
PGESCO
PGESCo
FUTURE@FINGERTIPS

PGESCo “Who We Are”

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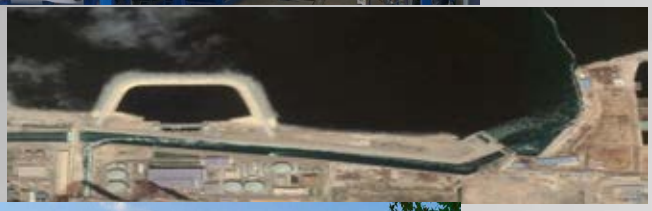

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HISTORY OF COMMITMENT

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.

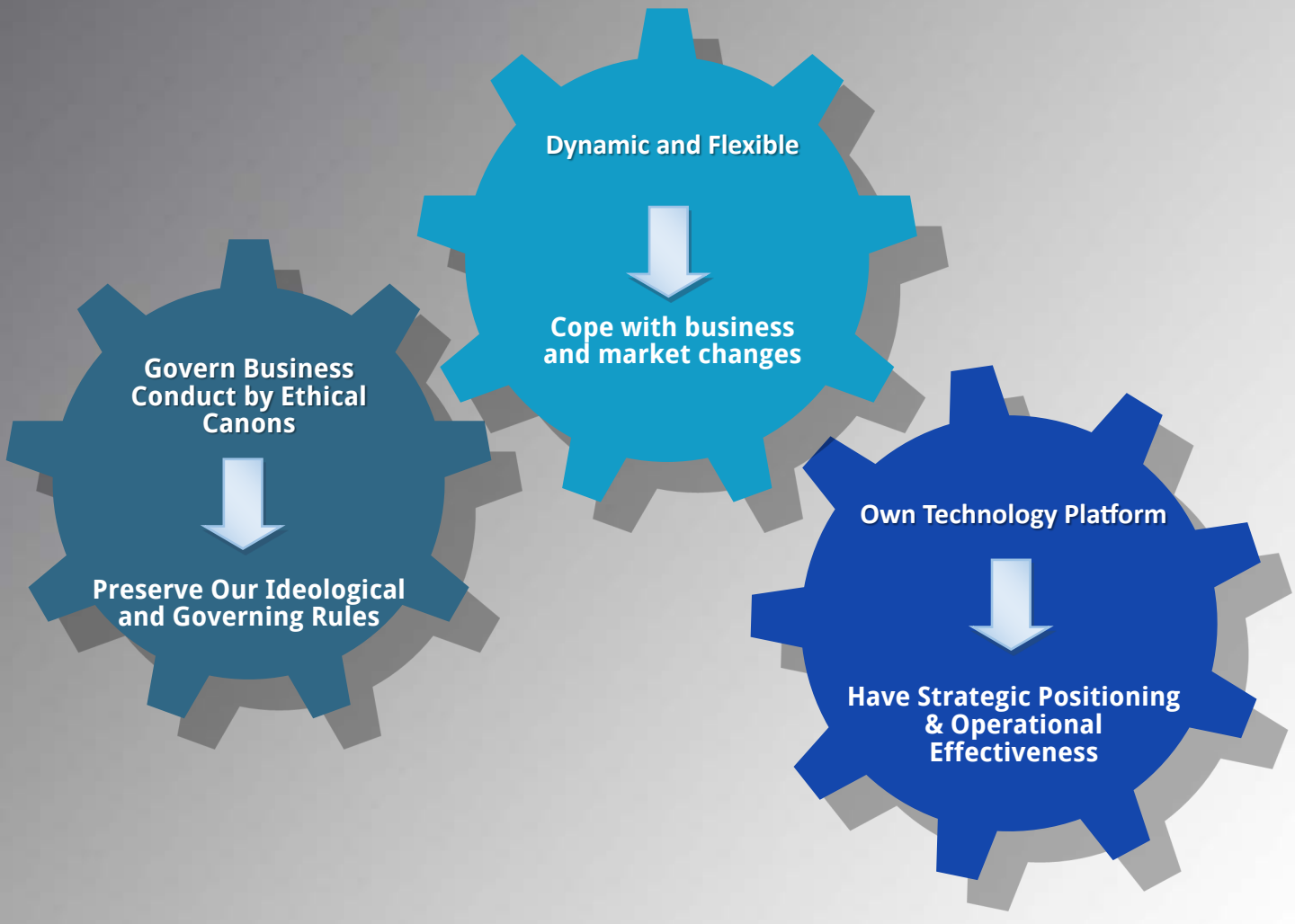
For more than two decades, we have manifested proven capabilities by providing land mark projects for energy and industrial sectors in Egypt and the MENA region with focus on timely response, safety, value and quality deliverables

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

TOWARDS THE YEAR 2020

STRATEGIC DIRECTION



PGESCo 2020

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

Owner: Middle Delta Electricity Production Company

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

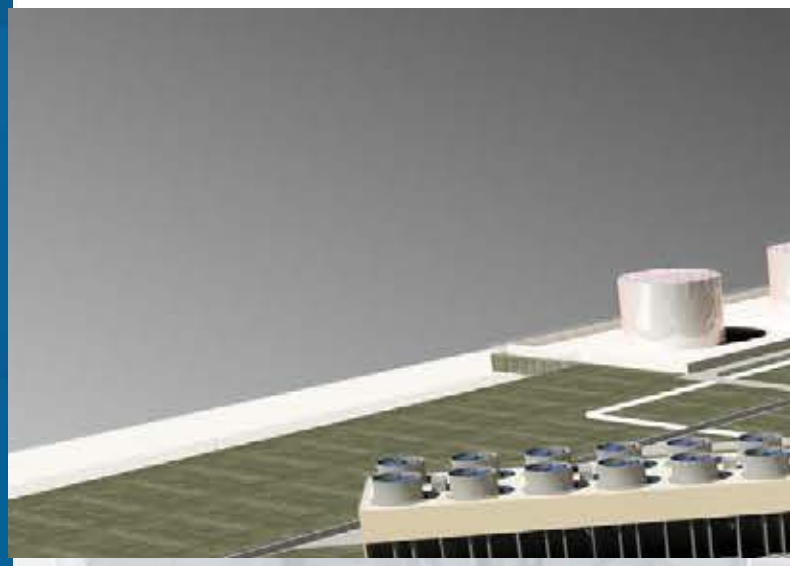
Location: Kafr El Sheikh, Egypt

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.

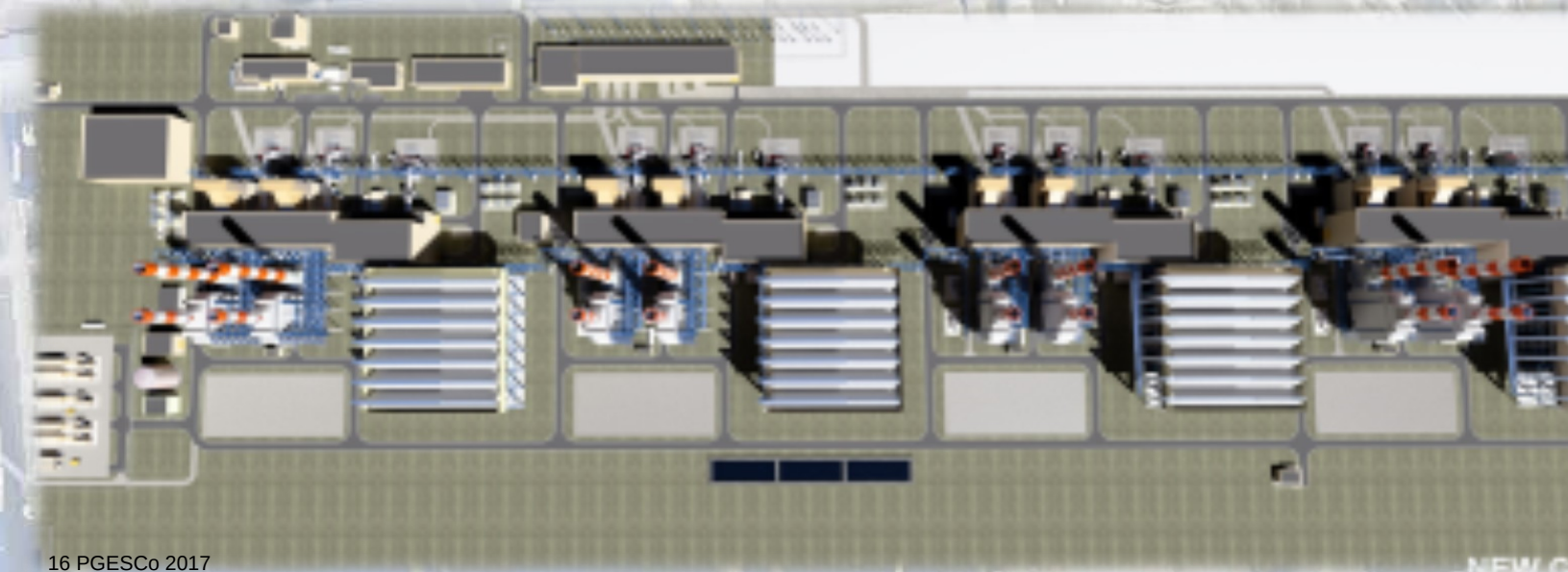
- Four (4) water cooled condensers with all required balance of plant systems.
- Four (4) cooling towers with all required balance of plant systems.
- The Plant utilizes Seawater as its Raw Water Source. The Plant is planned to be operated by Fuel Gas only. Two CTGs have the Capability to run on Light 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

PGESCO

Owner: Upper Egypt Electricity Production Company

Client: Orascom Construction
(GE'S 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

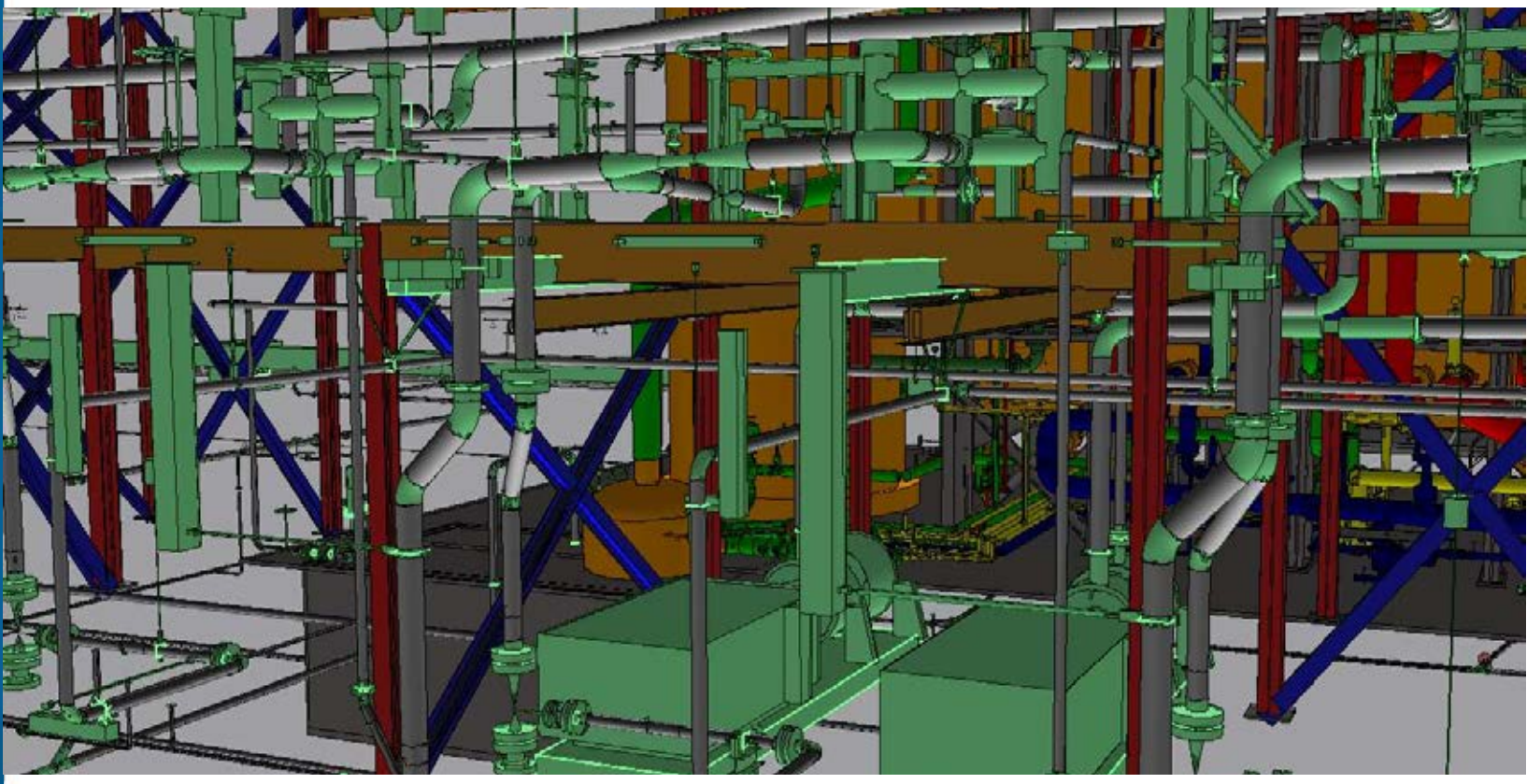
Status: on-going

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)

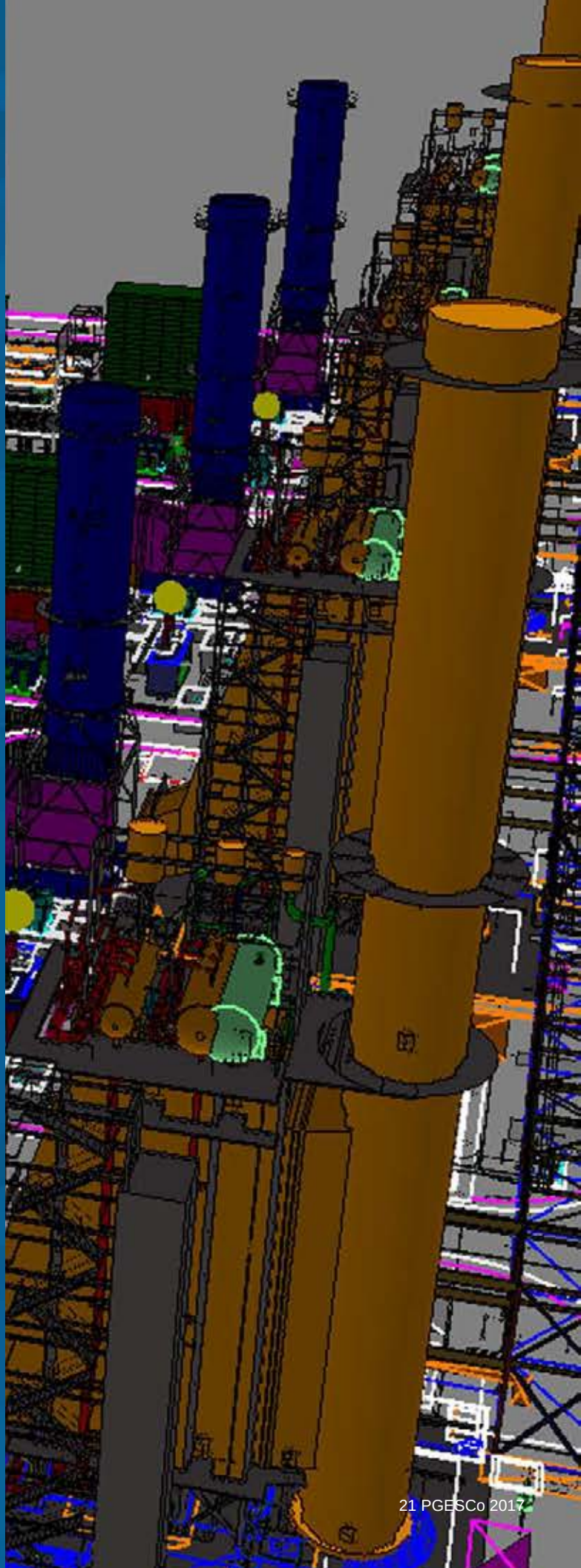
Location: Damietta, Egypt

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 over head 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

