

# **A C E T O      I N D U S T R I E S**

## **- P R E Q U A L I F I C A T I O N -**

## COMPANY PROFILE

Founded in 1973, **ACETO** 100% Egyptian limited liability Company is a leading Egyptian company for import, export and installation of all electro-mechanical equipments, measuring & control equipments besides its own range of products.

**ACETO** now is a leading company covering electro-mechanical, measure and control application in all major industries:

- Automation & Control Systems (PLC, SCADA, DCS).
- High Voltage Substations.
- Electrical power Generation, Switchgears, Transmission & Distribution.
- Water / Sewage water treatment and distribution.
- Chemicals & Petrochemical.
- Metering & Regulating.
- Steam Generators.

**ACETO** has established long-term partnership and alliances with several manufacturers in Europe USA & Asia. The objective is to bring the newest and most innovative know-how and technology where opportunities exist for reducing total cost of ownership and providing high quality products.

**ACETO** Company has a wide experience in several engineering fields and all phases of the project activities, starting from planning to commissioning and start of the most up-to-date automation and control technologies such as PLC, DCS, PAC and SCADA.

**ACETO** is also committed to the development and enhancement of the Egyptian industries, and locally manufacture low, medium and high voltage switchboards, transformers kiosks and main ring units up to 36 KVA; we also manufacture load break and isolating switches. All are made following to the requirement of the international standards for quality management.

## Quality Assurance

*ACETO Industries obtained ISO 9001/1994 quality system certification through QMI Canada in October 29<sup>th</sup> 1997.*

*ACETO Industries obtained ISO 9001/2000 system and services certification through SGS/UK in may 5<sup>th</sup> 2004.*

*ACETO Industries is currently working for ISO 9001/2008.*

## Scope Of Work

### **1- SCADA & Telemetry systems**

Design, Engineering, Supply, Instrumentation supervision of installation, commissioning and start up of SCADA (Supervisory control and Data Acquisition) and telemetry systems for:

- Water Transmission & Distribution Networks.
- Water & Waste-water Treatment Plants.
- Water & Waste-water Pumping Stations
- Irrigation Networks.
- Oil & Gas Distribution Networks.

### **2- Automation Systems**

Automation and control systems for:

- Water & Waste-water Treatment Plants.
- Water & Waste-water Pumping Stations.
- Irrigation Pumping Stations.
- Steam and Industrial Boilers.

### **3- Metering Systems**

Design, Supply, Installation, Commissioning & Start up of Metering Systems for:

- Water Transmission & Distribution Networks.
- Water Cooling Systems.
- Gas Transmission & Distribution Networks.
- Oil Transmission & Distribution Networks.
- Oil Refineries.
- Oil & Fuel Loading Unloading Facilities.
- Aircraft Fuel Loading & Unloading.
- Milk & Liquid Food Products
- Steam

#### **4- Regulation Systems**

Design, Supply, Installation, Commissioning & Start up of Regulation Systems for:

- Pressure Regulating (Reducing) Stations for Gas Transmission and Distribution Networks.
- Pressure Regulating (Reducing) Stations for Steam.
- Temperature De-superheating Systems for Steam.

#### **5- Turn-Key Contracting**

Complete Turn-Key delivery of:

- Pumping Stations for Water & Waste-water.
- Pumping Stations for Irrigation Networks.
- Turn-Key Contracting of Electrical Networks up to 36 KV.
- Water Treatment Plants.

#### **6- Electrical Equipment & Systems**

Design, Manufacturing and Installation of:

- Compact Transformer Substations/Kiosks for 12, 24 KV Applications.
- Electrical Distribution Panels and Switchgears for various applications up to 24KV.
- Ring main units up to 24 KV.
- Load Break Switch for indoor applications up to 24 KV.
- Circuit Breakers up to 36KV, SF6 & Vacuum.
- Metering Systems for Electrical Transmission & Distribution Networks.

## BUSINESS STRATEGY

We believe that our presence, continuity and growth in the market depends on our commitment towards the following main parties.

### **Customers:**

- Understanding and delivering the needs and expectation of our customers mainly in Quality, Delivery time and Cost.
- Providing our customers with the up-to-date technology by cooperating with leading international companies in our business field.

### **Sub-contractors:**

- We choose our subcontractors on the basis of their supplied products, Quality, Services and Cost.
- We evaluate the performance of our subcontractors regularly to meet our obligations.

