deionization System</td>
<td>4 x 2400 m³/day</td>
</tr>
<tr>
<td>Condensate polisher System</td>
<td>Pre-coat filters</td>
<td>(12,000 m³/day)</td>
</tr>
<tr>
<td>Waste water treatment system</td>
<td>Oil separation / clarification / filtration / pH adjustment</td>
<td>2 x 600 m³/h</td>
</tr>
<tr>
<td>Potable water treatment</td>
<td>UF + RO + activated carbon + chlorination</td>
<td>1920 m³/day</td>
</tr>
<tr>
<td>Sewage treatment plant</td>
<td>Extended aeration</td>
<td>100 m³/day</td>
</tr>
</tbody>
</table>
**Owner:** Upper Egypt Electricity Production Company

**Client:** Orascom Construction

**Location:** Assiut, Egypt

**Date of Award:** November 2014

**Project Contractual Duration:** 4 Month

**Scope:** Detailed Engineering, Procurement Support, and Design Review

**Status:** Completed
SUEZ DESALINATION AND WATER TREATMENT FACILITIES

Suez power project includes desalination and water/waste water treatment systems to serve the plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. Sea water from Red sea is supplied via intake structure to feed the desalination system through power plant pump house where supply pumps and sea water screens is located. The desalination and water/waste water treatment installed in Suez power project includes:

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorination System</td>
<td>On site hypochlorite generation system</td>
<td>2 x 300 kg Cl₂/h</td>
</tr>
<tr>
<td>Desalination System</td>
<td>Multi Effect Distillation with Thermal Vapor compression (MED-TVC)</td>
<td>6,000 m³/day</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Mixed bed deionizer</td>
<td>3 x 1080 m³/day</td>
</tr>
<tr>
<td>Condensate polisher System</td>
<td>Externally Regenerated Mixed Beds</td>
<td>2 x 900 m³/h</td>
</tr>
<tr>
<td>Waste water treatment system</td>
<td>Oil separation / clarification / filtration / pH adjustment</td>
<td>2400 m³/h</td>
</tr>
</tbody>
</table>
Owner: East Delta Electricity Production Company

Location: Suez, Egypt

Date of Award: October 2012

Project Contractual Duration: 18 Month

Scope: Engineering, Procurement, and Construction Management Services

Status: Completed
WEST DAMIETTA DESALINATION AND WATER TREATMENT FACILITIES

West Damietta power project includes desalination and water/waste water treatment systems to serve the plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. Ground Water is supplied via deep well field to feed the desalination and water treatment systems. The desalination and water/waste water treatment installed in West Damietta power project includes:

<table>
<thead>
<tr>
<th>System</th>
<th>Equipment</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretreatment System</td>
<td>Ultra filtration modules (UF)</td>
<td>2 x 2880 m³/day</td>
</tr>
<tr>
<td>Desalination System</td>
<td>Double pass reverse osmosis (brackish water)</td>
<td>2 x 1560 m³/day</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Mixed bed deionizer</td>
<td>2 x 1560 m³/day</td>
</tr>
<tr>
<td>Condensate polisher System</td>
<td>Pre-coat filters</td>
<td>2 x 600 m³/h</td>
</tr>
<tr>
<td>Waste water treatment system</td>
<td>Oil separation / clarification / filtration / pH adjustment</td>
<td>1200 m³/day</td>
</tr>
</tbody>
</table>
Owner: East Delta Electricity Production Company

Location: Damietta, Egypt

Date of Award: March 2011

Project Contractual Duration: 12 Month

Scope: Engineering, Procurement, and Construction Management Services

Status: Completed
Owner: East Delta Electricity Production Company

Location: Sinai, Egypt

Date of Award: June 2010

Project Contractual Duration: 29 Month

Scope: Engineering, Procurement, and Construction Management Services

Status: Completed
EL AIN EL SOKHNA DESALINATION AND WATER TREATMENT FACILITIES

El Ain El Sokhna power project includes desalination and water/waste water treatment systems to serve the plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. Sea water from Red sea is supplied via intake structure to feed the desalination system through power plant pump house where supply pumps and sea water screens is located. The desalination and water/waste water treatment installed in El Ain El Sokhna power project includes:

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorination System</td>
<td>On-site Hypochlorite generation system</td>
<td>3 x 450 kg Cl₂/h</td>
</tr>
<tr>
<td>Desalination System</td>
<td>Multi Effect Distillation with Thermal Vapor compression</td>
<td>8,000 m³/day</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Mixed bed deionizer</td>
<td>1,800 m³/day</td>
</tr>
<tr>
<td>Condensate polisher System</td>
<td>Externally Regenerated Mixed Beds</td>
<td>6 x 760 m³/h</td>
</tr>
<tr>
<td>Waste water treatment system</td>
<td>Oil separation / clarification / filtration / pH adjustment</td>
<td>1,440 m³/day</td>
</tr>
<tr>
<td>Sewage treatment plant</td>
<td>Extended aeration</td>
<td>2,040 m³/day</td>
</tr>
</tbody>
</table>
ABU QIR DESALINATION AND WATER TREATMENT FACILITIES