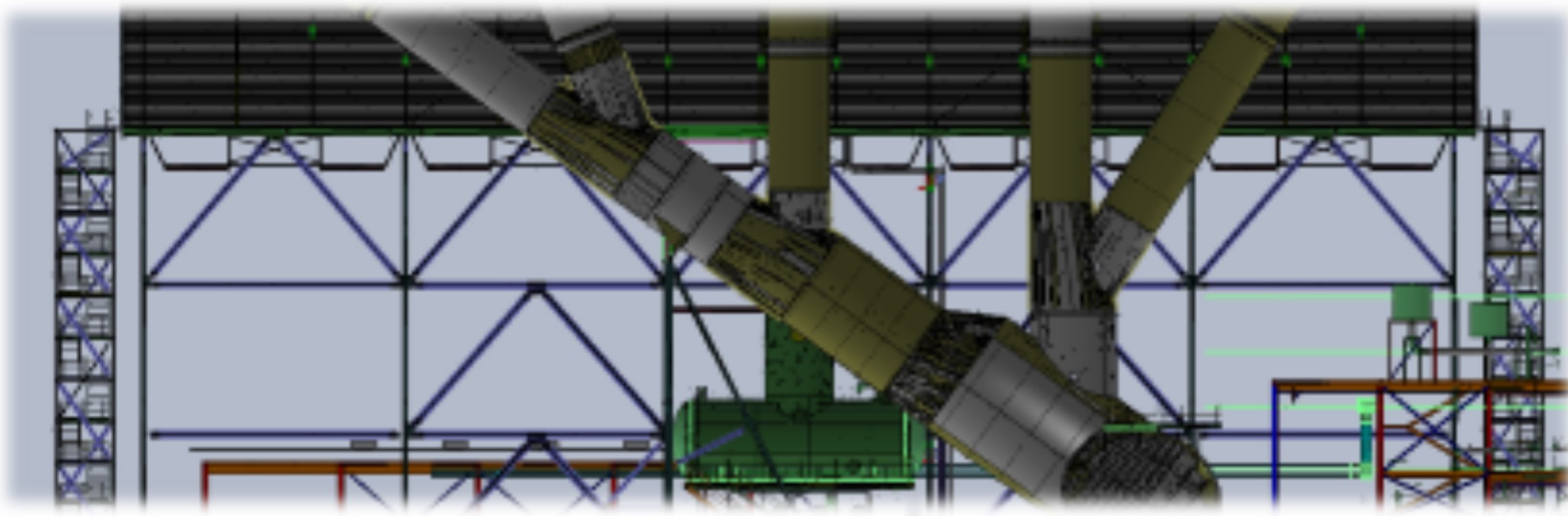
COMBINED CYCLE

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 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 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

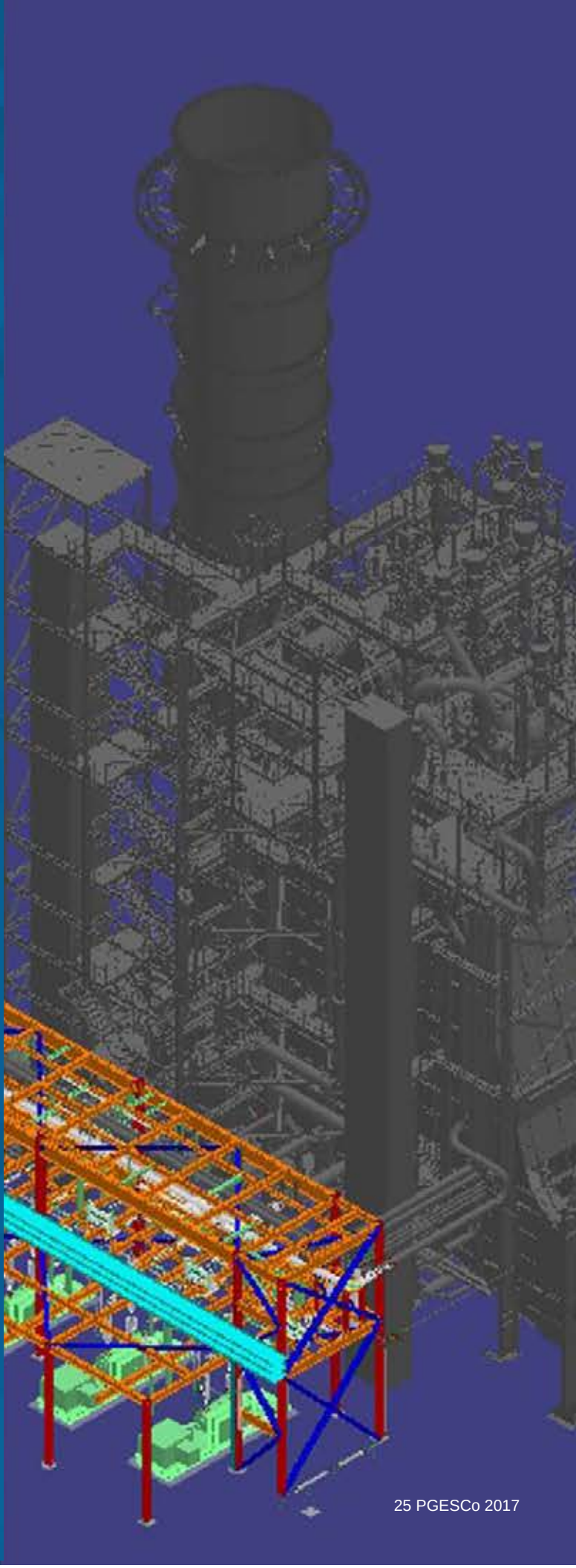
Date of Award: September 2013

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

BANHA POWER PLANT 750 MW

COMBINED CYCLE

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 con-trolled 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 Tawfiki 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

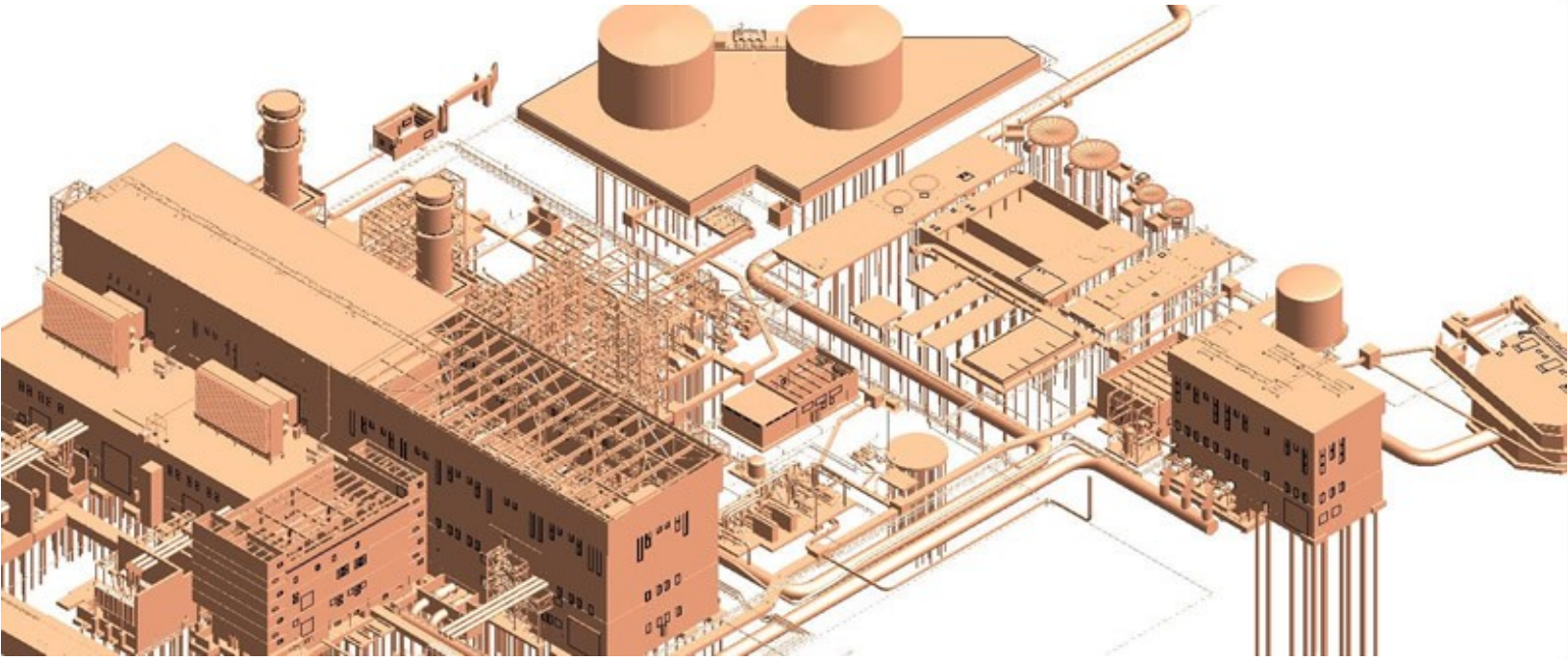
COMBINED CYCLE

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.

TALKHA POWER PLANT 750 MW

COMBINED CYCLE

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

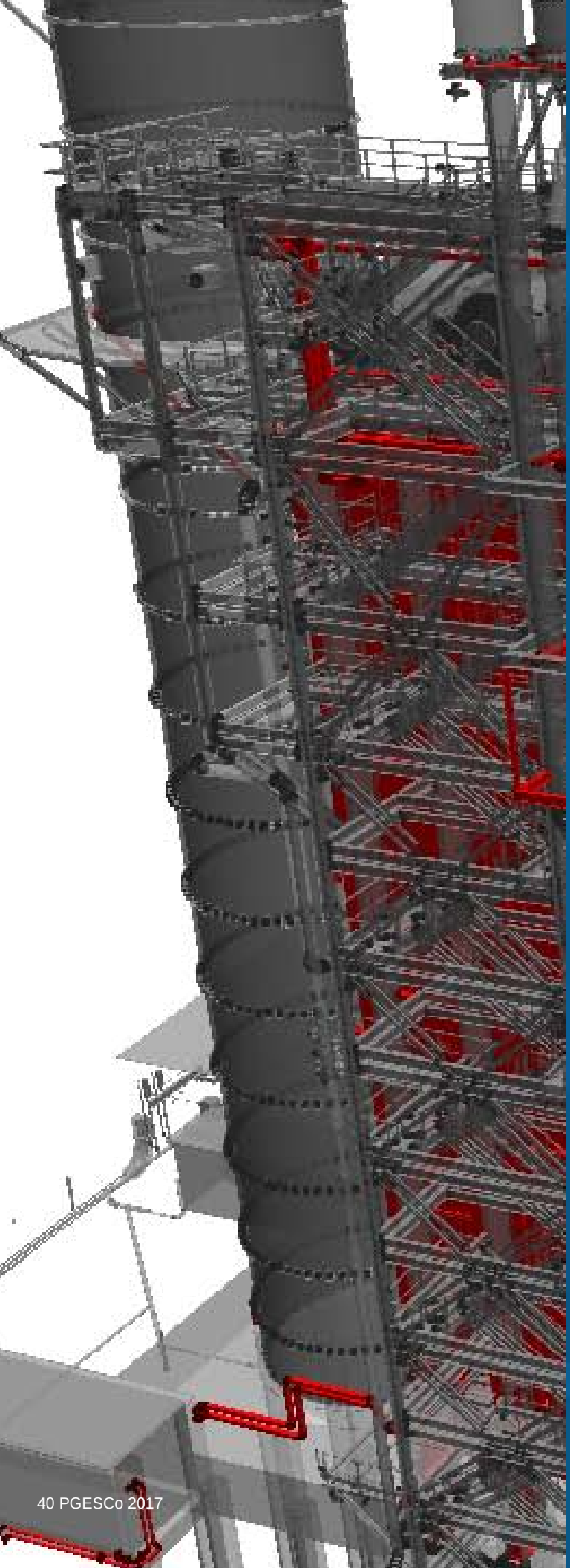
Date of Award: October 2003

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

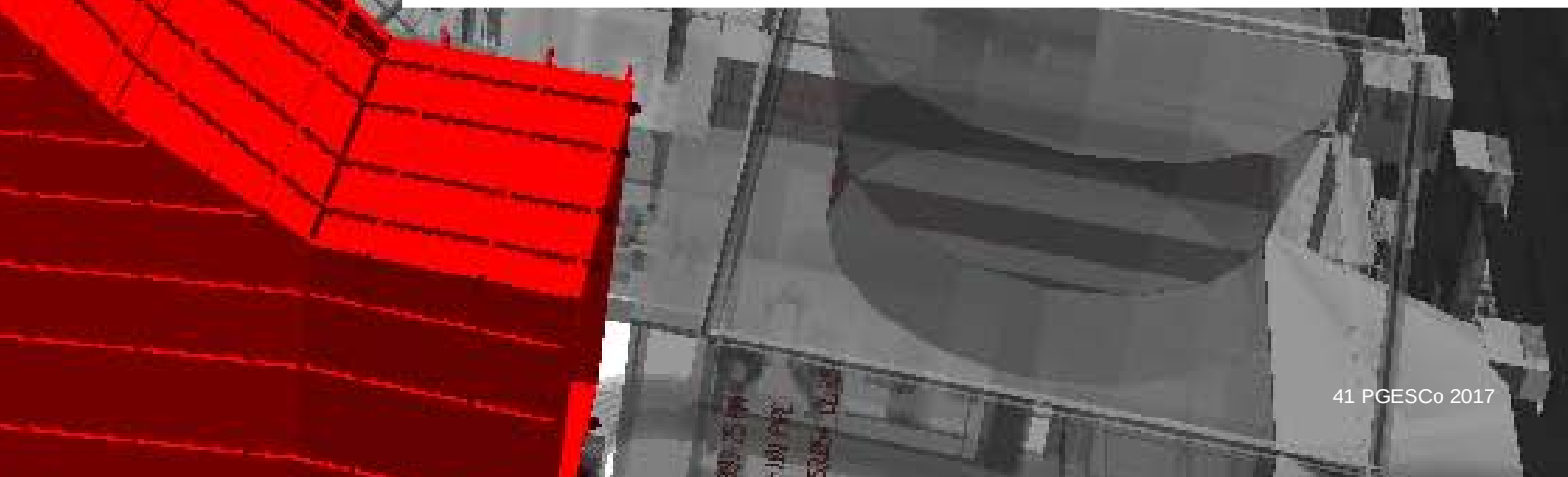
COMBINED CYCLE

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

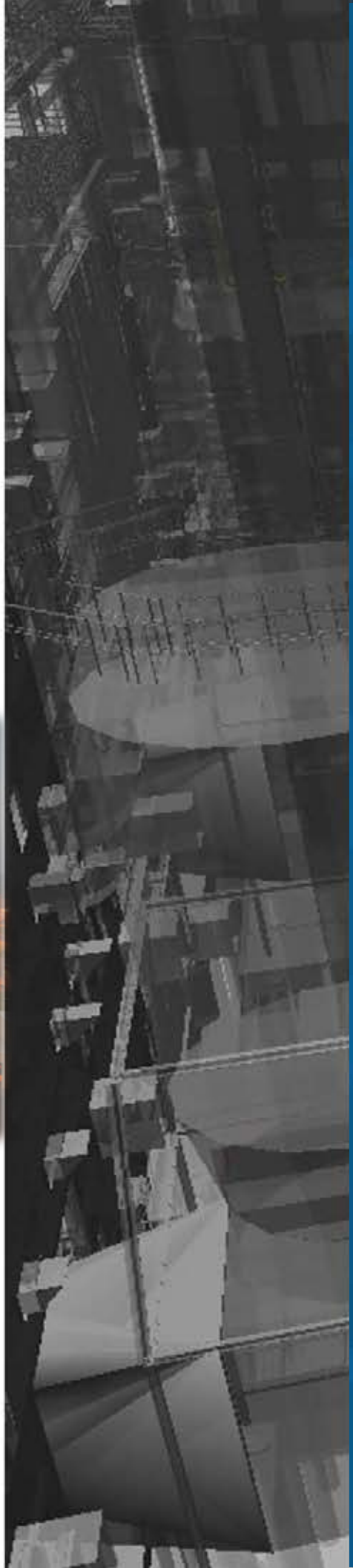
COMBINED CYCLE

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

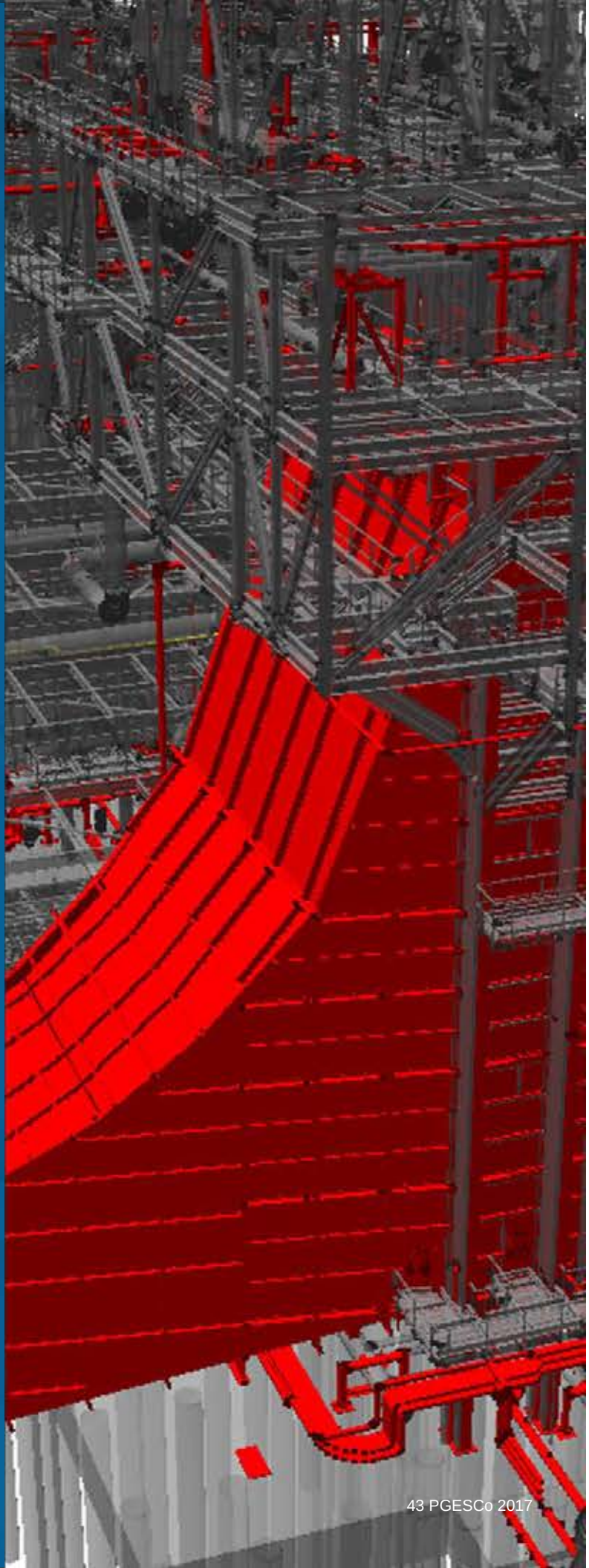
Date of Award: August 2002

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

UNITED ARAB EMIRATES

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.