### **Business Society And Environment:**

With our modern technology solutions, we aim to maximize your plant's efficiency by:

- Lowering cost (minimize operational faults, longer lifetime of equipment, less consumption).
- Minimize waste and environmental pollution.
- Increasing reliability, flexibility and stability.
- Increasing safety and profitability.
- Commitment to the regulatory and statutory requirements.

## References List

### DCS SYSTEMS

#### **Power Generation:**

- Cairo west power station units 1-4 x 87.5 MW.
- Sidi Krir power station 2x320 MW.
- Oyoun Moussa power station 2x320 MW.
- Damanhour power station 2x320 MW.
- Mahmoudia & Damanhour combined cycle power plan.
- Esna Dam hydro power plant.
- Assuit power station 2X320 MW.

#### **Sugar Industry:**

Complete plant DCS control instrumentation and valves for the following projects:

- Belkas Beet sugar factory.
- Delta Beet sugar factory extension.
- Abu Kourkas Beet sugar extension.
- El Fayoum Beet sugar factory.

#### **Water & Waste water filter control valves instrumentation for:**

- El Giza water treatment plant.
- El Roda water treatment plant.
- El Manshia (Alex) water treatment plant.
- El Fayoum water treatment plant.
- Damanhour water treatment plants (old & new).

## Oil & Gas Refineries:

### Alexandria Petroleum Company

- CDU & VRU.

### Balaem Petroleum Company

- Port Fouad Gas production facilities.
- Wakkar Gas field.

### Enppi

- Transgulf LPG expansion (GUPCO).
- Light Naphtha isomerization petroleum (CORC).
- PL-Platform (WEPCO).

### Sumed

- Control of pumping stations at Sidi Krir and Soukhna terminals.

### SOPC

- Crude Distillation Unit.

## Telemetry Systems

- **Sadat** main pumping station and well areas.
- **Obour City** Raw water pumping stations (Intake, PCI) and pipelines.
- **Obour City** treated water pumping stations and pipelines.



## PLC Systems

- Sumed Pipelines – Sukhna.
- Sumed pipelines – Sidi Krir.
- Sumed pipelines – SCADA.
- Shemto.
- Asuit Refinery.
- Trengo.
- Aluminum Co. Of Egypt.
- Arab Co. Of Egypt.
- Arab Aluminum.
- El Saad Aluminum.
- Misr Aluminum.
- Nasr Co. for Steel pipes.
- The African Arabian Company.
- Geisum Offshore.
- Military Factory 63.
- Military Factory 99.
- Egyptian Iron and Steel.
- Abu Zaabal Engineering.
- Asuit Cement Co.
- Ahlia Co. for Metallurgical Industries.
- Oriental Weaves Co.
- WEPCO.
- GUPCO.
- Petrobel.
- Sugar Co.
- Finpak.
- Egypak.
- Factory 200.

## Reducing & Desuperheating Steam Stations

- Abu Kourkas Sugar plant.
- Arment Sugar plant.
- Belkas Sugar plant.
- El Fayoum Sugar plant.

## Gas Pressure Reducing and Metering Stations

(Gas Meters, Regulators, Filters, Slam shut-off Valves)

### **EGYPT Gas Co.**

- 10 Pressure regulators and meter modules.

### **GASCO (Ex-Petroleum Pipeline Co.)**

- Pressure reduction station, turbine meter, regulators.

### **CITY Gas Co.**

- 2 Pressure reduction stations ( Suez city gate, Cement company).

### **Petroleum Gas Co.**

- Pressure reduction station (Alexandria, Portsaid, Suez, Mokattam, El Salam, Cement, Ismalira) About 200 pressure regulators and meter modules.

# PROJECTS

# OVERVIEW

## SCADA SYSTEM EL OBOUR WATER SCHEME

### Project Overview

El Obour water project is a scheme to produce 600000 m<sup>3</sup>/day and to distribute this water into three areas of 1.5 million in El Obour city, El Shrouk city and New Cairo zones.

The contract covers the supply, installation and start up of a complete monitoring & control (9000 I/O) of:

- A. Raw water pipelines (2 x 1800 mm) for a total length of 24 KM to feed water treatment plant.
- B. Monitoring of the water treatment plant.
- C. Complete monitoring & control of treated water pipelines (2 x 1400 mm) for a length of 28 KM + 2 x 1200 mm for a length of 17 KM.
- D. Complete monitoring & control of 6 pumping stations, two of them for the raw water lines and the other four for the treated lines.
- E. All the sensors and transmitters for the project including water metering, transducers for all electric signals, interface to valve, ..etc.

