



# OPERATION AND MAINTENANCE OF WASTE WATER TREATMENT PLANTS

Within the hydraulic infrastructure business sector, SICE provides engineering, construction, conservation, operation and maintenance services, as well as other highly qualified services resulting from its extensive knowledge of these systems and long-lasting presence on these markets. Its activity is based on the Integral Water Cycle, including collection, treatment, purification and reuse of water, before finally returning it to its natural environment.

SICE focuses its activity on everything from major infrastructure, such as dams or distribution and irrigation channels, to urban ornamental fountains, as well as water supply systems (drinking water treatment plants, piping), sewerage (waste water treatment plants, collectors, drains, reuse of effluent) and desalination.

SICE works in the following two areas of activity in the sewerage and purification sector: Operation and maintenance as well as infrastructure execution.

As with services provided to the supply sector, the first area of activity includes staff management, ordinary and specialized maintenance, system operation, energy management and optimization of consumption, waste management, analytical control, etc.

## OBJECTIVES

In waste water treatment, SICE always offers performance in accordance with current applicable Legislation with the minimum financial and social costs and minor environmental impact.

The work that makes up the running of a Waste Water Treatment Plant (WWTP) can be classified into two sections:

- **System operation:** Different works to manage installation through an understanding of the parameter values which define the status of different treatment processes.
- **Maintenance of the infrastructure:** Ensuring the condition and operation of equipment and facilities which allows treatment with the inflow parameters determined by Legislation.

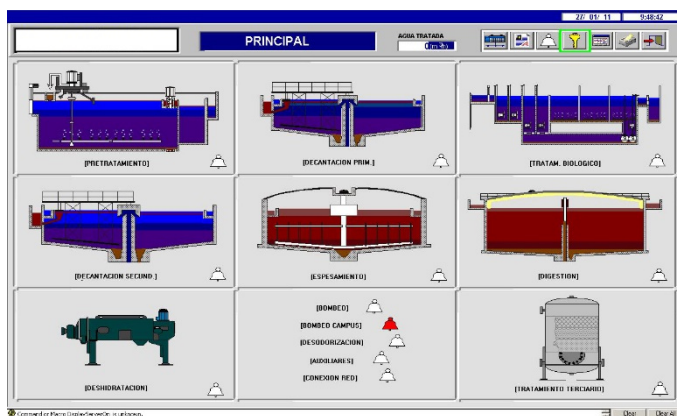


## OPERATION AND CONTROL SERVICES

### Operation and control of processes

Operational calculations which are theoretical calculations of the working conditions required to compare deviation with actual operations.

- Performance: Ratio (%) between the input and output quantity for any inflow parameter
- Hours of operation of the equipment
- Waste production ratios relative to treated volume (daily, monthly)
- Electrical and reagent consumption ratios relative to treated volume (daily, monthly)
- Hydraulic operation parameters: Tank retention times
- Biological process operational parameters: mass load, volumetric load, sludge age, oxygen required, Molhmann Index (IVF-30), bulking, foaming, etc.



### Waste management

Identification, segregated storage, removal by an authorized manager, production control, etc.

### Consumption Management

Optimization of electrical consumption (analysis and optimization of electricity tariffs)

### Consumption historian data

Control of reagents: (control of consumption, optimization of dosing, analysis to use new reagents, ratios, etc.

### Risk Prevention

Risk assessment, training, PPE, medical surveillance, coordination, working protocols, etc.

### Administrative Management

Invoicing, orders, certifications, etc.

## MAINTENANCE SERVICES

SICE offers a comprehensive maintenance solution for all facilities, including:

**Preventive Electromechanical Maintenance:** All operations that are carried out to maintain electrical and mechanical equipment in order to avoid breakdowns and stoppages, reduce corrective maintenance costs and process shutdowns.

**Predictive Electromechanical Maintenance:** Operations to control the condition of equipment operations in order to predict breakdowns and carry out a rapid repair following a failure. It is based on the ongoing understanding of the condition and operation of the facilities.

**Corrective Electromechanical Maintenance:** Work to repair equipment, to detect an anomaly or stoppage of equipment and to return it to normal operations.

**Metrological Maintenance:** Regular calibration and adjustments to continuous measurement equipment and facilities' instrumentation. Requires a high level of specialization (sensors, flowmeters, etc.)

**Regulatory Maintenance:** To comply with current regulation for specific equipment, carried out by specialist and authorized companies (HV, LVP, etc.)

**Specialized Maintenance:** Maintenance of certain types of machinery and systems which due to their complexity or being subject to special regulations require maintenance by specialized companies.

**Analytical control:** Understanding the parameter values for process waste water (influent, effluent, out-fall, sludge, etc.).

**Upkeep:** Upkeep of facilities includes all the work required to maintain equipment, civil works, buildings and the remainder of facilities in an adequate state (painting, leaks, carpentry, gardening, rat extermination, etc.).