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

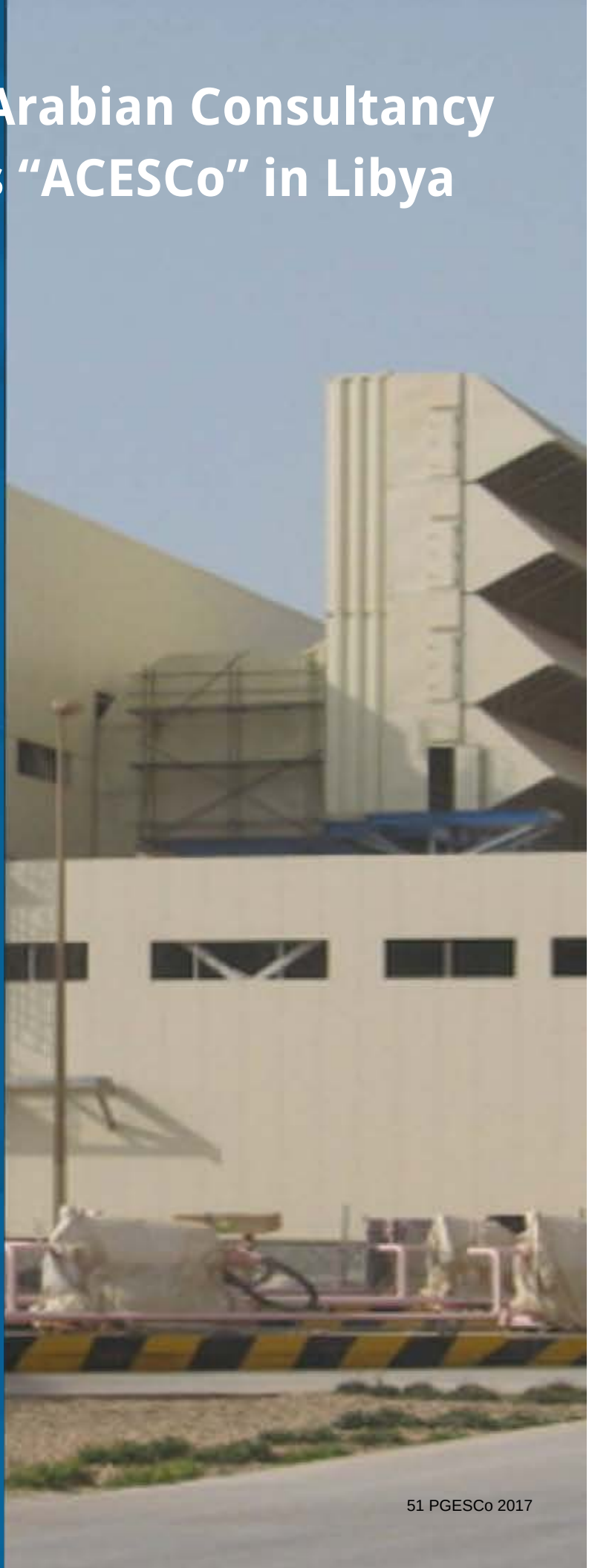
PGESCo scope included design review, site supervision and project management of Zawia Combined Cycle project. The scope also included plant equipment material inspection and performance testing.

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



II - SIMPLE CYCLE POWER PLANTS PROJECTS

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

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: 6th of October City, Egypt

Award Date: June 2013

Project Contractual Duration: 17 month

Scope: Engineering, Procurement, Project and Construction Management Services

Status: Completed

6th OF OCTOBER II POWER PLANT 4X160 MW

SIMPLE CYCLE

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

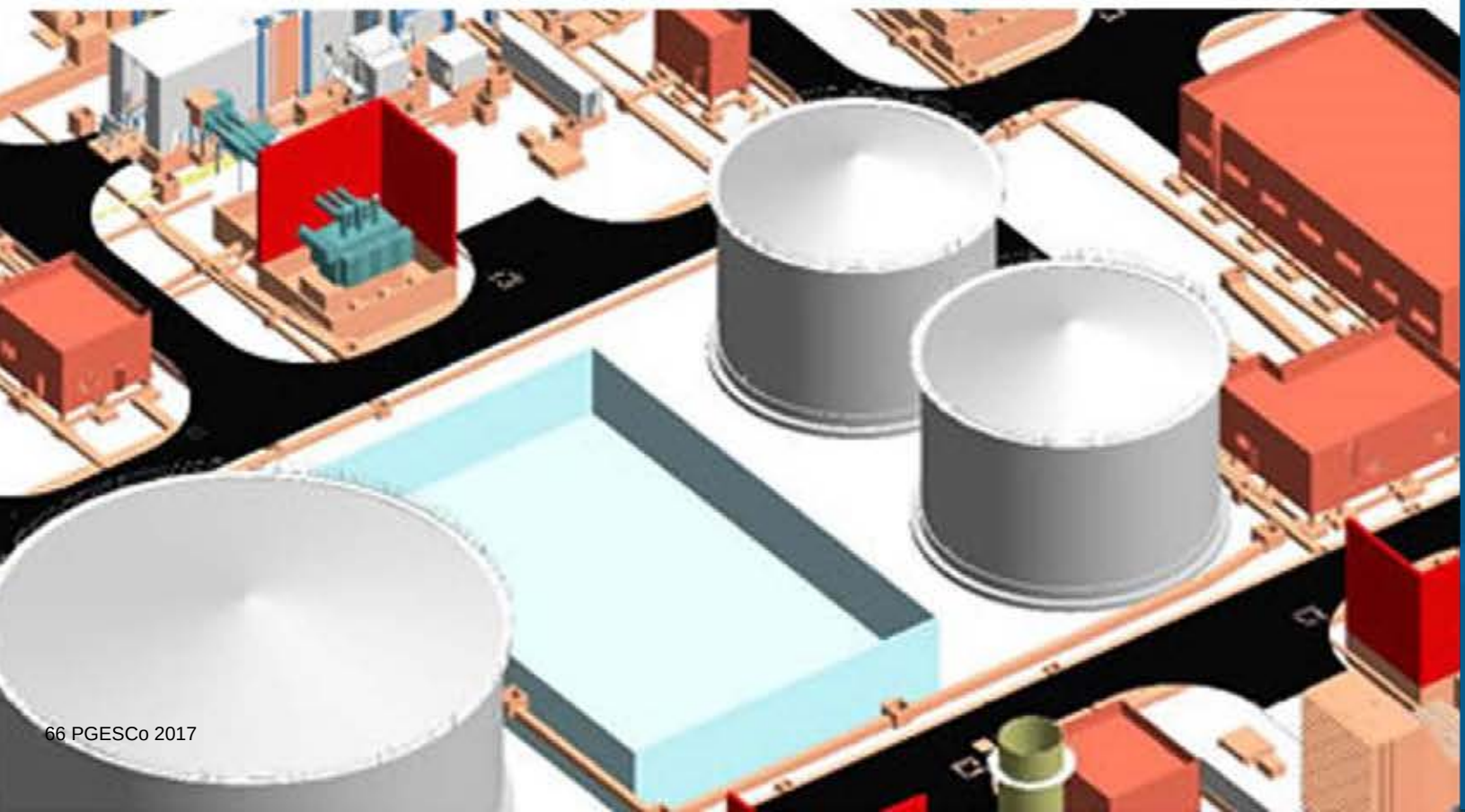
Al Shabab power project is a simple cycle power generation project located near the vicinity of the existing Al Shabab power station.

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

PGESCo

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

EGYPT

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.

ABU QIR POWER PLANT 2X650 MW

STEAM

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 Tebbin 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

AYOUN MOUSSA POWER PLANT 1&2 – 2X325 MW

STEAM

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

SIDI KRIR 3&4 POWER PLANT 2X340 MW - BOOT PROJECT

STEAM

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

GHAZLAN POWER PLANT

STEAM - 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.

SAUDI ARABIA

SYRIA

ALEPPO POWER PLANT 200 MW

STEAM - COMPLETED

In1996, 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

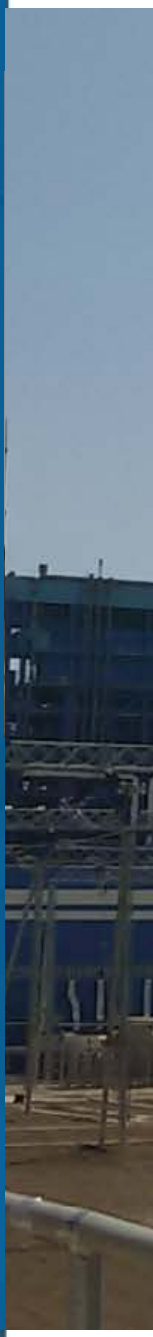
Location: Zobidia, Wassit Governorate, Iraq

Date of Award: May 2014

Project Contractual Duration: 12 months

Scope: Engineering Consultancy Services

Status: Completed



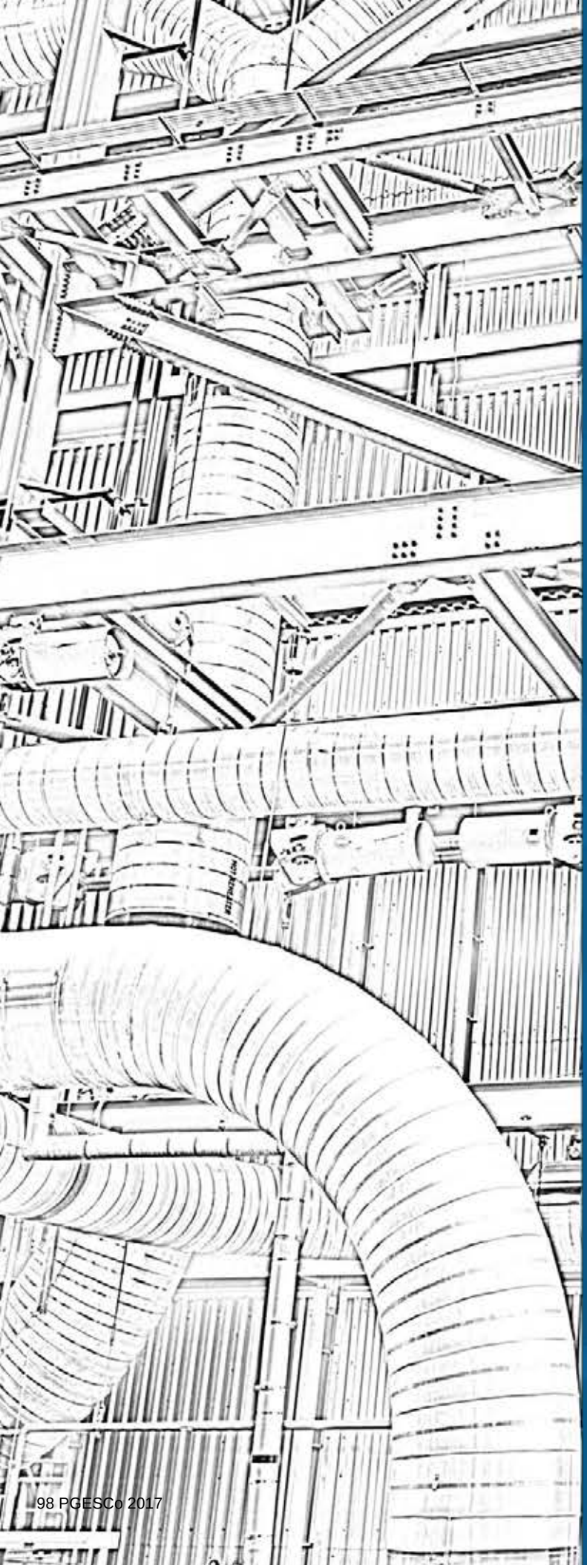
WASSIT PHASE II POWER PLANT 2X630 MW

STEAM

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.

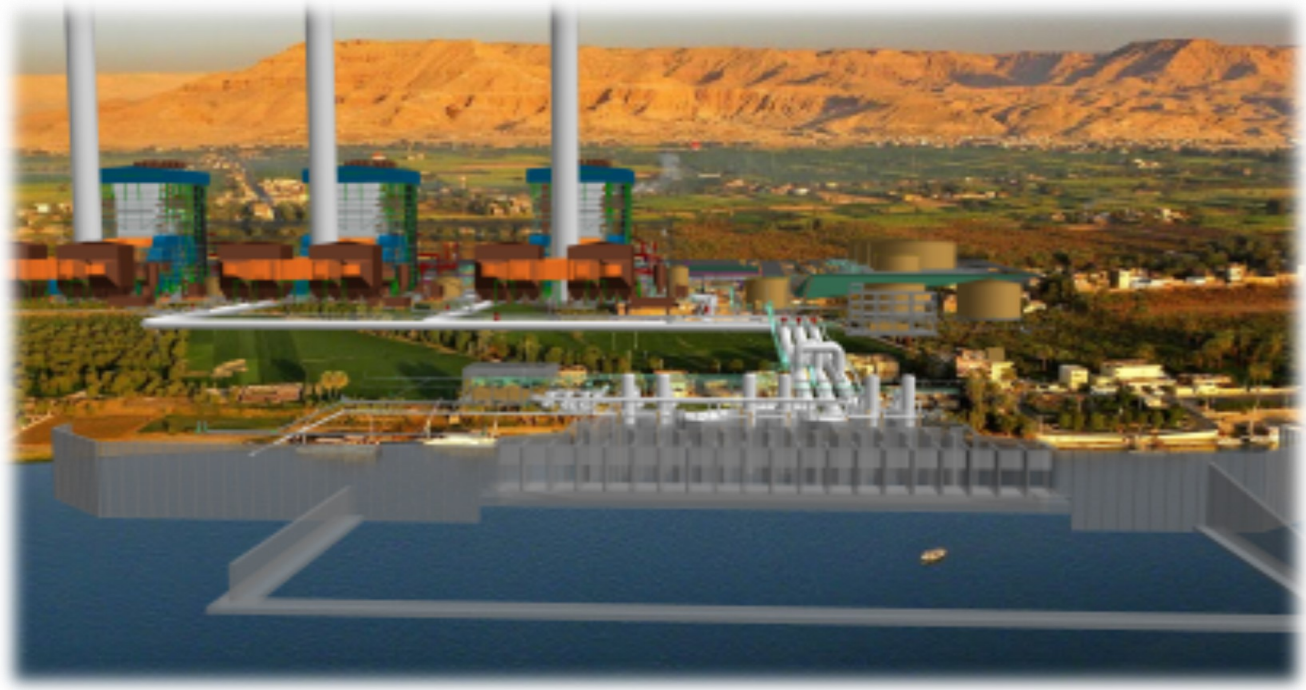
Status: On-going

SOUTH HELWAN POWER PLANT 3X650 MW

SUPERCRITICAL

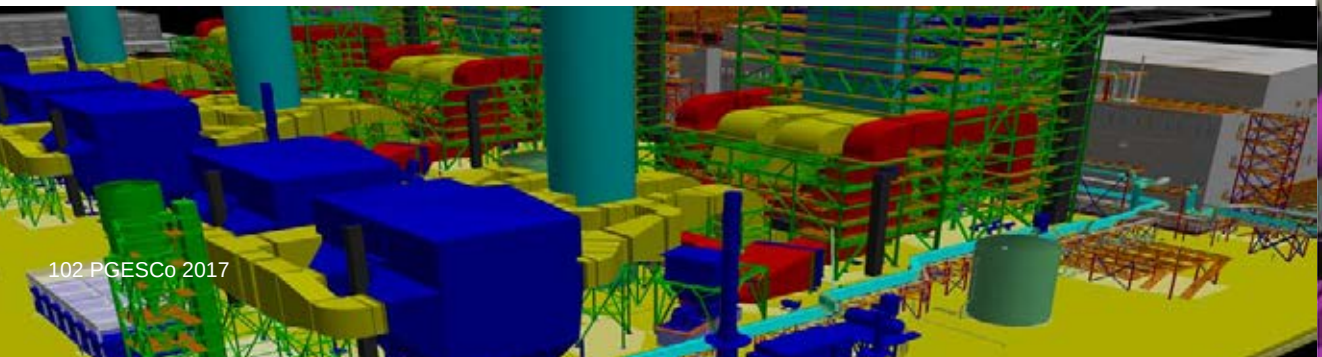
PLANT DESCRIPTION:

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

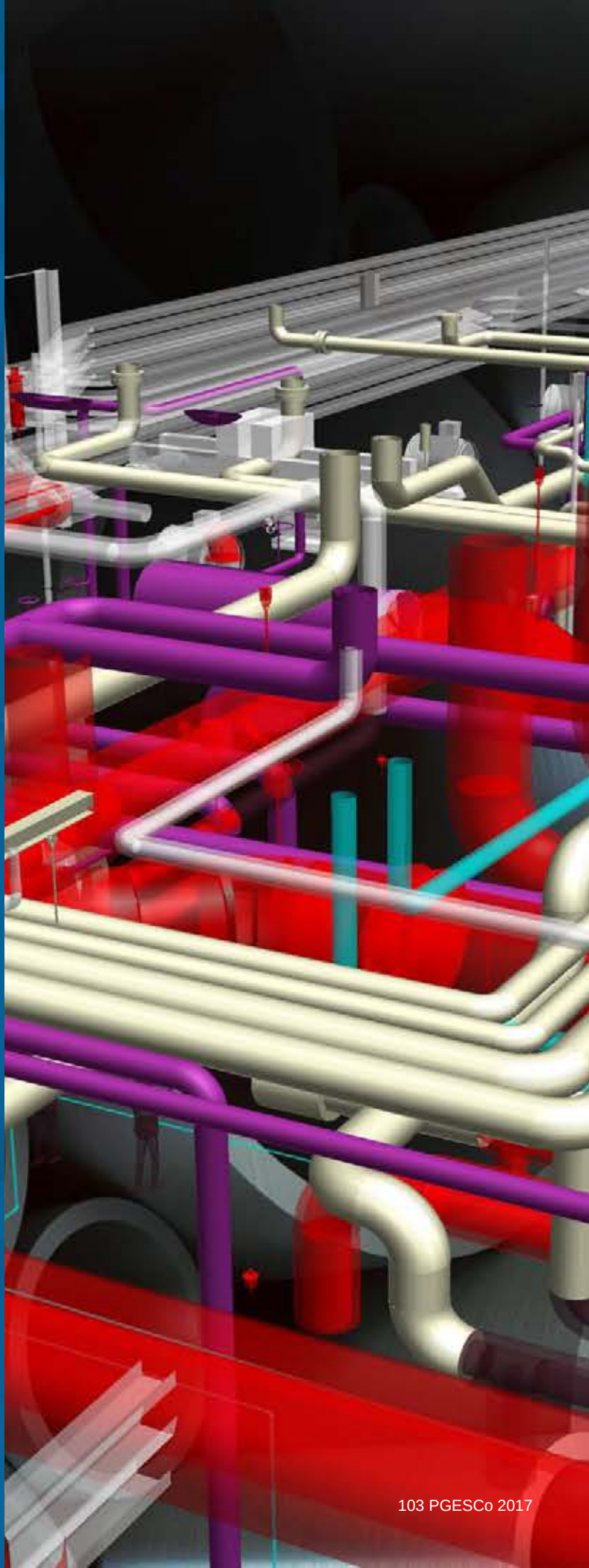
Award Date: October 2011

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: on-going



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 - PGESCO RENEWABLES PROJECTS

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.

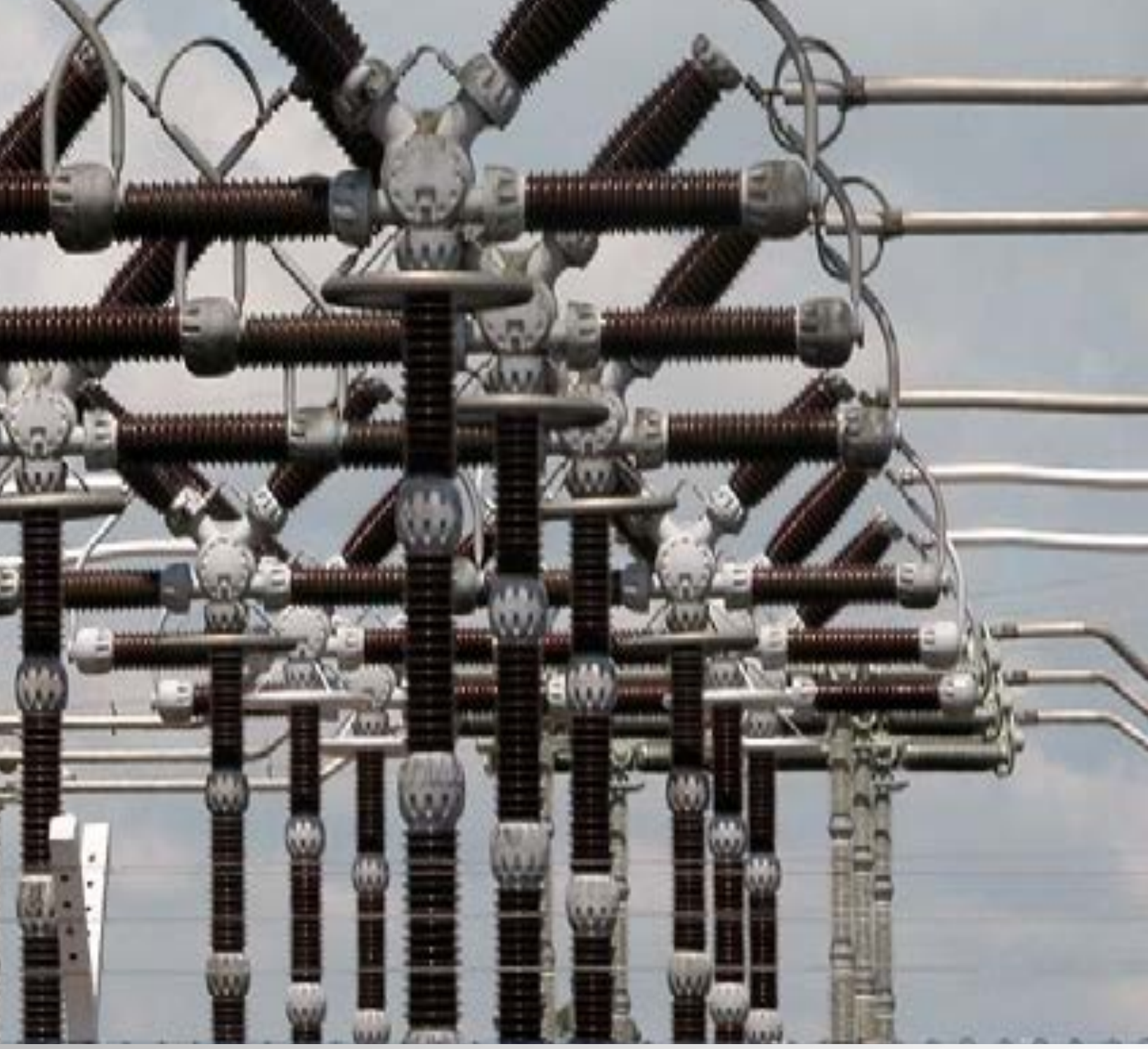
ROOFTOP ON-GIRD PV SYSTEMS

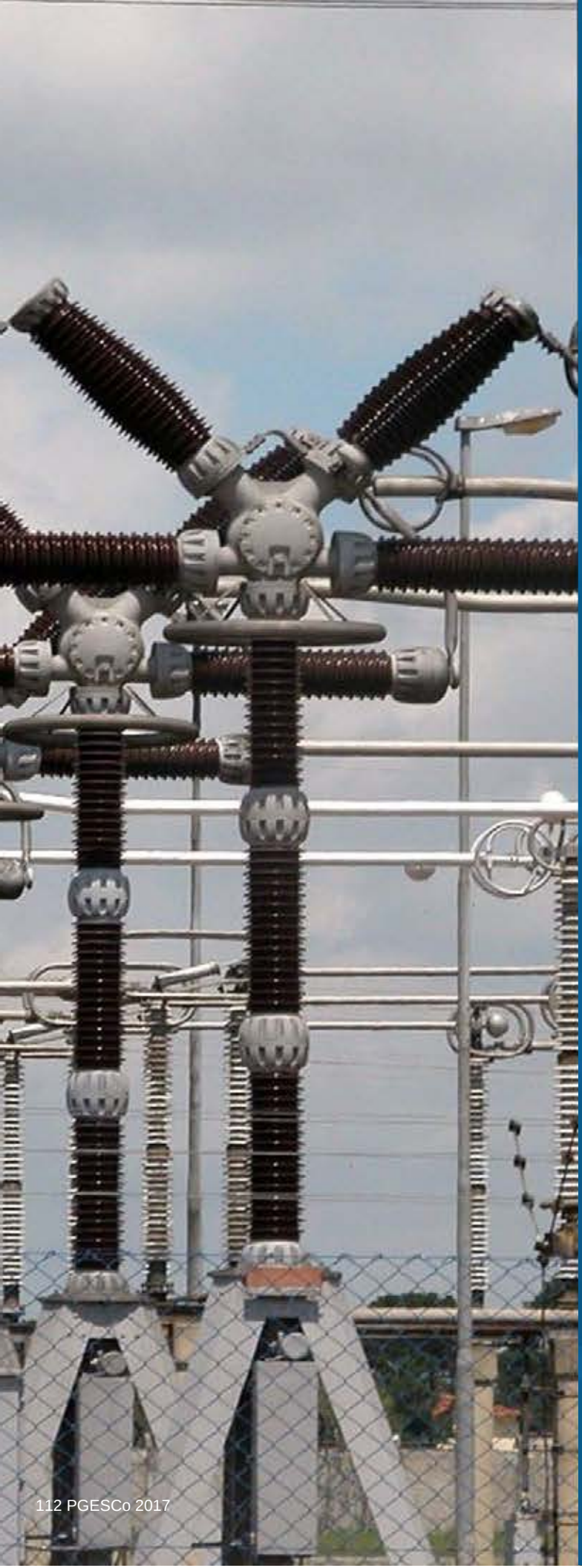
PGESCo has carried out the detailed design of 216 KWp rooftop on-gird PV systems inside Al-Shabab and West Damietta Power Plants.

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.

VI - SUBSTATIONS AND OHTL





EGYPT

SUBSTATIONS

Substations implemented by PGESCo

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

All the listed substations are within Power Plants and included 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

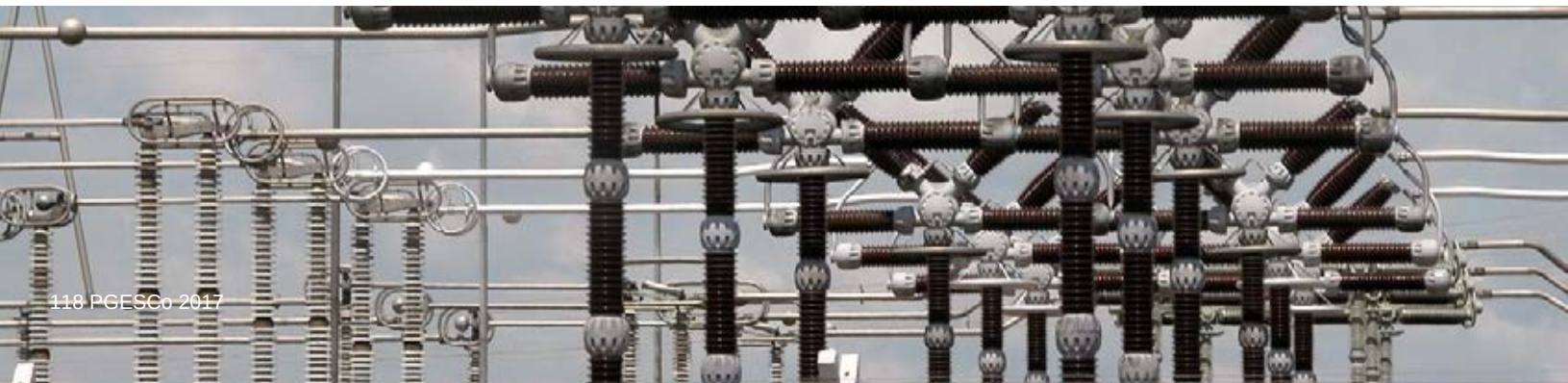
1) Implemented Projects

	Substation	Sub-contractor	Year	Equipment Type/ Rating	Configuration
1	**SIDI KRIR** 220 kV	Groupe Schneider	1995	220 kV GIS (Hexablock H9S), Busbar rating: 245 kV, 4000 A, 40 kA, 1sec, Breaker rating: 2500 A	5 Diameters, Breaker and a half
2	**AYOUN MOUSA:**				
	500 kV	Cogelex Alsthom	1996	500 kV GIS (Gec Alsthom Type T155), Busbar rating: 525 kV, 3000 A, 40 kA, 1sec, Breaker rating: 3000 A 1 x 500/220 kV Tie Transformer	5 Bays, Double Busbar-Double Breaker
	220 kV	Cogelex Alsthom	1996	220 kV GIS (Gec Alsthom Type T105), Busbar rating: 245 kV, 3000 A, 40 kA, 1sec, Breaker rating: 3000 A	6 Bays and one Bus-Tie, Double Busbar, Single Breaker
3	**CAIRO NORTH** 220 kV	Siemens	2003	220 kV GIS (Siemens Type 8DN9), Busbar rating: 245 kV, 3150 A, 50 kA, 1sec, Breaker rating: 1600 A	6 Diameters and two Bus-Ties, Breaker and a half

	Substation	Sub-contractor	Year	Equipment Type/ Rating	Configuration
4	**NUBARIA I&II :**				
	Nubaria I&II 500 kV	Consortium: Japan AE, Sumitomo and Conisys	2005	500 kV AIS (Hitachi Power Systems), Busbar rating: 500 kV, 3000 A, 40 kA, 1sec, Breaker rating: 2000 A	11 Bays, Double Busbar-Double Breaker
		Consortium: Japan AE, Sumitomo and Conisys	2005	3 x 500/220 kV Tie Transformers (manufactured by ZTR)	
	Cairo 500 kV AIS exten-sion	Consortium: Japan AE, Sumitomo and Conisys	2006	500 kV AIS, Busbar rating: 500 kV, 3000 A, 40 kA, 1sec, Breaker rating: 2000 A	Single Bay, Double Busbar, Double Breaker
	Nubaria I&II 220 Kv	ABB	2003	220 kV AIS (ABB), Bus-bar rating: 245 kV, 3000 A, 40 kA, 1sec, Breaker rating: 1600 A	12 Bays Double Busbar-Single Breaker and one Bus-Tie
5	**NUBARIA III** 500 kV	Areva T & D	2007	500 kV AIS (Areva Type GL 317), Busbar rating: 500 kV, 3000 A, 40 kA, 1sec, Breaker rating: 2000 A	3 Bays, Double Busbar-Double Breaker
6	**KUREIMAT** 220 kV	Siemens	2005	220 kV GIS (Siemens Type 8DN9), Busbar rating: 245 kV, 3150 A, 50 kA, 1sec, Breaker rating: 1600 A	8 Diameters, Breaker and a half
7	**AL TEBBIN** 220 kV	Siemens	2007	220 kV GIS (Siemens Type 8DN9), Busbar rating: 245 kV, 3150 A, 50 kA, 1sec, Breaker rating: 1600 A	5 Diameters, Breaker and a half
8	**AL ATF** 220 kV	Siemens	2007	220 kV GIS (Siemens Type 8DN9), Busbar rating: 245 kV, 2000 A, 50 kA, 1sec, Breaker rating: 2000 A	5 Diameters, Breaker and a half
9	**SIDI KRIR** 500 kV GIS Extension	Siemens	2005 2006/2007	500 kV GIS (Siemens Type 8DQ1), Busbar rating: 550 kV, 3150 A, 40 kA, 1sec, Breaker rating: 2000 A 1 x 500/220 kV Tie Transformer	4 Bays, Double Busbar-Double Breaker