### Control Strategy

- 1. Each valve chamber along the pipelines will have capability of local control in case of communication failure.
- 2. Each pump station will have full control of the pump station itself and the valve chambers ahead up to next pumping station.
- 3. All pumping stations are communicating all the data and information to the main center through data communication network.  
Communication media will be telephone cable (First phase) and audio frequency (Second phase).

**Main Control Center**

Located at the water treatment plant.

**Capacity:**

1. 7000 signals to be received from RTU's.
2. 1600 signals to be received from WTP and local pumping station.

**Displays**

1. Mosaic Mimic panel 10 x 2.
2. 6 off pc's for complete monitor and control.
3. 2 off printers.

**RTU's at each of the pumping stations**

Quantity : 6

Capacity : 600 point from the pumping station.  
200 point from the valve chambers RTU's under the control of the pumping station

Display at each site :

1. Hard wired control panel including mimic panel 3 x 0.9 m.
2. 1 off pc for complete monitor and control.
3. 1 off printer.

**RTU's at each valve chamber**

1. 31 RTU's capacity 32 I/O's.
2. 1 RTU's capacity 64 I/O's.
3. 2 RTU's capacity 400 I/O's.

# **Development and Implementation of SCADA System Based Remote Intelligent Pumps Control for "El-Sadat" City Water Supply System**

## **INTRODUCTION**

Developing a control system and effectively managing system information for utilities, becomes increasingly complex as the expectations of regulatory agencies, customers and the public are constantly rising. Supervisory Control and Data Acquisition (SCADA) solutions are designed to meet the challenges of today's rapidly changing operational environments for utilities. When the utilities in Egypt has just started adopting SCADA for better management and control of its processes, we has gone a step further, to develop SCADA system for enhancing and utilizing intelligent process automation and maximizing the benefit of adopting this technology. Actually, SCADA focuses on gathering and circulating the right amount of system information to a main computer within the right amount of time so that any control solutions are made possible. The major attraction of SCADA to the utilities is the ability to significantly reduce operating labor costs, while at the same time improving overall system performance and reliability.

## **PROCESS DESCRIPTION**

Sadat City located about 100 Km north of Cairo in Egypt with about one million population. It is a growing residential and industrial community dependent upon wells for its fresh water supply. A new water supply facility was needed in order to meet the city growing demand. A well field comprised of fifteen artesian wells distributed in about 55 Km<sup>2</sup> along the desert has been constructed.

Fig.1 shows the schematic representing the well field.

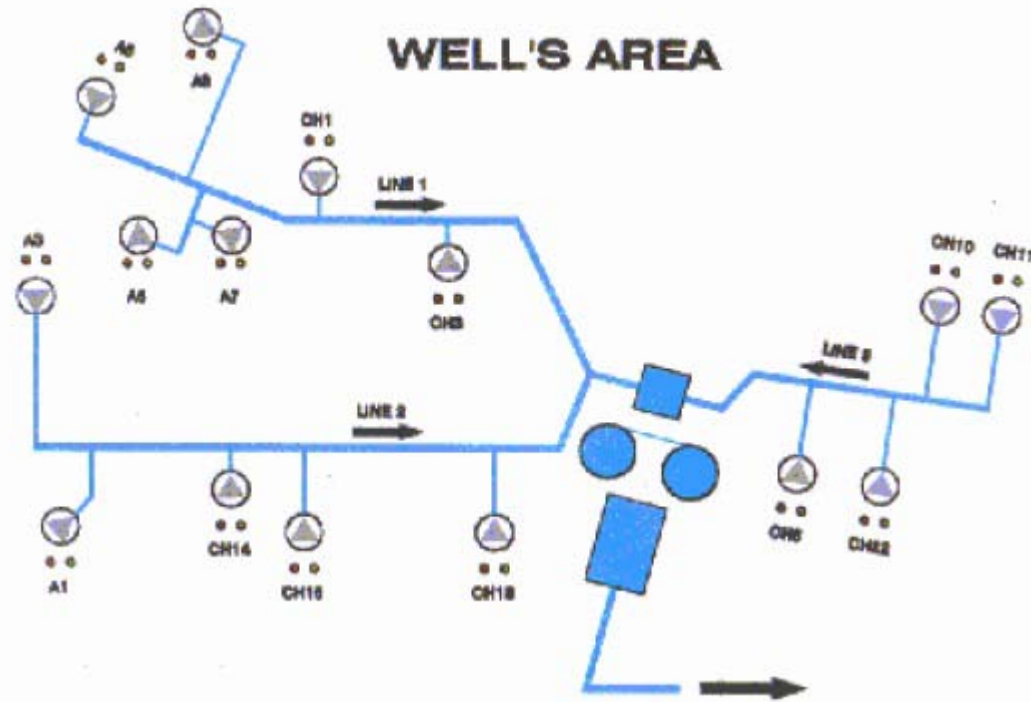


Fig.1 shows the schematic representing the well field.

