

Project brief

## Freelance

Never lose another drop of water with Freelance distributed control system



### Water is the new gold

The water cycle is often cited as an example of a self-sustaining and self-replenishing natural phenomenon. Nevertheless, the ready availability of clean water should not be taken for granted.

As the world's population continues to increase, the pressure on water resources also escalates. The problem is exacerbated by the disproportionate geographic distribution of water as well as by climate change.

For nearly 50 years, ABB has been equipping thousands of water treatment facilities, providing expertise and solutions for all activities related to the water life cycle, from water intake to reintroduction into the environment.

### EMCO triumphs in the Middle East

In late 2011, the EMCO group successfully completed the commissioning of one of the most sophisticated reverse osmosis (RO) desalination projects by a Middle Eastern refinery company using Freelance — the distributed control system for process industries. The plant was set up to meet the most stringent and current water and oil industry standards, and executed within a short time frame under very difficult environmental conditions. The RO plant treats brackish water using RO to produce a highly purified water stream for refinery industrial use.

Natural osmosis, takes place when water naturally moves through a membrane from an area of low solute concentration to an area of high solute concentration. This natural tendency to equalize solute concentrations on each side of the

membrane generates osmotic pressure. In RO, the feed water is elevated to the required pressure to pass through a semi-permeable membrane, during which 97-99.9% of total dissolved solids are filtered out while the stream that permeates through the membrane is purified.

This RO project's capacity is 510 m<sup>3</sup>/h with a pre-treatment filtration unit capacity of 1000 m<sup>3</sup>/h. Worth USD18 million, the project had 2 main scopes. The first scope was civil works completed by another engineering company and the second was technological works designed and executed by EMCO.

**EMCO: An ABB Authorized Value Provider**

EMCO, a water solutions company with roots in the United States, expanded to the Middle East over 35 years ago offering engineering design, production facilities, project management, installation, operations, maintenance and after-sales support services.

From package type plants with quick and easy installation, to municipal plants delivering millions of gallons of water every day, EMCO designs and deploys water and wastewater treatment systems to suit multiple market sectors.

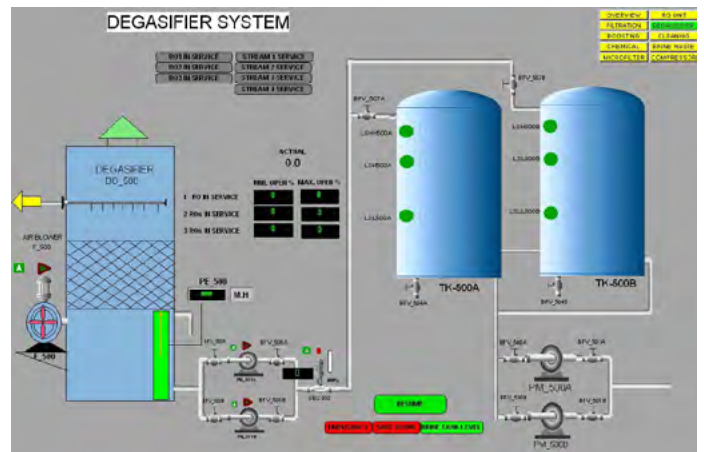
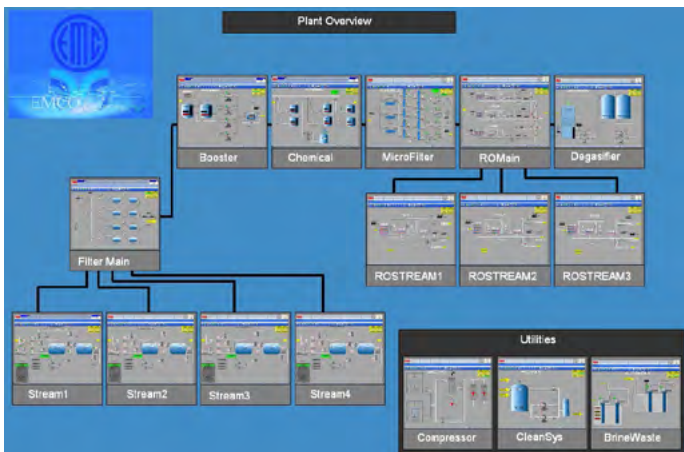
EMCO is also the first channel partner worldwide to be recognized under the ABB Value Provider Program for the Control Technologies business unit.