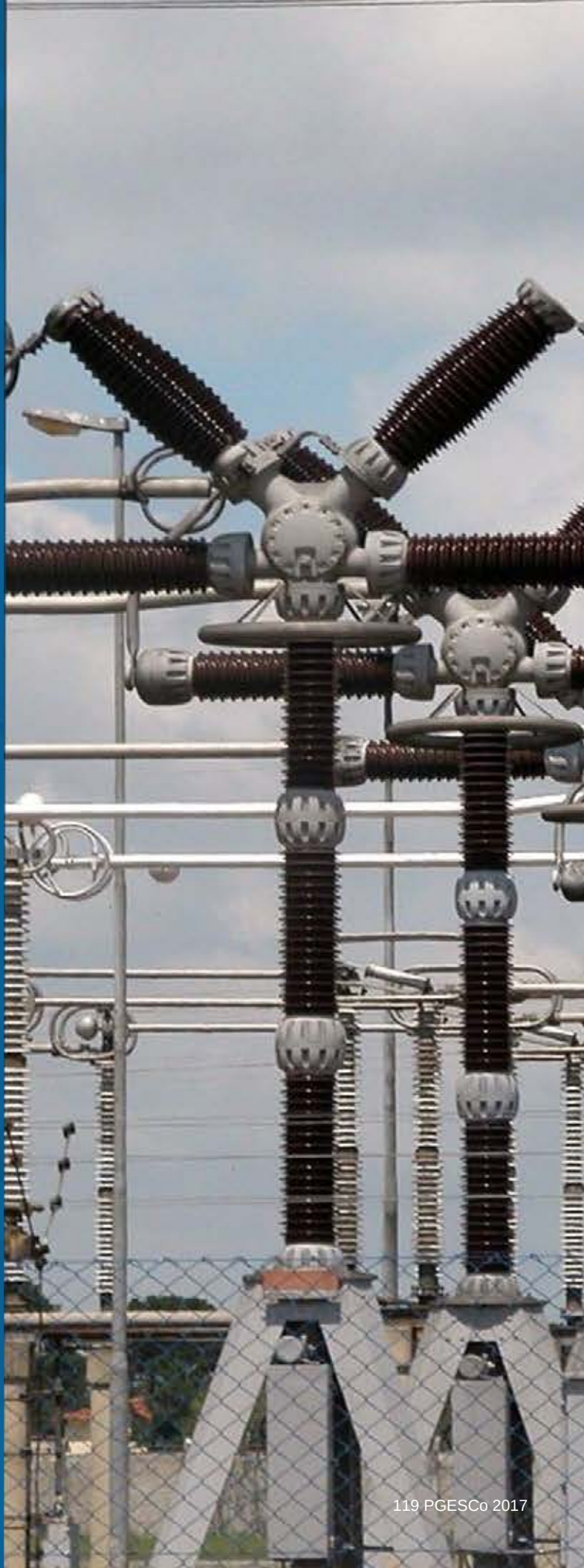
	Substation	Sub-contractor	Year	Equipment Type/Rating	Configuration
10	**CAIRO WEST** 500 kV Extension	Areva T & D	2008	500 kV GIS Extension (Areva Type GL 317), Bus-bar rating: 500 kV, 2000 A, 40 kA, 1sec, Breaker rating: 2000 A	Installing one breaker and a GIB in a single Diameter, Breaker and a half
11	**ABU QIR** 500 kV	Siemens	2012	500 kV GIS (Siemens Type 8DQ1), Busbar rating: 550 kV, 3150 A, 40 kA, 1sec, Breaker rating: 2000 A 1 x 500/220 kV Tie Trans-former (Manufactured by Hyundai)	6 Bays, Double Busbar-Double Breaker
12	**DAMIETTA** 220 kV	Hyosung	2010	220 kV GIS (Siemens Type 8DN9), Busbar rating: 245 kV, 2000 A, 50 kA, 1sec, Breaker rating: 2000 A	4 Diameters, Breaker and a half
13	**AL SHABAB** 220 kV	Siemens	2010	220 kV GIS (Siemens Type 8DN9), Busbar rating: 245 kV, 2000 A, 50 kA, 1sec, Breaker rating: 1600 A	8 Diameters and two Bus-Ties, Breaker and a half
14	**WEST DAMIETTA**	Hyundai	2011	220 kV GIS (Hyundai Type 300 SR), Busbar rating: 245 kV, 2000 A, 50 kA, 1sec, Breaker rating: 2000 A	4 Diameters, Breaker and a half
15	**AL AIN EL SOKH-NA** 500 kV	EGEMAC	2010	500 kV GIS (Xian Type ZF8A 550 GIS), Busbar rating: 550 kV, 3150 A, 40 kA, 1sec, Breaker rating: 2000 A	4 Bays Double Bus-bar-Double Breaker
16	**BANHA** 220 kV	Hyundai	2011	220 kV GIS (Hyundai Type 300 SR), Busbar rating: 245 kV, 2000 A, 40 kA, 1sec, Breaker rating: 2000 A	4 Diameters, Breaker and a half
17	**GIZA** 500 kV	Hyundai	2011	500 kV GIS (Hyundai Type 550 SR), Busbar rating: 550 kV, 3150 A, 40 kA, 1sec, Line Breaker rating: 2000 A 2 x 500/200 kV Tie Trans-former (Manufactured by Hyundai)	13 Bays, Double Busbar-Double Breaker
	220 kV	Hyundai	2011	220 kV GIS (Hyundai Type 300 SR), Busbar rating: 245 kV, 2500 A, 50 kA, 1sec, Line Breaker rating: 1600 A, Transformer breaker rating 2500	8 Bays and one Bus -Tie, Double Busbar, Single Breaker

	Substation	Sub-contractor	Year	Equipment Type/ Rating	Configuration
18	**6 OCTOBER** 220 kV Phase (1)	Ansaldo/ABB	2011	220 kV GIS (ABB Type ELK-14/300), Busbar rating: 245 kV, 2500 A, 50 kA, 1sec, Breaker rating: 2000 A	4 Diameters, Breaker and a half
19	**6 OCTOBER** 220 kV Phase (2) Extension of Phase (1) GIS by one diameter	Ansaldo/ABB	2013	220 kV GIS (ABB Type ELK-14/300), Busbar rating: 245 kV, 2500 A, 50 kA, 1sec, Breaker rating: 2000 A	4 Diameters, Breaker and a half 1 Diameter Breaker and a half extension to Phase (1) GIS
20	**SUEZ** 500 kV	Siemens	2012	500 kV GIS (Siemens Type 8DQ1), Busbar rating: 550 kV, 3150 A, 40 kA, 1sec, Breaker rating: 2000 A	3 Bays, Double Busbar-Double Breaker
21	**BAIJI, IRAQ** 400 kV	Siemens	2014	400 kV GIS (Siemens Type 8DQ1), Busbar rating: 420 kV, 4000 A, 50 kA, 1sec, Breaker rating: 2000 A, Bus-Tie rating: 4000 A	7 Diameters and two Bus-Ties, Breaker and a half
22	**NEW ASSIUT** 220 kV	Siemens	2015	220 kV GIS (Siemens Type 8DN9), Busbar rating: 245 kV, 2000 A, 50 kA, 1sec, Breaker rating: 1600 A	8 Diameters and two Bus-Ties, Breaker and a half
23	**NEW WEST DAMIETTA** 220 kV	Alstom	2015	220 kV GIS (Alstom Type B105), Busbar rating: 245 kV, 2000 A, 50 kA, 1sec, Breaker rating: 1600 A	4 Diameters, Breaker and a half



	Substation	Sub-contractor	Year	Equipment Type/ Rating	Configuration
24	**SOUTH HELWAN** 500 kV	Alstom Grid	2015	500 kV GIS (Alstom Type T155), Busbar rating: 550 kV, 3150 A, 40 kA, 1sec, Breaker rating: 2000 A	7 Bays, Double Busbar-Double Breaker
25	**AL SHABAB** 220 kV switchyard Extension:	Siemens	2015	220 kV GIS (Siemens Type 8DN9), Busbar rating: 245 kV, 2000 A, 50 kA, 1sec, Breaker rating: 1600 A	Two Diameters, Breaker and a half
26	**WEST DAMIETTA** 220 kV Switchyard Extension	Hyundai	2015	220 kV GIS (Hyundai Type 300 SR), Busbar rating: 245 kV, 2000 A, 50 kA, 1sec, Breaker rating: 2000 A	One Diameter, Breaker and a half
27	**NEW ASSIUT** 220 kV Switchyard Extension	Siemens	2016	220 kV GIS (Siemens Type 8DN9), Busbar rating: 245 kV, 2000 A, 50 kA, 1sec, Breaker rating: 1600 A	Two Diameters, Breaker and a half
28	**NEW WEST DAMIETTA** 220 kV Switchyard Extension	Alstom Grid	2016	220 kV GIS (Alstom Type B105), Busbar rating: 245 kV, 2000 A, 50 kA, 1sec, Breaker rating: 1600 A	One Diameter, Breaker and a half

Substations implemented by PGESCo



2) Ongoing Projects

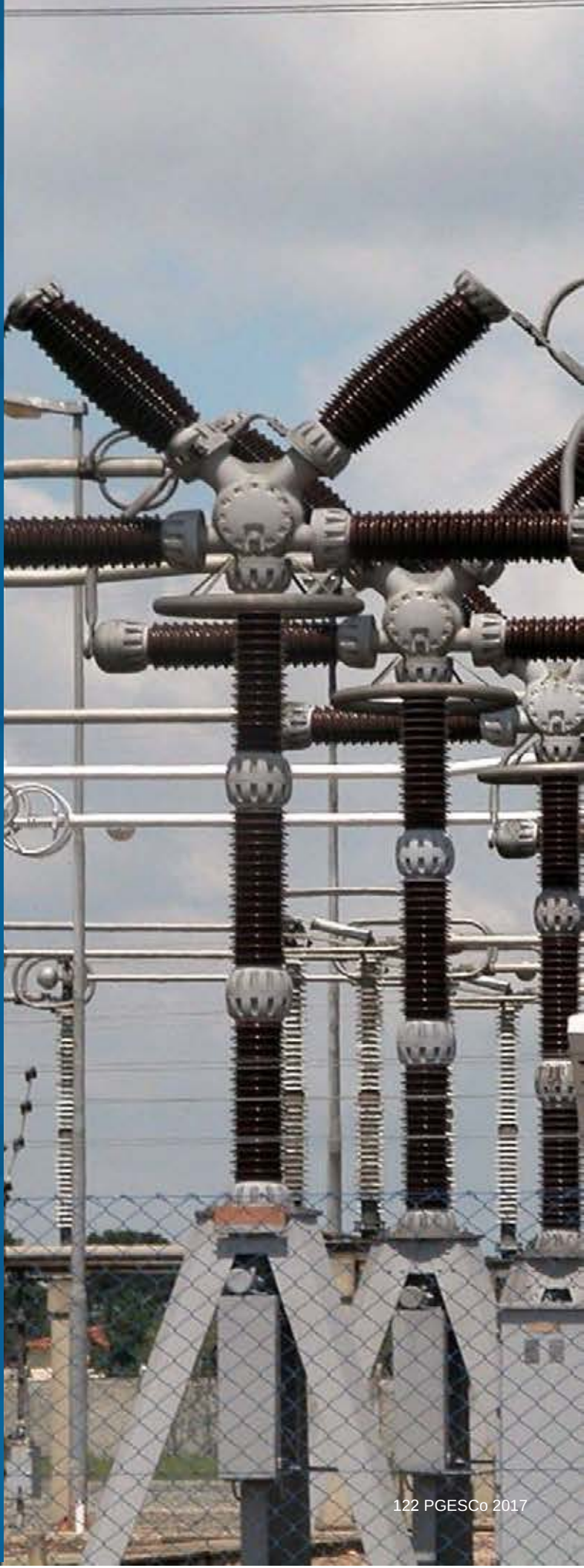
The following listed projects are under construction

	Substation	Sub-contractor	Year	Equipment Type/ Rating	Configuration
1	**Naga Hamady** 500/220/66/11 kV	XD-EGEMAC	2018-2019	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
2	**East Qena** 500/220/66/22 kV	XD-EGEMAC	2018-2019	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.

Substations implemented by PGESCo

	Substation	Sub-contractor	Year	Equipment Type/ Rating	Configuration
3	**New Cairo West** 220 kV / 500 kV	Daewoo-as lead with Hyundai and KIC.	2017 Contract. 2019 Energizing	220/500 kV GIS (Hyundai), Bus bar rating: for 550 kV: 550 kV, 3150 A, 50 kA, 1sec, Breaker rating: 3150/2000 A for 220 kV: 245 kV, 3150 A, 63 kA, 1sec, Breaker rating: 3150 A	The 500 kV & 220kV GIS buildings will be designed to accommodate three (3) bays 500kV indoor Gas insulated switchyard "GIS" (Double bus bar–double breaker) and space area for future extension for one bay and Four (4) bays 220 KV indoor Gas insulated switchyard "GIS" (Double bus bar-One and half breaker) with Tie XFMR 750 MVA-500 kV & 220kV 750 MVA-500 kV & 220kV
4	**ASSIUT** 500 kV	NCC as lead with Hyosung.	2017 Contract. 2019 Energizing	500 kV GIS (Hyosung), Bus bar rating: 550 kV, 3150 A, 50 kA, 1sec, Breaker rating: 3150/2000 A	Four (4) bays, (Double bus bar–double breaker) and space area for future extension for one bay with Tie XFMR 750 MVA-500/220kV

LIBYA



14 X 220 KV SUBSTATIONS

On-going

PGESCo scope included design review, site supervision and project management of fourteen (14) 220 kV substations. The scope also included material inspection. The project consists of seven 220 kV substations throughout Libya.

3 X 220/400 KV SUBSTATIONS – SABHA, TUBROK AND MELITA

On-going

PGESCo scope included design review, site supervision and project management of three (3) 220/400 kV substations. the scope also included material inspection.

7 X 400 KV SUBSTATIONS

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 seven (7) 400/220 kV substations throughout Libya.

EGYPT

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 mm^2 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 mm^2, AAAC (bundle of three per phase) was used. Galvanized steel shield wire of cross sectional area of 108 mm^2 was used, except for the last 30 km of the line (Sidi Krir direction), 94.1 mm^2 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

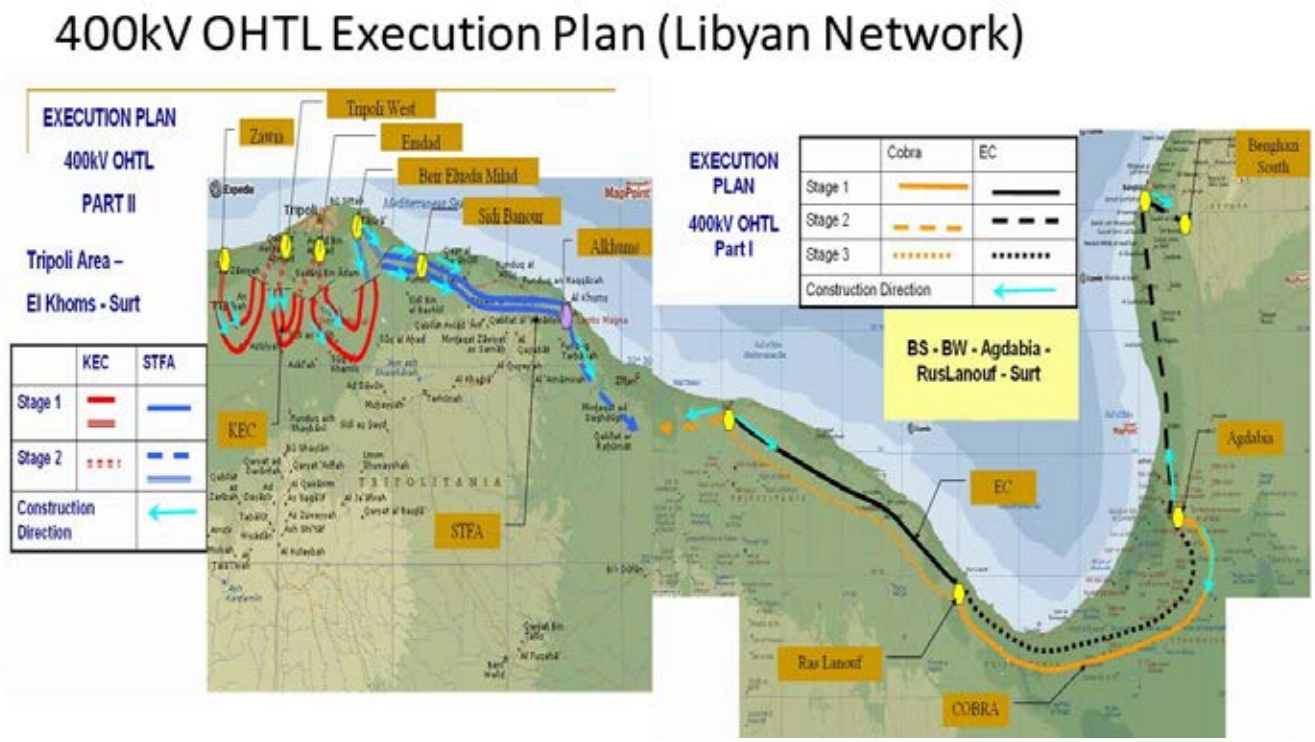
Assist the Owner for specific activities such as;

- Evaluation of piling foundation
- Manage and schedule for the foundation and tower erection

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.