At each well submersible motor pump rated 250 H.P is fitted to deliver water to two under ground reservoir tanks located at central location. The central location located near by the center of the well field. At the central location eight pumps rated 450 H.P each, has been installed in order to operate in sequence to fulfill the city needs of water. A schematic of the two reservoirs tanks and the associated pump arrangement connected with the inlet of the city water network is shown in Fig. 2.

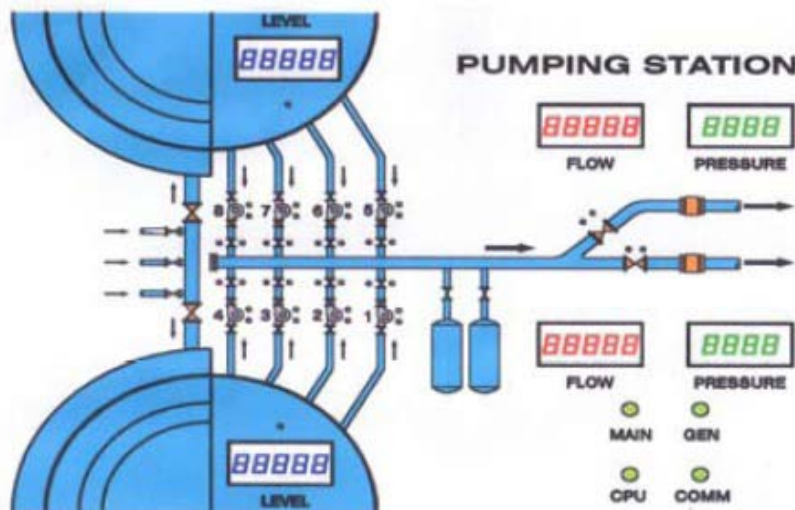


Fig. 2 shows schematic representing the pump arrangement connected with the inlet of the city water network.

At the present time since there are no surface water sources therefore, this is a non-filtered system. The water is pumped from the wells through small flow monitoring and control facilities where any necessary chemicals such as chlorine are added based on flow pacing. As the fresh water is pumped directly into the distribution system at a flow rate above the usage rate, the reservoir tanks fill up. The reservoir tanks provide the necessary volume of water during certain periods when the usage rate is greater than the incoming flow from the wells.

### SCADA SYSTEM ARCHITECTURE AND SYSTEM COMPONENT

Wide area SCADA systems provide a means of remotely monitoring events and controlling systems at unattended locations. To accomplish this task, as in any system design, various disparate components must be integrated. In this case they include: sensors and metering devices, motor controls, programmable logic controllers, a communications network to link it all together, a host computer and HMI software. Fig.3 shows the typical SCADA System architecture.