Abu Qir power project includes desalination and water/waste water treatment systems to serve the plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. Sea water from Mediterranean sea is supplied via intake structure to feed the desalination system through power plant pump house where supply pumps and sea water screens is located. The desalination and water/waste water treatment installed in Abu Qir power project includes:

<table>
<thead>
<tr>
<th>System</th>
<th>System Description</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorination System</td>
<td>On-site Hypochlorite generation system</td>
<td>2 x 500 kg Cl₂/h</td>
</tr>
<tr>
<td>Desalination System</td>
<td>Multi Effect Distillation with Thermal Vapor compression (MED-TVC)</td>
<td>10,000 m³/day</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Mixed bed deionizer</td>
<td>2 x 3000 m³/day</td>
</tr>
<tr>
<td>Condensate polisher System</td>
<td>Externally Regenerated Mixed Beds</td>
<td>2 x 880 m³/h</td>
</tr>
<tr>
<td>Waste water treatment system</td>
<td>Oil separation / clarification / filtration / pH adjustment</td>
<td>240 m³/day</td>
</tr>
<tr>
<td>Sewage treatment plant</td>
<td>Extended Aeration</td>
<td>200 m³/day</td>
</tr>
</tbody>
</table>
Owner: West Delta Electricity Production Company

Location: Alexandria, Egypt

Date of Award: September 2009

Project Contractual Duration: 23 Month

Scope: Engineering, Procurement, and Construction Management Services

Status: Completed
Owner: East Delta Electricity Production Company

Location: Ismailia, Egypt

Date of Award: October 2011

Project Contractual Duration: 10 Month

Scope: Engineering, Procurement, and Construction Management Services

Status: Completed
# AL SHABAB DESALINATION AND WATER TREATMENT FACILITIES

Al Shabab power project includes desalination and water/waste water treatment systems to serve the plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. Ground Water is supplied via deep well field to feed the desalination and water treatment systems. The desalination and water/waste water treatment installed in Al Shabab power project includes:

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretreatment System</td>
<td>Ultra filtration modules (UF)</td>
<td>3 x 3500 m³/day</td>
</tr>
<tr>
<td>Desalination System</td>
<td>Double pass reverse osmosis (brackish water)</td>
<td>2 x 3750 m³/day</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Mixed bed deionizer</td>
<td>2 x 3120 m³/day</td>
</tr>
<tr>
<td>Condensate polisher System</td>
<td>Pre-coat filters</td>
<td>4 x 600 m³/h</td>
</tr>
<tr>
<td>Waste water treatment system</td>
<td>Oil separation / clarification / filtration / pH adjustment</td>
<td>1200 m³/day</td>
</tr>
<tr>
<td>Potable water treatment</td>
<td>UF + RO + Activated carbon + Chlorination</td>
<td>120 m³/day</td>
</tr>
<tr>
<td>Sewage treatment plant</td>
<td>Extended aeration</td>
<td>120 m³/day</td>
</tr>
</tbody>
</table>
Owner: East Delta Electricity Production Company

Location: Sinai, Egypt

Date of Award: May 1996

Project Contractual Duration: 35 Month

Scope: Engineering, Procurement, and Construction Management Services

Status: Completed
AYOUN MOUSA DESALINATION AND WATER TREATMENT FACILITIES

Ayoun Moussa power project includes desalination and water/waste water treatment systems to serve the plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. Sea water from Red sea is supplied via intake structure to feed the desalination system through power plant pump house where supply pumps and sea water screens is located. The desalination and water/waste water treatment installed in Ayoun Moussa power project includes:

<table>
<thead>
<tr>
<th>System</th>
<th>System Description</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorination System</td>
<td>On-Site Hypochlorite Generation System</td>
<td>3 x 110 kg/hr Cl₂</td>
</tr>
<tr>
<td>Desalination System</td>
<td>Multi Effect distillation (MED)</td>
<td>2 x 5000 m³/day</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Mixed bed deionizer</td>
<td>3 x 1500 m³/day</td>
</tr>
<tr>
<td>Condensate polisher System</td>
<td>Externally Regenerated Mixed Beds</td>
<td>3 x 522 m³/h</td>
</tr>
<tr>
<td>Waste water treatment system</td>
<td>Oil separation / DAF system</td>
<td>2400 m³/day</td>
</tr>
</tbody>
</table>
SIDI KRIR 1 & 2 desalination and water treatment facilities

SIDI KRIR 1 & 2 power project includes desalination and water/waste water treatment systems to serve the plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. Sea water from Mediterranean Sea is supplied via intake structure to feed the desalination system through power plant pump house where supply pumps and sea water screens is located. The desalination and water/waste water treatment installed in Sidi Krir power project includes:

<table>
<thead>
<tr>
<th>System</th>
<th>Type</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorination System</td>
<td>On-Site Hypochlorite Generation System</td>
<td>3 x 110 kg/hr Cl₂</td>
</tr>
<tr>
<td>Desalination System</td>
<td>Multi stage flash distillation (MSF)</td>
<td>2 x 5000 m³/day</td>
</tr>
<tr>
<td>Demineralization System</td>
<td>Mixed bed deionizer</td>
<td>3 x 1500 m³/day</td>
</tr>
<tr>
<td>Condensate polisher System</td>
<td>Externally Regenerated Mixed Beds</td>
<td>3 x 522 m³/h</td>
</tr>
<tr>
<td>Waste water treatment system</td>
<td>Oil separation / DAF system</td>
<td>2400 m³/day</td>
</tr>
</tbody>
</table>
Owner: West Delta Electricity Production Company

Location: North Coast, Egypt

Date of Award: April 1996

Project Contractual Duration: 26 Month

Scope: Engineering, Procurement, and Construction Management Services

Status: Completed
IRAQ

Owner: Orascom Construction

Location: Baiji, Salaheldeen, Iraq

Date of Award: 2012

Project Contractual Duration: 24 months

Scope: Engineering Procurement and Construction Management

Status: Completed
**BAIJI, IRAQ WATER TREATMENT FACILITIES**

New Assiut project includes water/waste water treatment systems to serve the power plant water demand of high purity demineralized water required for boiler feed as well as various power plant users. Raw water from Nile River is supplied via intake structure to feed the water treatment system through plant pump house where supply pumps and raw water screens are located. The water/waste water treatment installed in New Cairo West project includes:

<table>
<thead>
<tr>
<th>Intake Design</th>
<th>Sedimentation Tank + Clarifiers double stages multimedia filtration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Raw Water Pretreatment System</strong></td>
<td>12960 m³/day</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Demineralization System</th>
<th>Reverse Osmosis + Electrodeionization (EDI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demineralization System</strong></td>
<td>6912 m³/day</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Potable water treatment</th>
<th>Oil separation / clarification / filtration / pH adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Potable water treatment</strong></td>
<td>2880 m³/day</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Potable water treatment</th>
<th>activated carbon filtration+ chlorination</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Potable water treatment</strong></td>
<td>100 m³/day</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sewage treatment plant</th>
<th>Extended aeration activated sludge</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sewage treatment plant</strong></td>
<td>100 m³/day</td>
</tr>
</tbody>
</table>
ZAWIA DESALINATION PROJECT (80,000 M³/DAY)
Complete 2010

PGESCo scope included design review, site supervision and project management of Zawia Sea Water Desalination Project. The scope also included plant equipment material inspection and performance testing as well as training and technology transfer to GPCOEWG (General People's Committee of Electricity, Water and Gas).

DERNA SEA WATER DESALINATION PROJECT (40,000 M³/DAY)
Completed 2010

PGESCo scope included design review, site supervision and project management of Derna Sea Water Desalination Project. The scope also included plant equipment material inspection and performance testing as well as training and technology transfer to GPCOEWG (General People's Committee of Electricity, Water and Gas).

SOUSA SEA WATER DESALINATION PROJECT (40,000 M³/DAY)
Completed 2010

PGESCo scope included design review, site supervision and project management of Sousa Sea Water Desalination Project. The scope also included plant equipment material inspection and performance testing as well as training and technology transfer to GPCOEWG (General People's Committee of Electricity, Water and Gas).

ABU TRABA SEA WATER DESALINATION PROJECT (40,000 M³/DAY)
Completed 2007

PGESCo scope included design review, site supervision and project management of Abu Traba Sea Water Desalination Plant. The scope also included plant equipment material inspection and performance testing as well as training and technology transfer to GPCOEWG (General People's Committee of Electricity, Water and Gas).

The project capacity is 2 X 20,000 M³/DAY using MED (Multiple Effect Distillation) units.
VIII - Intake / Discharge Water Structures
Concrete Velocity Cap
El Ain EL Sokhna Project
Red Sea, Egypt
Offshore velocity cap intake structure, fully designed and modeled
Concrete Discharge
El AIN EL Sokhna Project
Red Sea, Egypt

Design of the structure and protections with modeling
Concrete Pump House
El Ain EL Sokhna Project
Red Sea, Egypt
Full design, details, modeling and electro mechanical works
Intake Basin
EL Tebbin Project, EGYPT
Debris and weeds mitigation system
Kureimat III Project, EGYPT
Full design, details and modeling of concrete intake structure on the Nile River
Intake Basin
Suez Project, Red sea, EGYPT

Full design, details and modeling. Natural stones and concrete intake basin.
Intake Basin
Abu Qir Project, Mediterranean Sea, EGYPT
Full design, details and modeling, natural stones, concrete and piping intake basin.
VIII - BUILDING & HOUSING
NUBARIA II PROJECT - EGYPT

Nubarlia II project Architectural Design included the following Ancillary buildings:

- One, (1) Administration Building, (3-Story Building, approx.1400 Square Meters each).
- One, (1) Owner Construction Offices Building, (2-Story Building, approx.600 Square Meters each).
- One, (1) PGESCo Construction Offices Building, (2-Story Building, approx.600 Square Meters each).
- One, (1) Warehouse/ Workshop, (2-Story Building, approx.3000 Square Meters each).
- One, (1) Firefighting Stations, (2-Story Building, approx.700 Square Meters each).
- One, (1) Gasoline station, (Single-Story Building, approx. 500 Square Meters).

