



Seawater Desalination Plant Valdelentisco, Spain

Totally Integrated Automation in Europe's largest
Seawater Desalination Plant



The requirements

In January 2008 Europe's largest seawater desalination plant was completed in Valdelentisco, located in the south of Spain between Mazarrón and Cartagena. The project was facilitated by the program A.G.U.A of the Spanish Ministry of Environment and will contribute to ensuring the drinking water supply and the agricultural irrigation in the constantly water scarce region.

One of the requirements for the plant was the application of significantly less chemicals for the pre-treatment of seawater than in established plants. Furthermore a full automated operation with a maximum in process security and availability has to guarantee the highest possible supply security. In addition, with comprehen-

sive research projects a reduction of the energy required for seawater desalination of up to 30% and thus a cost reduction for the produced water of up to 15% should be achieved.

The solution

The plant operates according to the Totally Integrated Automation principle. The automation of all processes from the seawater pre-treatment up to reverse osmosis is done by the process control system SIMATIC PCS7. All essential system components have been consistently laid-out redundantly. This applies for the servers as well as for all controllers of the AS417-4H line and the PROFIBUS connection of the field instrumentation via the SIMATIC ET200M distributed I/O.

Water and Wastewater

Answers for industry.

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The operator

Aguas de la Cuenca del Segura S.A
(Spanish state-owned enterprise)

The system in brief

Europe's largest seawater desalination plant in Valdelentisco, Spain, was completed in the beginning of 2008.

The plant is a fundamental part for the reliable water management in the region

- Two production lines
- Current capacity of 145,000 m³/d (32 MIGD); expansion possible to 200,000 m³/d (44 MIGD)
- Reverse-Osmosis-Process
- Highly-available process through a consistent redundant automation system

The system integrator

A Joint Venture of Grupo Ferrovial (www.ferrovial.com) and Cadagua (www.cadagua.es)



Products installed

- Process Control System SIMATIC PCS7 with 5 redundant AS417-4H controllers and 73 SIMATIC ET200M (distributed I/O)
- Redundant PROFIBUS with FO cabling
- 24 Flow-, 40 Pressure-, 8 Level- and 8 Temperature-meters from the SITRANS product family
- SIMATIC PDM configuration software
- 6 H-Compact medium voltage motors for high pressure pumps (1,5 MW)
- 14 SINAMICS G150 frequency converters
- 30 MICROMASTER MM440 frequency converters
- 9 UPS SITOP power supplies
- 71 network analyzers and 34 motor protection relays

Advantages at a glance

- A maximum supply security through complete hard- and software redundancy
- Operational efficiency through transparency on all plant levels
- Efficient engineering through centralized configuration of all actuators and sensors with SIMATIC PDM
- Reduction of energy costs through tailored pumping with SINAMICS and MICROMASTER frequency converters

Access to all process data via the internet is possible through the SIMATIC PCS7 Web Navigator. An engineering station in the control room permits the centralized configuration of all field devices (process instrumentation from the SITRANS product family and frequency converters) via the SIMATIC PDM configuration software. The high efficient H-Compact motors and the installed frequency converters of the SINAMICS and MICROMASTER lines are a major contribution to the operational efficiency of the plant. With these frequency converters an energy reduction of up to 40% can be achieved compared to fixed-speed drives.

The benefits

The seawater desalination plant in Valdelentisco is a fundamental factor of a sustainable and efficient use of the resource water. For the largest and most modern plant the operator Aguas de la Cuenca del Segura S.A. received an automation system which secured maximum availability and virtually excludes any plant downtime. The redundant automation system SIMATIC PCS7 with its TIA philosophy not only provides a maximum of process security and plant availability, but also continuous transparency of the complete process with consistent information regarding all process parameters up to the single field device or drive.

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