LIBYA

VII - DESALINATION AND WATER TREATMENT FACILITIES

EGYPT

Owner: Upper Egypt Electricity Production company

Location: South Helwan, Egypt

Date of Award: November 2015

Project Contractual Duration: 26 Month

Scope: Engineering, Procurement, and Construction Management Services

Status: On Going

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:

Intake Design	Open intake	
Chlorination System	Chlorine Gas feed system	3 x 1300 kg cl_2/h
Raw Water Pretreatment System	Ultra filtration (UF)	3 x 2400 m^3/day
Demineralization System	Reverse Osmosis + mixed bed demineralizer	3 x 1200 m^3/day
Condensate polisher System	Externally Regenerated Mixed Beds	3 x 900 m^3/h
Waste water treatment system	Oil separation / clarification / filtration / pH adjustment	1920 m^3/day
Potable water treatment	UF + activated carbon filtration+ chlorination	100 m^3/day
Sewage treatment plant	Extended aeration	100 m^3/day

Owner: Cairo Electricity Production company

Client: ORASCOM CONSTRUCTION

Location: New Capital, Egypt

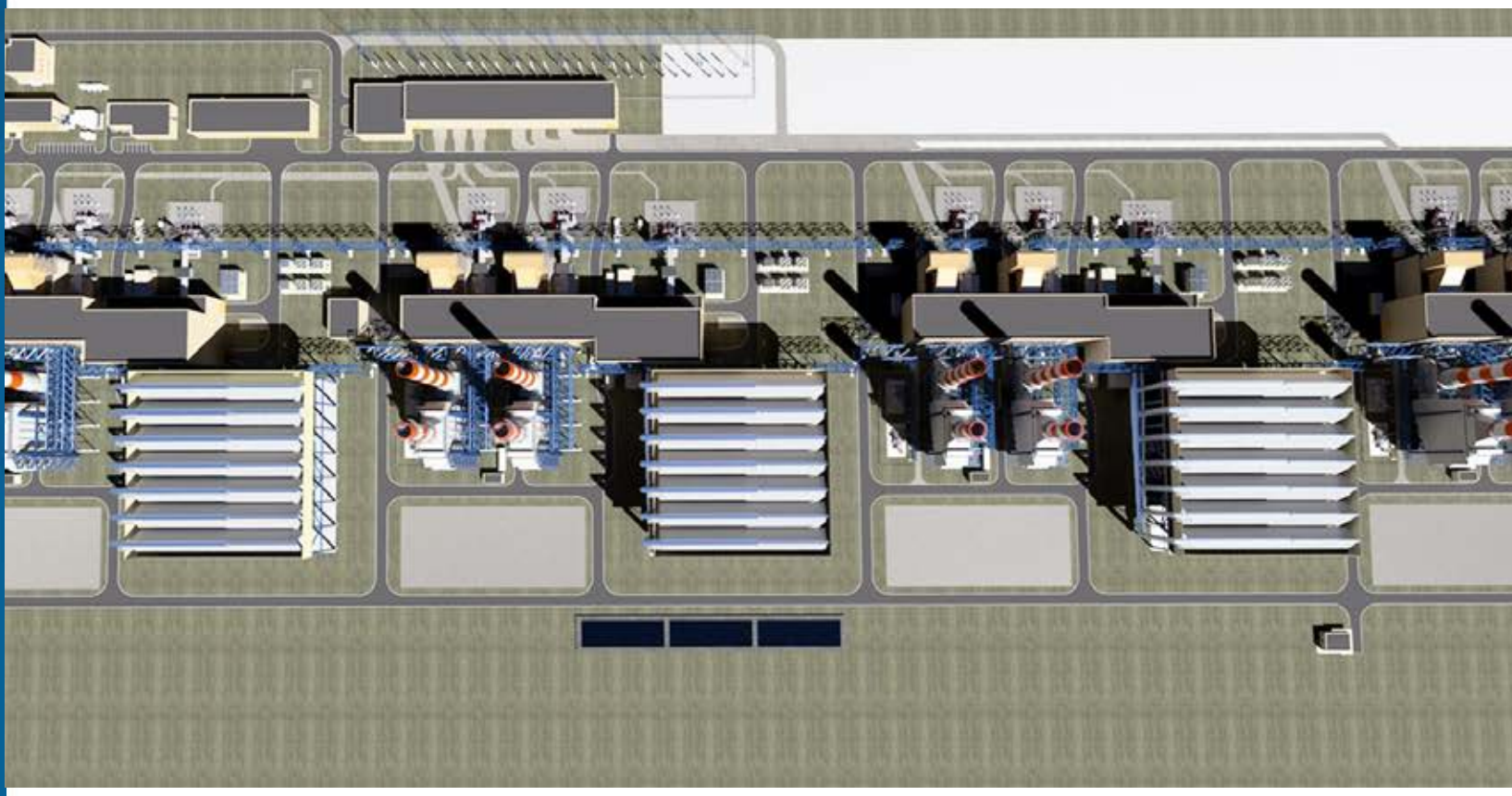
Date of Award: August 2015

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:



Pretreatment System	Ultra filtration (UF)	3 x 1800 m^3/day
Desalination System	reverse Osmosis (RO) system	3 x 1200 m^3/day
Demineralization System	Electro Deionization	3 x 960 m^3/day
Waste water treatment system	Oil separation / clarification / filtration / pH adjustment	2 x 480 m^3/day
Sewage treatment plant	Extended aeration STP	2 x 100 m^3/day

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:

Intake Design	Open intake	
Chlorination System	On-site Hypochlorite Generation	3 x 40kg/hr Cl_2
Pretreatment System	Ultra filtration (UF)	3 x 2760 m^3/day
Desalination System	Double Pass reverse Osmosis (RO) system with energy recovery system	3 x 1,000 m^3/day
Demineralization System	Electro deionization	3 x 960 m^3/day
Waste water treatment system	Oil separation / clarification / filtration / pH adjustment	2 x 480 m^3/day
Potable water treatment	Activated carbon filters/remineralization filters	2 x 100 m^3/day
Sewage treatment plant	Extended aeration STP	2 x 100 m^3/day

Owner: Middle Delta Electricity Production company

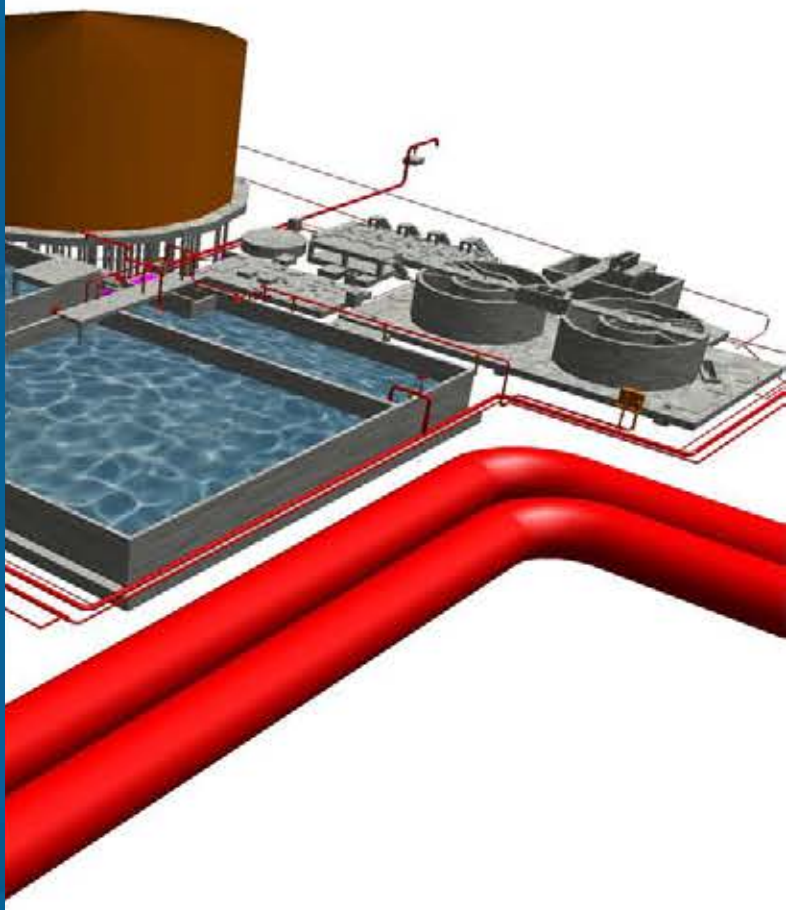
Client: ORASCOM CONSTRUCTION

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:

Intake Design	Open intake	
Chlorination System	Hypochlorite Solution injection system	
Raw Water Pretreatment System	Clarification + Ultra filtration (UF)	2280 m^3/day
Demineralization System	Cation / degasifier /anion / mixed bed deionizer	3 x 1800 m^3/day
Waste water treatment system	Oil separation / clarification / filtration / pH adjustment	2400 m^3/day
Potable water treatment	UF + Activated carbon filtration + chlorination	100 m^3/day
Sewage treatment plant	Packaged Type - Extended aeration	100 m^3/day

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:

Intake Design	Open intake	
Chlorination System	Chlorine Gas feed system	3 x 1200 kg Cl_2/ h
Raw Water Pretreatment System	Clarification + Ultra filtration (UF)	3 x 2520 m^3/day
Demineralization System	Cation / degasifier /anion / mixed bed de-ionizer	3 x 2040 m^3/day
Waste water treatment system	Oil separation / clarification / filtration / pH adjustment	5280 m^3/day
Potable water treatment	UF + activated carbon filtration+ chlorination	80 m^3/day
Sewage treatment plant	Extended aeration	80 m^3/day

Owner: Cairo Electricity Production Company

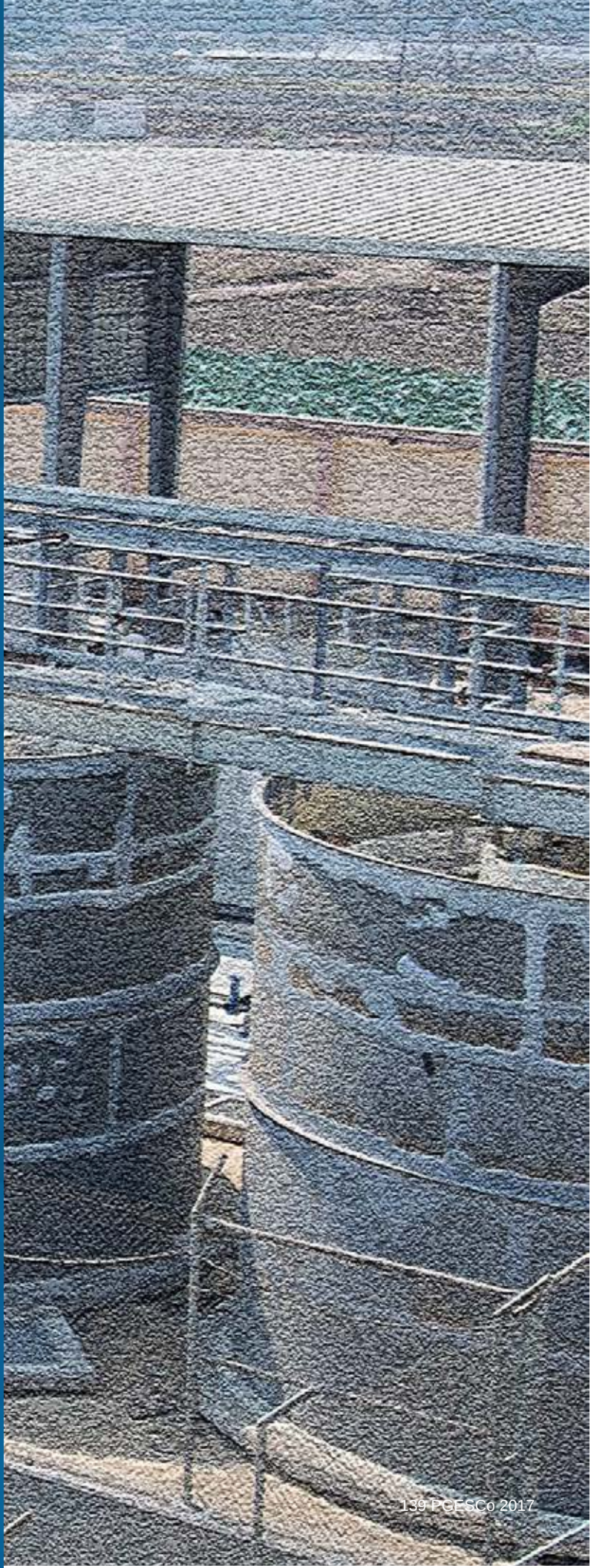
Location: Giza, Egypt

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:

Intake Design	Open intake	
Chlorination System	Hypochlorite Solution injection system	
Raw Water Pretreatment System	Clarification / Multi Media Filtration	2 x 2400 m^3/day
Demineralization System	Cation / degasifier /anion / mixed bed deionizer	2 x 1200 m^3/day
Condensate polisher System	Externally Regenerated Mixed Beds	2 x 450 m^3/h

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:

Intake Design	Open intake	
Chlorination System	On site hypochlorite generation	2 x 250 kg/hr
Demineralization System	mixed bed deionizer	2 x 1560 m3/day

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:

Intake Design	Open intake	
Chlorination System	Hypochlorite Solution injection system	
Raw Water Pretreatment System	Clarification / Multi Media Filtration	2 x 2400 m^3/day
Demineralization System	Cation / degasifier /anion / mixed bed deionizer	2 x 1200 m^3/day
Condensate polisher System	Externally Regenerated Mixed Beds	2 x 435.6 m^3/h
Waste water treatment system	Oil separation	1 x 80 m^3/h and 1 x 25 m^3/h

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:

Intake Design	Open intake	
Chlorination System	Hypochlorite Solution injection system	
Raw Water Pretreatment System	Clarification / Multi Media Filtration	3 x 2400 m^3/day
Demineralization System	Cation / degasifier /anion / mixed bed deionizer	3 x 1500 m^3/day
Waste water treatment system	Oil separation / clarification / filtration / pH adjustment	WW 2 x 1440 m^3/day Oil Sep 100 m^3/h
Potable water treatment	Activated carbon filtration+ chlorination	20 m^3/h

TALKHA WATER TREATMENT FACILITIES

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:

Intake Design	Open intake	
Chlorination System	Hypochlorite Solution injection system	
Raw Water Pretreatment System	Clarification / Multi Media Filtration	2 x 2800 m^3/day
Demineralization System	Cation / degasifier /anion / mixed bed deionizer	2 x 2160 m^3/day
Waste water treatment system	Oil separation / clarification / filtration / pH adjustment	2 x 580 m^3/day

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:

Intake Design	Open intake	
Chlorination System	Hypochlorite Solution injection system	
Raw Water Pretreatment System	Clarification / Multi Media Filtration	3 x 2016 m^3/day
Demineralization System	Cation / degasifier /anion / mixed bed deionizer	3 x 1500 m^3/day
Waste water treatment system	Oil separation / clarification / filtration / pH adjustment	2 x 1440 m^3/day
Potable water treatment	Activated carbon filters and disinfection with sodium hypochlorite dosing	400 m^3/day
Sewage treatment plant	Extended Diffused Aeration system	2 × 022m^3/day

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:

Intake Design	Open intake	
Chlorination System	Hypochlorite Solution injection system	
Raw Water Pretreatment System	Clarification / Multi Media Filtration / Sludge Dewatering	2 x 1680 m^3/day
Demineralization System	Cation / degasifier /anion / mixed bed deionizer	2 x 1680 m^3/day
Waste water treatment system	API Oil separation / DAF oil separation	2400 m^3/day

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:

Intake Design	Open intake	
Chlorination System	Hypochlorite Solution injection system	
Raw Water Pretreatment System	Clarification / Multi Media Filtration	2 x 80 m^3/hr
Demineralization System	Cation / degasifier /anion / mixed bed deionizer	2 x 1300 m^3/day
Waste water treatment system	Oil separation / clarification / filtration / pH adjustment	2 x 840 m^3/day