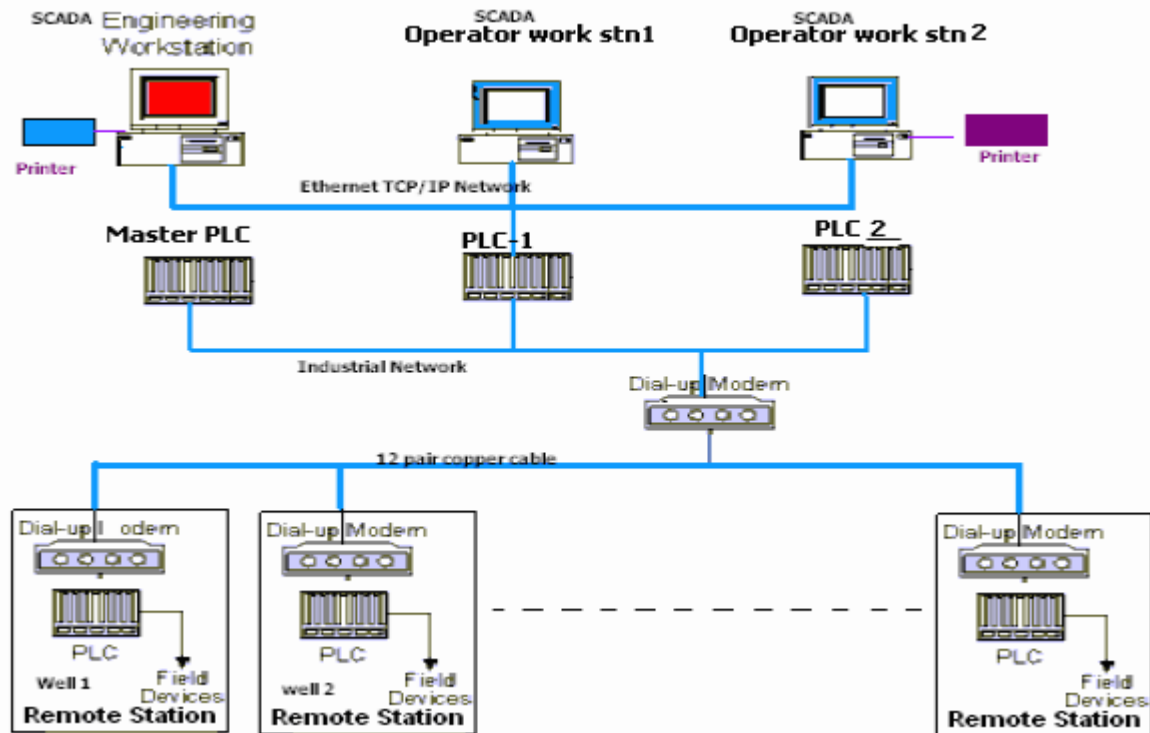


Fig. 3 Schematic of SCADA System Architecture



The SCADA system consists of networked client-server architecture with a main control centre located at a master station. The master station located near by the center of the well field. Operator interface equipment is located at each of the fifteen pumping sites as well as at the central location eight pumps.

RTU's, Motor Operated Valves, and instrumentation are located at all well sites, The system is composed of the following essential components:

- One Master Panel includes Master Terminal Unit (MTU) and two PLC's
- Fifteen Remote Terminal Units (RTU's) located at well pumps, and Eight RTU's located at central

Pumps. The RTU's interfaced to field sensing devices such as level transmitters, flow transmitters,

Electrical power consumption meters, pressure meters, valve position transmitters, as well as to local control switchboxes.

- Variable frequency drive (VDF) for each motor pump interfaced to the associated RTU.
- Communication equipment and SCADA software.
- Mimic panel through the SCADA software

Data transfer from the MTU to the remote well RTU's is accomplished via private cables. Because of the distance and location of some of the remote SCADA sites, repeaters were required to improve the communications path. Two central host Industrial Computers are used as operator workstations. They provided Human Machine Interface (HMI) for monitoring the system and entering parameters such as level set points for pumping operations and alarm limits. Printers connected to the PC provide alarm logging and process reports. The computers process the information received from and sent to the RTU sites and present it to human operators in a form that the operators can work with. The RTU panels contain PLC equipment for monitoring the tank levels and controlling the chemical feed and pumping operations. Each RTU panel also contains an operator interface keypad display unit for entering operating parameters if local control becomes necessary. The central processing unit within the RTU receives a data stream via hardware equipment protocol. When the RTU sees its specific address embedded in the protocol, data is interpreted and the CPU directs the specified action to take. The RTU's provided remote programmable functionality while retaining the communications capability of an RTU.

The main functions of the RTU's are a local monitor of system parameters and to telemeter these local data to the master control station, to perform remote manual open-loop control on command from the master station. Also, it performs local closed-loop automatic level control for the reservoir tank sites. The software installed at each RTU provides interfacing between the master control station, the RTU, and the control equipment at each site. The software incorporate suitable control algorithms (controllers) using local feedback data for intelligent control of pump [1].

## PROJECT DESCRIPTION

When it was decided to install a PC based SCADA system to increase in labor productivity, system reliability and maintenance cost. The Project specifications have been requested for sequential control and monitor of 15 well pumps, 8 central pumps as well as some pipeline valves remotely from master pumping station. Also, each pump should have a local control facility. The operation of each pump will be done according to the water level in the reservoir tanks as well as the current need of city. The system hardware selected is based on standardized, reliable, user-friendly, and modern technology.

The SCADA system has been designed to accomplish the following tasks:

- Measure signals with the installed sensors.
- Log, present and record them.
- Intelligently control and manipulate the events of the pumps.