Nubarlia II project Architectural Design included a Housing Colony that consisted of the following:

- Twelve, (12) Manager's Villa (approx.100 Square Meters).
- Two, (2) Guesthouse buildings (approx.120 Square Meters).
- Sixty, (60) Employees Apartment buildings (2-Story Building, approx.120 Square Meters Each).
- One, (1) Dormitory building for single engineers (3-Story, 60 Rooms).
- One, (1) Mosque (For 200 Persons).
- One, (1) Shopping Center (Of 12 Stores).
- One, (1) Social Building.
- One, (1) Kindergarten Building.
- One, (1) Shower and Lockers Building.
- One, (1) Medical Clinic Building.
- One, (1) Main Guard House.
- One, (1) Secondary Guard House.
- Four, (4) Guard Towers.
- Landscape, Roads, playgrounds, and wall fence.
EL TEBBIN PROJECT - EGYPT

EL Tebbin project Architectural Design included the following Ancillary buildings:

- One, (1) Administration Building, (3-Story Building, approx. 1400 Square Meters each).
- One, (1) Owner Construction Offices Building, (2-Story Building, approx. 600 Square Meters each).
- One, (1) PGESCo Construction Offices Building, (2-Story Building, approx. 600 Square Meters each).
- One, (1) Warehouse/Maintenance Workshop, (2-Story Building, approx. 3000 Square Meters each).
- One, (1) Firefighting Stations, (2-Story Building, approx. 700 Square Meters each).
- One, (1) Gasoline station, (Single-Story Building, approx. 500 Square Meters).
- One, (1) Security Guards Dormitory Building, (60 persons) (2-Story Building, approx. 500 Square Meters each).
- One, (1) Main Security Gatehouse (Single-Story Building).
- One, (1) Security fences, Eight, (8) guard towers and Two (2) gates.
- Landscape, Roads, playgrounds, and wall fence.
Giza North Project - EGYPT

Giza North project Architectural Design included the following Ancillary buildings:

- One, (1) Administration Building, (3-Story Building, approx.1400 Square Meters each).
- One, (1) PGESCo Construction Offices Building, (2-Story Building, approx.900 Square Meters each).
- One, (1) Warehouse/Workshop, (2-Story Building, approx.1600 Square Meters).
- One, (1) Workshop, (2-Story Building, approx.1600 Square Meters).
- One, (1) Firefighting Stations, (2-Story Building, approx.600 Square Meters each).

BAIJI POWER PLANT PROJECT - IRAQ

BAIJI project Architectural Design included the following ancillary buildings:

- One, (1) Administration Building, (2-Story Building, approx.900 Square Meters each).
- One, (1) Firefighting Stations, (Single-Story Building, approx.500 Square).
- One, (1) Store Building, (Single-Story Building, approx.960 Square Meters).
- One, (1) Workshop Building, (2-Story Building, approx.1000 Square Meters each).

BAIJI project Architectural Design included a Housing Colony that consisted of the following:

- One, (1) Bachelor house Building, (30 persons) (2-Story Building, approx.500 Square Meters each).
- One, (1) Mosque ((Single-Story Building, for 100 Persons).
- One, (1) First Aid Building (Clinic) (Single-Story Building).
- One, (1) Canteen Building (Single-Story Building).
- One, (1) Staff Amenities Building (Single-Story Building).
- One, (1) Garage Building (Single-Story Building).
- One, (1) Main Security Gatehouse (Single-Story Building).
- One, (1) Security fences, Sixteen, (16) guard towers and Two (2) gates.
- Landscape, Roads, playgrounds, and wall fence.
X - TECHNICAL AND ECONOMICAL STUDIES
MIDELEC TIE TRANSFORMER STUDY

PLANT DESCRIPTION:
PGESCo to assess the need for exercising the 33/66 kV Tie Transformer to be connected between Midelec’s (Expansion Project) and tied to the 56kV Unified National Grid.