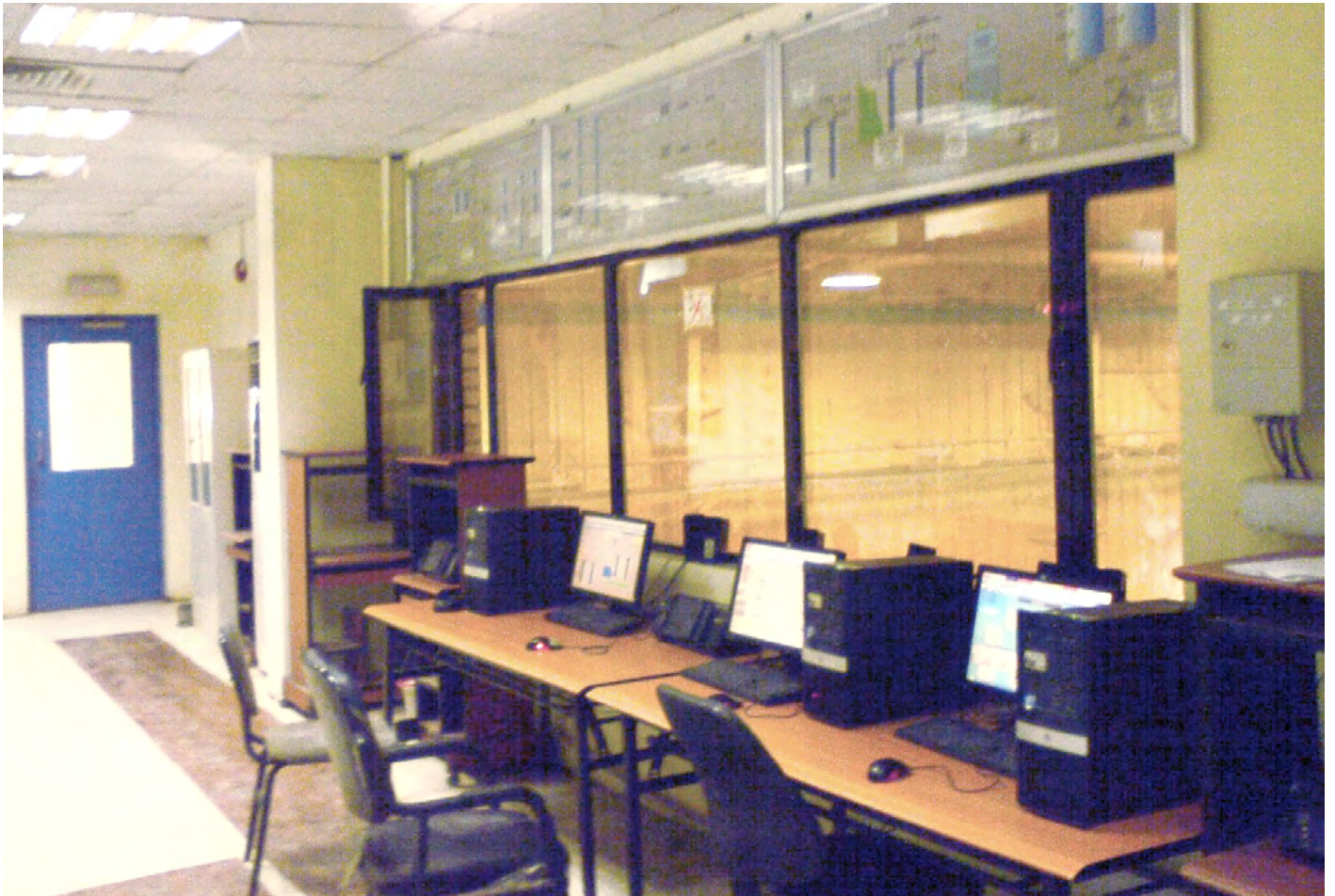
**The partnership between ABB and EMCO, in addition to the trust ABB has put in EMCO, reinforces EMCO's leading position in automation field of the entire water and wastewater treatment industry. This partnership will open new doors for both ABB and EMCO.**

**-- Mr. Salim Shalhoub  
Chairman and CEO, EMCO Group**

**Benefits**

ABB was chosen for this project for a number of reasons. Decades of experience of both ABB and EMCO ensured that the project is executed according to the highest industry standards. All electrical and control components were procured from one source – ABB. The end result: the customer is able to enhance water productivity – without a single drop of water being lost.





The Freelance DCS was used to automate the entire plant, fulfilling the following rigorous customer requirements:

- Redundancy
- CPU, Profibus and Ethernet communication redundancy
- Easy-to-use engineering features
- One software for programming, configuration, graphical display
- One shared database
- Ready-made faceplates
- Wide range of ready-made function blocks
- Easy diagnostics and extended troubleshooting capabilities
- Built-in modules, CPUs and communication diagnostics
- Ready -made system communication
- Communication with ABB VFD using Profibus
- Simplicity — a matter of parameters assignment
- Competitive pricing

Apart from the DCS solution, ABB also provided operator training, engineering training, technical and sales support.

**“When we set out to select an automation solution for this project, our main goal was to find the right solution to meet our client’s requirement of having a robust, redundant and flexible system that would allow for exceptionally easy operation. Additionally, the system would feature optimal functionality and reporting capacity to properly monitor and optimize plant operations in order to ensure efficient treatment and the most efficient conversion of complex and scarce raw water into vital, high purity treated water. The Freelance system met those precise requirements and perfectly complemented our system design to achieve that result.”**

**-- Wael Shalhoub  
EMCO’s Operations Manager**

## ABB’ supply

The Freelance DCS is comprised of:

- 2 Redundant Controllers (AC 800F)
- 500 I/O channels (S800L)
- 3 Operator Stations (DigiVis)
- 1 Engineering Station (CBF)

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