## HMI GRAPHICAL DESIGNS

In order to help the control-center operators monitor the water supply system in an efficient way, we designed graphical displays for the SCADA system with links to process variables. By moving the mouse pointer to the system layout, any of the well site components and parameters will be displayed on the screen showing the actual real-time operating conditions. Parameter values at the cursor position can be displayed. From this display, the user can get into the details of the specific site parameters that to be real time or historically trended in a chart that can be predefined or defined on-line. Alarm handling is based on limit and status defined by the SCADA operators.

It was decided to install the SCADA system with the appropriate hardware, with extra advanced automation feature for the motor pumps. Since energy consumed by the motor pumps is the largest and most variable cost for the water supply system, efficient motor control strategies can address energy scarcity. Our main target was to implement a intelligent control strategy through SCADA systems in order to operate the motor pumps effectively and conserve their operating energy.

# INTELLIGENT PUMP CONTROL DEVELOPMENT

## FUZZY LOGIC APPROACH

Fuzzy logic is a valuable engineering tool because it does a good job of trading off between significance and precision [2]. It is a tool to deal with uncertain, imprecise, or qualitative decision-making problems. Recently, fuzzy logic has been greatly increased in the industrial applications. The most successful applications have been developed in the control systems area [2-3]. Fuzzy logic is therefore an attractive technique for the control of plants that are ill-defined or non-linear system. The design methodology of the fuzzy controller involves utilization of human expert knowledge to construct a set of rules that can be used to control the system. This is a major advantage. However, one of the main drawbacks of fuzzy controller is a large amount of parameters to be tuned [3].

## INDUCTION MOTOR FIELD-ORIENTED CONTROL OVERVIEW

- When it is required to operate the induction motor at relatively high speeds, due to the drive Voltages limits, the motor may fail to reach the required speed without reducing the flux set point to smaller values.
- The input power to the induction motor can be changed by changing the motor flux set point at the same speed and load torque.
- Furthermore, improper excitation current may lead to under excitation or magnetic saturation. This may lead to reduction in torque generating capability and the stator current drawn may increase for the same load conditions and thus the efficiency may be reduced.
- Many authors has been investigating the issue in theoretical and with simulation approved but yet we got no information about the implementation. We may claim that this is the first implementation of such a system. Then, the main goal is to improve the efficiency and the operation characteristics of the motor pump integrated with field oriented vector control drives. This is realized by providing a way to:

1-Minimize the input power to the drive system.

2-Making the drive capable of reaching the high-speed set points with the drive voltages limits constrains.

## CONCLUSION

The supervisory control system has been installed at the control center at the master station. It is able to provide both manual and automatic control capabilities for well submersible motor pumps, and master station pumps. The primary objectives are to meet the delivery needs of the water users with a high efficiency as well as to provide remote intelligent pump controls. To achieve these purposes, the supervisory control system should be able to achieve target discharges and water levels within reasonable limits as well as optimizing the motor efficiency and utilizing better performance of the motor pumps. Keeping in view, the absence of a serious attempt of designing and implementing powerful controllers that works as a part of SCADA system and makes it more attractive to the customers and utilities. The developed intelligent pump controller makes a significant contribution in terms of the energy consumed by the motor pumps. The site operation has been confirmed the performance and effectiveness of the designed intelligent pump controller.

## Control Panels Projects

- Observation panel for Mansoura water station through IEEE.
- Observation panel for Zagazeeg water station.
- Filter control desk for Alex. Water treatment.
- Control panel for El Amerya Airport.
- Filter control desk for El Giza water treatment plant.
- Filter control desk for El Rouda water treatment plant.
- **Control panel for Talo-Filtrate stations for the following factories :**
  - Nag Hamadi sugar plant.
  - Deshna sugar plant.
  - Abu Kourkas sugar plant.
  - Edfu sugar plant.
  - Gerga sugar plant.
- **Boilers control panel for the following factories :**
  - Nag Hamadi sugar plant.
  - Kom Ombo sugar plant.
  - Armant sugar plant.
- **Control panel steam reducing and desuperheating, concerning the vapour pressure station for the following factories :**
  - Dekahlia sugar plant.
  - El Fayoum sugar plant.

- **Control panel for boiler water treatment plant for Edfu pulp & paper factory**
- **Control panel for Edfu pulp & paper factory cooking instruments**
- **Control panels for squeezing Automation for the following plants :**
  - Kous sugar plant.
  - Kom Ombo sugar plant.