Owner/Client: MIDOR ELECTRICITY CO. “MIDELEC”

Location: Alexandria

Date of Award: April 2020

Project Contractual Duration: 4 Months

Scope: Engineering Studies Services

Status: Completed
MIDELEC desires PGESCo to perform certain professional services consisting of activities encompassing the assessment and evaluation of existing power system performance including the existing power plant and technical / economical evaluation of the proposed recommendations of implementation of efficiency improvement alternatives. Maintaining a continuous and instantaneous balance between the production and consumption of electricity in power system is necessary. Collecting data about power demand consumption is a way to ensure the required energy balance, this to determine required improvement needed to the power plant.

**Owner/Client:** MIDOR ELECTRICITY CO. “MIDELEC”

**Location:** Alexandria

**Date of Award:** April 2020

**Project Contractual Duration:** 4 Months

**Scope:** Engineering Studies Services

**Status:** Completed
MIDELEC INTERCONNECTIONS WITH EETC, APC AND APRCO STUDY

PLANT DESCRIPTION:

MidElec Interconnections with EETC, Alexandria Petroleum Co. and Amerya Petroleum Refining Company Study.

PGESCo scope is to analyze the real case of the power flow between MidElec, EETC, APC and APRCo during their interconnecting OHTL isolation. This analysis result in a recommendation(s) for MidElec to review and consider for improving the system setup.

Owner/Client: MIdOR ELECTRICITY CO. “MIDELEC”

Location: Alexandria

Date of Award: February 2020

Project Contractual Duration: 4 Months

Scope: Engineering Studies Services

Status: Completed
MIDELEC DECOUPLING DEVICE STUDY

PLANT DESCRIPTION:
PGESCo to study the well-timed decoupling and following load shedding to ensure continued operation following faults and to avoid the total loss of the refinery, the scope of work includes the following activities as following:

- Data collection
- ETAP modeling for the electrical network considering national electrical network interconnection
- Data verification
- Load flow analysis
- Transient stability study
- Decoupling device and load shedding study
- Decoupling device setting

Owner/Client: MIDOR ELECTRICITY CO. “MIDELEC”
Location: Alexandria
Date of Award: June 2020
Project Contractual Duration: 4 Months
Scope: Engineering Studies Services
Status: Completed
MIDELEC POWER GENERATION
56 MW EXPANSION PROJECT

PLANT DESCRIPTION:
It’s an expansion project to add a fourth unit 56 MW Siemens GT to its Power Generation capacity to connect it to the existing 3 Gas turbines units Power Generation facilities and to carry out certain modifications to those existing facilities to receive the forth GT as well as to improve maneuverability and operability of the Power Generation Plant.

Owner/Client: MIDOR Electricity Co
Location: Alexandria
Date of Award: November 7, 2019
Project Contractual Duration: 18 Months
Scope: Consultancy Services Agreement
Status: On going
POWER STUDY FOR POWER HOUSE AT RAS SHUKEIR

PLANT DESCRIPTION:
The scope of work was a conceptual design study with the objective to establish the actual reserve power available at the Ras Shukeir Power House to evaluate against the power demand of water desalination plant. The assessment of the reserve power level available involved evaluation of the existing facility and the expected power demand. The scope of the Engineering Services of the conceptual design power study consists of powerhouse visit, data collection, capacity testing of all gas turbine sets, Power system study, conclusion and Recommendation.

Owner/Client: Gulf of Suez Petroleum Company - GUPCo

Location: Ras Shukeir/Sinai/Egypt

Date of Award: August 31, 2016

Project Contractual Duration: 8 weeks

Scope: Power Study

Status: Completed
MIDELEC INSULATORS REPLACEMENT STUDY

PLANT DESCRIPTION:
PGESCo scope is preparing a tender and invite interested tenderers to execute a limited operation for replacing the porcelain insulators with rubber insulators of MidElec 66kV OHTLs (M1, M2 & M3) and applying RTV protective coatings as needed.

The outline of the intended work will include the listed below activities:
PGESCo scope is preparing a tender and invite interested tenderers to execute a limited operation for replacing the porcelain insulators with rubber insulators of MidElec 66kV OHTLs (M1, M2 & M3) and applying RTV protective coatings as needed.

The outline of the intended work will include the listed below activities:
Phase 1 (11 weeks)
- Surveys (for Site and Market).
- Tender Preparation including General, Special Conditions and technical requirements.
- Invitation to Tenderers.
- Receiving/Responding to Tenderer Clarifications (if any).
- Receiving offers and Evaluation.

Phase 2 (First quarter of 2021)
- Construction & installation supervision and management.

Owner/Client: MIDOR Electricity Co. “MIDELEC”
Location: Alexandria
Date of Award: September 2020
Project Contractual Duration: 4 Months
Scope: Engineering Studies Services
Status: On going
DEMOCRATIC REPUBLIC OF THE CONGO STUDY

PROJECT:
Consultancy Services (Firm) In Charge of The Study of The Works of The Photovoltaic Power Plant In Tshipuka In The Province Of Kasai-Oriental.