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 DESALINATION AND WATER TREATMENT FACILITIES - FAST TRACK

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:

Pretreatment System	Ultra filtration modules (UF)	3 x 3250 m^3/ day	
Desalination System	Double pass reverse osmosis (brackish water)	3 x 2400 m^3/ day	
Demineralization System	Electro deionization System	3 x 1800 m^3/day	
Condensate polisher System	Pre-coat filters	2 x 600 m^3/h	On-going
Waste water treatment system	Oil separation / clarification / filtration / pH adjustment	2400 m^3/day	
Potable water treatment	UF + RO + Activated carbon + Chlorination	100 m^3/day	
Sewage treatment plant	Extended aeration	100 m^3/day	

NEW ASSIUT DESALINATION AND WATER TREATMENT FACILITIES - FAST TRACK

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:

Pretreatment System	Ultra filtration modules (UF)	4 x 5040 m^3/day	
Desalination System	Double pass reverse osmosis (brackish water)	(12,000 m^3/day) 5 x 2400 m^3/day	
Demineralization System	Electro deionization System	4 x 2400 m^3/day (12,000 m^3/day)	
Condensate polisher System	Pre-coat filters	2 x 600 m^3/h	On going
Waste water treatment system	Oil separation / clarification / filtration / pH adjustment	1920 m^3/day	
Potable water treatment	UF + RO + activated carbon+ chlorination	100 m^3/day	
Sewage treatment plant	Extended aeration	100 m^3/day	

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:

Chlorination System	On site hypochlorite generation system	2 x 300 kg cl_2/h
Desalination System	Multi Effect Distillation with Thermal Vapor compression (MED-TVC)	6,000 m^3/day
Demineralization System	Mixed bed deionizer	3 x 1080 m^3/day
Condensate polisher System	Externally Regenerated Mixed Beds	2 x 900 m^3/h
Waste water treatment system	Oil separation / clarification / filtration / pH adjustment	2400 m^3/h

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:

Pretreatment System	Ultra filtration modules (UF)	2 x 2880 m^3/day
Desalination System	Double pass reverse osmosis (brackish water)	2 x 1560 m^3/day
Demineralization System	Mixed bed deionizer	2 x 1560 m^3/day
Condensate polisher System	Pre-coat filters	2 x 600 m^3/h
Waste water treatment system	Oil separation / clarification / filtration / pH adjustment	1200 m^3/day

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:

Chlorination System	On-site Hypochlorite generation system	3 x 450 kg cl_2/h
Desalination System	Multi Effect Distillation with Thermal Vapor compression (MED-TVC)	8,000 m^3/day
Demineralization System	Mixed bed deionizer	1800 m^3/day
Condensate polisher System	Externally Regenerated Mixed Beds	6 x 760 m^3/h
Waste water treatment system	Oil separation / clarification / filtration / pH adjustment	1440 m^3/day
Sewage treatment plant	Extended aeration	2040 m^3/day

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 :

Chlorination System	On-site Hypochlorite generation system	2 x 500 kg cl_2/h
Desalination System	Multi Effect Distillation with Thermal Vapor compression (MED-TVC)	10,000 m^3/day
Demineralization System	Mixed bed deionizer	2 x 3000 m^3/day
Condensate polisher System	Externally Regenerated Mixed Beds	2 x 880 m^3/h
Waste water treatment system	Oil separation / clarification / filtration / pH adjustment	240 m^3/day
Sewage treatment plant	Extended Aeration	200 m^3/day

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:

Pretreatment System	Ultra filtration modules (UF)	3 x 3500 m^3/day
Desalination System	Double pass reverse osmosis (brackish water)	2 x 3750 m^3/day
Demineralization System	Mixed bed deionizer	2 x 3120 m^3/day
Condensate polisher System	Pre-coat filters	4 x 600 m^3/h
Waste water treatment system	Oil separation / clarification / filtration / pH adjustment	1200 m^3/day
Potable water treatment	UF + RO + Activated carbon + Chlorination	120 m^3/day
Sewage treatment plant	Extended aeration	120 m^3/day

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 :

Chlorination System	On-Site Hypochlorite Generation System	3 x 110 kg/hr Cl_2
Desalination System	Multi Effect distillation (MED)	2 x 5000 m^3/day
Demineralization System	Mixed bed deionizer	3 x 1500 m^3/day
Condensate polisher System	Externally Regenerated Mixed Beds	3 x 522 m^3/h
Waste water treatment system	Oil separation / DAF system	2400 m^3/day

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:

Chlorination System	On-Site Hypochlorite Generation System	3 x 110 kg/hr Cl_2
Desalination System	Multi stage flash distillation (MSF)	2 x 5000 m^3/day
Demineralization System	Mixed bed deionizer	3 x 1500 m^3/day
Condensate polisher System	Externally Regenerated Mixed Beds	3 x 522 m^3/h
Waste water treatment system	Oil separation / DAF system	2400 m^3/day

Owner: West Delta Electricity Production Company

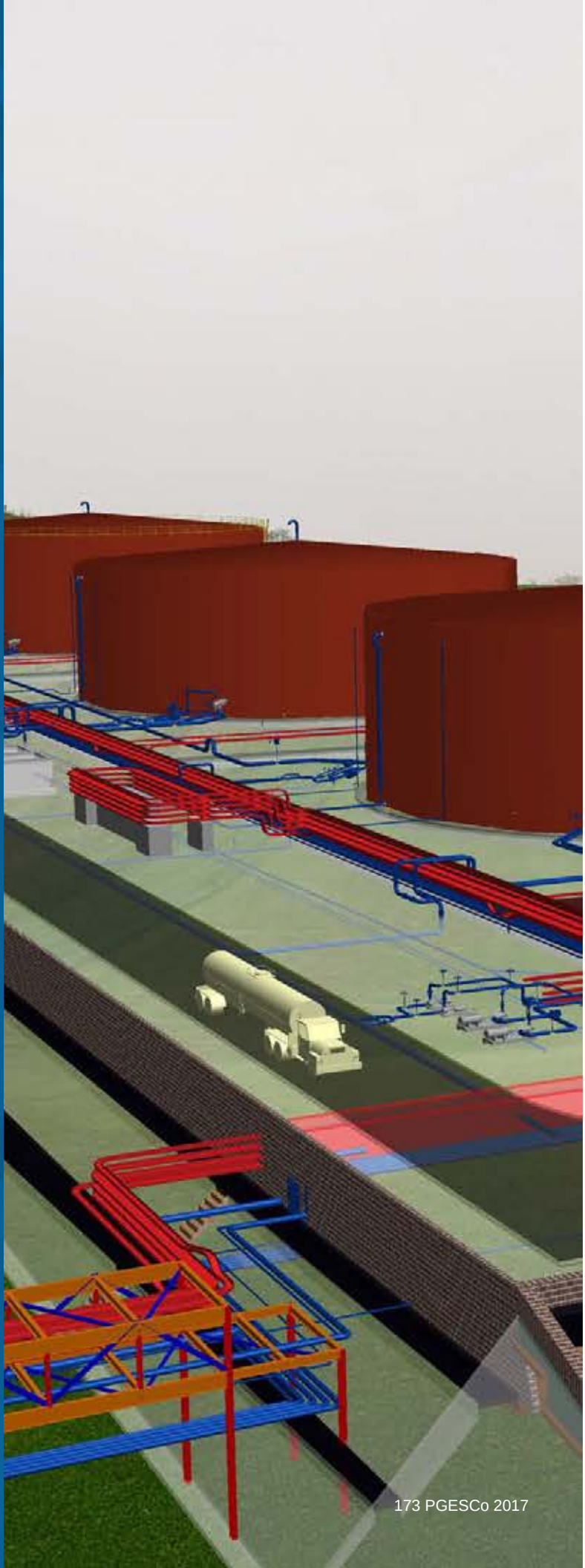
Location: North Coast, Egypt

Date of Award: April 1996

Project Contractual Duration: 26 Month

Scope: Engineering, Procurement, and Construction Management Services

Status: Completed



LIBYA

ZAWIA DESALINATION PROJECT (80,000 M^3/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 - OFFSHORE INTAKE BASIN

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

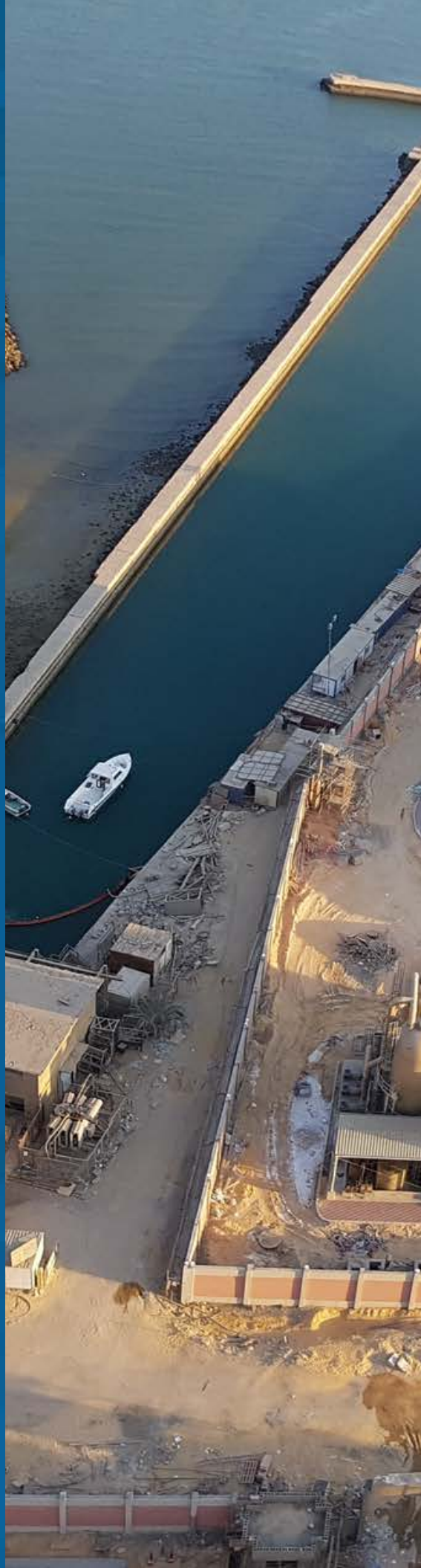
Kureimat III Project, EGYPT

Full design, details and modeling of concrete intake structure on the Nile River

PGESCO

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.

PGESCO

VIIII - BUILDING & HOUSING

BUILDING & HOUSING

NUBARIA II PROJECT - EGYPT

Nubaria 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).

Nubaria 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.

BUILDING & HOUSING

PGESCo

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) Secondary 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

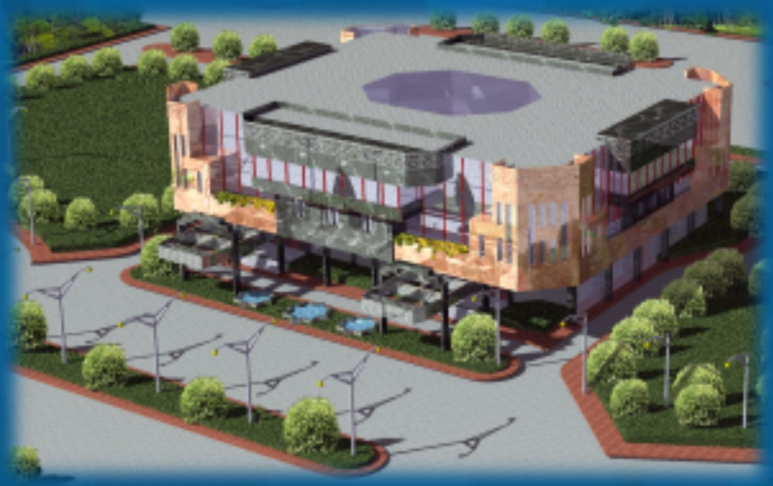
BAIJI project Architectural Design included the following ancillary buildings:

- 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) Secondary Security Gatehouse (Single-Story Building).
- One, (1) Security fences, Sixteen, (16) guard towers and Two (2) gates.
- Landscape, Roads, playgrounds, and wall fence.

BUILDING
&
HOUSING



X - TECHNICAL AND ECONOMICAL STUDIES

STUDIES

TECHNICAL STUDIES

EGYPT

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.

TECHNICAL STUDIES

EGYPT

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TECHNICAL STUDIES

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

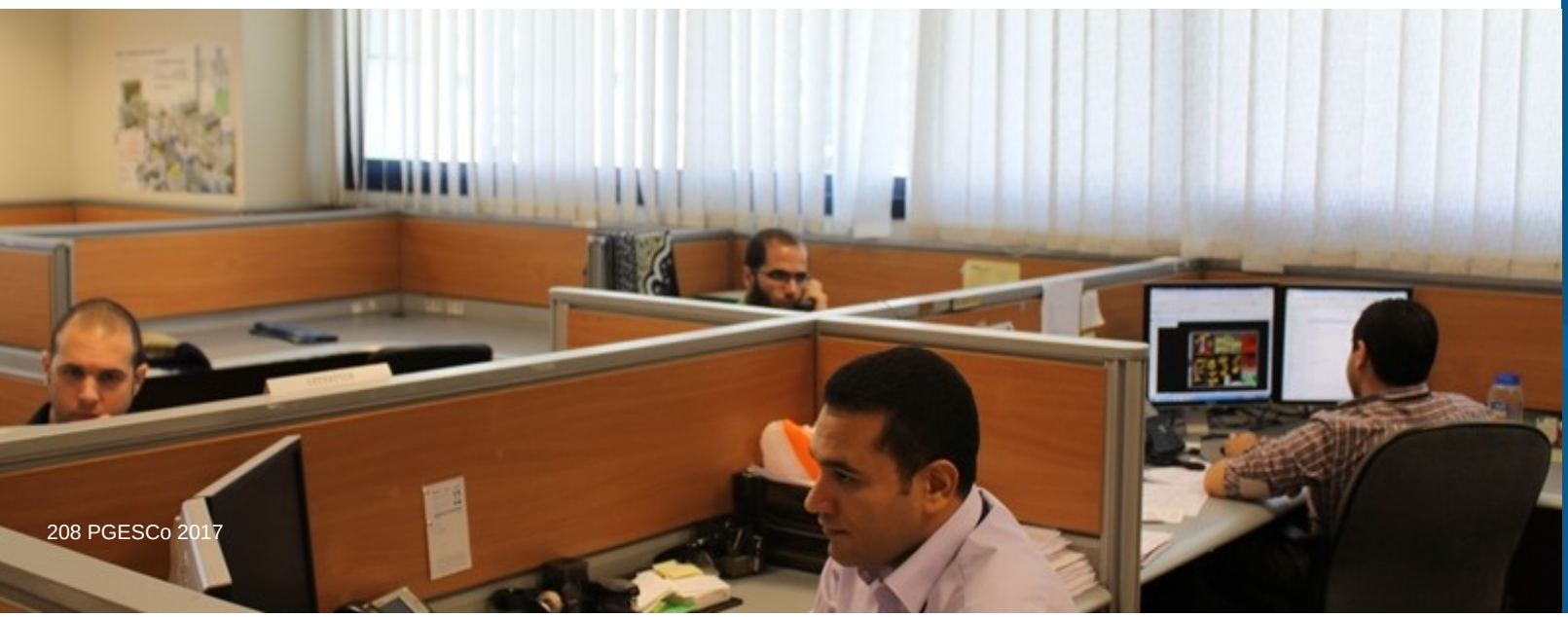
Description: This study was prepared in order to compare the economical aspects of implementing two different approaches of implementation a thermal power plants.

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.



ECONOMICAL STUDIES

EGYPT

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

EGYPT

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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.

LIBYA

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.