**This is addition to our role in the design of control panel, which is directly assigned by our representative abroad :**

- Alexandria Carbon black (Filters control panels, concerning packing stations).
- El Nasr Petroleum Co. Suez (Control panel concerning Distillation oven No.3).
- Misr Aluminum Co. for Kalciner unit project.

## **Manufacturing Program**

### **Electrical Switch Boards:**

- M.V Distribution panels, 12-24 KV.
- Low voltage panels, 380 V.
- Process control panels.

### **Kiosks for Transformers:**

- Compact substation up to 24 KV, 2000 KVA.

### **Ring main Units:**

- Up to 24 Kv.

### **On-Load break switches:**

- Up to 24 KV, 630 A.

### **No-Load break switches:**

- Up to 24 KV, 400 A.

### **Circuit breakers:**

- Up to 36 KV, SF6 & Vacuum.

### **Non directional protection relays:**

- Over current, short circuit, earth leakage.
- Digital Micro processor based.

### **Current Transformers & Potential Transformers:**

- Up to 24 KV.
- Different burdens & Accessories.

## Kiosk & Ring Main Unit

- Sadat City – 1<sup>st</sup> Phase. (Quantity – 22)
- Sadat City – 2<sup>nd</sup> phase. (Quantity – 17)
- Sadat City – 3<sup>rd</sup> Residential Area. (Quantity – 21)
- Sadat City – 4<sup>th</sup> Residential Area. (Quantity – 19)
- New Dowmiat City. (Quantity – 47)
- Sadat City – 7<sup>th</sup> & 8<sup>th</sup> Residential Area. (Quantity – 26)
- 10<sup>th</sup> of Ramadan – El Canal Distribution Co. (Quantity – 40)
- West Noubaria – El Behera. (Quantity – 9)
- Sadat City – 10<sup>th</sup> Residential Area. (Quantity – 18)
- Sadat City 13<sup>th</sup> Residential Area. (Quantity – 20)
- Sadat City – Wells Area. (Quantity – 17)
- Behera Electric Distribution Co. (Quantity – 26)
- North Sinai – El Canal & Sinai Co. (Quantity – 12)
- El Obour City. (Quantity – 8)
- General Land Reclamation. (Quantity – 14)
- Sadat City – 11<sup>th</sup> Residential Area. (Quantity – 8)
- Ring Main Unit – North Delta Electric Distribution Co. (Quantity – 60)
- Ring Main Unit – El Behera Electric Distribution Co. (Quantity – 80)
- Kiosk (100/200/300/800 KVA) Upper Egypt Electric Disc. Co. (Quantity – 38)



## Low Tension Switchboards "Ministry of Electricity Authority"

| Quantity | PROJECT   |
|----------|---|
| 202      | 10 <sup>th</sup> of Ramadan                                     |
| 211      | Sadat City – 5 <sup>th</sup> Residential Area                   |
| 140      | New Amreya City   |
| 149      | Sadat City – 7 <sup>th</sup> & 8 <sup>th</sup> Residential Area |
| 116      | Sadat City – 3 <sup>rd</sup> & 4 <sup>th</sup> Residential Area |
| 85       | Sadat City – 10 <sup>th</sup> Residential Area                  |
| 144      | Bani Sweif  |
| 140      | El Kanater Shark – ARAB Contractors                             |
| 63       | El Noubaria Pump Station  |
| 53       | Sina Developing Organization                                    |
| 11       | Mansoura Water Treatment Plants Panels                          |
| 11       | Suez Co. Operating Pump Station                                 |
| 6        | Bahr El Bakar Pump Station                                      |
| 408      | Wadi El Naqra Pump Panels                                       |
| 150      | Iraq Panels (Through Al Wayler Farid Co.)                       |
| 635      | Panels for Pumps Operating - GEMECO                             |