PLANT DESCRIPTION:
- The feasibility study relating to the realization of a photovoltaic solar installation connected to the grid should cover the various aspects related to these projects, namely:
  - Technical aspects: determination of the available solar resource, sizing of the installations, criteria for choosing the installation sites, components of the installations and their technical characteristics, estimation of the electrical energy produced, analysis of the possibilities of connection to the electrical network, etc.
  - Economic and financial aspects: investment costs, operating and maintenance costs, evaluation of savings on the electricity bill or the annual gains generated, main financial parameters of the project (NPV, IRR, return time, etc.), study the sensitivity of factors.
  - Environmental and Social Impact studies of the power plant and of the connection station to the main network, as well as of the possible connection line. The expected results are:
    - The finalization and validation by the competent authorities of the country, of the TFPS of the ESIA report (EvIES, PAR and PGES), to support the establishment of project financing;
    - The issuance of the Environmental Permit to allow the implementation of the project.
    - Development of the constituent elements of the tender dossier in accordance with Congolese legislation.

Owner:/Client: Fonds de Promotion de l'Industrie
Location: Democratic Republic of the Congo
Date of Award: August 2020
Project Contractual Duration: 12 Months
Scope: Consultancy and Engineering Studies Services
Status: On going
TARIFF PRICE STUDY FOR AL KHAIKAT, RUMAILA & SHATT AL BASRA POWER PLANTS

PLANT DESCRIPTION:

Provide consulting services for the financial modeling of the Power Tariff price for green field plants and O&M tariff price for brown field plants. The scope includes:

- Preparation of clarifications/questionnaire for data gathering, perform technical.
- Review and assessment for the proposed plants data.
- Thermodynamic modeling preparation to support the future estimation of the plants performance.
- Financial modelling, cost estimating to support financial modelling, perform and conduct the financial model runs.
- Prepare, attend and issue minutes for workshops in Iraq to review the report.
IRAQ

**Owner/Client:** Ministry of Electricity of Iraq

**Location:** Iraq

**Date of Award:** October 30, 2019

**Project Contractual Duration:** 9 weeks

**Scope:** Consultancy Services Agreement

**Status:** Completed
MESTURKUAZ – HEAVY FUEL OIL TREATMENT PLANT

PLANT DESCRIPTION:

Oil & Gas
Heavy Fuel Oil Treatment plant

Prepare the Specification & Flow Diagrams for HFO Treatment Plant.
Owner/Client: Mesturkuanz

Location: Mesturkuanz, Istanbul, Turkey

Date of Award: December 01, 2016

Project Contractual Duration: months

Scope: Technical Services Agreement

Status: Completed
GAS TURBINES INLET AIR COOLING STUDY

Year: 2010
Client/Project: EEHC/Giza North & Banha
Description: A case study for the effect of inlet air-cooling to the gas turbine on power augmentation.

COMPARATIVE STUDY OF CONVENTIONAL BURNERS VS DLN BURNERS FOR GE MACHINE FRAME 9E AL SHABAB POWER PLANT

Year: 2012
Client/Project: EDEPC/AL Shabab & West Damietta
Description: Comparative study between the DLN and conventional burners for GE gas turbines in Kharafi projects to help the owner to tack the decision to change the burners to DLN ones.

DIFFERENT COOLING TECHNOLOGIES STUDY - COOLING TOWER, AIR COOLED CONDENSER & ONCE THROUGH SYSTEMS

Year: 2013
Client/Project: EEHC/AL Shabab & West Damietta
Description: Comparative study for using different condenser cooling technologies for West Damietta CCPP Steam Add-on and Introduction to the new application of ACC to help the owner decide to use the ACC in future projects.

CO-GENERATION POWER PLANT- COMBINED CYCLE WITH DESALINATION METHODS

Year: 2015
Client/Project: EEHC/EDEPC/IPP
Description: A comparison between the different methods of seawater desalination, to help the customer in choosing the optimum solution.
PROPER SELECTION OF WATER TREATMENT SYSTEM

Year: 2012

Client//Project: UEEPC/South Helwan

Description: An introduction to new technologies in water treatment systems and to help the owner to properly select the suitable WT system to the project.

SUPERCritical VS SUBcritical POWER PLANTS

Year: 2014

Client//Project: UEEPC/Assiut

Description: Comparison between the super-Critical vs Sub-Critical power plants to help the owner to decide whether to convert the plant to super-critical or not.

PRE-FEASIBILITY STUDY FOR THE COAL FIRED POWER PLANT 2X700 MW- 800 MW

Year: 2014

Client/Project: Orascom Construction /International Petroleum Investment Company

Description: The Pre-feasibility study report developed over two stages where the first stage is to issue the “Draft Baseline Report” that shall address all technical opportunities and approaches, this stage shall conclude base configuration of the power plant, selected technology, Coal parameters, supply and logistics to be used as inputs for the second stage of “Inputs to Financial Modeling.”
FEASIBILITY STUDY FOR THE COAL FIRED POWER PLANT
2X700 MW - 800 MW

Year: 2015

Client/Project: Orascom Construction / International Petroleum Investment Company

Description: Feasibility study report developed where, this stage concludes base configuration of the power plant, selected technology, Coal parameters, supply and logistics to be used as inputs for the second stage of "Inputs to Financial Modeling. Also includes developing the RFP specification.