Tenders

XI- TENDERS DOCUMENTS

LIBYA

MISURATA CO-GENERATION POWER PLANT (700 MW + 100,000 M^3/DAY) TENDER DOCUMENTS

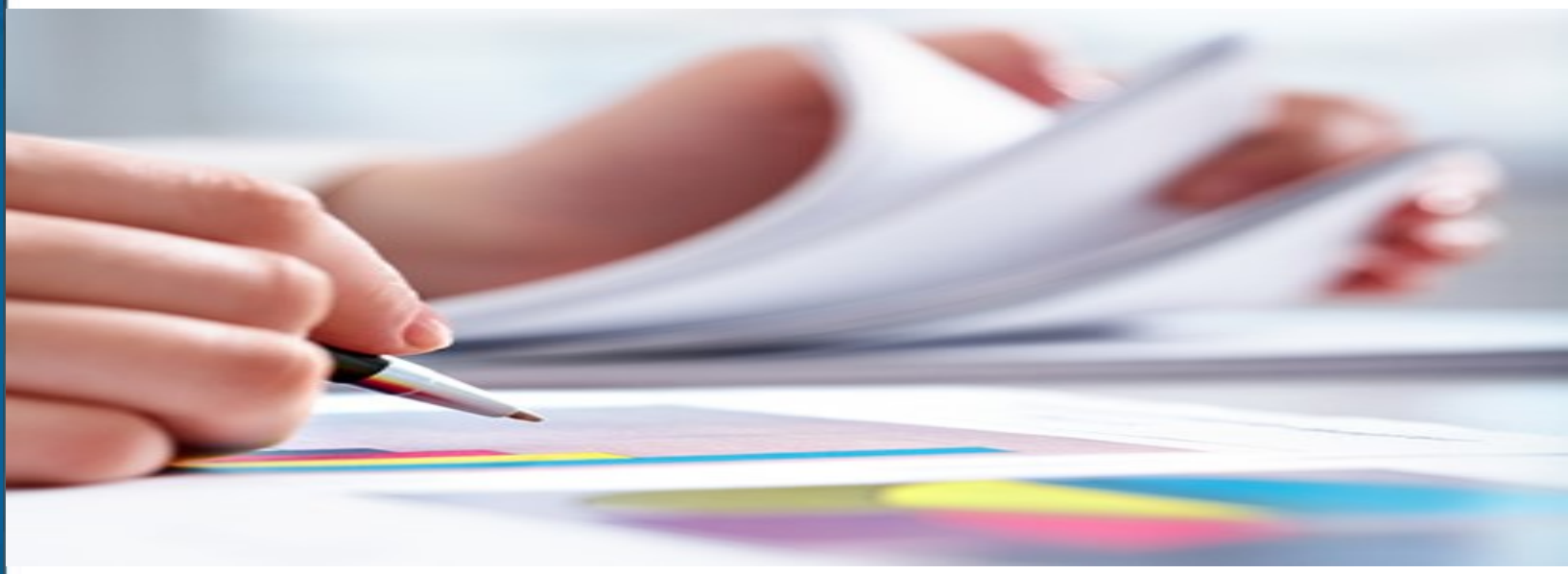
Completed 2010

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

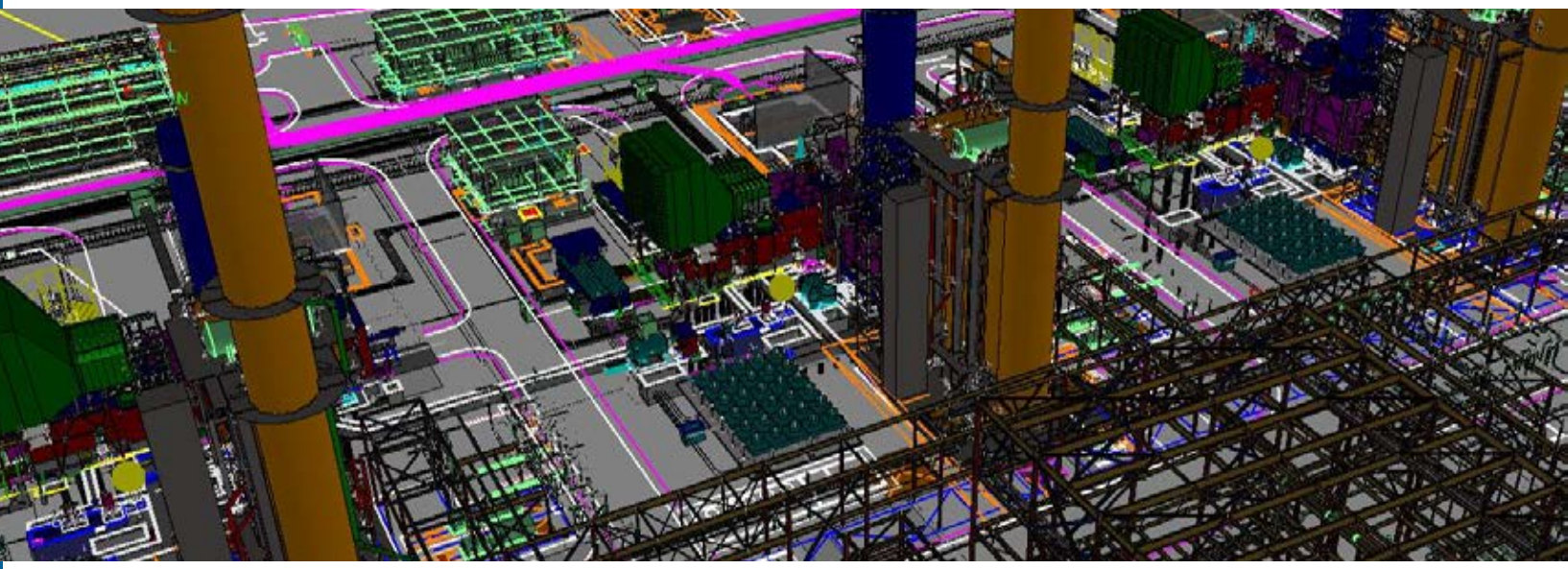
PGESCo scope included conceptual design development and tender document preparation for six packages and purchase orders. They also assisted the Owner with bid evaluations and award recommendation report preparation.

LIBYA

MASTER PLAN OF THE MAIN SUPPLY AND TRANSMISSION GAS PIPELINES AND CITY GAS DISTRIBUTION NETWORKS STUDY

Completed 2009

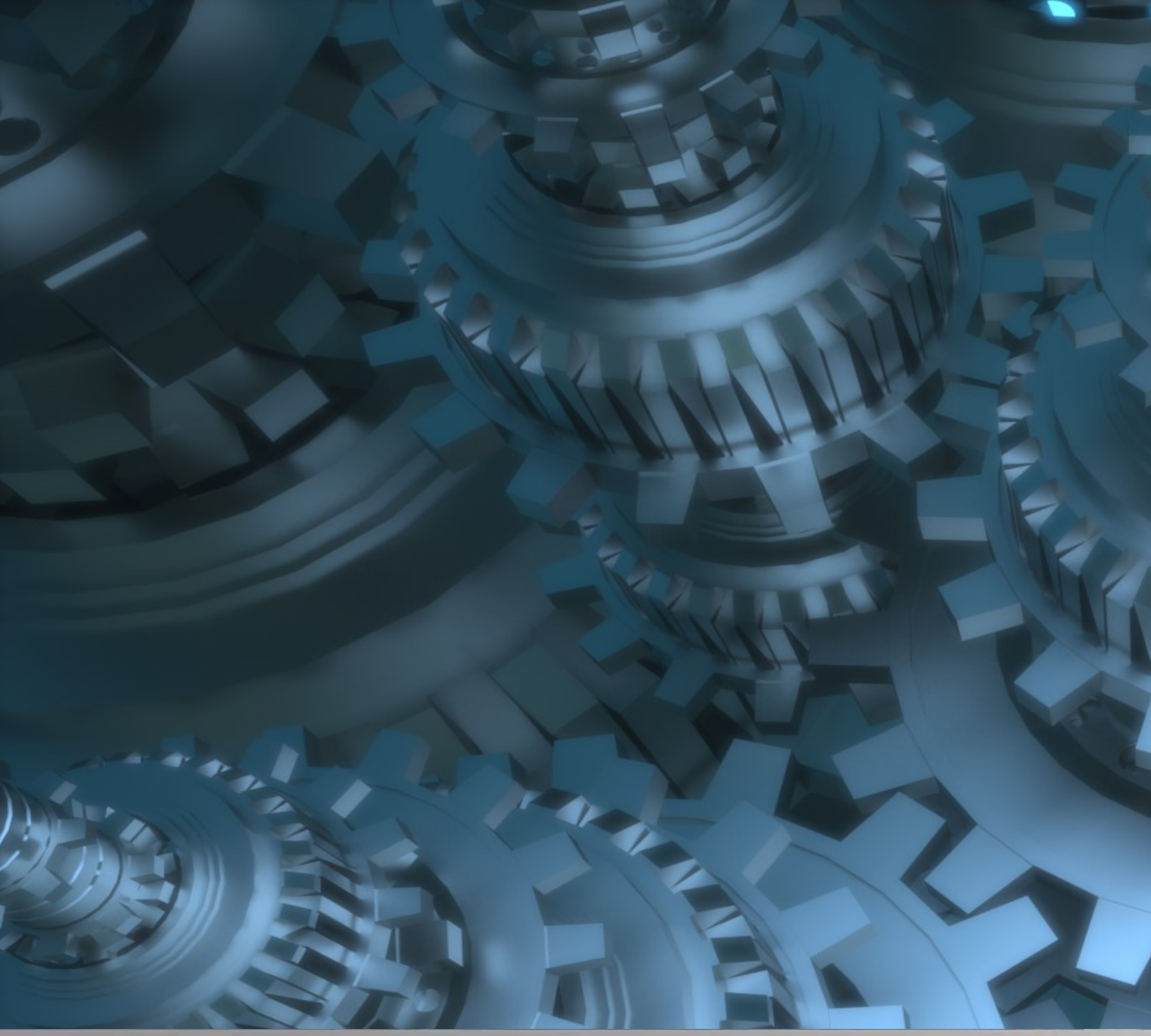
The main report objective was to determine the optimum Gas Master Plan in terms of required transmission capacity taking into account gas demand, gas supply and their locations. PGESCo teamed with ACESCo/ Tractabel to provide the base design and tender documents for the construction of four transmission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



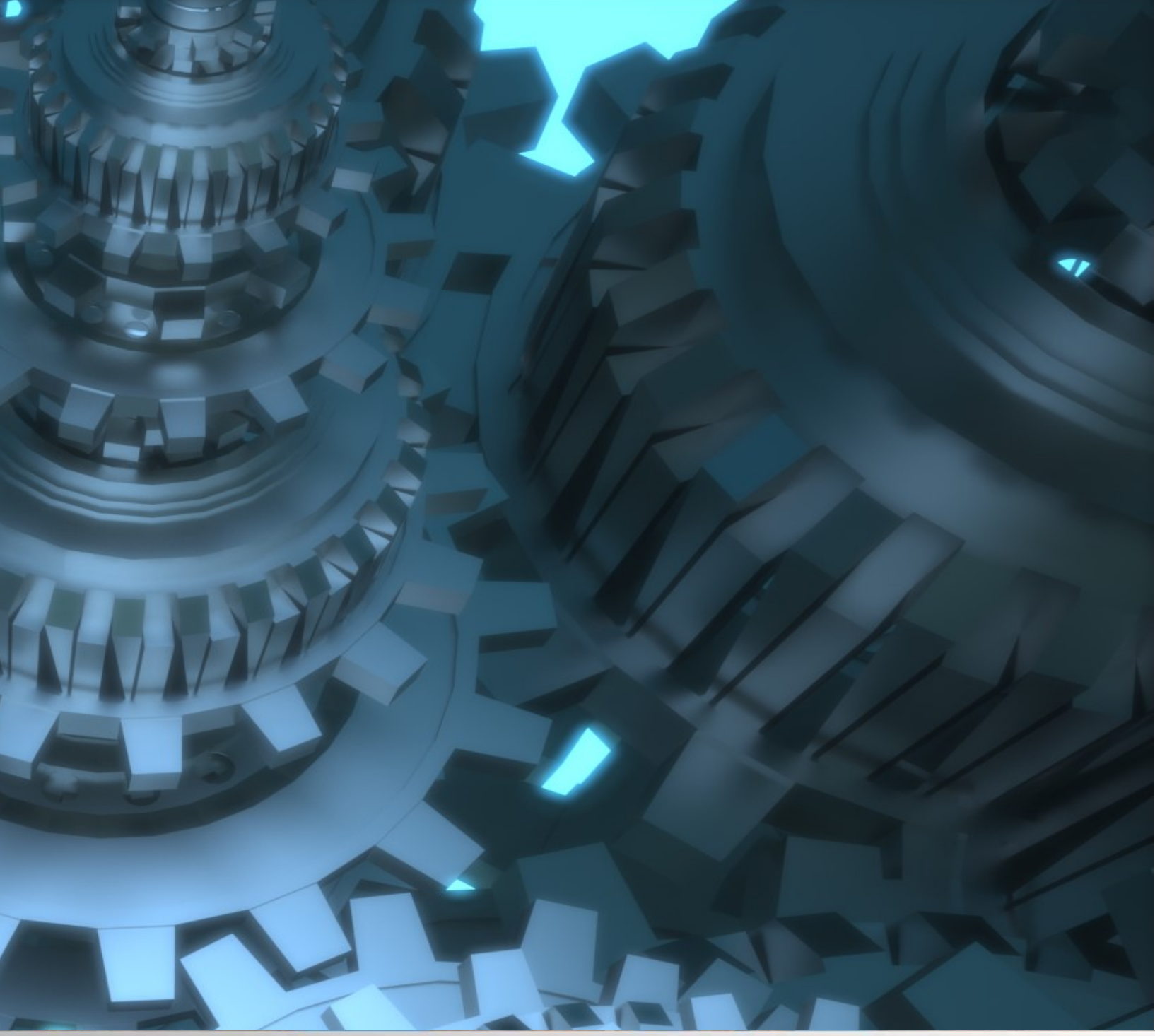
FEASIBILITY STUDIES OF TOBRUK, TRIPOLI AND BENGHAZI DESALINATION AND POWER CO-GENERATION PLANTS STUDY

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 m^3/day to 500,000m^3/day water production.



XII - INDUSTRIAL PROJECTS



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

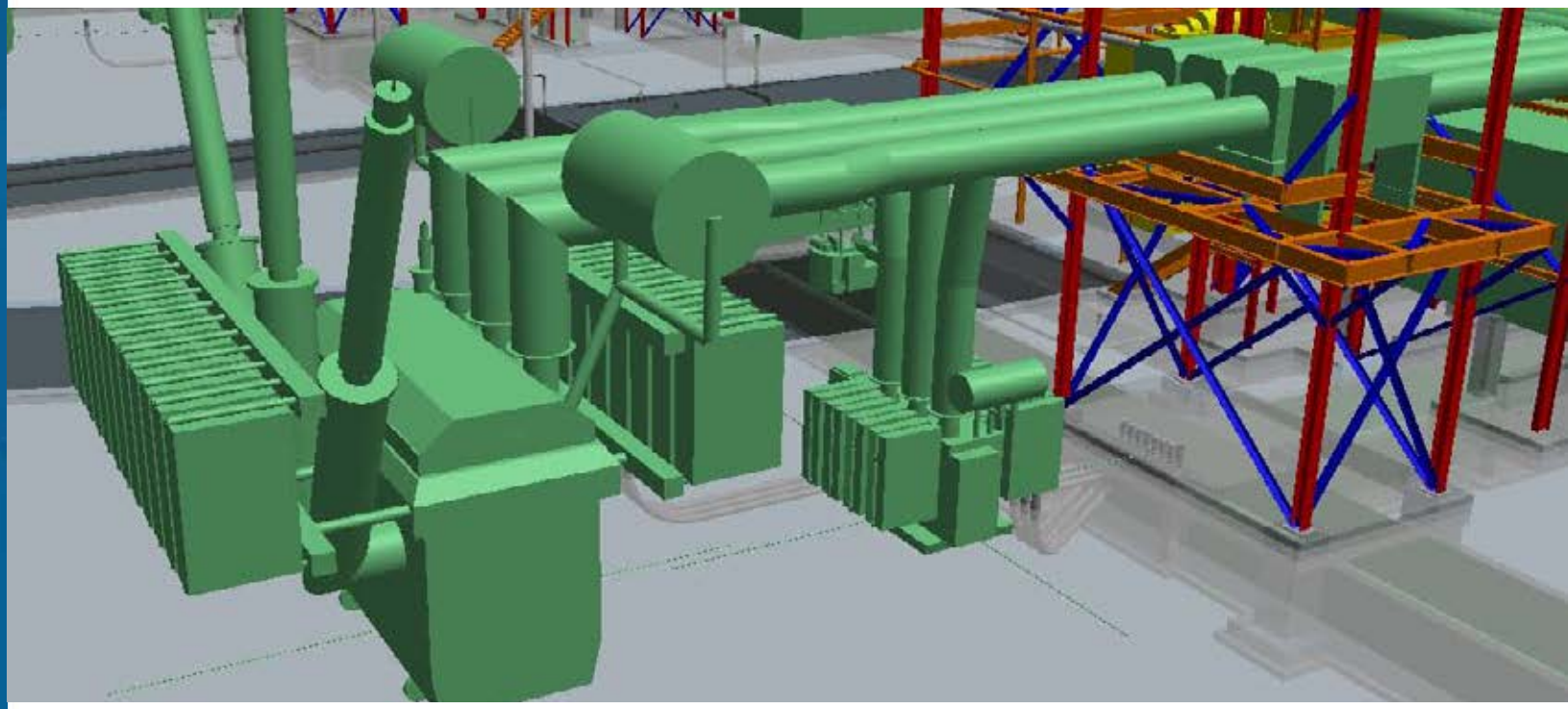
Project Contractual Duration: 14 months

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.

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