## Medium Voltage Switchboards (Up to 24 KV)

| Quantity | PROJECT  |
|----------|--|
| 1        | Mansoura Water Station   |
| 1        | Zagazeeg Water Station   |
| 1        | Fakous Water Station   |
| 6        | Bahr El Bakar Pump Station                                     |
| 1        | Serum & Vaccine Lab  |
| 1        | King Faisel Sewage Station                                     |
| 1        | Suez Co. Operation Station                                     |
| 1        | Egyptian Japanese Co.  |
| 1        | Kahramana Village  |
| 1        | Queen Sharm  |
| 7        | Land Reclamation Pump Station ( El Behera )                    |
| 1        | Kafr El Mansoura Sewage Station                                |
| 1        | Sadat City Zone 13 <sup>th</sup>                               |
| 1        | Esna Water Treatment Plant (N.O.P.W.A.S.D)                     |
| 1        | Aswan Water Pumping Station (N.O.P.W.A.S.D)                    |
| 2        | Kafr El Zayat Water Pumping Station (N.O.P.W.A.S.D)            |
| 1        | Sharq El Tafrea Water Pumping Station                          |
| 5        | El Hawamdia Pumping & Drainage Station (supply & installation) |
| 1        | M.T Switchboard 22KV (6 Panels) for Arab Contractors           |
| 1        | Engine Operation 6.6KV for Egyptian Carbonate Co.              |

## Water Sector Projects

1. Supply, Erection, Testing and commissioning the electromechanical equipment for El Mansoura water treatment plant (National Organization for potable water & Sanitary drainage) as following :  
  
(Filter house – Clariflocculators – Chlorine house – Raw water pumps – Underground reservoir – Sludge house – Workshop machinery).
2. Supply, Erection, Testing and Commissioning the electromechanical equipment for 20 filters at El Roda water treatment plant (Cairo water General Authority).
3. Supply and Erection of water treatment station of Movinpick Hotel, Sharm El Shiekh.
4. Supply and Erection of El Fayoum station filters.
5. Supply and Erection of electromechanical works, Hurghada Port.
6. Supply, Erection, Testing and commissioning the electromechanical equipment for 16 filters at Giza water treatment plant (Cairo water General Authority).
7. Supply, Erection, Testing and commissioning the electromechanical equipment for El Zagazeeg water treatment plant (National Organization for Potable water and Sanitary Drainage).
8. Supply, Erection, Testing and commissioning the electromechanical equipment for El Azab water treatment plant (Alexandria water general Authority).
9. Supply and Erection of the water treatment station for Golf project, Kattamia –Cairo.
10. Raman water station extending.
11. Supply, Erection, Testing and commissioning the electromechanical equipment for 4 filters at Kous water treatment plant (National Organization for Potable water and Sanitary Drainage).
12. Carrying out El-Barameter project at El Sadat City (Utilities and Electrecity).
13. Supply, Erection, Testing and commissioning the electromechanical equipment for Kafr El Zayat Sanitary Drainage plant.
14. Supply, Erection, Testing and commissioning the electromechanical equipment for Sharq El Tafrea water booster station consists of four pumps (300 L/S), two underground reservoir and two high tanks to supply water to industrial zone in Shark El Tafrea.

## Electromechanical Equipment

- Filter control desks for El Rodah water station.
- Filter control desks for Alexandria water station.
- Low tension switchboard & control panel for Mansoura water station.
- Diesel engines for El Mansoura water station.
- Electric distribution panel for Fouh water station.
- Electric distribution panel for Fakous boosting water station.
- Valves and control instrumentation for El Menya water station.
- Kiosks & electric distribution panels for El Sadat city.
- Flow measurement instrumentation for El Tal El Kebeer boosting station.
- Low tension switchboards & control panels for Zagazeeg water station.
- Valves for El Kantarah water line – Port Said 150mm.
- Butterfly valves for El Obour water network.
- Pneumatic gate valves for Banha water station.
- Control instruments for El Shrouk city tank.
- Control instruments for El Obour line.
- Kiosks, Transformers, and Electric distribution panels for El Rehab sewage boosting station.
- Pneumatic butterfly valves and non return valves for Sheraton boosting station.
- Instrumentation valves for Belbees boosting station.
- Non return and butterfly valves for 6<sup>th</sup> October tourist village utilities.
- Gate valves for Borg El Arab Residential Area.

## CONTRACTING

1. Supply and Erection of the electricity distribution network, Kattamya Golf Club.
2. Supply and Erection of the water treatment station for Golf project, Kattamya.
3. Supply and Erection the complete substation Vaccine lab.
4. Sadat City parameter road & utilities.
5. Ramadan water station extending.
6. Supply and Erection of Giza station filters.
7. Supply and Erection of El Roda station filters.
8. Supply and Erection of El Fayoum station filters.
9. The erection of Calcic factory in Torah Cement Co.
10. Supply and Erection of electromechanical works, Hurghada Airport.
11. Supply and Erection of electric works and station, Nowaibaa Port.
12. Supply and Erection of Electric works and station of El Sauadeen Village.