CO-GENERATION POWER PLANT - LIBYA

Year: 2010

Client/Project: Arabian Consulting Engineering Services Company

Description: Introduction of different configurations of cogeneration plants to produce electric power and desalinated water.

STEAM ADD-ON COMBINED CYCLE - IRAQ

Year: 2013

Client/Project: Orascom Construction / Baiji

Description: Evaluation and optimization of steam add-on CC power plant for the existing GTs firing HFO, as an upgrade for the Baiji project. The study included the steam parameters and pressure levels of the heat recovery steam generators. Also, the study included the cooling technologies to suit the existing plant.
PRELIMINARY ECONOMICAL STUDY FOR 1X650 MW SUPERCritical THERMAL PLANT VERSUS 1X850 MW SUPERCritical THERMAL PLANT

Year: 2012

Client/Project: EEHC/CEPC / EGYPT

Description: This study was prepared in order to compare the economical aspects of implementing two different approaches of implementation a thermal power plants.

FEASIBILITY STUDY COMBINED HEAT & POWER PROJECT (WADI)

Year: 2013

Client/Project: Wadi Group / EGYPT

Description: A study was carried out to investigate the feasibility of utilizing cogeneration plant (Combined Heat & Power system). to provide steam to the Wadi Food Olive oil extraction process through new Steam generators and provide power from small gas turbines to act as primary source of power while utility connection remain as backup.
REVIEW BENCHMARK POWER PLANT PROJECT FEASIBILITY STUDY

Year: 2013
Client/Project: Benchmark / EGYPT
Description: Review Benchmark feasibility study for a 750MW combined cycle IPP project.

WEST DAMIETTA POWER PLANT CONVERSION PROJECT - COOLING WATER SYSTEM COMPARISON STUDY

Year: 2013
Client/Project: EEHC / EGYPT
Description: This study was prepared to study the technical and economic feasibility for the use of different cooling systems.

ASSIUT THERMAL POWER PLANT 1X650 VERSUS 1X850 MW

Year: 2014
Client/Project: EEHC / UEEPC / EGYPT
Description: This study was prepared in order to compare the economic aspects of two different approaches of upgrading the capacity to the Egyptian grid.

EL MAHMOUDIA POWER PLANT

Year: 2014
Client/Project: Beltone private equity / EGYPT
Description: The Baseline Study describes the initial analysis of the technical and economic parameters for the implementation of new proposed 480MW Mahmoudia Combined Cycle Power Plant and presents the concept of the project.
ECONOMICAL STUDIES
ASSIUT THERMAL POWER PLANT 1X650 MW VERSUS 1X730 MW

Year: 2014

Client/Project: EEHC / UEEPC / EGYPT

Description: This study was prepared in order to compare the economic aspects of two different approaches of upgrading the capacity to the Egyptian grid.

20MW PHOTOVOLTAIC STUDY

Year: 2015

Client/Project: Internal Use / EGYPT

Description: The study is implemented to measure the feasibility and return on investment for PGESCo to penetrate the photovoltaic Egyptian IPP market.

BAIJI POWER PLANT COMBINED CYCLE CONVERSION - IRAQ

Year: 2013

Client/Project: Orascom Construction / Ministry of Electricity / IRAQ

Description: This study was prepared in order to compare the economic aspects of two different approaches of upgrading the capacity of BAIJI simple cycle power plant to combined cycle power plant.
OBARI SIMPLE CYCLE CONVERSION TO COMBINED CYCLE FEASIBILITY STUDY

Year: 2013

Client/Project: General Electricity Company of Libya/Arabian Consulting Engineering Services Company / LIBYA

Description: This study was prepared in order to compare the economic aspects of two different approaches of upgrading the capacity of Obari simple cycle power plant to combined cycle power plant.

SARIR SIMPLE CYCLE CONVERSION TO COMBINED CYCLE FEASIBILITY STUDY

Year: 2013

Client/Project: General Electricity Company of Libya/Arabian Consulting Engineering Services Company / LIBYA

Description: This study was prepared in order to compare the economic aspects of two different approaches of upgrading the capacity of Sarir simple cycle power plant to combined cycle power plant.

WESTERN MOUNTAIN SIMPLE CYCLE CONVERSION TO COMBINED CYCLE FEASIBILITY STUDY

Year: 2013

Client/Project: General Electricity Company of Libya/Arabian Consulting Engineering Services Company / LIBYA

Description: This study was prepared in order to compare the economic aspects of two different approaches of upgrading the capacity of Western Mountain simple cycle power plant to combined cycle power plant.

