



ADVANCED DATA MANAGEMENT FOR THE OPTIMUM OPERATION AND CONTROL OF WASTEWATER TREATMENT PLANTS

The EU-funded DIAMOND project was established to enhance 'Wastewater treatment plant' (WWTP) operations through efficient and intelligent management and the use of all available plant data at every moment. This was achieved through the development of strategies for plant data management, process performance monitoring and automatic control.

Nowadays, several software tools are used to facilitate decision making in the day-to-day operation of WWTPs, helping to maintain them at an optimum level. The information used comes from various sources, including online sensors and analysers, laboratory tests, meteorology data and manually collected data. Thus, complex decisions must be made based on a large number of variables which are provided in different formats. Successful operation depends on the reliability and completeness of collected data, plus the quality of the information extracted and its accessibility.

The team in the DIAMOND (Advanced data management and informatics for the optimum operation and control of wastewater treatment plants) project worked to address the problems associated with WWTPs by centralising the process data acquired from the different sources and ensuring effective data processing to detect faulty sensor data. This improved data is then feed into tools focused on the operational optimisation of the plant.

For the first step, the DIAMOND project partners developed an advanced online data pre-processing tool and an 'Advanced data management' (ADAM) tool to ensure the provision of high-quality data. This tool facilitates the straightforward connection and implementation of advanced process monitoring and control systems, enabling the optimisation of WWTP operations globally.

The ADAM tool, which is at the core of the project, has three main objectives: to store, in a standard way, all of the information related to plant status in a

central unique database, to validate the stored data and to synthesis new useful information related to plant status such as plant-wide key performance indicators. ADAM, together with another central tool, the advanced monitoring system, has been validated at full-scale at the Mekolalde WWTP in Spain.

Project partner Gipuzkoako Urak (Consortio de Aguas de Gipuzkoa) is one of the end-user project partners and has been involved in the validation of ADAM and the advanced monitoring system at Mekolalde WWTP. The CAG team says that both systems are helping them to centralise all the experimental data that was previously scattered across many different programmes and generated by many different data sources. Aitor Irizar, manager of the Mekolalde plant noted, 'The systems are allowing us to improve data management and to have new useful information that was not available before. The automatic generation of new information means that we are now spending less time on processing plant data. Now we can spend much more time analysing the information and so the systems are allowing us to draw better conclusions.'

The DIAMOND project team also examined the design, development and implementation of two advanced plant operation systems based on the information provided by the ADAM tool. The first was an advanced monitoring system of plant-wide key performance indicators; the second was an advanced control system based on plant-wide control algorithms that optimises plant operations according to economic and environmental criteria.

DIAMOND outcomes will help WWTPs to improve operations, minimise waste (thereby protecting water quality) and reduce energy consumption. In addition, the knowledge gained will make Europe a leader in sustainable wastewater treatment processes.

DIAMOND

- ★ Coordinated by MSI Grupo in Spain.
- ★ Funded under FP7-SME.
- ★ http://cordis.europa.eu/result/rcn/152075_en.html
- ★ Project website: <http://www.diamond-eu.org/>
- ★ <http://bit.ly/1SpqvHu>

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