BOMBA DESALINATION PROJECT FEASIBILITY STUDY

Year: 2010

Customer/Project: General Electricity Company of Libya/Arabian Consulting Engineering Services Company/ LIBYA

Description: This study was prepared in order to compare the economical aspects of two different approaches of upgrading the capacity of Bomba desalination plant.
XI- TENDERS DOCUMENTS

LIBYA
MISURATA CO-GENERATION POWER PLANT (700 MW + 100,000 M³/DAY) TENDER DOCUMENTS
Completed 2010

PGESCo scope included conceptual design development and EPC tender preparation by PGESCo's team at the Cairo office.

TUBROK CO-GENERATION POWER PLANT (600 MW + 100,000 M³/DAY) TENDER DOCUMENTS
Completed 2010

PGESCo scope included conceptual design development and tender document preparation for six packages and purchase orders. They also assisted the Owner with bid evaluations and award recommendation report preparation.

SABHA AND SARIR SIMPLE CYCLE POWER PLANTS TENDER DOCUMENTS
Completed 2009

PGESCo scope included conceptual design development and tender document preparation for six packages and purchase orders. They also assisted the Owner with bid evaluations and award recommendation report preparation.
MASTER PLAN OF THE MAIN SUPPLY AND TRANSMISSION GAS PIPELINES AND CITY GAS DISTRIBUTION NETWORKS STUDY

Completed 2009

The main report objective was to determine the optimum Gas Master Plan in terms of required transmission capacity taking into account gas demand, gas supply and their locations. PGESCo teamed with ACESCo/Tractabel to provide the base design and tender documents for the construction of four transmission pipelines and two area distribution networks.

FEASIBILITY STUDIES OF TOBRUK, TRIPOLI AND BENGHAZI DESALINATION AND POWER CO-GENERATION PLANTS STUDY

Completed 2009

The feasibility studies included technical and economical optimization for each site (Tobruk, Tripoli and Benghazi) to allow for the most flexible water and power production. The cogeneration plants configuration varied from 400 MW to 750 MW power production and 250,000 m³/day to 500,000 m³/day water production.
XII - INDUSTRIAL PROJECTS
BORG AL-ARAB POWER PLANT - II EXTENSION

PLANT DESCRIPTION:

It's an extension project to add approximately extra 40 MW to its existing Power Generation Plant Phase I - 30 MW.
Owner/Client: Kahraba National Electricity Technology Company

Location: Borg Al Arab City, industrial zone, 50 km South West of Alexandria city

Date of Award: June 2020

Project Contractual Duration: 6 Months

Scope: Consultancy Services Contract

Status: on going
ELMACO TRANSFORMERS FACTORY PROJECT

PGESCo scope of services included Engineering, Procurement and Construction Management for ELMACO Transformers factory.

ELMACO Transformers factory is an industrial complex owned by EL NASR TRANSFORMERS AND ELECTRICAL PRODUCTS Co. and located at BADR City, Egypt.

The factory represents a complex for the supply and construction of power and distribution transformers, the complex consists of:

- Twelve (12) steel structure building for transformers fabrication processes.
- Thirty four (34) concrete skeleton building including auxiliary building and services buildings.

This complex shall help ELMACO to be a market-driven company and to diversify its products. New products shall be manufactured such as:

1. Dry type transformers winding and assembly hall and test field.
2. 220 kV power transformers assembly hall and test field.
Owner: EL NASR TRANSFORMERS AND ELECTRICAL PRODUCTS Company

Award Date: January 2009

Project Contractual Duration: 24 months

Scope: Engineering, Procurement, and Construction Management Services
Owner: National Electricity Technology Co. “KAHRABA”

Award Date: January 2015

Project Contractual Duration: 14 months

Scope: Engineering, Procurement, Project and Construction Management Services
BORG AL-ARAB 60 MW POWER PROJECT

PGESCo scope includes engineering, procurement and construction management services. The plant is owned to National Electricity Technology Co. “KAHRABA” is subsidiary of Egyptian Kuwait Holding Company licensed for producing and selling electricity.

The plant will include gas engine units rated for a total capacity of 60 MW and capable to continuously evacuate at part or full load in either grid or island mode.

The power will be generated at 11 kV, stepped up to 66 kV through two main oil transformers and evacuated through a new GIS substation within the property of the plant to the National Grid.
50,000,000 SAFE MAN HOUR

PGESCo proudly announces the achievement of 50,000,000 plus Safe Man-hours in South Helwan; three units of 650 MW capacity utilizing supercritical thermal technology.

Kudos to all dedicated participants and stakeholders, the commitments from the Project Executives and all Contractors Management to the Safety program planning and control, training adequacy and implementation altogether are highly represented in achieving those challenging targets.
PGESCO has been recognized by the Engineering News-Record ENR as one of the Top 225 International Design Firms for the year 2020; based on revenues deriving from services performed in 2019.

We are proud of this global recognition that comes as a reflection of the continued growth in our markets, our dedication and commitment throughout the years.